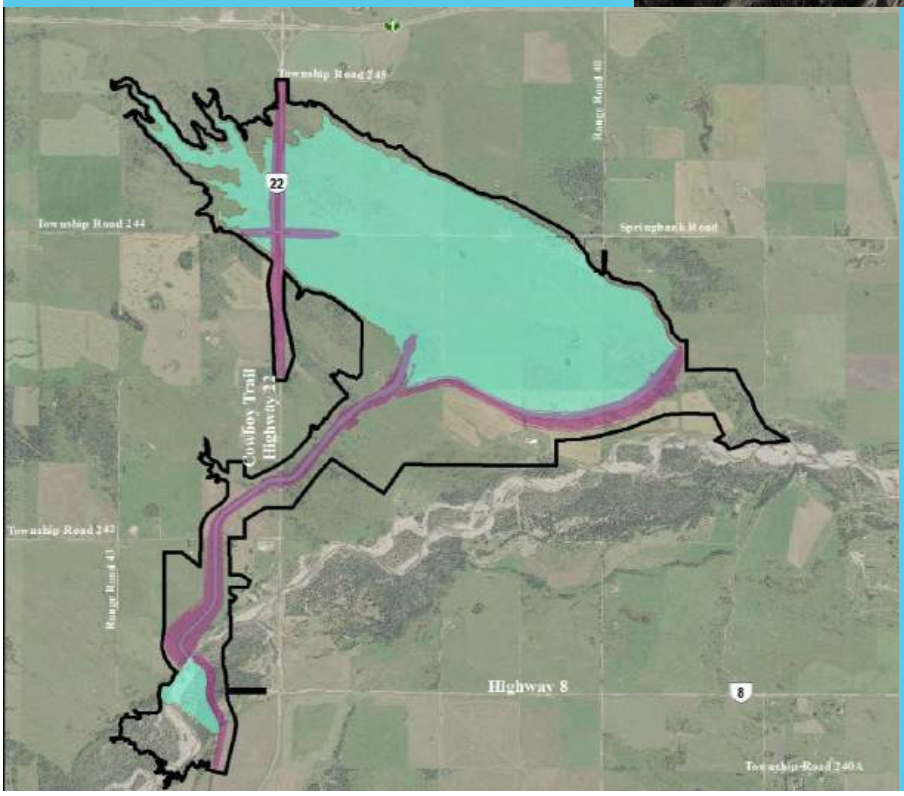
Springbank Off-stream Reservoir Project





Impact Assessment Agency of Canada Annual Report - 2023/2024 Reporting Year

October 2024

Alberta Transportation and Economic Corridors

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Executive Summary

The Springbank Off-stream Reservoir Project (the Project; SR1) is a flood mitigation Project under construction to help reduce the effects of future extreme floods on infrastructure, water courses and people in the City of Calgary and downstream communities. The Project is located approximately 15 kilometres (km) west of Calgary in Rocky View County.

Alberta Transportation and Economic Corridors (TEC) received the Impact Assessment Agency of Canada (IAAC) Decision Statement in July 2021 and the Natural Resources Conservation Board (NRCB) Approval in October 2021. TEC holds all approvals for the Project until construction completion, thereafter approvals will transfer to Alberta Agriculture and Irrigation (AGI) for operation and maintenance. In addition to the IAAC Decision Statement and NRCB approvals, TEC obtained all required Provincial and Federal approvals and authorizations prior to the start of construction activities with the exception of temporary construction approvals/permits being obtained by the contractor as needed.

TEC is committed to constructing SR1 in accordance with all regulatory approvals, ongoing communications with Indigenous groups, local landowners, and stakeholders. This report comprises a summary of construction activities and environmental monitoring completed during the 2023/2024 reporting year (July 1, 2023, to June 30, 2024) as it pertains to the IAAC approval conditions.

Construction Activities during 2023/2024 Reporting Year

During the 2023/2024 annual reporting year, construction activities continued at the inlet channel at the Elbow River, excavation of the Diversion Channel, excavation of the approach channel and exit channel of the low-level outlet structure, fill placement at the dam, and the completion of roadwork at Township 242 (bridge), Highway 22 (bridge) and the Highway 22 grade raise.

Environmental Management and Mitigation

To manage impacts to the surrounding environment as a result of construction activities, best management practices were implemented and adhered to provincial and federal requirements. Sediment and erosion control measures were installed in Project construction areas that were most sensitive to construction activities (e.g., adjacent to Elbow River, wetlands). These were and continue to be routinely inspected and replaced or augmented as necessary.

Water

Two Sondes were installed the previous reporting year (one each at an upstream location and downstream location of the Project) to collect continuous turbidity samples between July 2023 to June, 2024.

The Elbow River turbidity monitoring sondes were occasionally affected by measurement errors, which resulted in zero reading by the sondes. These zero values have been removed from the result graphs presented below. Continuous data collection was halted during sonde maintenance and repair as follows:

- Upstream sonde: December 15, 2023 to January 9, 2024
- Downstream sonde: September 27, 2023 to October 2, 2023
- Downstream sonde: October 13, 2023 to November 1, 2023
- Downstream sonde: November 14, 2023 to December 15, 2023

Manual samples were collected during sonde maintenance and repair. Turbidity measurements by the sondes is higher than manual turbidity measurements due to shallow water in the Elbow River and fouling of the sensors due to turbidity near the substrate. Manual measurements are considered to be a more accurate representation of the Elbow River turbidity.

TSS concentrations were relatively high during several events in spring and summer 2024 both at the upstream and the downstream monitoring locations; however, it was likely related to sonde malfunctions and ice break-up events upstream. Downstream TSS concentrations were similar to levels reported on during the 2022/2023 reporting year. No effects of Project construction on TSS concentrations are evident based on the monitoring data.

Terrestrial

Wildlife surveys were completed in accordance with IAAC approval conditions. Vegetation removal was completed prior to April 1, 2023, and pre-construction wildlife sweeps were completed in areas where construction activities were planned during the migratory bird breeding period.

One active Canada goose (*Branta canadensis*) nest and one active killdeer (*Charadrius vociferus*) nest were discovered in April 2024 within the Project area. A 100 metre (m) buffer was established for both nests. Four active nests were observed during the wildlife sweep conducted in June 2024, including two savannah sparrow nests (*Passerculus sandwichensis*) and two brewers blackbird (*Euphagus cyanocephalus*) nests.

A 30 m buffer was established around the Savannah sparrow nests using stakes and flagging. Buffers were avoided until each of the species left the nests. A buffer was not established for either of the observed Brewer's blackbird nests because the nests were located adjacent to a busy hauling road with frequent traffic and human presence. No construction mitigation was required. A wildlife monitor was present to observe the birds daily while construction was taking place.

Wildlife sweeps also included amphibian surveys in wetlands and waterbodies located within the construction boundary. Areas were surveyed using auditory methods, and visual survey methods. In May 2024, one adult western tiger salamander was rescued during fish rescue operations at Unnamed Creek. After finding the adult western tiger salamander, an egg survey was conducted at the outlet pool in Unnamed Creek. No eggs were present at the time of the salamander rescue, during fish salvage activities, or during the egg surveys. No breeding habitat was identified during the 2023/2024 reporting year.

Vegetation

The topsoil and subsoil stockpiles were monitored during the growing season for the presence of invasive alien and noxious weeds during the 2023/2024 reporting year. Black henbane (*Hyoscyamus niger*), listed as a Noxious weed under the Alberta *Weed Control Act*, was observed on-site growing along the construction area entrance of the Floodplain berm next to the access road and soil stockpiles. Plants were hand-picked on June 2024, before the plants produced seed. Collected plants were disposed of off-site at an approved waste facility.

Vegetation removal (i.e., shrubs within the borrow pit areas) and soil stripping were done in phases and soil handling was avoided during excessively windy conditions and inclement weather (e.g., heavy rain) to reduce the area of exposed soils vulnerable to wind and water erosion. Soil stockpiles were stabilized as soon as possible by track packing the top surface, and silt fences were installed at the toe side of several stockpiles. Silt fences were routinely inspected. Topsoil was placed in July 2023 in the Highway 22 embankment south of Highway 1 to south of Springbank Road following construction completion of the Highway 22 grade raise. Reseeding will commence in the following reporting year (2024/2025) using Project approved seed mixes.

Existing roads farm trails as well as a constructed light-duty vehicle road paralleling the diversion channel and dam were used to access the construction area. Equipment fueling, cleaning, and maintenance activities maintained a distance of 100 m from waterbodies and wetlands and utilized secondary containment. Substances with potential to cause harmful effects to the environment were stored over 100 m from water bodies and wetlands.

Dewatering occurred throughout the 2023/2024 reporting year, except in the winter when the ground was frozen. Dewatering occurred at the following locations:

- Diversion Inlet Structure
- Grade Control Structure Construction Area
- Dam Area

No water was directly discharged to any nearby waterbodies; however, construction dewatering was inadvertently directed into a wetland located in SW 14-024-04-W5M in May 2024 resulting in an unintentional sediment release into the wetland. Once identified, discharge was directed to a vegetated area upslope and straw wattles were installed to slow and capture sediment. The release was reported to AEPA in June 2024 and additional mitigation measures were implemented, including a reduced pumping rate, hose extension, and a silt bag was attached to the pump.

Air and Noise

The air quality monitoring network was established in June 2022. During the 2023/2024 reporting year, the air monitoring stations at SR1 continued to collect data. Any concentrations of total suspended particulates (TSP), coarse particulate matter (PM_{10}), or fine particulate matter ($PM_{2.5}$) above the Alberta Ambient Air Quality Objectives (AAAQO) were investigated and when necessary, dust mitigation measures were implemented. Dust and emission control mitigations that were implemented included the application of water or calcium chloride to roads to suppress dust generation, speed limit reductions on roads within the Project construction areas, a no-idling policy, visual inspection of roads and Project construction areas for dust, and adaptive mitigation in response to dust complaints and elevated ambient particulate monitoring concentrations at the monitoring stations.

Monitoring continued to operate throughout the 2023/2024 reporting year at the following three sites:

- Between the construction access road and the diversion channel excavation work (Station 1)
- At the dam construction site (Station 2)
- At any borrow source site used and at the parking areas (Station 3)

No changes were made to the monitoring equipment and the location of the three sites remains the same as the previous reporting period (2022/2023).

In addition to the three sites, the Springbank Air Quality Monitoring Station (AQMS) was commissioned on June 7, 2023. The AQMS is in the community of Springbank at the Lions Soccer Park near the intersection of Range Road 33 and Township Road 244. The AQMS is equipped with $PM_{2.5}$ and nitrogen dioxide (NO_2) analyzers, and meteorological sensors to measure wind speed, wind direction, vertical wind speed, ambient temperature, relative humidity, barometric pressure, solar radiation, and precipitation. The wind sensors are mounted on a 10 m tower attached to the AQMS shelter and the other sensors and analyzer inlets are located on the roof of the shelter at a height of 3 m above the ground surface.

A monitoring site was located on the west side of Calaway Park during the period when the park was open to the public. In 2023 the site was active from May 2 to October 12 and in 2024 the site was active started on May 2 and will be deactivated in October when the park closes for the season. The site is equipped with two environmental beta-attenuation mass monitor (EBAM) stations to measure $PM_{2.5}$ and TSP. Meteorological monitoring of wind speed, wind direction, temperature, relative humidity, and atmospheric pressure is co-located with the $PM_{2.5}$ EBAM station with the sensors are installed at instrument height (2 m above ground surface).

Indigenous Monitor and Independent Environmental Monitor

In accordance with IAAC Condition 9.1, eleven Indigenous Monitors were retained prior to construction to observe, record, and report to TEC and Indigenous groups on the implementation, throughout construction, of requirements set out in the Decision Statement.

Additionally, a third-party Independent Environmental Monitor was retained for the construction phase. The Independent Environmental Monitor and Indigenous Monitors observed Project activities for adherence to IAAC approval conditions.

Monitoring Plans

Mitigation and monitoring measures were developed, which were outlined in various Monitoring Plans for SR1. The monitoring plans that were required to be finalized prior to the start of construction were sent to Indigenous groups and appropriate regulators (e.g., IAAC, Health Canada, Environment and Climate Change Canada (ECCC) for review prior to implementation. Monitoring during construction was and continues to be completed, and mitigation measures are implemented as necessary. No updates to Monitoring Plans were required during the 2023/2024 reporting year.

Résumé

Le projet de réservoir hors cours d'eau de Springbank (le projet SR1) consiste en la conception d'une infrastructure d'atténuation des crues destinée à prévenir les effets d'éventuels événements extrêmes sur les infrastructures, les cours d'eau et la population de la ville de Calgary et des villes en aval. Le projet est situé à environ 15 kilomètres à l'ouest de Calgary, dans le comté Rocky View.

L'agence *Transportation and Economic Corridors* de l'Alberta (TEC) a reçu la déclaration de décision de l'Agence d'évaluation d'impact du Canada (AEIC) en juillet 2021, et les autorisations de l'organisme *Natural Resources Conservation Board* (NRCB), en octobre 2021. La TEC a obtenu toutes les autorisations pour la construction du réservoir, après quoi, l'organisme *Alberta Agriculture and Irrigation* devra obtenir les autorisations relatives à l'exploitation et à l'entretien de l'infrastructure. En plus de la déclaration de décision de l'AEIC et des autorisations du NRCB, la TEC a obtenu tous les permis et toutes les autorisations nécessaires des autorités provinciales et fédérales avant le début des travaux de construction, sauf les permis et autorisations de construction temporaires que doit obtenir au besoin l'entrepreneur.

La TEC s'est engagée à construire SR1 dans le respect de toutes les autorisations réglementaires et à entretenir des communications continues avec les groupes autochtones, les propriétaires fonciers locaux et les intervenants. Le présent document dresse un résumé des travaux de construction et des activités de surveillance environnementale réalisés au cours de la période de déclaration 2023-2024 (1er juillet 2023 au 30 juin 2024) conformément aux conditions d'autorisation de l'AEIC.

Travaux de construction réalisés au cours de la période de déclaration 2023-2024

Pendant la période de déclaration 2023/2024, les activités de construction se sont poursuivies au canal d'amenée de la rivière Elbow, dont l'excavation du canal de dérivation, l'excavation du canal d'approche et de sortie de l'ouvrage d'évacuation de bas niveau, la mise en place de remblais au barrage et l'achèvement des travaux sur la route de canton 242 (pont), la route 22 (pont) et la route 22 (élévation de la pente).

Gestion environnementale et mesures d'atténuation

Pour limiter les effets sur les milieux environnants des travaux de construction, des pratiques exemplaires ont été mises en œuvre et les exigences des autorités provinciales et fédérales ont été respectées. Des mesures d'atténuation de l'érosion et du transport des sédiments ont été mises en place dans les zones du projet les plus sensibles aux travaux de construction (p. ex. les zones adjacentes à la rivière Elbow et les milieux humides). Ces mesures ont fait (et font toujours) l'objet d'une surveillance régulière, et ont été augmentées ou modifiées au besoin.

Eau

Au cours de la période de déclaration précédente, deux sondes ont été installées (une en amont et une en aval du site du projet) pour recueillir des données de turbidité en continu entre juillet 2023 et juin 2024.

Les sondes de suivi de la turbidité de la rivière Elbow ont parfois connu des problèmes de fonctionnement, ce qui a entraîné des mesures nulles. Ces mesures nulles ont été supprimées des graphiques de résultats présentés ci-dessous. La collecte continue des données a été interrompue pendant l'entretien et la réparation des sondes, comme suit :

- sonde en amont – du 15 décembre 2023 au 9 janvier 2024;
- sonde en aval – du 27 septembre 2023 au 2 octobre 2023;
- sonde en aval – du 13 octobre 2023 au 1er novembre 2023;
- sonde en aval – du 14 novembre 2023 au 15 décembre 2023.

Lors de l'entretien et de la réparation des sondes, des échantillons ont été prélevés manuellement. Les mesures de turbidité provenant des sondes sont plus élevées que celles des échantillons prélevés manuellement en raison des eaux peu profondes de la rivière Elbow et de l'encrassement des sondes dû à la turbidité près du substrat. Les mesures manuelles sont considérées comme une représentation plus précise de la turbidité de la rivière Elbow.

Les concentrations de matières en suspension totales (MES) se sont avérées relativement élevées lors de plusieurs événements au printemps et à l'été 2024, à la fois sur les sites de suivi en amont et en aval. Cependant, ces concentrations étaient probablement liées au mauvais fonctionnement des sondes et à des épisodes de débâcle des glaces en amont. Les concentrations de MES en aval étaient semblables à celles signalées au cours de la période de déclaration 2022-2023. Les données de suivi indiquent que les travaux de construction du projet n'ont eu aucun effet sur les concentrations de MES.

Environnement terrestre

Des relevés fauniques ont été réalisés, conformément aux conditions d'autorisation de l'AEIC. De la végétation a été retirée avant le 1er avril 2023, et dans les zones où des activités de construction étaient prévues durant la période de nidification des oiseaux migrateurs, des relevés fauniques préconstruction ont été réalisés.

Un nid actif de bernache du Canada (*Branta canadensis*) et un de pluvier kildir (*Charadrius vociferus*) ont été découverts en avril 2024 dans la zone du projet. Une zone tampon de 100 mètres a été établie autour des deux nids. Quatre nids actifs ont été observés lors du relevé faunique effectué en juin 2024, dont deux nids de bruant des prés (*Passerculus sandwichensis*) et deux nids de quiscale de Brewer (*Euphagus cyanocephalus*).

Une zone tampon de 30 mètres a été mise en place autour des nids de bruant des prés à l'aide de piquets et de drapeaux. Les travaux ont été évités dans les zones tampons jusqu'à ce que chaque espèce quitte son nid. Aucune zone tampon n'a été établie pour les deux nids de quiscale de Brewer observés, car les nids se trouvaient à proximité d'une route de transport très achalandée, où la circulation et la présence humaine sont fréquentes. Aucune mesure d'atténuation relative aux travaux de construction n'a été nécessaire. Un agent de la faune était présent pour observer les oiseaux pendant les travaux de construction.

Des relevés des amphibiens ont aussi été réalisés dans les milieux humides et les plans d'eau situés à l'intérieur du périmètre de construction. Les zones ont été observées à l'aide de méthodes auditives et visuelles. En mai 2024, une salamandre tigrée de l'Ouest adulte a été sauvée lors d'opérations de récupération du poisson dans un ruisseau sans nom. Après avoir trouvé la salamandre, un relevé des œufs a été effectué dans le bassin de sortie du ruisseau. Aucun œuf n'était présent au moment où la salamandre a été découverte, lors des activités de récupération du poisson ou pendant le relevé concernant les œufs. Aucun habitat de reproduction n'a été identifié au cours de la période de déclaration 2023-2024.

Végétation

Les amoncellements de terre végétale et de sous-sol ont été surveillés pendant la saison de croissance pour détecter la présence d'espèces exotiques envahissantes et d'herbes nuisibles au cours de la période de déclaration 2023-2024. La jusquiame noire (*Hyoscyamus niger*), inscrite sur la liste des mauvaises herbes de la loi *Weed Control Act* de l'Alberta, a été observée sur le site, poussant le long de l'entrée de la zone de construction de la berme de la plaine inondable, à côté de la route d'accès et des amoncellements de terre. Les plantes ont été cueillies à la main le 20 juin 2024, avant qu'elles ne produisent des graines. Elles ont été éliminées hors site dans des installations autorisées de traitement des déchets.

L'enlèvement de la végétation (c.-à-d. des arbustes dans les zones d'emprunt) et le décapage des sols ont été effectués par étapes et la manipulation des sols a été évitée pendant les périodes de grand vent et de mauvais temps (p. ex. en cas de fortes pluies) afin de réduire la surface des sols exposés à l'érosion éolienne et hydrique. Les amoncellements de terre ont été stabilisés dès que possible par la mise en place d'un revêtement sur la surface et par l'installation de clôtures anti-érosion au pied de plusieurs amoncellements de terre. Les clôtures anti-érosion faisaient l'objet d'une surveillance régulière. En juillet 2023, la terre végétale a été utilisée dans le remblai de la route 22 au sud de la route 1, et jusqu'au sud du chemin Springbank après l'achèvement des travaux d'élévation du niveau de la route 22. Le réensemencement commencera au cours de la prochaine période de déclaration (2024-2025) avec des mélanges de semences approuvés pour le projet.

Des routes existantes, des sentiers agricoles ainsi qu'une route pour véhicules légers construite en parallèle du canal de dérivation et du barrage ont été utilisés pour accéder au chantier de construction. Les activités de ravitaillement en carburant, de nettoyage et d'entretien de l'équipement se sont déroulées à une distance de 100 mètres des plans d'eau et des milieux humides et un système de confinement secondaire a été déployé à cet effet. Les substances susceptibles d'avoir des effets nocifs sur l'environnement ont été stockées à plus de 100 mètres des plans d'eau et des milieux humides.

Un assèchement a eu lieu tout au long de la période de déclaration 2023-2024 (sauf en hiver lorsque le sol était gelé). L'assèchement a eu lieu aux endroits suivants :

- ouvrage de dérivation d'entrée;
- site de construction de l'ouvrage de contrôle de la pente;
- zone du barrage.

Aucun déversement d'eau n'a été directement effectué dans les plans d'eau avoisinants. Cependant, en mai 2024, des eaux d'assèchement ont été dirigées par inadvertance dans un milieu humide situé dans la section SO 14-024-04-W5M, ce qui a entraîné un déversement involontaire de sédiments dans ce milieu humide. Une fois la situation identifiée, les eaux ont été évacuées vers une zone végétalisée en pente et des boudins de paille ont été installés pour ralentir le débit d'eau et retenir les sédiments. Le rejet a été signalé à l'AEPA en juin 2024 et des mesures d'atténuation supplémentaires ont été mises en place, notamment une réduction du débit de pompage, l'installation d'une rallonge du tuyau et la fixation d'un sac de rétention du limon à la pompe.

Bruit et qualité de l'air

Le système de surveillance de la qualité de l'air a été mis en place en juin 2022. Au cours de la période de déclaration 2022-2023, des données ont continué à être collectées par les stations de surveillance de la qualité de l'air de SR1. Dans tous les cas où la concentration des particules totales en suspension (PTS), des particules en suspension < 10 µm (PM_{10}) ou des particules fines ($PM_{2.5}$) a dépassé les limites fixées dans les lignes directrices Alberta Ambient Air Quality Objectives (AAAQO), une enquête a été menée et des mesures de réduction des poussières ont été prises au besoin. Les mesures de réduction des poussières et des émissions mises en place comprenaient l'établissement de limites de vitesse sur les routes du projet, une politique interdisant le fonctionnement des moteurs au ralenti, l'application d'eau ou de chlorure de calcium comme abat-poussière, l'inspection visuelle des routes et des zones de construction du projet relativement aux poussières, ainsi que des mesures d'atténuation particulières en réponse aux plaintes relatives à la poussière et aux concentrations élevées de particules en suspension mesurées aux stations de surveillance.

La surveillance s'est poursuivie tout au long de la période de déclaration 2023-2024 sur les trois sites suivants :

- entre la route d'accès au site de construction et le site des travaux d'excavation du canal de dérivation (station 1);
- sur le site de construction du barrage (station 2);
- sur tous les sites d'emprunt utilisés et sur les aires de stationnement (station 3).

Aucun changement n'a été apporté à l'équipement de surveillance et l'emplacement des trois sites de surveillance reste le même que pour la période de déclaration précédente (2022-2023).

En plus de ces trois sites, la station de surveillance de la qualité de l'air de Springbank a été mise en service le 7 juin 2023. La station se trouve dans la collectivité de Springbank, au parc de soccer (*Lions Soccer Park)*, près de l'intersection de la route rurale 33 et de la route de canton 244. La station est munie d'analyseurs des particules fines ($PM_{2.5}$) et du dioxyde d'azote (NO_2), ainsi que de capteurs météorologiques pour mesurer la vitesse et la direction du vent, la vitesse verticale du vent, la température ambiante, l'humidité relative, la pression barométrique, le rayonnement solaire et les précipitations. Les capteurs de mesure du vent sont montés sur une tour de 10 mètres fixée à l'abri de la station et les autres capteurs et dispositifs de mesure sont situés sur le toit de l'abri à une hauteur de 3 mètres au-dessus du sol.

Un site de surveillance a été installé sur le côté ouest du parc Calaway pendant la période où le parc était ouvert au public. En 2023, la surveillance a eu lieu du 2 mai au 12 octobre. En 2024, elle a commencé le 2 mai et elle prendra fin en octobre lorsque le parc fermera pour la saison. Le site est muni de deux appareils de mesure à technologie d'atténuation bêta pour mesurer les $PM_{2.5}$ et les particules en suspension totales (PST). Les dispositifs de mesures de la vitesse et de la direction du vent, de la température, de l'humidité relative et de la pression atmosphérique sont situés au même endroit que l'appareil de mesure des $PM_{2.5}$, les capteurs étant installés à la hauteur de l'appareil (soit 2 mètres au-dessus du sol).

Surveillance environnementale effectuée par les communautés autochtones et une tierce partie indépendante

Avant la construction, conformément à la condition 9.1 de l'AEIC, la TEC a retenu les services de onze surveillants autochtones pour observer et documenter la mise en œuvre des conditions énoncées dans la déclaration de décision et en rendre compte à la TEC et aux groupes autochtones.

De plus, les services d'un surveillant environnemental indépendant tiers ont été retenus pour effectuer la surveillance pendant la construction. Le surveillant environnemental indépendant et les surveillants autochtones observent les activités du projet relativement au respect des conditions énoncées dans la déclaration de décision de l'AEIC.

Programmes de suivi

Des mesures d'atténuation et des activités de surveillance qui figurent dans les différents programmes de suivi du projet SR1 ont été élaborées. Les programmes de suivi qui devaient être finalisés avant le début des activités de construction ont été transmis aux groupes autochtones et aux autorités réglementaires appropriées (AEIC, Santé Canada, Environnement et Changement climatique Canada) pour examen avant leur mise en œuvre. Depuis le début de la construction, la surveillance est réalisée de manière continue et les mesures d'atténuation nécessaires ont été mises en œuvre. Aucune mise à jour des programmes de suivi n'a été requise pour la période de déclaration 2023-2024.

Abbreviations

%	percent
°C	degrees Celsius
µg/m^3	microgram per cubic metre
AAAQG	Alberta Ambient Air Quality Guidelines
AAAQO	Alberta Ambient Air Quality Objectives
AACSW	Alberta Arts, Culture and Status of Women
AEIC	Agence d'évaluation d'impact du Canada
AEPA	Alberta Environment and Protected Areas
AGI	Agriculture and Irrigation
AMD	Air Monitoring Directive
AQMP	Air Quality Monitoring Plan
AQMS	Air Quality Monitoring Station
AVC	Animal-vehicle collision
BC AQO	British Columbia Ambient Air Quality Objective
BTEX	benzene, toluene, ethylbenzene, xylenes
BV	Bureau Veritas
CAAQS	Canadian Ambient Air Quality Standards
CCME	Canadian Council of Ministers of the Environment
CEAA	*Canadian Environmental Assessment Act, 2012*
CRAZ	Calgary Region Air Zone
DFO	Fisheries and Oceans Canada
DO	Dissolved oxygen
DOC	dissolved organic carbon
EBAM	environmental beta-attenuation mass monitors

EC	Electrical conductivity
ECCC	Environment Climate Change Canada
EIA	Environmental Impact Assessment
FNLUAC	First Nations Land Use Advisory Committee
FNLUCC	First Nations Land Use Collaboration Committee
GoA	Government of Alberta
GWMP	Groundwater Monitoring Plan
HADD	harmful alteration, disruption, and destruction
HRA	*Historical Resources Act*
HRA Section 31	*Historical Resources Act* Section 31 Chance Find
IAAC	Impact Assessment Agency of Canada
km	kilometre
km/h	kilometres per hour
kPa	kilopascal
KWBZ	Key Wildlife Biodiversity Zone
L	litre
LAA	Local Assessment Area
LOC	Licenses of Occupation
m	metre
m^3	cubic metre
mg/L	milligrams per litre
m/s	metres per second
mm/h	millimetre per hour
µg	micrometre
NO	Nitrogen monoxide
NO_2	Nitrogen dioxide

NO_X	Oxides of Nitrogen or Nitrogen Oxides
NRCB	Natural Resources Conservation Board
NTU	Nephelometric Turbidity Units
ORP	oxidation-reduction potential
PDA	Project Development Area
PLA	*Public Lands Act*
PM_{10}	Course particulate matter with an aerodynamic diameter of 10 µm or less
$PM_{2.5}$	Fine particulate matter with an aerodynamic diameter of 2.5 µm or less
ppbv	parts per billion volume
QA/QC	quality assurance and quality control
RAP	Restricted Activity Period
SARA	*Species at Risk Act*
SIR	Supplemental Information Requests
SR1; Project	Springbank Off-stream Reservoir Project
SWMP	Surface Water Monitoring Plan
TDL	Temporary Diversion License
TEC	Alberta Transportation and Economic Corridors
TFA	Temporary Field Authorization
TSP	Total suspended particulate; with an aerodynamic diameter 100 µm or less
TSS	Total Suspended Solids
W/m^2	watts per square metre
WMMP	Wildlife Mitigation and Monitoring Plan
WSC	Water Survey of Canada

1.0 INTRODUCTION

The Springbank Off-stream Reservoir Project (the Project; SR1) is located in the Springbank area of Rocky View County 15 kilometres (km) west of the City of Calgary, Alberta (see Figure 1.1). The Project is a flood diversion system that will divert excess flood water from Elbow River to an off-stream reservoir where it will be held until the risk of flooding has passed. At that time, the retained flood water will be returned to Elbow River in a controlled manner.

Alberta Transportation and Economic Corridors (TEC) received Project approvals for SR1 from the Impact Assessment Agency of Canada (IAAC) in July 2021, and the Natural Resources Conservation Board (NRCB) in October 2021. The Government of Alberta Order in Council was signed in October 2021. IAAC approval conditions for Project construction and operations outline federal reporting requirements to be carried out during all phases of the Designated Project.

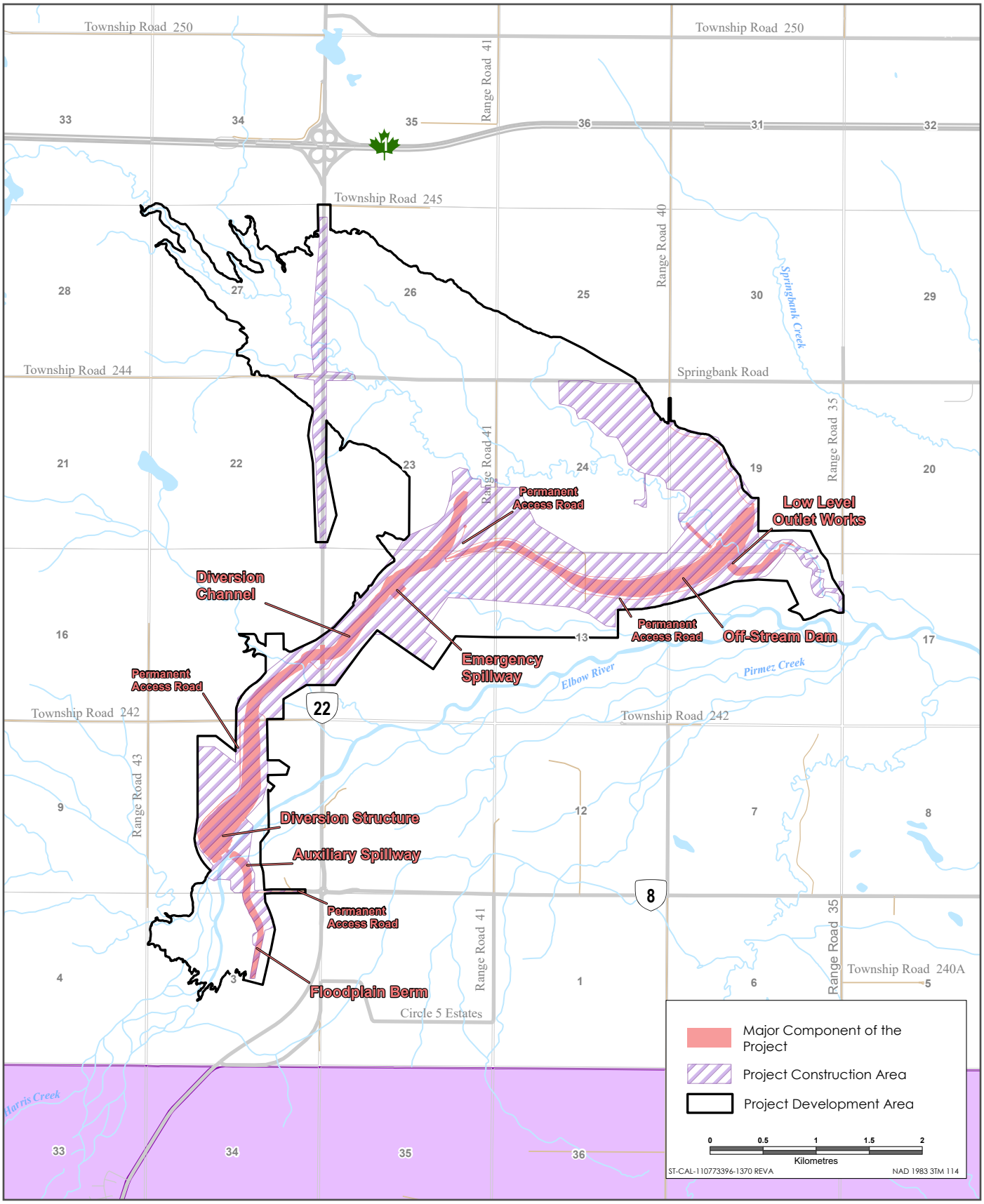
TEC submitted the IAAC 2021/2022 and 2022/2023 Annual Report on October 31, 2022, and October 31, 2023, respectively. The reports captured pre-construction and early construction activities during the 2021/2022 and 2022/2023 reporting year. TEC Construction activities continued during the 2023/2024 reporting year and were restricted to the construction footprint (see Figure 1.1). During the 2023/2024 annual reporting year, construction activities continued at the inlet channel at the Elbow River, excavation of the Diversion Channel, excavation of the approach channel and exit channel of the low-level outlet structure, fill placement at the dam, and the completion of roadwork at Township 242 (bridge), Highway 22 (bridge) and the Highway 22 grade raise.

TEC confirms that, during the 2023/2024 reporting year, all activities undertaken during construction were executed in a careful and precautionary manner, promoting sustainable development, utilizing the best available information, including Indigenous and community knowledge, and adhered to recognized industry standards, while employing qualified individuals and the most economically and technically feasible technologies. A concordance table in Appendix A provides a summary of the IAAC approval conditions and indicates the sections of this report where these conditions are addressed.

1.1 REPORT STRUCTURE

TEC is committed to regulatory compliance. As required by IAAC approval condition 2.11, the following annual report provides a summary of all activities completed for SR1 undertaken by TEC during the 2023/2024 reporting year (July 1, 2023, to June 30, 2024) of the construction period. The report has been organized into the following sections:

- Regulatory Update
- Monitoring Update
- Project Activities and Status



Sources: Base Data - Government of Canada. Thematic Data - Government of Alberta
Service Layer Credits:

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.
10/25/2022

Stantec

ALBERTA TRANSPORTATION SPRINGBANK OFF-STREAM RESERVOIR PROJECT

Project Location

Figure 1.1

2.0 REGULATORY UPDATE

TEC holds all regulatory permits and approvals for the Project. Should they be required, the Prime Contractor is responsible for obtaining any additional temporary permits required to complete construction activities in accordance with provincial and federal regulations.

2.1 PROJECT APPROVALS

Table 2.1 summarizes the Project approvals, authorizations, and notifications received prior to the start of construction activities.

Table 2.1 SR1 Project Approvals

Subject Matter/Commitment	Approval Number	Approval Received	Approval Expiry
***Canadian Environment Assessment Act, 2012* (CEAA)**			
IAAC Decision Statement	139551E	8-Jul-21	N/A
***Natural Resources Conservation Board Act* (NRCB)**			
Decision Statement	NR-2021-1	19-Oct-21	N/A
Alberta Environment and Protected Areas (AEPA)			
Water Act Approval for Wetland Disturbance	DAUT008702	08-Feb-22	31-Dec-72
Temporary Field Authorization (TFA) - Watercourse Realignment/Reconstruction	TFA221088	13-Aug-21	31-Mar-25
TFA Incidental Activity – Temporary Workspace	TFA221119	13-Aug-21	31-Mar-25
Public Lands Act (PLA) Licences of Occupation (LOC) – Water Diversion – Outfall	DLO210186	09-Feb-22	08-Feb-47
PLA LOC - Water Diversion – Water Intake	DLO200141	09-Feb-22	08-Feb-47
Fisheries and Oceans Canada			
Fisheries Act Authorization also Acting as a Permit under the *Species at Risk Act* (Elbow River)[2]	16-HCAA-00537	18-Mar-22	31-Mar-36
Transport Canada			
Canadian *Navigable Waters Act*	2021-604875	14-Dec-21	N/A
Alberta, Arts Culture and Status of Women			
Historical Resources Act[1]	4825-15-0004-018	22-Jan-24	N/A

Notes:

1 Work is ongoing to address the outstanding requirements in order to receive approval under the *Historical Resources Act* (HRA), which will include construction monitoring and investigations of chance finds.

2 TEC obtained an amended to the *Fisheries Act Authorization* on February 6, 2024, which resulted in a revised approval expiry date. See Section 4.8.4.4 for details.

2.2 PERMITS RECEIVED

In addition to the approvals, authorizations and notifications, the Prime Contractor, on behalf of TEC obtained the following permits for temporary construction activities:

- Temporary Diversion License (TDL) DAUT0015676 from 18-Apr-24 to 17-Apr-25 to withdraw water from the Elbow River at the Diversion Point called "North 2"
- TDL DAU0013860 from 24-Nov-23 to 23-Nov-24 to withdraw water from the Elbow River at well 1023595 in SE 23-024-04 W5 to support construction of the Springbank Dam
- TDL DAUT0013861 from 24-Nov-23 to 23-Nov-24 to withdraw water from the Elbow River at well 1023594 in SE 23-024-04 W5 to support construction of the Springbank Dam
- TDL DAUT0009542 was replaced with DAUT0016658 from 11-Jun-24 to 12-Jun-25 to withdraw water from the Elbow River in SE 10-024-04 W5 and SW 13-024-04 W5
- Approval DAUT0010134 from 26-Aug-22 to 31-Dec-25 to store water in 3 dugouts
- Research Permit #154-150 from 22-Mar-24 to 31-Dec-24 to capture amphibians within the Springbank Dam Project Area and translocate amphibians to identified release sites

3.0 MONITORING UPDATE

Mitigation and monitoring measures developed and captured in various plans for SR1 (see Table 3.1 below for a list of plans) that are consistent with the measures identified in the Environmental Impact Assessment (EIA), Supplemental Information Requests (SIRs) and in accordance with approval conditions identified by IAAC and the NRCB.

Table 3.1 provides a summary of activities and results pertaining to the monitoring plans for the Project.

Table 3.1 Summary of Activities

Monitoring Plans	Summary of Activities
Air Quality Monitoring Plan (AQMP) *(IAAC Approval Condition(s) 6.4, 7.10)*	An Air Quality Management Plan was prepared based on the final decision documents from IAAC and NRCB. The three sites located around the Project boundary were established as per the AQMP in June 2022. Each site is equipped with three environmental beta-attenuation mass monitor (EBAM) stations to measure total suspended particulates (TSP), coarse particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$). Meteorological sensors were co-located with the $PM_{2.5}$ EBAM station at each site. An additional site is located on the west side of Calaway Park when the park is open to the public. The site is equipped with two EBAM stations to monitor $PM_{2.5}$ and TSP as well as meteorology. In 2023, the site was active from May 2 to October 12, and in 2024 the site was active from May 2 and will be removed in October. On June 2, 2023, an Air Quality Monitoring Station (AQMS) was commissioned in the community of Springbank in the Lions Soccer Park at the corner of Range Road 33 and Springbank road. The AQMS was equipped with instruments to measure $PM_{2.5}$ and nitrogen dioxide (NO_2) as well as meteorology. Any concentrations of TSP, PM_{10}, $PM_{2.5}$, or nitrogen dioxide (NO_2) above the Alberta Ambient Air Quality Objectives (AAAQO) were investigated and when necessary, dust mitigation measures were implemented. Monthly calibration and maintenance were conducted. See Section 4.9.1 for details on air quality monitoring during the 2023/2024 reporting year.

Monitoring Plans	Summary of Activities
Wildlife Mitigation and Monitoring Plan (WMMP) *(IAAC Approval Condition(s) 4.1 to 4.10; 4.11; 5.1; 5.2 to 5.5; 8.1; 8.3 to 8.5)*	In areas where construction activities were planned during the migratory bird breeding period, pre-construction wildlife sweeps were completed by qualified wildlife biologists to reduce potential disturbance to nesting birds and appropriate setback buffers were implemented where necessary, consistent with conditions 4.6 and 4.8 as well as direction provided in the WMMP. In accordance with IAAC approval condition 4.11.1, and the Bank Swallow Mitigation Plan, bank swallow use was monitored during Project construction where active residences were checked twice yearly between May 1 and August 31. The 2023/2024 monitoring focused on bank swallow colonies that were identified on Elbow River during the 2022/2023 monitoring period. In accordance with the WMMP, a remote camera monitoring program was completed in the local assessment area (LAA) between April 1, 2023 to March 31, 2024. See Section 4.7.2 and Appendix B.1 for details on the WMMP during the 2023/2024 reporting year.
Surface Water Monitoring Plan (SWMP) *(IAAC Approval Condition 3.19)*	Installation of turbidity sondes at the Bragg Creek, Highway 22 bridge and Sarcee bridge locations did not occur in the 2023/2024 reporting year. During the 2023/2024 reporting period, TEC selected locations where two of the three sondes will be installed and obtained permission to install these two sondes to existing bridges. Options for the location of the third sonde (near the Hamlet of Bragg Creek) have been identified, however, identifying and selecting the specific location (near the sampling locations specified in the SWMP) has taken longer than anticipated due to the depth and flow conditions required to operate the equipment continuously year-round. During the 2023/2024 reporting year, turbidity samples were hand collected four times and will continue to be until these sondes are installed. During the 2022/2023 reporting year, turbidity sampling was conducted daily in the Elbow River at two locations (upstream and downstream) during construction activities, and at a third location at Unnamed Creek when flows were present. See Section 4.8.1.1 for details of the surface water quality monitoring completed during the 2023/2024 reporting year.
Fish Tissue Program *(IAAC Approval Condition 7.8)*	This condition pertains to post flood operations and thus was not initiated in the 2023/2024 reporting year.
Fish Rescue and Fish Health Monitoring and Mitigation *(IAAC Approval Condition 3.18)*	This condition pertains to post flood operations and thus was not initiated in the 2023/2024 reporting year.
Fish Passage *(IAAC Approval Condition 3.17)*	Construction of the fish passage v-weirs was initiated at the end of the 2023/2024 reporting year and will be finished during the 2024/2025 reporting year. Fish passage monitoring will be conducted following the installation of these structures.

Monitoring Plans	Summary of Activities
Vegetation and Wetland Mitigation, Monitoring and Revegetation Plan *(IAAC Approval Condition 8.13)*	In accordance with IAAC approval conditions 3.5, 8.1, 8.2 and 9.8, equipment arrived clean and free of debris at site and soil stockpiles were monitored for weeds and erosion. Erosion and sediment control measures were adjusted when required; for example, additional silt and sediment fencing was installed around topsoil stockpiles. Fuel and other harmful substances have been stored and re-fueling conducted a minimum of 100 metres (m) from waterbodies and wetlands and spill containment measures were in place. Reclamation has not started as construction is on-going in disturbed areas. Disturbed areas will be monitored for a minimum of two years post-construction and a minimum of two to five years post-flooding. Monitoring will continue if targets are not achieved, or conditions are not reasonably stable by the end of the minimum monitoring period. In accordance with IAAC approval condition 8.2 TEC will manage noxious weeds and invasive alien species as necessary to promote successful revegetation. Black henbane (*Hyoscyamus niger*) was observed in the floodplain berm and stockpile area during a site inspection in May 2023. The plants were pulled and disposed at an approved off-site waste facility.
Archaeological and Heritage Management Plan *(IAAC Approval Condition 9.3)*	Archaeological pre-impact investigation was completed for the Project as required by Alberta Arts, Culture and Status of Women (AACSW) and conditional approval was granted apart from one archaeological site requiring avoidance and a requirement for paleontological and archaeological construction monitoring. HRA approval will be obtained before construction occurs in the archaeological site area that is located within the construction area. Palaeontological construction monitoring is ongoing, as required. *The Historical Resources Act* Section 31 (HRA Section 31) clause in the Plan has been enacted on several occasions. One HRA Section 31 Find identified a new archaeological site and was reported to AACSW; another find was determined to be a cultural site and was communicated to Indigenous groups. Two additional finds were determined to not be protected by the *Historical Resources Act* due to the disturbed context of the finds and were communicated to Indigenous groups. All finds were communicated to AACSW, IAAC and Indigenous groups. Semi-permanent buffers were installed at two sites identified in 2023 to facilitate that no inadvertent impacts occurred during construction. These buffers will be removed following construction completion. HRA approval will be obtained before construction recommences in that area.
Groundwater Monitoring Plan (GWMP) (*IAAC Approval Condition 7.9*)	The GWMP was prepared in accordance with IAAC approval conditions 7.6, 7.9, and domestic well baseline testing commitments made during the NRCB hearing. Groundwater monitoring network development, monitoring and sampling was completed between July 2023 and June 2024. Monitoring network development included decommissioning and installation of Tier 2 monitoring wells to continue to develop the monitoring network. Fall 2023 and Spring 2024 groundwater monitoring and sampling programs were completed and are summarized in Section 4.8.2 and Appendix B.2.

3.1 CONSULTATION

TEC is committed to ongoing communication with the Indigenous groups involved in the Project.

As required by IAAC approval conditions 2.4, 2.5, and 2.10 Indigenous groups were provided written notice of opportunities to present their views on monitoring plans, to participate in ceremonies prior to the start of construction activities and offered opportunities to observe historical resource pre-impact investigations. This communication took place in advance of construction starting in late 2021/early 2022. There were no updates to the monitoring plans during the 2023/2024 reporting year. As required by IAAC approval condition 2.13 and 2.14, the 2022/2023 Annual Report was distributed on October 31, 2023, and was posted on the TEC SR1 website.

During the 2023/2024 reporting year, Indigenous groups were informed of *Historical Resource Act* Section 31 (HRA Section 31) Finds, see Section 4.10.1 for additional details.

4.0 PROJECT ACTIVITIES AND STATUS

4.1 SUMMARY OF WORK COMPLETED ON SITE

Construction of the following Project components continued during the 2023/2024 reporting year:

- Raising of Highway 22 and switching over to the new highway alignment
- Excavation of the Emergency Spillway and Concrete Works
- Realignment of Unnamed Creek through conduit under the dam (Low Level Outlet channel)
- Low-level outlet concrete works
- Concrete casting at the emergency spillway
- Excavation of Debris Deflection Barrier Structure
- Township Road 242 bridge over the Diversion Channel
- Highway 22 bridge over the Diversion Channel
- Civil works at the Grade Control Structure
- Removal of the temporary haul bridge over highway 22

All equipment and machinery were inspected daily for drips, leaks, and new or returning equipment and machinery to the construction area were inspected for the presence of invasive alien species and noxious weeds. A preventive maintenance schedule, based on the number of hours worked and the parts of the equipment, was in place. Drip trays were placed under idle equipment and machinery as well as fueling equipment. Monitoring was conducted to confirm drip tray use and deficiencies were reported to the Contractor and mitigated. See Section 4.4 for a summary of the accidents and malfunctions that occurred during the 2023/2024 reporting year.

During the 2023/2024 reporting year, night shifts began in May and continued through winter with minor activities such as de-watering and heater maintenance. Night shifts resumed in late May 2024. These comprised earthworks and concrete construction activities at the Dam, Grade Control Structure. Lighting towers were installed in key areas such as the construction site office, Diversion Inlet, low-level outlet, bridges and along certain portions of the Haul road/light duty road to allow work to proceed during low light hours. All lighting installed complied with the International Commission on Illumination enforced by Labour Canada and Occupational Health and Safety Code, RA 87/2009 Part 12. Any portable lighting devices installed were pointed downwards towards the construction area and not towards public roads. Portable lighting devices were relocated as required to focus light on the active work areas only.

4.1.1 Construction Activities

4.1.1.1 Earthworks

Earthwork activities were ongoing during the 2023/2024 reporting year with the exception of the winter months when work earthwork activities were stopped due to frozen conditions and in the spring during snow/rain events. Topsoil and subsoil were removed from the following locations between July 2023 and June 2024 when weather conditions permitted:

- The north bank of the Elbow River (diversion inlet structure)
- Diversion Channel
- Dam area
- Approach Channel and Exit Channel for the Low-Level Outlet
- Unnamed Creek in relation to the excavated channel
- Borrow Pits one and two
- Riprap placement along portions of the Diversion Channel and Low-Level Outlet Exit Channel

Excavation and other earthwork activities also occurred at the above locations.

Stripped soil was generally stockpiled in the vicinity of the area being stripped, and in some instances relocated to other places for longer storage. When possible, stockpiles near Elbow River and Unnamed Creek were placed at least 50 m and 30 m respectively from the top of the bank; in areas where space was limited, sediment fencing and straw wattles were installed at the base of the stockpiles to prevent sediment releases. Topsoil and subsoil were stockpiled separately to prevent mixing; stockpiles were spaced at least 3 m apart, in cases where stockpiles were closer than 3 m at the toe of the slope silt fencing was installed to prevent admixing. In order to place the stripped topsoil back in the same general area, or as required by IAAC approval condition 3.8, topsoil stockpile locations have been documented.

Topsoil stripped from the Diversion Channel was stockpiled along the channel within the construction boundary, stockpiled topsoil is to be used in the restoration of the Diversion Channel when excavation is completed, as required by IAAC approval condition 3.8.

Stockpiles were inspected to determine the appropriate erosion and sediment control measures. To protect the topsoil and subsoil from erosion and sediment discharge, silt fences were installed at the downstream side of stockpiles. In some locations, wattles were installed as a measure to protect from erosion and sediment release; for example, this occurred on the south bank of the Elbow River, on the cliff on the north bank of the Elbow River and at the low-level outlet.

Routine inspections of the Project construction area were conducted to assess the stripped areas and the stockpiles. The quality of the stripped soil was not impacted. It was noted that the stripping operations were performed with negligible admixing of soils, and that the topsoil recovery was excellent.

4.1.1.2 Civil Works

During the 2023/2024 reporting year, Civil Works construction activities continued at the Highway 22 Bridge and Township Road 242 Bridge

- Highway 22 Bridge included excavation, backfilling and concrete works
- Township 242 Bridge included excavation, backfilling and concrete works
- The Temporary Highway 22 Heavy Duty Bridge Crossing included backfilling and concrete works

Each construction activity area was provided with various waste skips (receptacles) to collect construction wastes depending on their type (wood, metal, concrete) for further segregation and disposal. Each location where concrete was poured had a dedicated skip to collect the wastewater from cleaning the gully of the concrete truck at the end of the pouring.

Any equipment that was filled with fuel was provided with a drip-tray to contain spillage in case of incident; the drip-trays were appropriate size (able to collect 110 percent [%] of the main content of the hazardous substance container). All generators (diesel powered) at the Auxiliary Spillway were provided with drip-trays and replaced as required. Spill-kits of suitable size were also available should they have been required.

Equipment fueling, cleaning, and maintenance activities maintained a distance of 100 m from waterbodies and wetlands and utilized secondary containment.

4.1.1.3 Structure

During the 2023/2024 reporting year, Structural works construction activities continued at the Diversion Structure, low-level outlet, Grade Control Structure, Auxiliary Spillway and Emergency Spillway.

Each construction activity area was provided with waste skips (receptacles) to collect construction wastes depending on their type (wood, metal, concrete) for further segregation and disposal. Each location where concrete was poured had a dedicated skip to collect the wastewater from cleaning the gully of the concrete truck at the end of the pouring.

Any equipment that was filled with fuel was provided with a drip-tray to contain spillage in case of incident; the drip-trays were appropriate size (able to collect 110% of the main content of the hazardous substance container). For example, all generators (diesel powered) at the Auxiliary Spillway were provided with drip-trays and replaced as required. Spill-kits of suitable size were also available should they have been required.

Equipment fueling, cleaning, and maintenance activities maintained a distance of 100 m from waterbodies and wetlands and utilized secondary containment.

4.2 EROSION AND SEDIMENT CONTROL

Specific erosion and sediment control measures are described in Sections 4.1 above and 4.3.1 below. In general, erosion and sediment control measures included:

- Installation of straw wattles
- Installation of silt/sediment fences
- Leaving a natural vegetative buffer
- Installation of fiber rolls
- Covering of exposed areas using geotextile or other suitable material
- Placing stockpiles at least 50 m from the Elbow River and 30 m from Unnamed Creek; in areas where space was limited, sediment fencing and straw wattles were installed at the base of the stockpiles to prevent sediment releases
- Separating topsoil and subsoil piles by at least 3 m; in areas where space was limited, sediment fencing was installed in between topsoil and subsoil piles to prevent admixing of soil
- Erosion control measures were revised and implemented prior to winter shutdown and additional measures were taken to insulate/cover drainage pipes and installation of additional silt fencing to manage snow drifts and snowmelt/surface run off during the spring
- Installation of control devices that are winter melt and spring runoff appropriate

A combination of the above measures were used to control erosion and sedimentation as and where needed. These measures were inspected routinely and replaced or augmented when necessary. Inspections were increased following snow melt or rain events.

Additional erosion and sediment control supplies and equipment were available onsite to be used as required.

4.3 WATER MANAGEMENT

4.3.1 Surface Drainage/Runoff

Surface water and runoff within the Project construction area was managed as follows:

- Where water pooled naturally, and there were no potential impacts to the surrounding environment, it was left to naturally seep into the ground. In the event of potential impacts to surrounding environments, pooled water was pumped into nearby dug-outs or to a nearby vegetated buffer to naturally seep into the ground (see Section 4.3.2 for details surrounding dewatering activities).
- Silt fences were installed at the perimeter of wetlands that intersect the construction area where either construction activities were directly adjacent to the wetland or where there was the potential for water to flow into the wetland from the construction area. For areas where the topography sloped away from a wetland, a 10 m vegetated buffer was maintained.
- Along the Unnamed Creek, erosion and sediment control measures (i.e., straw wattles) were installed to direct water away from the Unnamed Creek.
- Surface water (from drainage and runoff) was collected in small dug-outs and drained via tube away from the construction site to a vegetated buffer
- Straw wattles were installed parallel to the Elbow River to control potential surface water flows into Elbow River.
- Silt fencing was installed along the base of stockpiles that had greater risks of erosion
- A 500 m long earthen berm (constructed the previous reporting year) along the top of the north bank of the Elbow River was kept in-place to prevent water and debris from falling into the Elbow River by directing rainfall towards the diversion structure.

4.3.2 Dewatering

Dewatering occurred throughout the 2023/2024 reporting year (except in winter when the ground was frozen).

Dewatering activities at the Diversion Inlet Structure occurred continually throughout the 2023/2024 reporting year. Water entering the Diversion Inlet Structure excavation (i.e., naturally seeping through the excavated walls into the construction area) was pumped to a settling pond located to the East of the Diversion Structure. Water was pumped out of the Diversion Inlet Structure up the slope to a vegetated buffer; a sediment filter bag was attached to the hose outlet when near areas of ecological concern.

After snow melt and rainfall events, two types of dewatering activities were required at the Grade control structure construction area. Water was pumped from the low-lying areas to a collection pond which had a secondary pump and hose outfitted with a silt bag at the outlet.

An overflow channel was installed at the collection pond with multiple straw wattles in the channel to prevent any overflow run off carrying sediment to the Unnamed Creek. A vegetated buffer between the pumped water and Unnamed Creek was also utilized as an additional erosion and sediment control measure. Water was also pumped to a vegetated buffer between the Grade Control Structure and Unnamed Creek. A sediment filter bag was attached to the hose and sediment fencing was installed parallel to Unnamed Creek to minimize the potential for sediment entering the creek.

The Dam area dewatering occurred after rainfall events and involved pumping water into nearby dugouts when possible or pumping into vegetated areas. Water was not discharged directly to a waterbody.

Snow was actively removed from construction sites with the use of tracked equipment and runoff from snowmelt was collected in low laying areas then pumped into dugouts.

4.3.3 Work in River

There was no construction work completed in the Elbow River during the 2023/2024 reporting year.

The realignment of Unnamed Creek by the Low-level Outlet was completed during the 2023/2024 reporting year. The surrounding area was stripped and graded to create a constructed channel that connects to the creek's natural alignment on either side of the dam. As a result, when there is water flowing in Unnamed Creek, the water will now flow through the constructed channel and conduit and into Elbow River. Reclamation (i.e. seeding) of the realigned Unnamed Creek channel will be completed next year. On November 6, 2023, permission was granted by Fisheries and Oceans Canada (DFO) to complete the final, approved, design of the channel during the Restricted Activity Period (RAP). Activities were completed when no water was flowing, and the creek was dry.

4.3.4 Dug-Outs

During the 2023/2024 reporting year, the four dugouts that were established during the 2022/2023 reporting year were maintained and utilized during non-frozen conditions. TDLs were renewed to divert water from the Elbow River at three locations. A license to use groundwater in construction activities was also renewed. Water diverted from both sources was stored within the dugouts to be used during construction for Earthworks moisture conditioning and dust control across site. Pumping rates were kept within licensed amounts. Section 2.2 lists the permits that were obtained during the 2023/2024 reporting year include the TDLs described above.

4.4 ACCIDENTS AND MALFUNCTIONS

As required by IAAC approval condition 11.2, Accident and Malfunction measures that TEC was proposing for the construction phase were presented to Indigenous groups in a letter for review and comment. No feedback on the proposed accident and malfunction measures were received. TEC used the measures to develop the Construction Spill Response and Communications Plan which was submitted to IAAC and Indigenous groups in March 2022. The Plan outlines the following information:

- Types of spills that could result at the Project site
- Hazardous materials spills, handling, and containment procedures & practices
- Reporting requirements

There were no updates or revisions to the Construction Spill Response and Communication Plan during the 2023/2024 reporting year.

During the 2023/2024 reporting year, several minor leaks or spills of substances were reported internally but none met the threshold requiring self-reporting to regulators. All minor leaks and spills were documented internally including the date, time, location, equipment/machinery, substance, quantity, reason for the release and follow up actions. All contaminated soil and materials were contained, and the contaminated materials were removed and placed within a labeled waste bin for disposal at an appropriate waste facility. All equipment and machinery that experienced a leak or were malfunctioning were repaired or removed from the construction site for replacement. Equipment and machinery re-entering the construction site were inspected prior to re-use.

4.5 ONSITE MONITORS

4.5.1 Indigenous Monitoring Program

In accordance with IAAC approval condition 9.1 and condition 2.10, Indigenous Monitors were retained prior to construction to observe, record, and report to TEC and Indigenous groups on the implementation, throughout construction, of requirements set out in the Decision Statement including the Archeological and Heritage Management Plan referred to in IAAC approval condition 9.3. During the 2023/2024 reporting years, Indigenous Monitors from Ermineskin Cree Nation, Louis Bull Tribe, Métis Nation of Alberta Region 3, Montana First Nation, Piikani Nation and Samson Cree Nation participated. Eleven Indigenous Monitors were retained during the 2023/2024 reporting year.

During the 2023/2024 reporting year, discussions continued with the remaining Indigenous groups in an effort to finalize contracts and ultimately mobilize additional Indigenous Monitors.

All Indigenous Monitors, prior to mobilizing to the construction site, were provided onboarding training to discuss their role, review the Environmental Monitoring Plans, and the IAAC approval conditions to prepare for their role. Quarterly training sessions were held with the Indigenous Monitors to review monitoring plans, role descriptions and requirements, and to provide an opportunity for the Indigenous Monitors to discuss their experiences while onsite.

The Indigenous Monitors worked onsite with an Indigenous Relations Coordinator to observe construction activities on a daily basis. Each day, the Indigenous Monitors recorded their observations of the implementation of requirements in an online tool. These daily field reports were shared with the respective contract holders. A Monthly Observation report was drafted by the Indigenous Relations Coordinator using observations from the Indigenous Monitors' daily field reports. The draft monthly report was verified by the Indigenous Monitors and provided to the contract holders for review and comment prior to being finalized. Once final, these reports were shared with TEC and each Indigenous group engaged on the Project.

4.5.2 Independent Environmental Monitor

A third-party Independent Environmental Monitor was retained for the construction phase of the Project. The Independent Environmental Monitor observed and recorded the implementation of the IAAC approval conditions and submitted monthly reports directly to IAAC. The monthly reports summarized observations and made recommendations with respect to implementation of the approval conditions.

4.6 SCHEDULES

Schedules required under IAAC approval conditions 12.1 (schedule for the IAAC approval conditions), and IAAC approval condition 12.2 (activities required to carry out the Project) were prepared and submitted to the Agency and Indigenous groups on December 14, 2021, providing adequate notice prior to commencing pre-construction activities (i.e., site clearing) in February 2022. As required by IAAC approval condition 12.3 and 12.4, see Appendix C for revised schedules. Construction activities for the diversion structure are expected to be completed in the next reporting period. Despite unforeseen challenges, such as inclement weather and delays in material shipments, the project remains on track to be operational by Spring 2025.

On December 14, 2021, the Agency and Indigenous groups were provided figures illustrating the final project design and the Project construction area as part of IAAC approval conditions 8.7 and 9.6. There are no changes to the final Project design or construction area for the 2023/2024 reporting year.

4.7 TERRESTRIAL

4.7.1 Vegetation and Wetland Management

4.7.1.1 Weed Management and Invasive Species

In accordance with IAAC approval condition 3.5, all equipment and machinery that entered the construction area during the 2023/2024 reporting year of construction were inspected for the presence of invasive alien and noxious weeds, and soil debris.

The topsoil and subsoil stockpiles were monitored during the growing season for the presence of invasive alien and noxious weeds. Weed management was undertaken following the process outlined in the Vegetation and Wetland Mitigation, Monitoring and Revegetation Plan, Section 7.3 Table 7.4 (i.e. hand removal). No herbicides were used during the 2023/2024 reporting year.

4.7.1.2 Vegetation and Reclamation Monitoring

As discussed in Section 4.1.1.1, soil stripping activities commenced in February 2023 and continued for the duration of the 2023/2024 reporting year. During the 2023/2024 reporting year, key soil stripping and stockpiling mitigation measures included but were not limited to:

- Applying stripping and stockpiling practices which prevent admixing with other soil horizons such as spacing stockpiles 3 m apart or installing sediment fencing between topsoil and subsoil stockpiles when workspace was limited
- Placing stockpiles within the construction footprint area and storing the topsoil from the diversion channel separately for later use in the restoration of the diversion channel (i.e. adjacent to the diversion channel) as required by approval condition 3.8
- Sloping soil stockpiles (less than 70 degrees) to reduce the risk of erosion as required by approval condition 4.5.3
- Placing stockpiles within the construction footprint area at least 30 m from the top of Unnamed Creek and wetlands
- Monitoring topsoil piles for erosion and weed growth
- Silt fencing was also used to limit dust generation from stockpiled soils

The minor vegetation removal (i.e. shrubs within the borrow pit areas) and soil stripping was done in phases and soil handling was avoided during excessively windy conditions and inclement weather (e.g., heavy rain) to reduce the area of exposed soils vulnerable to wind and water erosion. Soil stockpiles were stabilized as soon as possible by track packing the top surface, and silt fences were installed at the toe side of several stockpiles. Silt fences were routinely inspected. Site specific conditions did not allow for the installation of silt fences at all stockpiles. For these stockpiles, other forms of erosion and sediment control measures (e.g., retaining a vegetated buffer, installing straw wattles) were implemented and/or installed. During the Migratory Birds

Restricted Activity Period, wildlife sweeps were conducted in advance of all topsoil and subsoil stripping activities.

Black henbane (*Hyoscyamus niger*), listed as a Noxious weed under the Alberta *Weed Control Act*, was observed on-site growing along the construction area entrance of the Floodplain berm next to the access road and soil stockpiles. Plants were hand-picked on June 26, 2024, before the plants produced seed. Collected plants were placed in a plastic bin and disposed of off-site at an approved waste facility by GFL Environmental Inc.

Topsoil was placed in July 2023 in the Highway 22 embankment south of Highway 1 to south of Springbank Road following construction completion of the Highway 22 grade raise. Topsoil in this area is to be seeded the following reporting year using Project approved seed mixes as detailed in the Vegetation and Wetland Mitigation, Monitoring and Revegetation Plan.

Reclamation activities were not conducted during the 2023/2024 reporting year.

4.7.1.3 Wetland

In fulfillment of IAAC approval conditions 5.8 and 5.9, IAAC and the Indigenous groups were provided with a figure prior to the start of construction (January 2022) showing the wetlands to be permanently removed as a result of construction activities.

During the 2023/2024 reporting year, existing roads farm trails as well as a constructed light-duty vehicle road paralleling the diversion channel and dam were used to access the construction area. Equipment fueling, cleaning, and maintenance activities maintained a distance of 100 m from waterbodies and wetlands and utilized secondary containment. Substances with potential to cause harmful effects to the environment were stored over 100 m from water bodies and wetlands. Sediment control measures, vegetated buffers and signage were used to avoid and minimize disturbance to wetlands.

Construction dewatering was inadvertently directed to wetland (SW 14-024-04-W5M) that extends outside of the construction area on May 29, 2024, resulting in sediment being released in the wetland. The portion of the wetland that falls within the construction area was approved to be impacted by construction in the Alberta *Water Act* Wetland Impact and Assessment Report but the portion outside of the construction area was not. Once identified, discharge was directed to a vegetated area upslope and straw wattles were in place to slow and capture sediment; however, these measures were not completely effective. This release was reported to AEPA June 11, 2024, by the Contractor. Additional mitigation measures were implemented and included pumping rate was reduced following identification of the release into the wetland and hose extension and silt bag attached to the pump. APEA completed their review and did not require additional information. This area was monitored during the summer months and vegetation was observed growing.

4.7.2 Wildlife

4.7.2.1 Preconstruction Surveys

The results of the pre-construction surveys to meet IAAC approval conditions 5.1, 5.2, and 6.3 were presented in 2021/2022 Annual Report. No further work is required for these approval conditions.

4.7.2.2 Wildlife Sweeps

Pre-construction wildlife sweeps were completed during August 2023, April 2024, and June 2024, as recommended in the WMMP to identify potential active wildlife features (e.g., nests, dens). One active goose nest and one active Killdeer nest were discovered during the wildlife sweeps conducted on April 29 and April 30, 2024. Both of the nests were discovered near the Highway 22 Bridge. A 100 m buffer was established around both nests. In addition, two Savannah sparrow (*Passerculus sandwichensis*) nests and two Brewer's blackbird (*Euphagus cyanocephalus*) nests were observed within the Project area (SW 24-024-04 W5M) during the wildlife sweep conducted on June 10, 2024, on the east side of Range Road 41.

A 100 m buffer was established around the killdeer nest and a 30 m buffer was established around the Savannah sparrow nests using stakes and flagging, and the buffers were avoided until each of the species left the nests. A buffer was not established for either of the observed Brewer's blackbird nests because the nests were located adjacent to a busy hauling road with frequent traffic and human presence. No construction mitigation was required. A wildlife monitor was present to observe the birds daily while construction was taking place.

Wildlife sweeps included amphibian surveys in wetlands, waterbodies and dugouts located in several areas of the Project construction area and intersecting the Project construction area. No amphibians were observed during the surveys.

Site-specific mitigation measures were implemented in accordance with IAAC approval conditions related to migratory birds and amphibian species at risk including IAAC approval conditions 4.1, 4.6, 4.8, and 5.2. In general, wildlife mitigation measures included:

- Wildlife monitors completing consistent and continuous monitoring of the nesting birds to assess bird behaviour/response and ensure that the established buffers were adequately mitigating construction disturbances.
- Restricting access and/or reducing speed of construction vehicles near active buffers.
- Regular weekly check-in meetings with construction crew/operators to ensure operator awareness and caution during construction activities.

Incidental Observations by Construction Crew and Indigenous Monitors

Indigenous Monitors and construction personnel recorded incidental observations of wildlife seen in or near the construction area. The list of wildlife species incidentally observed from July 2023 to June 2024 is included in Appendix D. A summary of incidental wildlife species observed, on or near the Project site, is provided below.

- Elk (Cervus canadensis)
- Mule deer (*Odocoileus hemionus*)
- White-tailed deer (*Odocoileus virginianus*)
- Coyote (*Canis latrans*)
- Canada geese (*Branta canadensis*)
- Great blue heron (*Ardea herodias*)
- Wood frog (*Lithobates sylvaticus*)
- Rabbit (Species not reported)
- Red-tailed hawk (*Buteo jamaicensis*)
- Golden eagle (*Aquila chrysaetos*)
- Owl (Species not reported)
- Bald eagle (*Haliaeetus leucocephalus*)
- Stoat (*Mustela erminea*)
- Grouse (Species not reported)
- Crow (Species not recorded)
- Minnow (Species not recorded)

The following additional observations were recorded from July 2023 to June 2024.

- Moose (*Alces alces*) pellets, and tracks
- Elk (*Cervus canadensis*) pellets, and tracks
- Deer pellets, and tracks
- Northern pocket gopher (*Thomomys talpoides*) mounds
- Coyote (*Canis latrans*) den identified 400 m south of the end of Range Road 41, west of the farmhouse. A 100 m semi-circle was staked with orange flagging labelled “wildlife” to notify construction workers. Coyote droppings and tracks
- Cougar (*Puma concolor*) tracks identified on the Floodplain Berm, on the access road into Floodplain Berm/Auxillary Spillway area, and south of the Exit Channel.

As per IAAC condition 8.5, wildlife friendly fencing was installed following design specifications described in the Alberta Landholder's Guide to Wildlife Friendly Fencing (Paige 2020) to prevent access by livestock and allow wildlife passage. There were two sections of wildlife friendly fencing installed in the Project Development Area during the 2022/2023 reporting year. Wildlife use of wildlife friendly fencing and crossing success will continue to be monitored as part of the WMMP.

Migratory Birds

The majority of trees and shrubs that could provide suitable nesting habitat were cleared during the 2021/2022 reporting year to reduce the potential for migratory birds nesting within the Project construction area. In accordance with IAAC approval condition 4.6, construction activities, such as vegetation clearing, that may affect migratory birds were scheduled to avoid the migratory bird breeding period (April 1 to August 31) where possible. In areas where construction activities were planned during the migratory bird breeding period (i.e. borrow pit areas), pre-construction wildlife sweeps were completed to reduce potential disturbance to nesting birds by implementing an appropriate setback buffer consistent with IAAC approval conditions 4.6 and 4.8 as well as direction provided in the WMMP. See Section 4.7.2.2 for additional information on wildlife sweeps.

The birds listed below were incidentally observed during construction. Wildlife sweeps occurred between July 2023 and August 2024; none of the birds listed below are listed under Schedule 1 of the *Species at Risk Act* (SARA):

- Black-capped chickadee (*Poecile atricapillus*)
- Canada geese (*Branta canadensis*)
- American crow (*Corvus brachyrhynchos*)
- American Goldfinch (*Spinus tristis*)
- Brewer's blackbird (*Euphagus cyanocephalus*)
- American robin (*Turdus migratorius*)
- Vesper sparrow (*Pooecetes gramineus*)
- Red-tailed (*Hawk Buteo jamaicensis*)
- Savannah sparrow (*Passerculus sandwichensis*)
- Barn swallow (*Hirundo rustica*)
- Chipping Sparrow (*Spizella passerine*)
- Black-billed Magpie (*Pica hudsonia*)
- Killdeer (*Charadrius vociferus*)
- Mallard (*Anas platyrhynchos*)
- Red-tailed hawk (*Buteo jamaicensis*)

- Wilson's snipe (*Gallinago delicata*)
- Red-winged blackbird (*Agelaius phoeniceus*)
- Franklins gull (*Leucophaeus pipixcan*)
- House wren (*Troglodytes aedon*)
- Belted Kingfisher (*Megaceryle alcyon*)
- Northern Harrier (*Circus hudsonius*)

The following nests were observed during the wildlife sweeps:

- Canada goose nest near the Highway 22 bridge. A 100 m setback buffer was installed and maintained.
- Killdeer nest near the Highway 22 bridge. A 100 m setback buffer was installed and maintained.
- Two Savannah sparrow nests within SW 24-024-04 W5M, east of Range Road 41. A 30 m buffer was installed and maintained.
- Two Brewer's blackbird nests along Range Road 41 (east side) in SW 24-024-04 W5M. The Brewer's blackbird nests were located on the right-of-way of a busy hauling road, which had frequent large passing trucks and human presence. A buffer was not installed as it was determined that no construction mitigative action was required.

Amphibians

One a western tiger salamander (*Ambystoma mavoritium*) was observed in the active Project construction area during 2023/2024 reporting year. The adult tiger salamander was observed on May 14, 2024, in the downstream end of the Low-Level Outlet in a ponded area of Unnamed Creek with no emergent or surrounding vegetation near riprap and a culvert. A visual survey was completed to determine if this area was a potential breeding site. The visual survey was completed, which included a scan of the ponded area, nearby riprap and culvert as well as a dip-netting. Following the survey, it was determined that there was no evidence of breeding in the ponded area or surrounding areas. The western tiger salamander was safely relocated to a suitable waterbody located downstream in a pooled area with vegetation cover.

4.7.2.3 Remote Camera Monitoring Program Summary

As part of the remote camera monitoring program, wildlife use in the Local Assessment Area (LAA) was monitored during the 2023/2024 construction period. This Annual Report includes data collected during all four seasons: spring (April 1 to May 31, 2023); summer (June 1 to August 31, 2023); fall (September 1 to November 30, 2023); and winter (December 1, 2023 to March 31, 2024).

The twenty-seven remote cameras were deployed during the 2021/2022 construction period were maintained, however, the number of cameras that were operational during each season varied due to battery failure or cameras being knocked off orientation by wildlife. Although some of the cameras were not fully operational during each seasonal monitoring period, there was sufficient data collected (> 30 monitoring days) for analysis. Overall, 23 of 27 (85.2%) cameras were operational during the 61-day spring monitoring period with the remaining cameras operational for 36, 59 and 47 days. Because these cameras were operational for more than 30 days they were retained for analysis. During summer, four cameras were omitted from the analysis because they were knocked off orientation and compromised the field of view, which resulted in 23 of 27 remote cameras (83.2%) operational for the 92-day monitoring period. During fall, 24 of 27 cameras (88.9%) were operational for the 91-day monitoring period with three remaining cameras operational for 72, 59 and 37 days. During winter, 22 of 27 cameras (81.5%) were operational during the 122-day monitoring period. The remaining five cameras collected data for 104, 98, 65, 42 and 38 days, which were retained for analysis (see Appendix B.1).

Remote cameras detected 9,220 independent events over 9,197 camera-days across all four seasons during the 2023-2024 construction period (April 1, 2023 to March 31, 2024) (Appendix B.1). Of those, 83.1% of total detections were comprised of three species, including white-tailed deer (*Odocoileus virginiana*) (38.6%), elk (29.3%), and coyote (15.2%). Other focal wildlife species detected included mule deer (*Odocoileus hemionus*) (4.4%), unidentified deer (*Odocoileus* spp.) (1%), red fox (1.1%), moose (*Alces alces*) (1.1%) as well as black bear (*Ursus americanus*), cougar (*Puma concolor*) and wolf each comprising less than 1% of independent events. The remainder of independent events included other wildlife (e.g., birds, small mammals) (4.3%), humans including vehicles and construction equipment (2.2%), cows (0.8%), and horses (0.4%) as well as unknown (unidentified) animals (0.6%).

Nine focal wildlife species were detected during the 2023-2024 construction period including the first detection of wolf during winter. Grizzly bear was not detected at remote camera stations; however, black bear was detected during summer and fall in upland areas and along Elbow River. Overall, elk had the highest relative abundance index across all seasons followed by white-tailed deer and coyote. Four species of small mammals were also detected including white-tailed jackrabbit (*Lepus townsendii)*, striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), and red squirrel (*Tamiasciurus hudsonicus*). Eleven bird species were also detected including three songbirds, Canada goose (*Branta canadensis)*, one woodpecker (northern flicker [*Colaptes auratus*] as well as American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida aurita*), black-billed magpie (*Pica hudsonia*), European starling (*Sturnus vulgaris*), ruffed grouse (*Bonasa umbellus*) and red-tailed hawk (*Buteo jamaicensis)*.

Although elk and white-tailed deer were detected at similar photographic rates during spring and summer, there were fewer detections/100 camera-days for both species during fall and winter. Coyote was detected more frequently during spring and winter compared to summer and fall, whereas mule deer and red fox photographic rates were relatively higher during winter compared to other seasons (Appendix B.1).

Overall, the relatively high naïve occupancy estimates for white-tailed deer (>80%), elk (>70%) and coyote (>80%) indicated these three focal wildlife species remained relatively well distributed throughout the LAA during the 2023-2024 construction period. There was seasonal variation in occupancy within each species where white-tailed deer were detected at the most remote camera stations during spring (100%), elk during summer (96%) and coyote during winter (100%).

The highest photographic rates for elk and white-tailed deer occurred at CAM-15b, CAM-19b, CAM-24b and CAM-30b during spring and summer with continued high use at CAM-30b during winter (see Appendix B.1, Figure 1). Relatively high photographic rates at these monitoring stations is consistent with previous monitoring years (IAAC Annual Report – 2022/2023 Reporting Year) and likely reflect the preferred forage and cover present at these locations that are varying distances from construction activities. Elk were detected frequently at CAM-15b near diversion channel construction (approximately 150 m) and at CAM-24b near the low-level outlet (approximately 200 m). CAM-19b and CAM-30b are relatively farther from construction activities (250-400 m), however, elk were detected at CAM-30b frequently during borrow source construction activities along the eastern edge of the Project Development Area (PDA). Elk photographic rates at CAM-01 along Elbow River also increased compared to 2022 (IAAC Annual Report – 2022/2023 Reporting Year). The relatively high percentage of cameras (67%) that detected elk calves during June and July was similar to 2022 (65%) (IAAC Annual Report – 2022/2023 Reporting Year), which indicates elk continue to use the LAA during the calf rearing period while construction activities occurred.

During winter, photographic rates for white-tailed deer and mule deer were relatively low compared to other seasons (see Table 2, Appendix B.1). Elk photographic rates increased during winter compared to fall but were still lower compared to the relatively higher rates detected during spring and summer. Except for CAM-01, elk were not detected along Elbow River during winter, but rather used upland areas (grassland/shrublands) extensively (e.g., CAM-04, CAM-19b, CAM-30b). Similar to the 2022-2023 winter construction period, elk photographic rates were highest at CAM-30b during the 2023-2024 winter when they were detected travelling through the adjacent aspen forest and feeding in grassland/tame pasture. Coyote and red fox photographic rates also increased during winter. Wolf was detected during winter at three monitoring stations including CAM-9b, CAM-10b along Elbow River and CAM-04 east of Highway 22. The wolf detections represent the first sightings recorded during the SR1 remote camera monitoring program.

Both white-tailed deer and elk appear to reduce their use of the PDA/LAA during winter, which was evident during the 2021 pre-construction period. White-tailed deer continued this trend during the 2022-2023 and 2023-2024 construction periods whereas elk photographic rates showed a relative increase during 2022-2023 and 2023-2024 winter periods (see Appendix B.1 Figure 4). Overall, elk and coyote photographic rates have shown a relative increase during winter construction compared to pre-construction. Although photographic rates of elk, white-tailed deer have varied by season and project phase a comparison of relative abundance indicated the differences are not statistically significant. However, there was a significant difference (positive trend) in coyote photographic rates between construction phases (P=0.018) where coyote photographic rates increased relative to 2021 pre-construction.

Detailed methods and results of the remote camera monitoring program are provided in Appendix B.1.

4.7.2.4 Bank Swallow

In accordance with IAAC approval condition 4.11.1, and the Bank Swallow Mitigation Plan, bank swallow (*Riparia riparia*) activity was monitored at three previously identified colonies between May 1 and August 31, 2024.

Methods

The status of three bank swallow colonies previously identified on Elbow River during 2022, the first year of construction, were visited twice on foot to determine colony status (i.e., active/inactive) and activity levels during the bank swallow nesting period for nesting zone B4 (early-May to mid-July) [Birds Canada 2023). The three colonies included BANS_BY01 located in NE-18-24-03-W5 as well as BANS_BY02, and BANS_BY03 located in NW-18-24-03-W5 (Figure 4.1). Although BANS_BY01 was not active last year due bank failure (IAAC Annual Report – 2022/2023 Reporting Year), it was visited during 2024 to determine colony status and assess bank conditions. Other suitable (vertical) banks along Elbow River were also scanned using binoculars for new bank swallow nesting activity. Each bank swallow colony was observed for 20 minutes during each visit. The number of individuals (adults and juveniles) and number of active burrows (i.e., burrows with active excavation, adults entering or exiting, or nestlings visible) were recorded, where possible.

Results

Three previously identified bank swallow colonies on Elbow River were surveyed on June 6, 2024, and July 3, 2024.

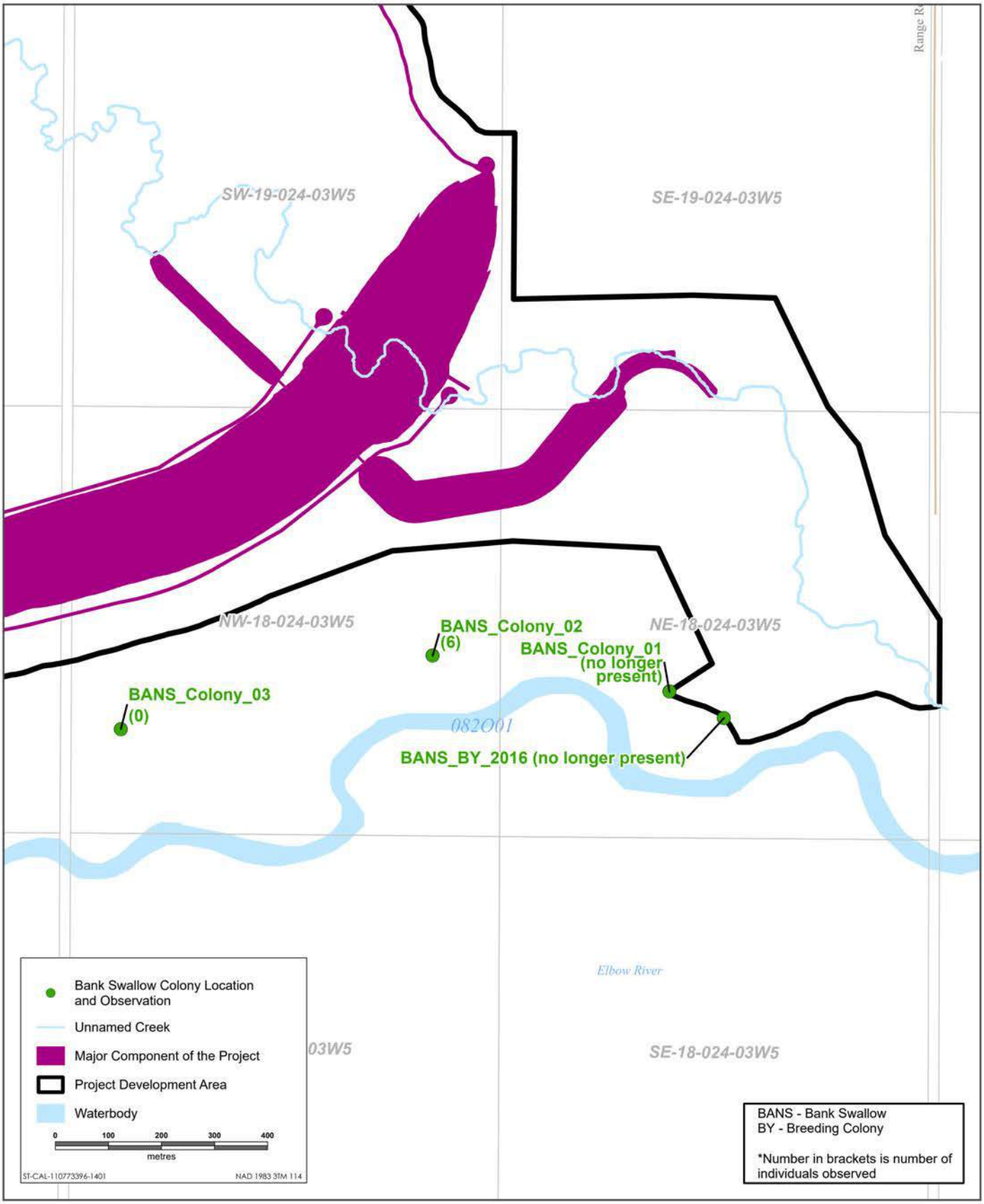
Bank Swallow Colony 1 (BANS_BY01)

BANS_BY01 was visited on June 6, 2024, between 07:45 and 08:05 AM. Temperature was 11 degrees Celsius (°C), wind was light (Beaufort 1), with 20% cloud cover and no precipitation. No swallows were observed foraging or nesting at this location. Overall, the banks along this section of Elbow River continue to erode, which appears to have reduced the area of suitable nesting habitat (Photo 1). Although no bank swallow were observed, six northern rough-winged swallows (*Stelgidopteryx serripennis*) were incidentally observed foraging at this location.

A second visit to BANS_BY01 was completed on July 3, 2024, between 07:15 and 07:40 AM. No bank swallow foraging or nesting activity was observed.

Photo 1 Eroded bank along Elbow River where bank swallow colony (BANS_BY01) was previously identified during 2022





Sources: Thematic Data - Stantec. Base Data - Government of Alberta. Stantec

Bank Swallow Colony Locations and Observations Along Elbow River - 2024 Monitoring Results

Stantec

ALBERTA TRANSPORTATION SPRINGBANK OFF-STREAM RESERVOIR PROJECT

Figure 4.1

Bank Swallow Colony 2 (BANS_BY02)

BANS_BY02 was visited on June 6, 2024, between 08:35 and 09:05 AM (Photo 2). Temperature was 11°C, with light winds (Beaufort 1) with 20% cloud cover and no precipitation. No bank swallows were observed. However, ten northern rough-winged swallows were incidentally observed at this location.

A second visit to BANS_BY02 was completed on July 3, 2024, between 08:10 and 08:40 AM, temperature was 11°C with light winds (Beaufort 1), overcast skies, and intermittent rain. Although there were no bank swallow observed on the north side of Elbow River, six adult bank swallows were observed using the vertical slopes on the south side of Elbow River. In addition, 10 northern rough-winged swallows were also incidentally observed along the south bank. Overall, continued bank erosion along the north side of Elbow River has reduced bank swallow nesting habitat suitability.

Photo 2 Unoccupied bank swallow colony (BANS_BY02) along north side of Elbow River during 2024



Bank Swallow Colony 3 (BANS_BY03)

BANS_BY03 was visited on June 6, 2024, between 09:20 and 09:45 AM (Photo 3). Temperature was 11°C, with light winds (Beaufort 1), with 20% cloud cover and no precipitation. No bank swallows were observed nesting or flying near the banks at this location (Photo 3).

A second visit to BANS_BY03 was completed on July 3, 2024, between 09:50 and 10:15 AM. Temperate was 11°C with light winds (Beaufort 1), overcast skies, and intermittent rain. No bank swallows were observed entering or exiting the burrows.

Photo 3 Unoccupied bank swallow colony (BANS_BY03) along Elbow River during 2024



Overall, BANS_BY01 remained unoccupied during the 2024 breeding season, BANS_BY02 was only occupied on the south side of Elbow River, and BANS_BY03 was not occupied. The maximum number of bank swallows observed at BANS_BY02 declined from 41 individuals observed in 2023 to 6 individuals observed in 2024 (Table 4.1). No new bank swallow colonies were identified during the 2024 surveys.

Overall, the monitoring program has indicated bank swallow nesting activity and the number of breeding pairs observed along Elbow River has varied annually since 2022. This appears to be partly related to natural bank erosion and collapse resulting in abandonment and/or reduced use. Trend in bank swallow abundance and status of three colonies located along Elbow River over the last three years is provided in Table 4.1. An evaluation of bank swallow monitoring results relative to performance indicators and targets identified in the WMMP is provided in Table 4.2.

Table 4.1 Summary of Bank Swallow Colony Status and Abundance: Construction 2022-2024

Colony ID	Monitoring Year	Status	Maximum Number of Individuals
BANS_BY01	2022	Occupied	12
	2023	Unoccupied	0
	2024	Unoccupied	0
BANS_BY02	2022	Occupied	10
	2023	Occupied	41
	2024	North Side Unoccupied South Side Occupied	6 (south side of Elbow River)
BANS_BY03	2022	Occupied	10
	2023	Occupied	14
	2024	Unoccupied	0

Table 4.2 Summary of Bank Swallow Monitoring Outcomes, Performance Indicators and Targets: 2023-2024 Construction

Performance Indicator	Target	Monitoring Outcomes
Number of breeding pairs and active bank swallow burrows in the Project area	• Continued use of the Project area each monitoring year as indicated by the number of breeding pairs of bank swallow and active burrows observed during construction and dry operations.	• Monitoring results for 2024 indicated reduced bank swallow use along Elbow River due to natural bank erosion and lower habitat suitability at previously identified colonies. • Maximum number birds observed at BANS_BY02 was 6 individuals over two visits (3 pairs), which is a decrease compared to the 26-41individuals (13 -20 breeding pairs) observed during 2023. Number of burrows was undetermined in 2024 due to access constraints/safety considerations. • Both BANS_BY01 and BANS_BY03 were not active during 2024. Heavy rain during June 2024 might have resulted in slope failure along Elbow River where colonies existed – further slumping appeared evident along Elbow River during 2024.
Number of residences destroyed or created due to Project activities	• Zero residences destroyed	• No residences were destroyed due to Project activities

4.7.2.5 Wildlife Monitoring Results, Performance Indicators, and Targets

An evaluation of wildlife monitoring results relative to performance indicators and targets identified in the WMMP is provided in Table 4.3.

Table 4.3 Summary of Wildlife Monitoring Outcomes, Performance Indicators and Targets used to Evaluate Mitigation Effectiveness during Construction 2023-2024

Residual Effect	Performance Indicator	Target	Monitoring Outcome
Change in Habitat (sensory disturbance)	• Number of active wildlife features that remain in use to meet species breeding needs (i.e., successful nesting, denning due to effective setback buffers)	• 100% of active wildlife features receive an effective setback buffer that results in nesting or denning success (i.e., evidence of fledging, or no den abandonment)	All active bird nests received appropriate setback buffers until the nests were complete (i.e., juvenile birds had fledged)
Change in Movement (Ungulate Movement/ Habitat Use)	• Number of days construction activities occur during the RAP for the Key Wildlife Biodiversity Zone (KWBZ) along Elbow River (December 15 to April 30)	• Minimize the number of days construction activities occur during the RAP for the KWBZ along Elbow River (December 15 to April 30	Construction activity occurred during approximately 98.5% of the KWBZ RAP (134 of 136 days), primarily along Elbow River near the diversion structure. Based on the results of the remote camera monitoring program, relative abundance (photographic rates) of ungulates along Elbow River during the 2023-2024 winter was variable. White-tailed deer photographic rates along Elbow River were relatively low during 2023-2024, which is consistent with previous monitoring years (i.e., 2021, 2022). Overall, white-tailed deer and elk were detected less frequently in the LAA during winter compared to other seasons (see Appendix B.1). Except for CAM-01, elk were not detected along Elbow River during the 2023-2024 winter, but rather used upland areas (grassland/shrublands) extensively, which is consistent with previous monitoring years (i.e., 2021, 2022). Mule deer were detected at CAM-01 as well as CAM-07 and CAM-11b along Elbow River near the diversion inlet and diversion channel construction activities but were not detected at other stations along Elbow River (CAM-09b, CAM10) (see Appendix B.1).

Table 4.3 Summary of Wildlife Monitoring Outcomes, Performance Indicators and Targets used to Evaluate Mitigation Effectiveness during Construction 2023-2024

Residual Effect	Performance Indicator	Target	Monitoring Outcome
Change in Mortality Risk	• Number of active wildlife features (i.e., nests, dens, roost sites, hibernacula) destroyed	• Zero active wildlife features destroyed	Pre-construction wildlife sweeps were completed to reduce potential mortality risk. No active wildlife features were destroyed.
	• Number of animal-vehicle collisions (AVC) in the LAA (e.g., Hwy 22, Springbank Road) that can be attributed to the Project (i.e., construction traffic)	• Zero AVC in the LAA that can be attributed to the Project	There was one AVC collision that resulted in two elk fatalities (cow and calf) on September 27, 2023. The collision occurred within the construction boundary along the heavy-duty haul road. Adaptive Management Action: observations and communications over the radio when wildlife are observed onsite. Wildlife observations are documented.
	• Number of reported wildlife–human conflicts	• Zero wildlife-human conflicts	There were no wildlife-human conflicts during this reporting period.
	• Number of problem (i.e., conflict) wildlife animals removed from the Project site	• Zero problem wildlife removed from the Project area due to human-wildlife conflicts • All workers (100%) on site receive wildlife awareness training (e.g., Bear Smart)	There was no problem wildlife removed from the Project area due to human wildlife conflicts. All workers on site received the appropriate safety training prior to all field surveys.

4.8 WATER AND AQUATICS

4.8.1 Water Quality

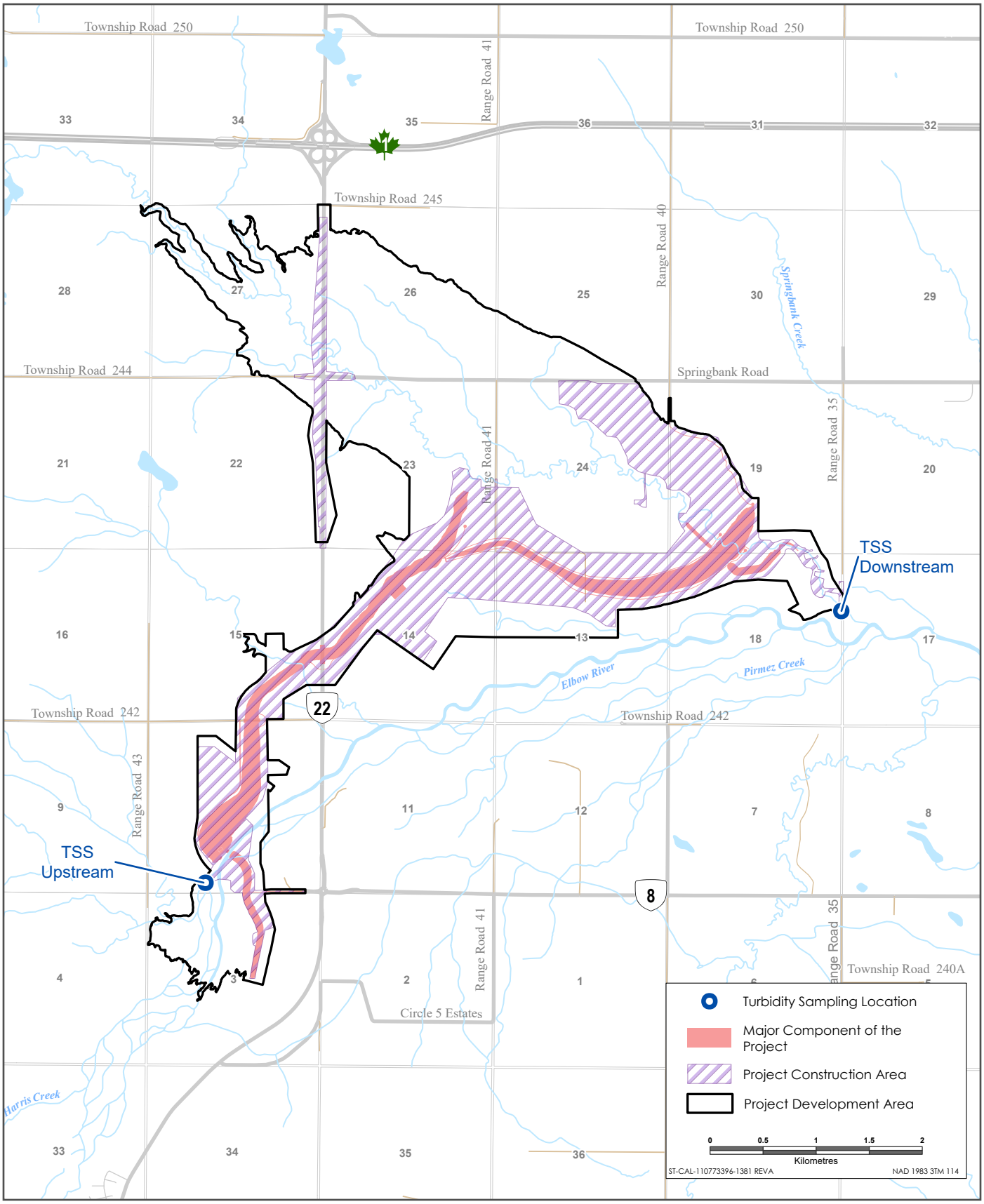
4.8.1.1 Turbidity Monitoring

Near-Field Turbidity Monitoring Locations and Frequency

Turbidity monitoring was conducted once per hour using turbidity sondes from July 1, 2023 to June 30, 2024 in the Elbow River at two locations (see Figure 4.2):

- Elbow River upstream of construction activity
- Elbow River downstream of the entire Project boundary

Additionally, turbidity was monitored with manual measurements in Unnamed Creek near confluence with the Elbow River, when flow was observed in the creek.



Sources: Base Data - Government of Canada. Thematic Data - Government of Alberta
Service Layer Credits:

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.
9/12/2023

Stantec

ALBERTA TRANSPORTATION SPRINGBANK OFF-STREAM RESERVOIR PROJECT

Turbidity Sampling Location

Figure 4.2

Near-Field Turbidity Monitoring Results

Total Suspended Solids (TSS, milligrams per litre [mg/L]) – Turbidity Nephelometric Turbidity Units (NTU) Curves were established in 2021 following guidance from *Alberta Transportation Special Provision – Turbidity* (Government of Alberta (GoA) 2021). The calculated relationships were used to determine the linear relationship between TSS and turbidity in the Elbow River and Unnamed Creek as per the conversion relationship between NTU into mg/L. This relationship was used in the field to determine the TSS (mg/L) based on the measured turbidity. The TSS/Turbidity regression curves are provided in Figure 4.3 and Figure 4.4 below.

Figure 4.3 Elbow River TSS-Turbidity Curve

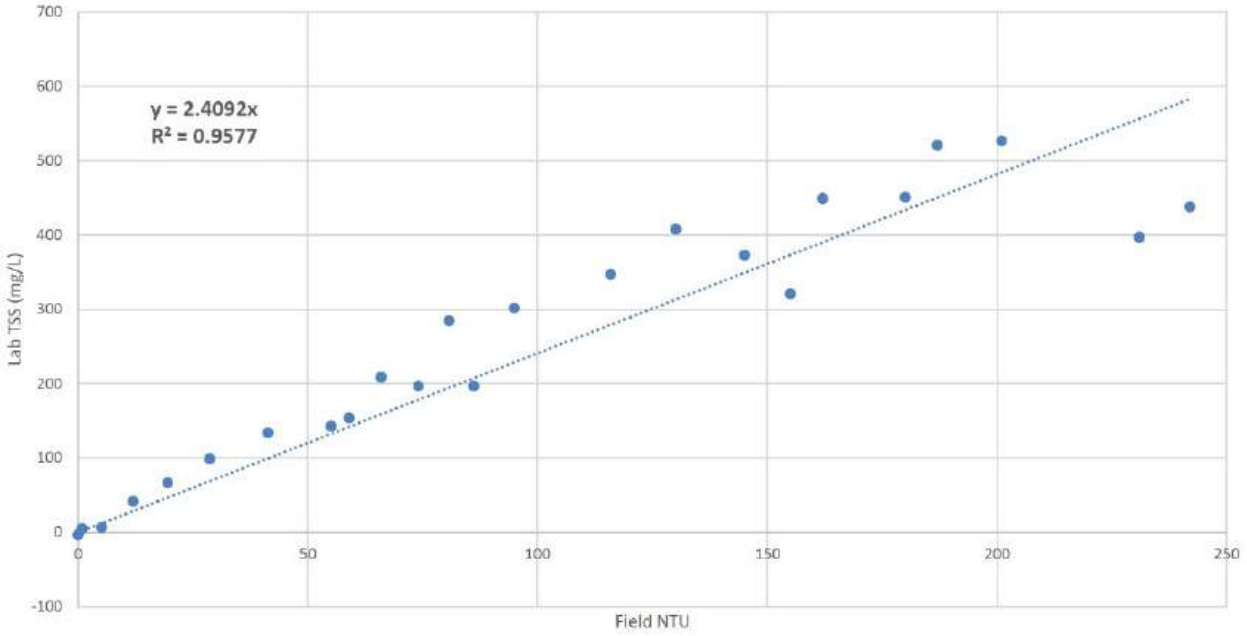
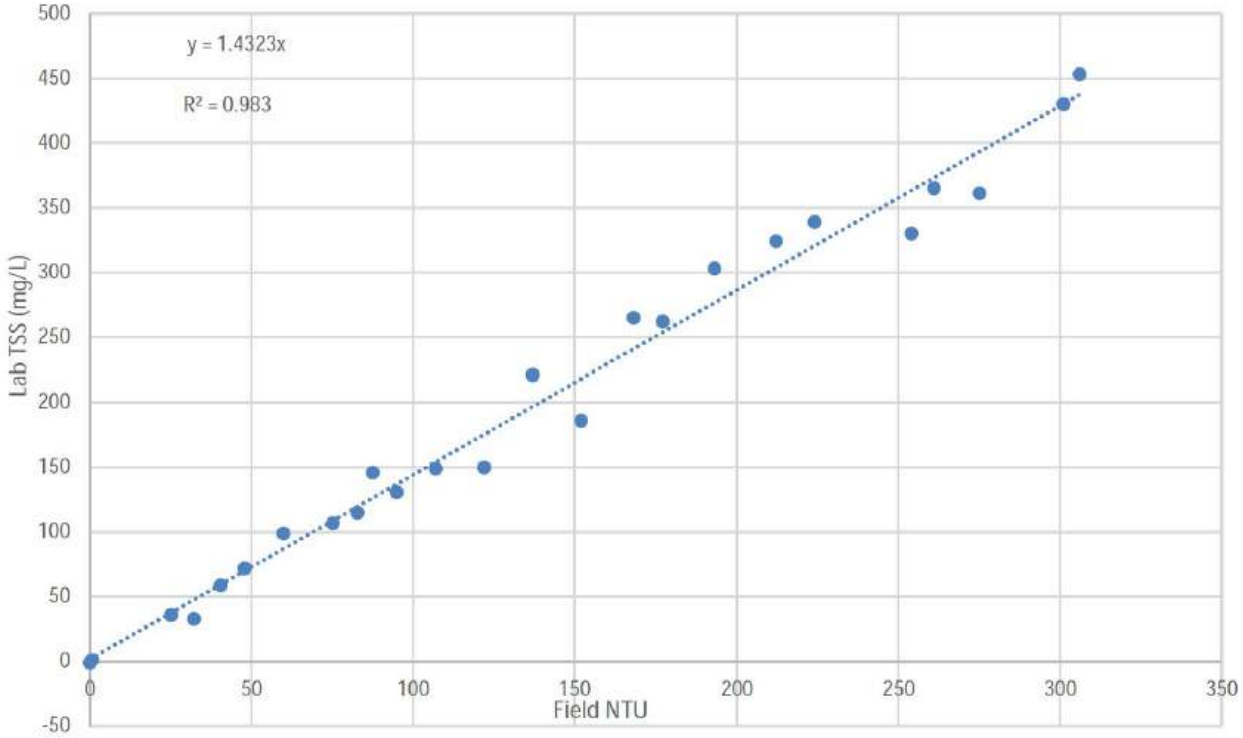


Figure 4.4 Unnamed Creek TSS-Turbidity Curve



The Elbow River turbidity monitoring sondes were occasionally affected by measurement errors, which resulted in zero reading by the sondes. These zero values have been removed from the result graphs presented below. Continuous data collection was halted during sonde maintenance and repair as follows:

- Upstream sonde: December 15, 2023 to January 9, 2024
- Downstream sonde: September 27, 2023 to October 2, 2023
- Downstream sonde: October 13, 2023 to November 1, 2023
- Downstream sonde: November 14, 2023 to December 15, 2023

Manual samples were collected during sonde maintenance and repair. Manual sample results are included in the graphs below, when continuous data were not available. Elbow River TSS results are provided in Figure 4.5 and Figure 4.6. The TSS concentrations were derived using the Elbow River TSS-Turbidity Curve in Figure 4.3. Two figures are provided with the first one showing the converted TSS concentrations up to the maximum observed and the second one truncates the data to up to 550 mg/L TSS to show variability in the lower range of concentrations.

Based on a comparison of manual turbidity measurements and continuous sonde turbidity measurements, turbidity measured by the sondes is higher than manual turbidity measurements. This difference is likely due to shallow water in the Elbow River and fouling of the sensors due to turbidity near the substrate, where the sondes are placed. Despite more frequent cleaning of the sensors in the 2023-2024 reporting year, the sondes continue to get fouled quickly after deployment in the river. Manual measurements are considered to more closely reflect actual turbidity in the Elbow River. Therefore, the results presented herein should be interpreted to reflect the fluctuations of turbidity and associated TSS concentrations. The monitoring results do not reflect absolute TSS concentrations in the river.

Observed TSS concentrations were relatively high during several events in spring and summer 2024 both at the upstream and the downstream monitoring locations. However, this may be related to sonde malfunctions and ice break-up effects. In keeping with observations made during the past two reporting years, downstream Elbow River TSS concentrations were generally similar or lower than upstream concentrations throughout the 2023-2024 reporting year. No effects of Project construction on TSS concentrations are evident based on the monitoring data.

Unnamed Creek TSS results are provided in Figure 4.7. The TSS concentrations were derived using the Unnamed Creek TSS-Turbidity Curve in Figure 4.4.

Figure 4.5 Elbow River TSS Concentrations Upstream and Downstream of the Project Site, Full Dataset (Continuous Sonde Measurements)

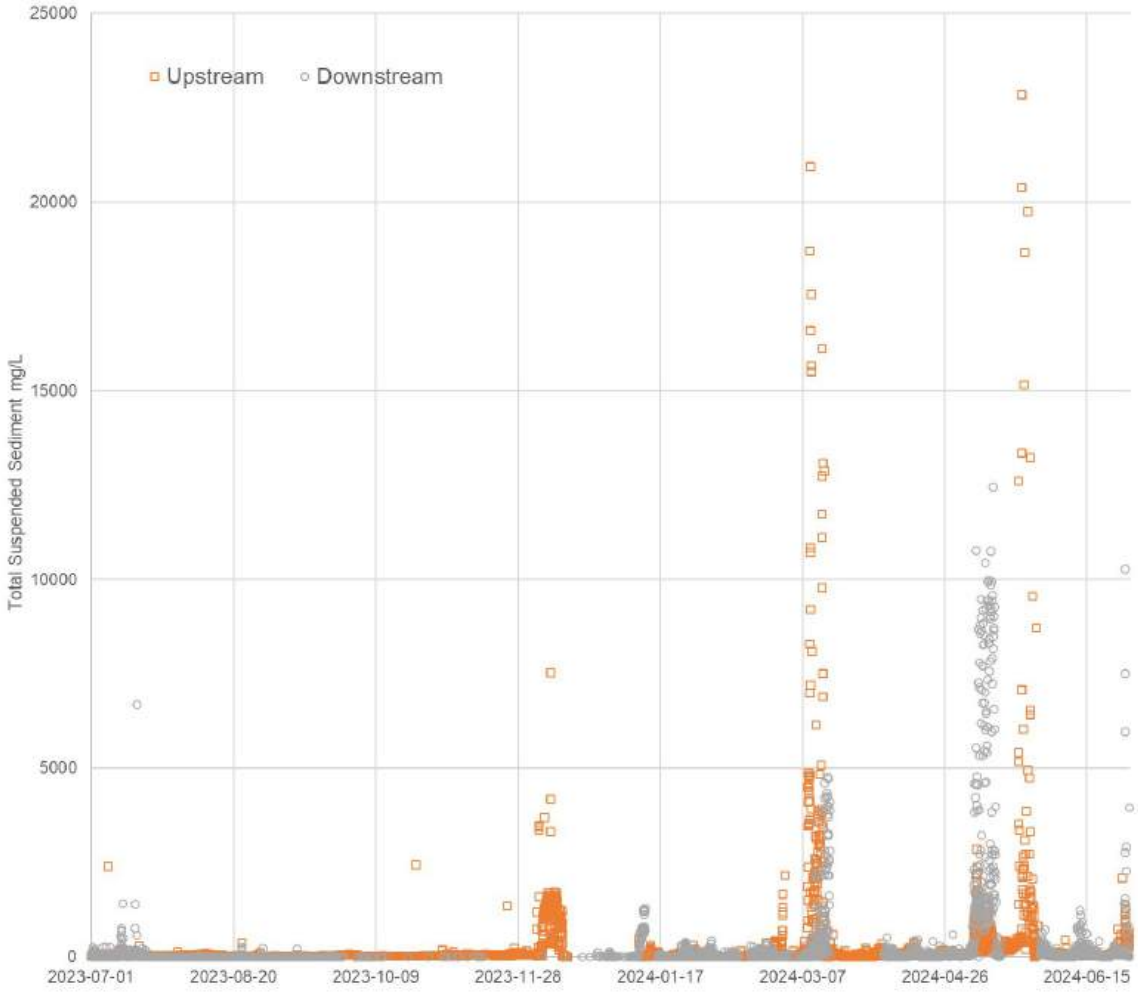


Figure 4.6 Elbow River TSS Concentrations Upstream and Downstream of the Project Site, Subset of Data Showing Concentrations up to 550 mg/L (Continuous Sonde Measurements)

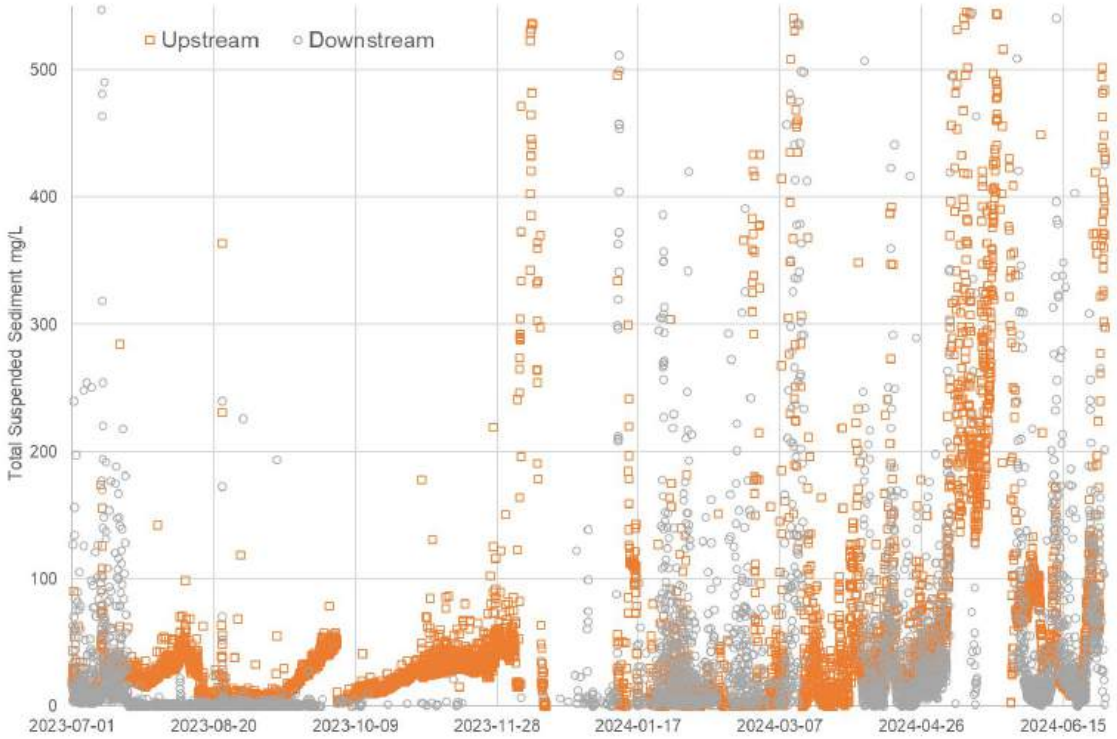
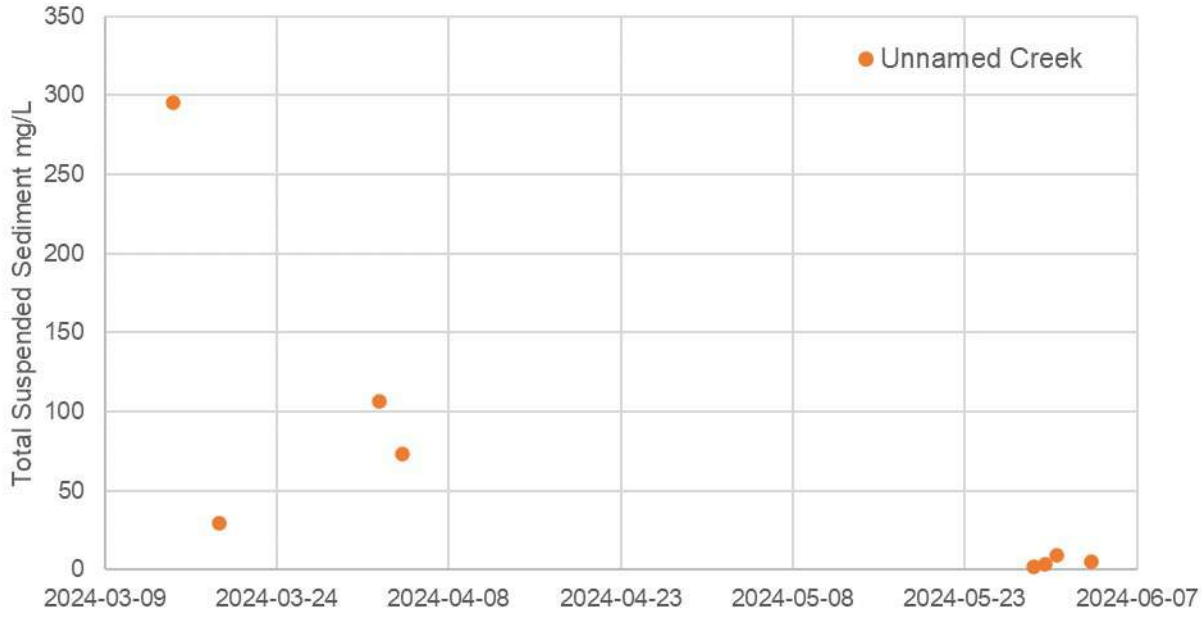


Figure 4.7 Unnamed Creek TSS Concentrations Near Confluence with the Elbow River (Manual Measurements)



Far-Field Turbidity Monitoring

A commitment was made during the Project regulatory process and in the SWMP to install continuous turbidity sensors at the existing Water Survey of Canada (WSC) Elbow River hydrometric stations at Bragg Creek (WSC Station 05BJ004) and Sarcee Bridge (WSC Station 05BJ010) during all phases of the Project.

Installation of turbidity sondes at the Bragg Creek, Highway 22 bridge and Sarcee bridge locations did not occur in the 2024/2025 reporting year. During the 2023/2024 reporting period, TEC selected locations where two of the three sondes will be installed and obtained permission to install these two sondes to existing bridges. No further approvals are required for these two locations. Options for the location of the third sonde (near the Hamlet of Bragg Creek) have been identified, however, identifying and selecting the specific location (near the sampling locations specified in the SWMP) has taken longer than anticipated due to the depth and flow conditions required to operate the equipment continuously year-round. During the 2023/2024 reporting year, turbidity samples were hand collected four times and will continue to be until the continuous turbidity sondes can be procured and installed in the sampling locations specified in the SWMP.

4.8.1.2 Reported Sediment Releases

Sediment releases into a watercourse were documented in two occasions during the reporting year:

- October 17, 2023: Sediment released to Unnamed Creek at the newly installed culvert under Highway 22 as a result of silt fence failure. There was no water flowing in Unnamed Creek. The silt fencing was fixed, additional wattles were installed, and the sediment was removed.
- April 15, 2024: As a result of re-grading activities, a combination of snow and soil was observed in in Unnamed Creek directly upstream of the Low-Level Outlet. Water flow in Unnamed Creek was not blocked, but to minimize the risk of sediment flowing downstream to the Elbow River, erosion and sediment control measures and fish fences were installed immediately following the observation. Turbidity measurements were taken at multiple locations in Unnamed Creek and no sediment was observed entering the Elbow River. This sediment release was reported to AEPA. as per the Alberta Special Provision – Turbidity document and mitigated as determined by a Qualified Aquatic Environmental Specialist.

4.8.2 Groundwater

Groundwater monitoring network development and groundwater monitoring activities were completed during the 2023/2024 reporting year and are described in detail in the Groundwater Monitoring Report in Appendix B.2. The groundwater monitoring was completed based on the GWMP.

The monitoring network includes three monitoring tiers that are summarized below and described in detail in Appendix B.2:

- Tier 1 monitoring wells will be shallow and located within or immediately adjacent to Project infrastructure (dam, diversion structure and channel) and used for geotechnical monitoring and also to support groundwater monitoring.
- Tier 2 monitoring wells are shallow and within or very near the wetted perimeter of the off-stream reservoir and Diversion Channel. They are installed specifically for the Project in both the unconsolidated and shallow bedrock deposits. A subset of Tier 2a wells are also included specifically to monitor drawdown near the Diversion Channel during construction and dry operations to address NRCB approval condition 11.5 a[1]). The Tier 2a wells are domestic water wells and are based on voluntary participation (all landowners within the potential drawdown area were invited to participate).

[1] "monitor water levels in domestic water wells west of the Diversion Channel to the boundary of the local assessment area that may be impacted by dewatering during the Project construction. During flood and dryland operation, monitoring of the wells should be continued by the Operator for a minimum of five years or until it can be demonstrated that permanent lowering of the water level does not significantly impact yields from the water wells,"

- Tier 3 monitoring wells are situated beyond the area of predicted project effects at locations of some of the closest potential receptors to the Project. The main purpose of these monitoring wells is to provide early detection of potential effects on groundwater that are propagating outward from the LAA. Tier 3 wells are primarily domestic water wells where landowners wished to participate.

Monitoring well installation activities were completed in August 2023 to continue to relocate monitoring wells outside of the construction footprint and to continue to establish the permanent monitoring network. Tier 2 monitoring well RRMW16-17-8 as relocated onto TEC owned land and monitoring well RMW16-15-39 was installed to replace previously damaged Tier 2 well MW16-15-39.

Groundwater monitoring and sampling was completed in October 2023 and May 2024. The monitoring and sampling included the Tier 2 monitoring wells, Tier 2a monitoring wells, Tier 3 domestic wells, and the legacy EIA Project wells. The locations and descriptions of the monitoring tiers and additional Project and domestic wells are presented in Appendix B.2.

The monitoring programs included measurement of groundwater levels, field parameters (dissolved oxygen (DO), oxidation-reduction potential (ORP), pH, electrical conductivity (EC)) and downloading and calibration of data logging pressure transducers. The transducers are deployed to measure and record near continuous water level, temperature, and electrical conductivity at the Tier 2, Tier 2a and Tier 3 monitoring wells. Groundwater samples were collected and submitted to an accredited laboratory for routine potability parameters, major ions, bacteriological parameters, dissolved organic carbon (DOC), dissolved metals, nutrients, benzene, toluene, ethylbenzene, xylenes (BTEX), and F1 to F2 fraction hydrocarbons.

Changes to groundwater levels were noted in some monitoring wells in the vicinity of the construction areas. Water level drawdown of up to 3.3 m was observed near the diversion channel and increases of up to 1.8 m were observed near the dam. The changes in groundwater levels are within the expected range predicted in the EIA and no groundwater quantity triggers were reached (i.e., increases resulting in flowing artesian conditions or decreases such that existing wells are no longer useable).

Groundwater quality in the 2023/2024 reporting year was consistent with historical results and, while there are numerous exceedances of the Guidelines for Canadian Drinking Water Quality (Health Canada 2024), no exceedances were attributed to Project effects.

The results of the monitoring and sampling events are presented in Appendix B.2.

4.8.3 Channel Morphology

Channel morphology will be monitored following a flood as required by IAAC approval condition 3.20.

4.8.4 Fish and Fish Habitat

4.8.4.1 Preconstruction (Baseline)

The results of the pre-construction surveys were presented in Annual Report 2021/2022. Several construction best management practices have been implemented during the 2023/2024 reporting year that pertain to the protection of fish habitat and aquatic life and measures that are listed in approval condition 3 of the IAAC Decision Statement. These are identified in detail below (Sections 4.8.4.2 through 4.8.4.4). No further work is required for these approval conditions.

4.8.4.2 Construction

Construction associated with the Diversion Inlet and the Low-Level Outlet progressed during the 2023/2024 reporting year. Fish rescues and relocations were undertaken to support instream work at the Unnamed Creek and the unnamed tributary associated with Low-Level Outlet channel. Construction activities were completed in accordance with the regulatory approvals associated with the Project.

4.8.4.3 Fish Passage

Construction of the fish passage v-weirs was initiated at the end of the 2023/2024 reporting year and will be finished during the 2024/2025 reporting year. Fish passage monitoring will be conducted following the installation of these structures.

Baseline pre-construction fish passage data was collected in 2021 and the results presented in the 2021/2022 annual report. Future monitoring programs (IAAC approval condition 3.17) will evaluate post-construction Elbow River velocities in the context of the baseline results presented in the 2021/2022 annual report.

4.8.4.4 Fish Tissue

The results of the pre-construction surveys to meet IAAC approval conditions 7.8 were presented in Annual Report 2021/2022. No further work was required during 2023/2024 for these approval conditions.

Future iterations of the invertebrate and fish tissue sampling program will be conducted as required by IAAC approval condition 7.8 following a flood event and results of those future studies will consider the baseline data described in the 2021/2022 annual report.

4.8.4.5 Offsetting

Offset measures are required as part of the *Fisheries Act* Authorization for the project. The Authorization outlines Project activities that may result in the harmful alteration, disruption, and destruction (HADD) of fish habitat, including critical habitat for bull trout, a species at risk. The Authorization also outlines Project activities that may result in the death of fish, including bull trout, a species at risk (IAAC approval condition 3.9). Offset measures address effects of the Project through various habitat improvements, channel construction, and efforts to increase Bull Trout populations.

The Offset Measures Plan was driven by Project requirements, regulatory and fisheries management objectives, and stakeholder feedback, including feedback received from Indigenous groups and the AEPA fisheries management group. Offset measures are required in the Elbow River watershed to address provincial fisheries management objectives and objectives in the Recovery Strategy for the Bull Trout (*Salvelinus confluentus*), Saskatchewan-Nelson Rivers population, in Canada (DFO 2020a). In addition, an adaptive management plan that addresses uncertainty associated with the death of fish that may result from Project operation was committed to. This adaptive management approach associated with the *Fisheries Act* Authorization states that the potential death of fish estimates based on an initial estimate proposed for the Project (and carried forward in the Authorization) will be offset. Post-flood monitoring will confirm whether initial estimates were appropriate. If post-flood monitoring suggests that the initial death of fish estimates were appropriate, no additional offsetting measures would be required. If post-flood monitoring suggests that the initial death of fish estimates were underestimated, additional offset measures will be instituted under authorization from DFO. Additional potential offsetting measures have been presented in the Application for *Fisheries Act* Authorization.

Three offset initiatives are currently in various stages of progress for the Project and are further discussed below:

- Elbow River Side Channels
- Bull Trout Recovery Program (previously titled the Brook Trout Removal Program)
- Elbow River Watershed Remediation Program

The *Fisheries Act* Authorization was amended to extend to March 31, 2036, due delays in receiving the provincial regulatory approvals for the Elbow River Side Channels and additional tasks that have been identified for the Bull Trout Recovery Program and the Elbow River Watershed Remediation Program. The general initiatives of the offsets remain the same as described in the 2022/2023 annual report and TEC continues to progress these initiatives in 2024/2025.

Should the offsetting works differ from what has been provided to and discussed with Indigenous groups, additional engagement on potential environmental effects will be undertaken (IAAC approval condition 3.10)

Elbow River Side Channels

The Elbow River Side Channels are currently under construction. Delays were encountered for the *Public Lands Act* and *Water Act* approval of the Elbow River Side Channels, which has resulted in construction being rescheduled for 2024 as per the *Fisheries Act* Authorization amendment for the SR1 Project. The Elbow River Side Channels will be constructed by the end of 2024.

Bull Trout Recovery Program

The Bull Trout Recovery Program is intended to eliminate invasive brook trout (*Salvelinus fontinalis*) from three waterbodies in the Elbow River watershed including Elbow Lake, Quirk Creek, and Prairie Creek such that bull trout populations can be re-established in these waterbodies. All three waterbodies, and their tributaries, are mapped critical habitat for bull trout (DFO 2020b; DFO 2024) and, in addition, Elbow Lake and Prairie Creek are mapped critical habitat for westslope cutthroat trout (*Oncorhynchus clarkii lewisi*; Alberta population; listed as threatened under Schedule 1 of SARA) (GOC 2024; DFO 2024), which is a native trout species in Alberta which will be benefitted by the Program. The intent of the Program is to increase bull trout productivity and habitat availability in the three waterbodies mentioned above. To support this program, migration barriers are proposed near the downstream end of Quirk Creek and Prairie Creek prior to rotenone application to prevent immigration of brook trout into habitat that supports bull trout populations. A natural barrier (i.e., Edworthy Falls) exists approximately 3 km downstream of the outlet of Elbow Lake and, therefore, construction of a barrier to prevent immigration is not required. TEC is currenting gathering additional field data to support the next stages of planning and will keep DFO informed as work progress.

Elbow River Watershed Remediation Program

The Elbow River Watershed Remediation Program intends to provide improve riparian health and reduce sediment sources in the middle Elbow River watershed, in an area that provides known bull trout critical habitat. These measures provide an in-kind offset through improved habitat quality within the watershed, and an out-of-kind offset for the death of fish. Six sites have been identified for riparian habitat remediation, and habitat assessments were complete for the projects in fall 2022. Designs are in progress and additional baseline studies have been identified to support monitoring for the program. Work associated with the Elbow River Remediation Program is ongoing and a progress update will be provided in 2024/2025.

4.9 AIR QUALITY, NOISE AND DUST

4.9.1 Air Quality and Dust

IAAC Approval Condition 6.1 – Vehicle Emissions

As per the AQMP, all vehicles and stationary equipment operating on the site meet or exceed the current emission standards. The construction contractor continued to ensure that all the equipment used in the Project is properly operated, regularly inspected, and maintained according to manufacture specifications. This included all equipment being operated by sub-contractors and consultants involved in the Project.

IAAC Approval Condition 6.2 – No-Idling Policy

As per the AQMP and the Project no-idling policy, vehicles were turned off when not being actively used within the Project areas unless there was a specific technical or safety reason for not doing so (e.g., extremely cold temperatures during the winter months).

IAAC Approval Condition 6.3 – Baseline Air Quality and CAAQS

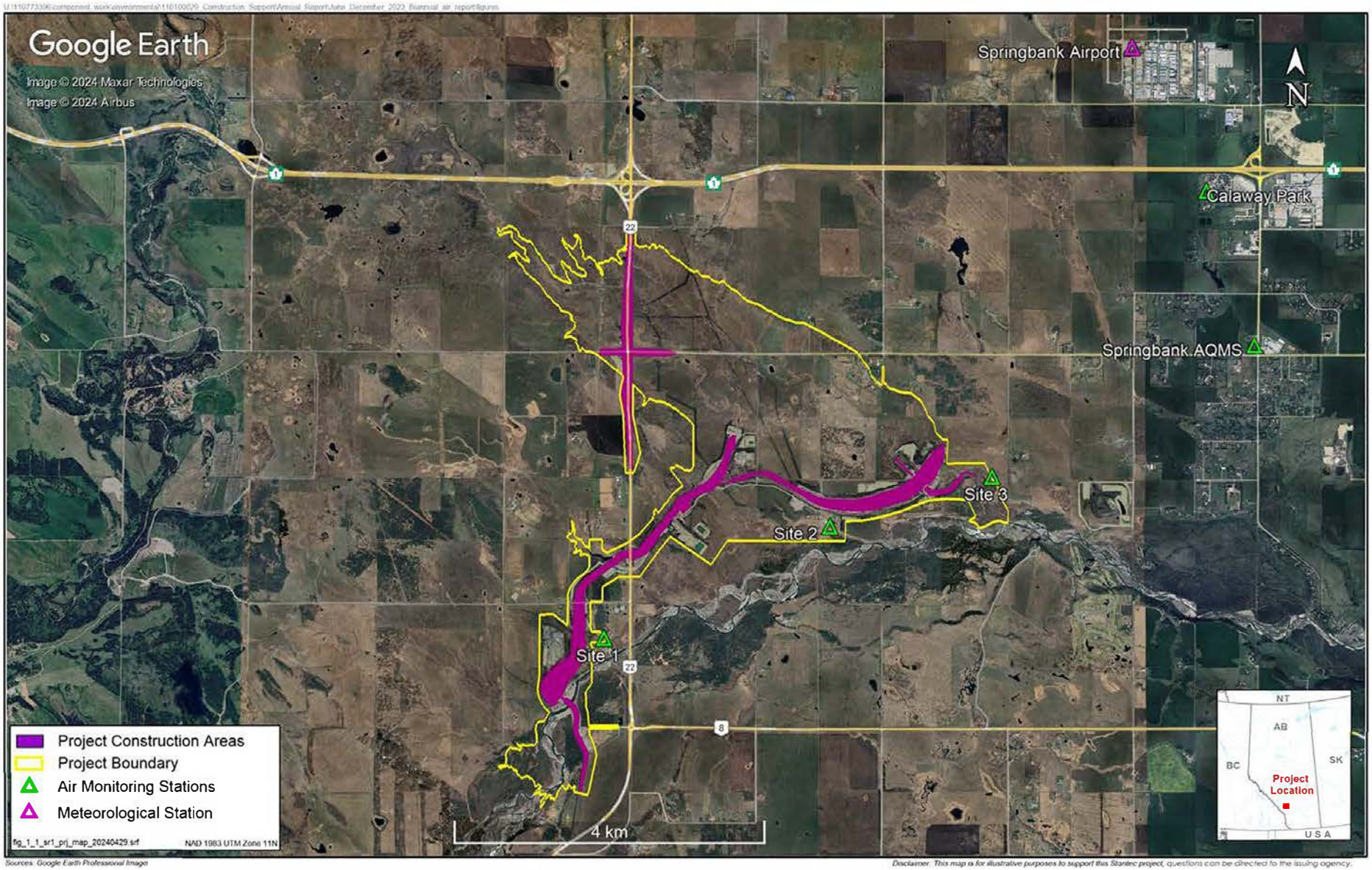
Current State of the Air Quality Monitoring Network

An air quality monitoring network was established starting in June 2022 to monitoring the ambient air quality around the Project area and selected regional sites. Figure 4.8 shows the monitoring sites in proximity to the Project construction areas. The initial monitoring was established at the three sites designated in the AQMP to monitor the concentrations of $PM_{2.5}$, PM_{10}, TSP.

- Between the construction access road and the diversion channel excavation work (Station 1) — Figure 4.9.
- At the dam construction site (Station 2) — Figure 4.10.
- At any borrow source site used and at the parking areas (Station 3) — Figure 4.11.

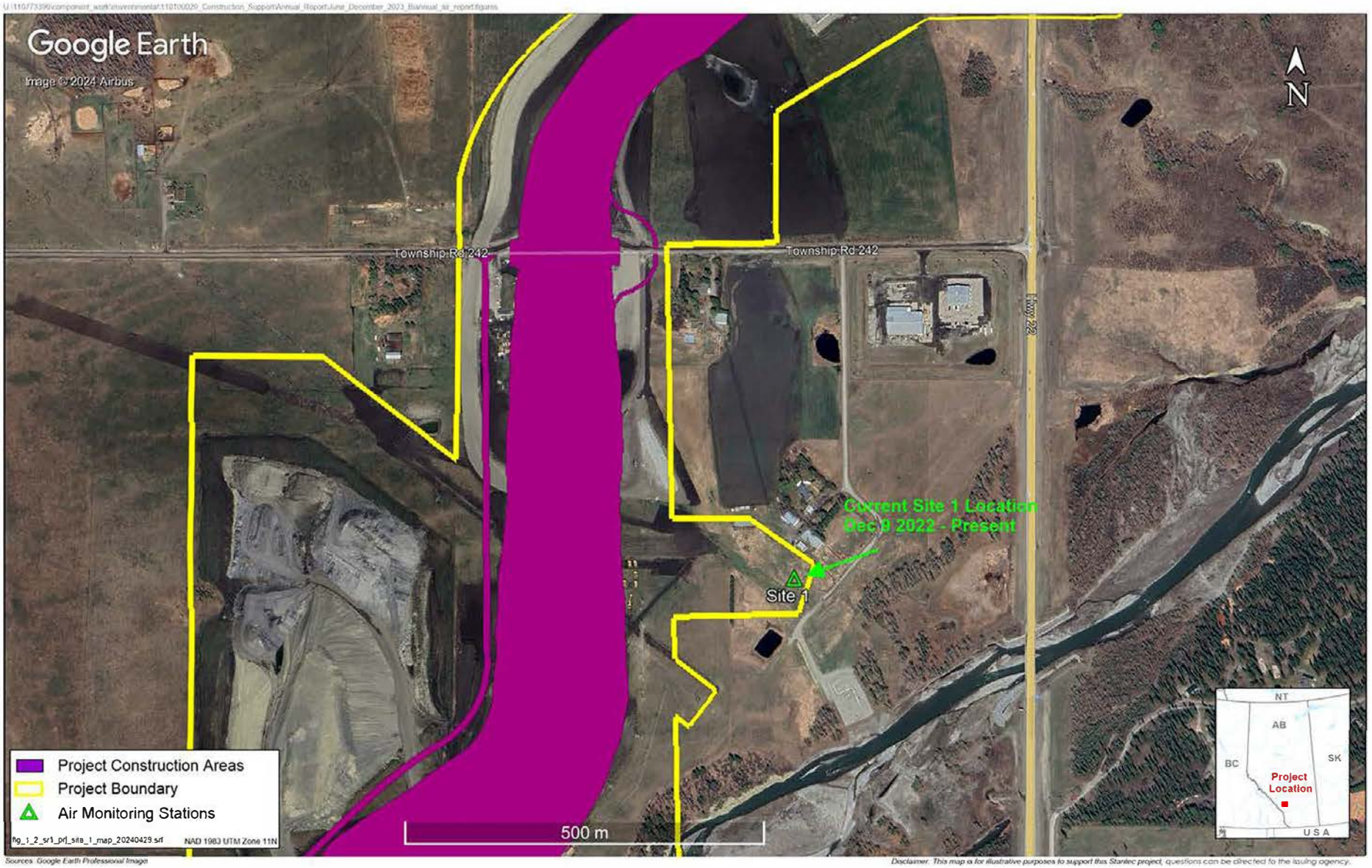
Site 1, Site 2, and Site 3 continued to operate throughout the 2023/2024 reporting year without changes to the location of the sites or major changes to the monitoring equipment. Table 4.4 shows the equipment specifications for the EBAM stations and meteorological instruments deployed at the sites.

Figure 4.12 shows they typical site setup used at the sites. Site 2 lost power due to inadvertent unplugging of the power cable and from damage to the power cable several times during the summer and fall during 2023. The power cable was re-routed to use power from another location at the site that is in a lower traffic area and the power is exclusively dedicated to the EBAM stations.



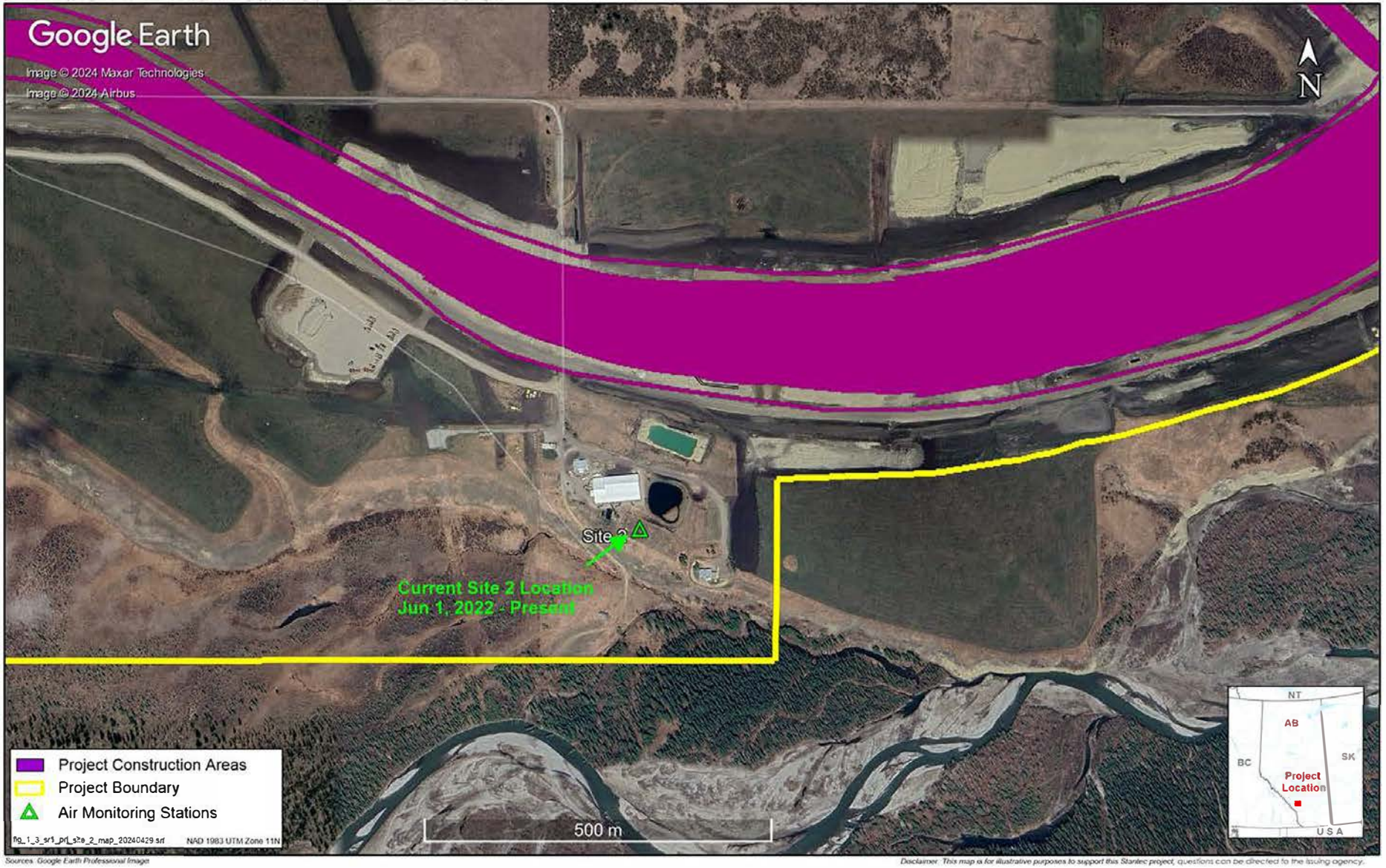
Springbank Off-stream Reservoir Project Area, Construction Areas, and Air Quality Monitoring Sites

Figure 4.8



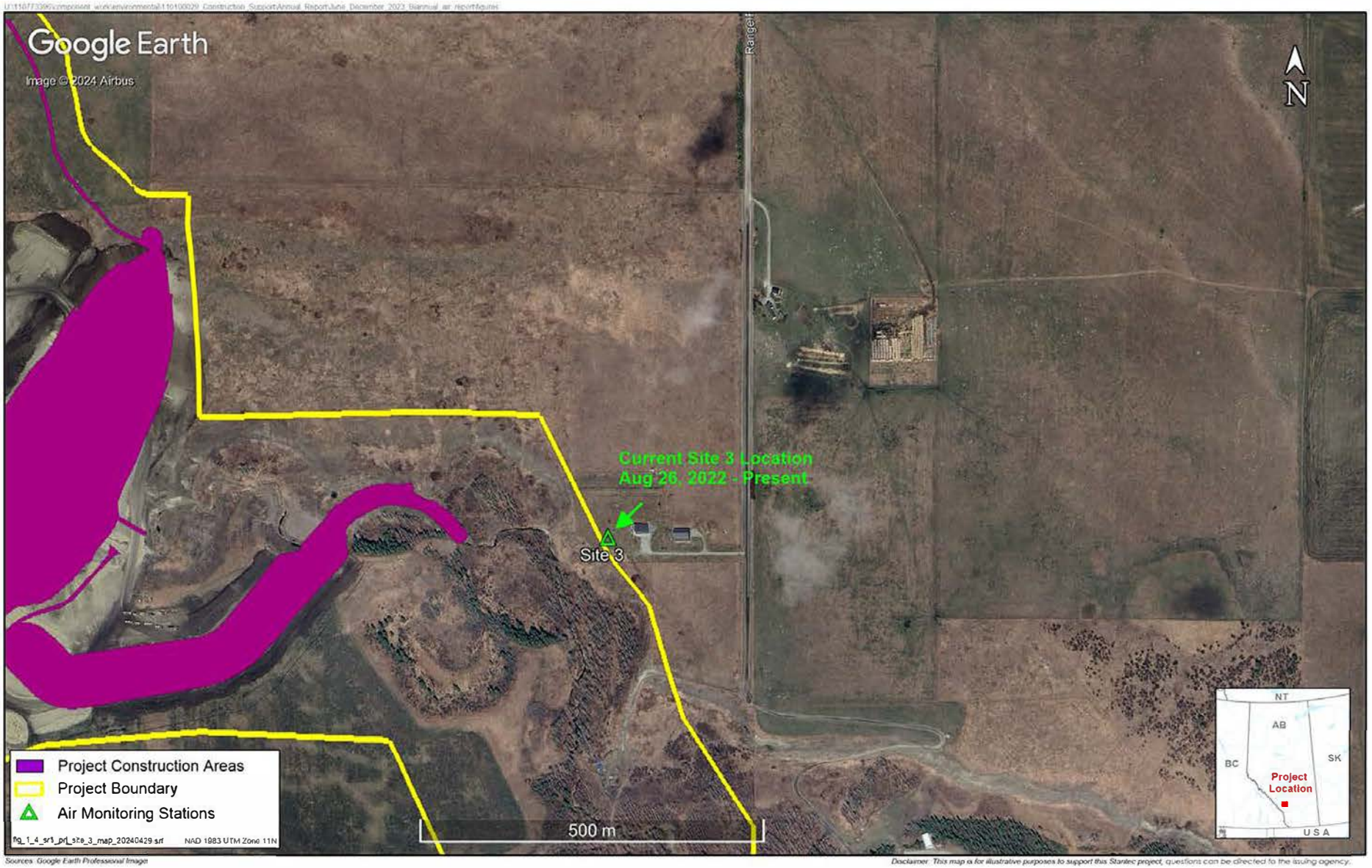
Air Quality Monitoring Site 1 — Three Environmental Beta-Attenuation Mass Monitor (EBAM) Stations Collecting $PM_{2.5}$, PM_{10}, TSP, and Meteorology

Figure 4.9



Air Quality Monitoring Site 2 — Three Environmental Beta-Attenuation Mass Monitor (EBAM) Stations Collecting $PM_{2.5}$, PM_{10}, TSP, and Meteorology

Figure 4.10



Air Quality Monitoring Site 3 — Three Environmental Beta-Attenuation Mass Monitor (EBAM) Stations Collecting $PM_{2.5}$, PM_{10}, TSP, and Meteorology

Figure 4.11

Table 4.4 Ambient Air Quality and Meteorological Instruments Installed at Site 1, Site 2, Site 3, and Calaway Park

Instrument	Manufacture Name	Model	Units	Lower Range	Upper Range	Resolution
$PM_{2.5}$ / PM_{10} / TSP [a]	MetOne	EBAM-9805	$\mu g/m^3$ [b]	0	10,000	1 $\mu g/m^3$
Wind (WS & WD)	MetOne	AIO 2 [c]	m/s; deg. From N	0	75	0.1 m/s
Ambient Temperature			°C	-40	+60	0.1 °C
Relative Humidity			%	0	100	1 %
Barometric Pressure			hPa	500	1,100	0.1 hPa

Notes:

- Three EBAM stations are deployed to measure $PM_{2.5}$, PM_{10}, and TSP at Site 1, Site 2, and Site 3. Calaway Park has two EBAM stations deployed to measure $PM_{2.5}$ and TSP. Meteorological instruments are attached to the $PM_{2.5}$ EBAM station at each site.
- microgram per cubic metre ($\mu g/m^3$) is the mass of the substance in micrograms per cubic meter of air.
- AIO 2 is an all-in-one meteorological sensor equipped with a two-dimensional sonic anemometer with a starting wind threshold of 0.2 metres per second (m/s).

Figure 4.12 A Typical Site Setup Showing the Three EBAM Stations Equipped to Measure Fine Particulate Matter, Coarse Particulate Matter, Total Suspended Particulates, and Meteorology at Site 2.



The Calaway Park site EBAM stations ($PM_{2.5}$, TSP, and meteorology) were deployed on May 2, 2023, to October 12, 2023, for the season at the same location as it was deployed in 2022 on the west side of the park (Figure 4.13). The site was taken offline by Calaway Park during some road construction and maintenance activities at the park in August and September 2023. The site was reactivated on May 2, 2024, and will operate until early October 2024 when the park closes to the public.

The Springbank AQMS site is located in the community of Springbank at the Lions Soccer Park near the intersection of Range Road 33 and Springbank Road (Figure 4.14). The site was prepared, and electrical service was installed to the site during the spring of 2023. The AQMS was commissioned and started monitoring on July 7, 2023. Figure 4.15 shows a picture of the installed AQMS with the 10 m meteorological tower. Table 4.5 shows the ambient air quality and meteorological analyzers and sensors installed at the Springbank AQMS. Initial calibrations and installation of all the equipment were done as per Chapter 3 and Chapter 4 of the Alberta Air Monitoring Directive (AMD) (AEP 2016; 2017).



Air Quality Monitoring Calaway Park Site — Two Environmental Beta-Attenuation Mass Monitor (EBAM) Stations Collecting $PM_{2.5}$, TSP, and Meteorology

Figure 4.13



Springbank Air Quality Monitoring Station — Collecting $PM_{2.5}$, NO_2, and Meteorology

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Figure 4.14

Figure 4.15 The Springbank Air Quality Monitoring Station (Looking East)



Table 4.5 Ambient Air Quality and Meteorological Instruments Installed at the Springbank Air Quality Monitoring Station

Instrument	Manufacture Name	Model	Units	Lower Range	Upper Range	Resolution
NO-NO_X-NO_2 [a]	Thermo Scientific	42i	ppb [b]	0	1,000	1 ppb
$PM_{2.5}$ [c]	Teledyne	T640	µg/m^3 [d]	0	10,000	1 µg/m^3
Wind (WS & WD)	RM Young	05305	km/h; deg. From N	1.8 km/h (0.5 m/s)	180 km/h (50 m/s)	0.1 km/h
Vertical Wind	RM Young	27106T	km/h	1.1 km/h (0.3 km/h)	90 km/h (25 m/s)	0.1 km/h
Ambient Temperature	Vaisala	HMP60	°C	-40	+60	0.1 °C
Relative Humidity	Vaisala	HMP60	%	0	100	1 %RH
Barometric Pressure	Vaisala	PTB120	mbar	500	1,100	1 mbar
Precipitation	RM Young	52202	mm	0	50 mm/h	0.1 mm
Shelter Temperature	Comet	T0310	°C	-30	+80	0.1 °C
Solar radiation	Apogee	SP-522	W/m^2	0	2,000	1 W/m^2

Notes:

[a] Nitrogen monoxide (NO), total nitrogen oxides (NO_X), and NO_2 analyzer.

[b] ppb is the volume of the substance (parts) per billion volumes of air.

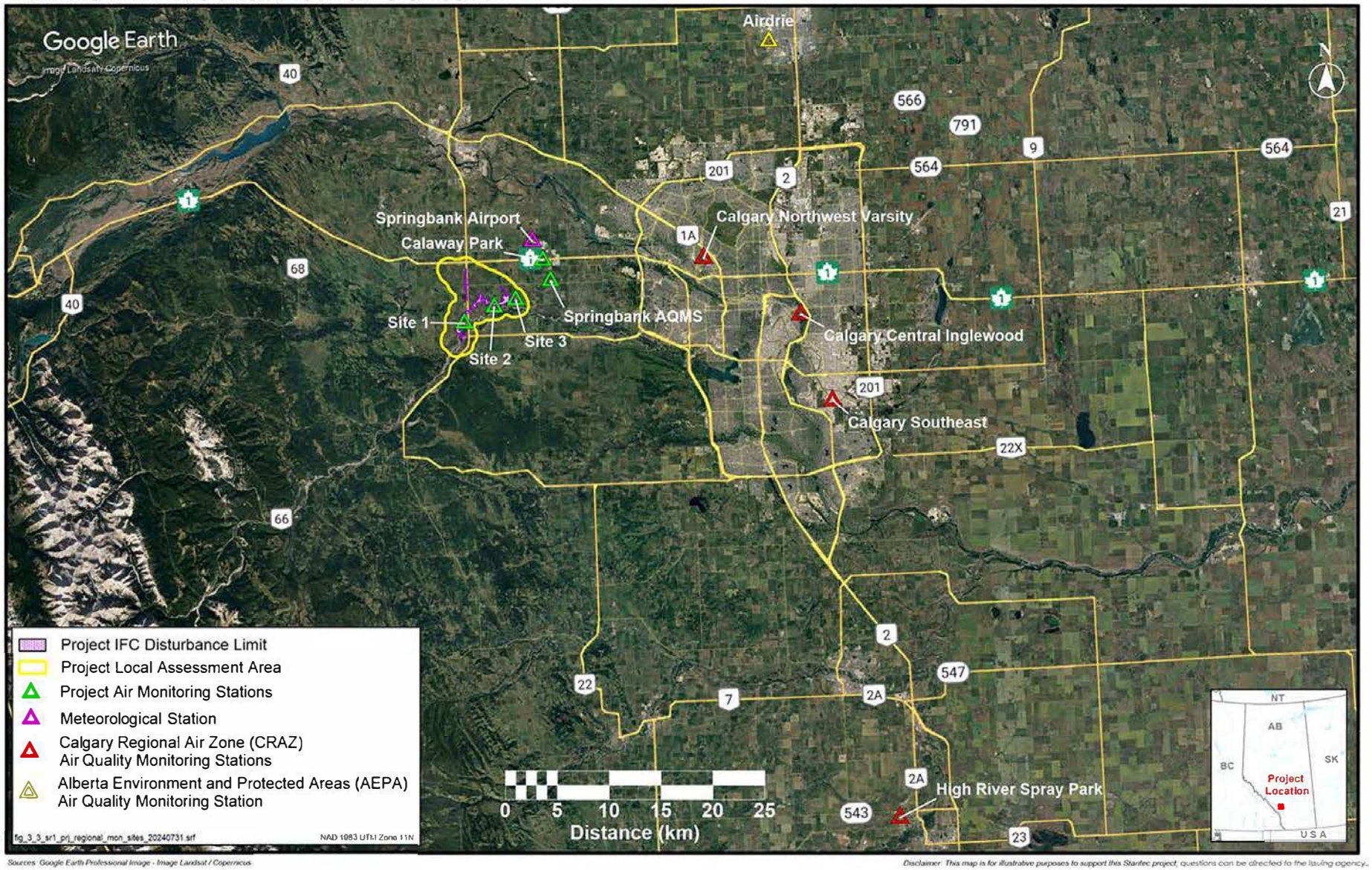
[c] $PM_{2.5}$ analyzer.

[d] µg/m^3 is the mass of the substance in micrograms per cubic meter of air.

Meteorological data from the Springbank Airport was obtained from Environment Climate Change Canada (ECCC) from their historical climate data website. This data was used to compare to the meteorology parameters at the EBAM stations and the Springbank AQMS.

Regional air quality data was downloaded from the AEPA Alberta Air Data Warehouse for the Calgary Region Air Zone (CRAZ) and AEPA stations located in Calgary, Airdrie, and High River. The regional data was used to compare the $PM_{2.5}$ and NO_2 concentrations measured as the EBAM Stations and the Springbank AQMS to determine if there were potential regional influences on the measured concentrations. Figure 4.16 shows the location of the regional air quality monitoring stations in relation the Project monitoring stations.

On November 27, 2023, CRAZ decommissioned the High River AQMS as it was part of a limited study on the air quality in the region. On March 1, 2024, AEPA transferred ownership of the Airdrie AQMS to CRAZ.



Regional and Project Air Quality Monitoring Station Locations

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Figure 4.16

Monitoring Data Quality Assurance, Quality Control, and Storage

Data collected during the 2023/2024 reporting year is provided as daily and monthly data Microsoft Excel files of 1-hour averaged data for all the active sites. A Level 0 quality assurance and quality control (QA/QC) process was completed to identify any issues with the monitoring equipment, communications with the EBAM stations and AQMS, and any observed issues with the data. Additional QA/QC processes are completed as per Chapter 6 of the AMD (AEP, 2016)

Daily data from the CRAZ AQMS sites were downloaded from their website which was subject to basic Level 0 QA/QC. Monthly data from the CRAZ AQMS sites is downloaded from the AEPA Air Data Warehouse which has been quality reviewed by CRAZ as per Chapter 6 of the AMD (AEP, 2016). The downloaded data is stored in the project folder on Stantec's file servers.

Daily and monthly data from the ECCC Springbank Airport meteorological station was downloaded using the WeatherCan R package (LaZerte & Albers, 2018) from the ECCC Historical Weather Data website. This data was processed using ECCC's QA/QC procedures. All data was processed into Microsoft Excel files and stored in the project folders on Stantec's file servers.

Monthly and Ad-hoc Site Visits

All the sites are visited monthly to conduct calibration audits as per Chapter 7 of the AMD (AEP, 2018) and manufacture guidance. The site visit includes inspection of the site and stations to ensure that the grounds are accessible, and the ground cover does not interfere with the EBAM stations and the Springbank AQMS.

Additional site visits were required during the 2023/2024 reporting year to restart the EBAM stations when they were not communicating with the datacenters or to investigate power loss at the sites.

Results from the Air Quality Monitoring Program

These sites have been operated and maintained to collect the $PM_{2.5}$, PM_{10}, TSP, and NO_2 concentrations around the Project and downwind of the Project. The ambient concentrations of these substances were compared to the applicable Alberta Ambient Air Quality Objectives and Guidelines (AAAQO and AAAQG; (AEPA, 2024)) and the Canadian Ambient Air Quality Standards (CAAQS; (CCME, 2021)). Table 4.6 shows the current AAAQO and AAAQG and Table 4.7 shows the CAAQS. As Alberta does not have an applicable AAAQO or AAAQG for PM_{10} the 24-hour average of 50 µg/m^3 British Columbia Ambient Air Quality Objective (BC AQO; (BC ENV, 2019) was used to evaluate the PM_{10} concentrations.

Table 4.6 Summary of Current Alberta Ambient Air Quality Objectives and Guidelines for the Substance of Interest

Substance	Averaging Period	Concentration [1]	
		µg/m³ [2,3]	ppbv [4]
Nitrogen Dioxide (NO_2)	1-hour	300	159
	Annual	45	24
Fine Particulate Matter ($PM_{2.5}$)	1-hour [5]	80	—
	24-hour	29	—
Total Suspended Particulate Matter (TSP)	24-hour	100	—
	Annual [6]	60	—

Notes:
1. Alberta Ambient Air Quality Objectives and Guidelines Summary (AEPA, 2024)
2. µg/m³ is the mass of the substance in micrograms per cubic metre of air.
3. Standard conditions of 25°C and 101.325 kilopascals (kPa) are used to convert from µg/m³ to parts per billion volume (ppbv).
4. ppbv is the volume of the substance (parts) per billion volumes of air.
5. Guideline values are used for planning, management, general performance indicators, and to assess local concerns but not for regulatory enforcement.
6. Based on annual geometric mean.

Table 4.7 Summary of Current Canadian Ambient Air Quality Standards for the Substance of Interest

Substance	Averaging Period	Concentration [1]			
		µg/m³ [2,3]		ppbv [4]	
		2020	2025	2020	2025
Nitrogen Dioxide (NO_2)	1-hour [5]	113	79	60	42
	Annual [6]	32	23	17.0	12.0
Fine Particulate Matter ($PM_{2.5}$)	24-hour [7]	27	— [8]	—	—
	Annual [9]	8.8	— [8]	—	—

Notes:
1. CAAQS (CCME, 2019) for 2020 and 2025.
2. µg/m³ is the mass of the substance in micrograms per cubic metre of air.
3. Standard conditions of 25°C and 101.325 kPa are used to convert from µg/m³ to ppbv.
4. ppbv is the volume of the substance (parts) per billion volumes of air.
5. The 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentration (CCME, 2020).
6. The average over a single calendar year (CCME, 2020).
7. The 3-year average of the annual 98th percentile of the daily 24-hour average concentrations (CCME, 2012).
8. Currently under review by the Canadian Council of Ministers of the Environment (CCME).
9. The 3-year average of the annual average of the daily 24-hour average concentrations (CCME 2012).

The following sections summarize the ambient and meteorological monitoring data collected from the monitoring conducted from July 2023 to June 2024 at the Project sites. This is presented with the data collected from the CRAZ and AEPA regional monitoring stations for comparison. Tables and figures are located in Appendix B.3.

Nitrogen Dioxide (NO_2)

Table B.3.1 (Appendix B.3) shows as summary of the measured NO_2 concentrations at the Springbank AQMS and the regional monitoring stations.

NO_2 concentrations were collected at the Springbank AQMS site starting on July 7, 2023. During July 2023 to June 2024 there were no concentrations measured at the Springbank AQMS that were above the 1-hour average AAAQO of 159 ppb. The highest 1-hour average NO_2 concentration measured during the period was 50.0 ppb on April 14, 2024, at 07:00 which is 31.4% of the AAAQO. The 98th percentile of the daily 1-hour average maximum is 29.2 ppb which is below the 1-hour average CAAQS threshold of 60 ppb.

Normally the annual average AAAQO is evaluated based on the calendar year. However, as the July 2023 to June 2024 NO_2 concentration data spans a nominal one-year period the annual average was calculated as 4.26 ppb which is below the annual average AAAQO of 24 ppb. This annual average is also below the annual average CAAQS threshold of 17 ppb.

Similarly, the 1-hour average NO_2 concentrations measured at the regional monitoring stations were below the AAAQO with the highest 1-hour average NO_2 concentration of 89.2 ppb measured at the Calgary Southeast Station on December 13, 2023, at 18:00. The Calgary Southeast Station measured the 98th percentile daily 1-hour average maximum NO_2 concentrations of 58.7 ppb which is just below the 60 ppb CAAQS threshold. It should be noted that the data from the Springbank AQMS, AEPA, and CRAZ monitoring stations was not processed to remove any identified data periods influenced by exceptional events and transboundary flow so these values may differ from the annual air zone report and management level determination. The annual average NO_2 concentrations were below both the AAAQO and CAAQS at all the regional stations.

Figure B.3.1 and Figure B.3.2 (Appendix B.3) show the time series of the 1-hour average NO_2 concentrations measured at the Springbank AQMS and the regional stations from July 2023 to June 2024. These plots are showing that the measured NO_2 concentrations tend to be higher in the winter months (November through March) and lower in the summer months (June through August). Figure B.3.2 (Appendix B.3) shows that the NO_2 concentrations measured at the Springbank AQMS are lower that those measured at most of the regional stations.

Box-whisker plots (as used throughout this section) are useful to show the distribution of measured ambient air quality and meteorological data. The midline is the median value observed and the 25 percent (%) and 75% quartiles form the top and bottom of the box. The whiskers, lines above and below the quartiles box terminating in a horizontal line, show the interquartile range with a

factor of 1.5 which indicates the amount of variability in the measurements. Measurements outside of the interquartile range are considered outlier values which would be measurements that would occur rarely or under specific conditions. Outliers are shown as dots outside of the whisker lines.

Figure B.3.3 (Appendix B.3) shows a box-whisker plot of the 1-hour average NO_2 concentrations measured at the Springbank AQMS and the regional air quality monitoring stations. This shows that the NO_2 concentrations measured at the Springbank AQMS during the July 2023 to June 2024 period are like those measured in the smaller cities of Airdrie and High River. Overall, it shows that most of the NO_2 concentrations tend to be below 10% of the 1-hour average AAAQO of 159 ppb within the Calgary Region. The higher NO_2 concentrations tend to be in areas with higher density industrial development in Calgary Central (Inglewood) and Calgary Southeast.

Fine Particulate Matter ($PM_{2.5}$)

Table B.3.2 (Appendix B.3) shows the summary statistics of the 1-hour average $PM_{2.5}$ concentrations measured at the Springbank Project monitoring stations. Figure B.3.4 (Appendix B.3) shows a time series of the 1-hour average $PM_{2.5}$ concentrations measured at the Springbank Project monitoring stations. Measured $PM_{2.5}$ concentrations are influenced by wildfire smoke. The highest 1-hour average $PM_{2.5}$ concentration of 202 µg/m^3 measured at the Springbank AQMS occurs on May 11, 2024, at 21:00. Overall, there were 40 to 97 hours where the 1-hour average $PM_{2.5}$ concentrations were above the AAAQG at the Springbank Project monitoring stations. The Springbank AQMS measured almost twice as many hours as the other sites likely due to being equipped with more sensitive sensors as the peak concentrations are aligned with peak concentrations at the other sites. For example, On May 11, 2024, at 21:00 the 1-hour $PM_{2.5}$ concentrations measured at Site 1 were 112 µg/m^3, at Site 2 were 114 µg/m^3, and at Site 3 were 125 µg/m^3.

Table B.3.3 (Appendix B.3) shows the summary statistics of the 1-hour average $PM_{2.5}$ concentrations measured at the regional monitoring stations operated by AEPA and CRAZ. Figure B.3.5 (Appendix B.3) shows a time series of the 1-hour average $PM_{2.5}$ concentrations measured at the Springbank Project monitoring stations and the regional monitoring stations. The highest 1-hour average $PM_{2.5}$ concentration of 235 µg/m^3 was measured at the Calgary-Central (Inglewood) station on May 11, 2024, at 20:00. At the regional stations there were between 28 hours to 94 hours where the 1-hour average $PM_{2.5}$ concentrations were above the AAAQG. In most cases, the high 1-hour average $PM_{2.5}$ concentrations measured at the Springbank Project monitoring stations, and the regional station occur at similar times which indicates that these peaks are due to regional events.

Figure B.3.6 (Appendix B.3) shows the box-whisker plot for the 1-hour average $PM_{2.5}$ concentrations for the Project and Regional air quality monitoring stations. This figure shows that the measured $PM_{2.5}$ concentrations mainly were below the AAAQG for most of the July 2023 to June 2024 period but there were $PM_{2.5}$ hourly averaged concentrations measured above the AAAQG for several hours during the period.

Table B.3.4 (Appendix B.3) shows the summary statistics of the 24-hour average $PM_{2.5}$ concentrations measured at the Project monitoring stations. Figure B.3.7 (Appendix B.3) shows the time series of the 24-hour average $PM_{2.5}$ concentrations measured at the Project stations for the July 2023 to June 2024 period. The maximum 24-hour average $PM_{2.5}$ concentrations were measured at the Springbank AQMS on September 4, 2023. Overall, there were between 10 to 16 days where the 24-hour average concentrations were measured above the AAAQO. The majority of these occur in the late Spring to early Fall periods. There was a period in the middle of January where high $PM_{2.5}$ concentrations were measured at the Project monitoring stations.

Table B.3.5 (Appendix B.3) shows the summary statistics of the 24-hour average $PM_{2.5}$ concentrations measured at the AEPA and CRAZ ambient air quality stations. Figure B.3.8 (Appendix B.3) shows the time series of the 24-hour average $PM_{2.5}$ concentrations measured at the Project and regional monitoring stations during the July 2023 to June 2024 period. The maximum 24-hour $PM_{2.5}$ concentration of 148 $\mu g/m^3$ was measured at the Calgary Northwest (Varsity) station on September 4, 2023. Overall, there were between 9 to 21 days with the 24-hour average $PM_{2.5}$ concentrations that were above the AAAQO. The time series shows that the peak values measured at the Project monitoring stations coincide with the peak values measured at the regional monitoring stations which suggest that these high $PM_{2.5}$ concentrations are a result of regional events.

Figure B.3.9 (Appendix B.3) shows the box-whisker plots of the 24-hour average $PM_{2.5}$ concentrations at the Project and Regional air quality monitoring stations. Like the 1-hour average statistics, these tables and box-whisker plot show that most of the measured concentrations were below the 24-hour average $PM_{2.5}$ AAAQO. There were several days when the 24-hour average $PM_{2.5}$ concentrations were above the AAAQO.

For the CAAQS 98th percentile 24-hour average, all the sites measured concentrations above the CAAQS limit of 27 $\mu g/m^3$. As with the NO_2 concentrations when compared to the CAAQS, the $PM_{2.5}$ data from the Project, AEPA, and CRAZ monitoring stations was not processed to remove any identified data periods influenced by exceptional events and transboundary flow so these values may differ from the annual air zone report and management level determination. The annual average of the 24-hour average $PM_{2.5}$ concentrations measured at the Springbank AQMS, Calgary Central (Inglewood), Calgary Northwest (Varsity), and Calgary Southeast were above the CAAQS limit of 8.8 $\mu g/m^3$. As mentioned in the NO_2 results summary, the Calaway Park and High River Splash Park stations did not collect enough data to properly evaluate the annual statistics.

Most of these high hourly and daily average $PM_{2.5}$ concentrations can be attributed to the wildfire smoke that occurred in the region from during the July to October 2023 from several large wildfires burning in Northern Alberta, British Columbia, the Northwest Territories, and Northern Saskatchewan (NRCan, 2023; Tran, 2024). Additionally, the high $PM_{2.5}$ concentrations in May 2023 is attributed to wildfire smoke from northeastern British Columbia (Hunt, 2024). The high concentrations measured in mid-January 2024 is attributed a stable air mass that trapping the pollution near the ground levels in the Calgary region (CBC, 2024).

Coarse Particulate Matter (PM_{10})

Table B.3.6 (Appendix B.3) shows the statistics of the 24-hour average PM_{10} concentrations measured at the three Project monitoring sites. Figure B.3.10 (Appendix B.3) shows the the time series of the 24-hour average PM_{10} concentrations measured at the Project stations for the July 2023 to June 2024 period. The maximum 24-hour average PM_{10} concentration of 562 µg/m^3 was measured at Site 1 on October 23, 2023. Overall, there were 21 days at Site 1, 32 days at Site 2, and 11 days at Site 3 that were above the 24-hour BC AQO. The higher number of days where the daily average was above the BC AQO at Site 1 and Site 2 could be due to being located near the active Project construction areas, existing sources of coarse particulate matter, and wildfire smoke events. The majority of these high PM_{10} 24-hour average concentrations occur in the late spring to late fall periods. There was a period in early January where high PM_{10} concentrations were measured at the Project monitoring stations. It was noted during the monitoring program that some of the PM_{10} concentrations were elevated during precipitation events associated with high winds which is likely the cause of the high 24-hour average PM_{10} concentrations measured in early January as it coincides with a high wind event with heavy snow fall.

Figure B.3.11 (Appendix B.3) shows the box-whisker plot of the 24-hour average PM_{10} concentrations measured at the three Project monitoring sites. Like the 24-hour average $PM_{2.5}$ concentrations, most of the 24-hour average PM_{10} concentrations were measured below the BC AQO of 50 µg/m^3. Site 2 had some measured concentrations in the upper quartile range that were above the BC AQO including the 75th percentile value of 66.3 µg/m^3.

The $PM_{2.5}/PM_{10}$ ratio can be a useful analysis to determine the source of particulate matter at each of the sites (Zhao, Chen, Yu, & Luo, 2019; Bamola, et al., 2024). High $PM_{2.5}/PM_{10}$ ratios (>0.7) indicate that there is a higher concentration of finer PM which is generally associated with combustion sources or secondary PM created by chemical reactions in the atmosphere. A low $PM_{2.5}/PM_{10}$ ratio (<0.3) is typically associated with higher concentrations of coarse PM from sources associated with earth works, road dust, and wind erosion. Between these ranges the source of PM can be associated with a mixture of the sources.

Figure B.3.12 (Appendix B.3) shows a scatter plot of the $PM_{2.5}/PM_{10}$ ratio as a function of the 24-hour average PM_{10} concentrations at Site 1. This plot is showing that there that the source of the PM_{10} emissions tends to be in the high and mid-level $PM_{2.5}/PM_{10}$ ratio indicating that most of the PM sources would likely be from combustion sources (i.e., wildfire smoke, home heating, or vehicle exhaust) and secondary PM generation. There is a mix of both the high and low $PM_{2.5}/PM_{10}$ ratio at the higher 24-hour average PM_{10} concentrations. The low $PM_{2.5}/PM_{10}$ ratios associated with 24-hour PM_{10} concentrations are likely from earthworks, road dust, or wind erosion.

Figure B.3.13 (Appendix B.3) shows a scatter plot of the $PM_{2.5}/PM_{10}$ ratio as a function of the 24-hour average PM_{10} concentrations at Site 2. Like Site 1, most of the $PM_{2.5}/PM_{10}$ ratio was split between high and mid-level which indicates that the source of PM was from combustion or secondary formation. The higher daily average PM_{10} concentrations were more strongly associated with the lower $PM_{2.5}/PM_{10}$ ratios indicating that these daily concentrations would be from earth works, road dust, erosion or possibly precipitation during high wind events. Site 2 is the closest monitoring location to the active Project construction activities.

Figure B.3.14 (Appendix B.3) shows a scatter plot of the $PM_{2.5}/PM_{10}$ ratio as a function of the 24-hour average PM_{10} concentrations at Site 3. Like the other sites, there is a split between the high and mid-level $PM_{2.5}/PM_{10}$ ratio for most of the 24-hour average data measured at Site 3. However, the higher daily average PM_{10} concentrations are associated more with combustion and secondary PM generation than to earthworks, road dust, wind erosion, or precipitation during high wind events. This site is the furthest monitoring site from active construction and other potential sources of PM_{10} in the region during 2023.

Total Suspended Particulate (TSP)

Table B.3.7 (Appendix B.3) shows the statistics of the 24-hour average TSP concentrations measured at the three Project and Calaway Park monitoring sites. Figure B.3.15 to Figure B.3.17 (Appendix B.3) shows the the time series of the 24-hour average $PM_{2.5}$, PM_{10}, and TSP concentrations measured at the Project stations for the July 2023 to June 2024 period. The maximum 24-hour average PM_{10} concentration of 508 µg/m^3 was measured at Site 2 on October 24, 2023. Overall, there were 38 days at Site 1, 66 days at Site 2, and 2 days at Site 3 that were above the 24-hour average TSP AAAQO. The higher number of days where the daily average was above the 24-hour average TSP AAAQO at Site 1 and Site 2 could be due to being located near the active Project construction areas and existing sources of particulates. Most of these high TSP 24-hour average concentrations occur in the late spring to late fall periods. There were periods in early January, late February, and mid April where high TSP concentrations were measured at the Project monitoring stations. It was noted during the monitoring program that some of the PM_{10} concentrations were elevated during precipitation events associated with high winds which is likely the cause of the high 24-hour average TSP concentrations measured during the winter and early spring as it coincides with weather events that had high winds with snow fall.

Figure B.3.18 (Appendix B.3) shows the the time series of the 24-hour average $PM_{2.5}$ and TSP concentrations measured at Calaway Park for the July 2023 to June 2024 period. The maximum 24-hour average PM_{10} concentration of 96.5 µg/m^3 was measured at the site on September 4, 2023. Calaway Park did some maintenance on a nearby access road in late August and Early September which would account for the high 24-hour average TSP measurements.

Figure B.3.19 (Appendix B.3) shows the box-whisker plot of the 24-hour average TSP concentrations measured at the three Project and Calaway Park monitoring sites. Most of the 24-hour average TSP concentrations were measured below the AAAQO of 100 µg/m^3. Site 1 and

Site 2 had some measured concentrations in the upper inter quartile range that were above the AAAQO with the top of the interquartile range values of 106 µg/m^3 at Site 1 and 109 µg/m^3 at Site 2.

All the sites are below the annual average AAAQO of 60 µg/m^3. Because the Calaway Park site is only active when the park is open (May 2, 2023, to October 12, 2023), the number of observations falls below the 75% annual completeness criteria so the annual average would not be considered valid but is shown for informational purposes. Site 2 had the highest annual average TSP concentrations in 2023 at 53.7 µg/m^3.

To determine the potential source of the TSP concentrations at the sites the $PM_{2.5}$/TSP and PM_{10}/TSP ratios were calculated using the same methodology as was used for the $PM_{2.5}/PM_{10}$ ratio. High $PM_{2.5}$/TSP ratios (>0.7) indicate that there is a higher concentration of $PM_{2.5}$ which is generally associated with combustion sources or secondary PM created by chemical reactions in the atmosphere. A high PM_{10}/TSP ratio would indicate that more of the PM is below 10 micrometres (µm) aerodynamic diameter. A low $PM_{2.5}$/TSP ratio (<0.3) is typically associated with higher concentrations of PM from sources associated with earth works, road dust, and wind erosion. A low PM_{10}/TSP ratio would indicate that more of the PM is above 10 µm aerodynamic diameter and likely would be linked with more visible dust. Between these ranges the source of PM can be associated with a mixture of the sources.

Figure B.3.20 (Appendix B.3) shows a scatter plot of the $PM_{2.5}$/TSP (Orange) and PM_{10}/TSP (Blue) ratios as a function of the 24-hour average TSP concentrations at Site 1. This plot is showing that at lower 24-hour average TSP concentrations, the source of the TSP particles tends to be within the 2.5 µm to 10 µm particle size range with only a few of the TSP concentrations associated with particles with a size larger than 10 µm aerodynamic diameter. At the higher TSP 24-hour average concentrations, the particles tend to be in the upper end of the PM_{10} range and larger.

Figure B.3.21 (Appendix B.3) shows a scatter plot of the $PM_{2.5}$/TSP (Orange) and PM_{10}/TSP (Blue) ratios as a function of the 24-hour average TSP concentrations at Site 2. This plot is showing that there that the source of the TSP concentrations tends to be within the 2.5 µm to 10 µm particle size range when the 24-hour average TSP concentration was below 100 µg/m^3. Above this concentration, the 24-hour average TSP concentrations associated with particles with a size larger around 10 µm aerodynamic diameter or larger. This site is closer to the active construction activities than the other sites which may be attributed with the higher TSP concentrations but not necessarily resulting from the larger particle sizes.

Figure B.3.22 (Appendix B.3) shows a scatter plot of the $PM_{2.5}$/TSP (Orange) and PM_{10}/TSP (Blue) ratios as a function of the 24-hour average TSP concentrations at Site 3. This plot is showing that there that the source of the TSP concentrations tends to be within the 2.5 µm to 10 µm particle size range with only a few of the TSP concentrations associated with particles with a size larger than 10 µm aerodynamic diameter.

Figure B.3.23 (Appendix B.3) shows a scatter plot of the $PM_{2.5}$/TSP ratios as a function of the 24-hour average TSP concentrations at Calaway Park. This plot shows that most of the PM daily concentrations are in the PM_{10} and $PM_{2.5}$ particle size ranges. Although there are no PM_{10} measurements at the Calaway Park site, the days with 24-hour average concentrations near or above 50 µg/m^3 also have a high $PM_{2.5}$/TSP ratio this suggests that it was likely due to wildfire influences.

Results from the Meteorological Monitoring Program

Table B.3.8 to Table B.3.13 (Appendix B.3) shows the summary statistics for the meteorological parameters measured at Site 1, Site 2, Site 3, Calaway Park, Springbank AQMS, and the Springbank Airport. These statistics show that there is some variability between the sites that can be attributed to some micrometeorological conditions (i.e., elevation, local terrain, land cover, and proximity to structures and trees) as well as variability in the deployment of the instruments and the instruments themselves. For instance, the sites with EBAM Stations (Site 1, Site 2, Site 3, and Calaway Park) have one of the EBAM Stations equipped with the meteorological instruments at instrument height approximately 2 m to 3 m above the ground surface. The Springbank AQMS and Springbank Airport have the wind instruments at the standard 10 m above the ground surface with the remaining instruments in the 2 m to 3 m above ground surface.

Wind Speed and Direction

Figure B.3.24 and Figure B.3.25 (Appendix B.3) show the joint frequency distribution commonly referred to as wind roses for each of the Project monitoring sites and the Springbank Airport. Figure B.3.26 (Appendix B.3) shows the histogram of the wind speed frequency distribution at the Project monitoring sites and the Springbank Airport.

At Site 1, the predominate wind direction during the 2023/2024 reporting year was blowing from the west (13.7%), east southeast (11.1%), and south southwest (10.4%) with wind speeds between 0.2 m/s and 3.0 m/s (87.5%). Calm winds with wind speeds below 0.2 m/s occurred 3.72% during the July 2023 to June 2024 period. The maximum 1-hour average wind speed of 10.1 m/s was measured on June 28, 2024, at 06:00 blowing from the southwest.

At Site 2 the predominate wind direction during the 2023/2024 reporting year was blowing from the northwest (11.3%), west southwest (10.1%), and west (9.87%) with wind speeds between 0.2 m/s and 3.0 m/s (82.4%). Calm winds with wind speeds below 0.2 m/s occurred 1.78% during the July 2023 to June 2024 period. The maximum 1-hour average wind speed of 12.9 m/s was measured on May 7, 2024, at 10:00 blowing from the east northeast.

At Site 3 the predominate wind direction during the 2023/2024 reporting year was blowing from the west (25.1%), west northwest (13.6%), and northwest (7.63%) with wind speeds between 0.2 m/s and 3.0 m/s (87.2%). Calm winds with wind speeds below 0.2 m/s occurred 1.07% during the July 2023 to June 2024 period. The maximum 1-hour average wind speed of 9.64 m/s was measured on November 11, 2023, at 11:00 blowing from the southwest.

At Calaway Park the predominate wind direction during the 2023/2024 reporting year was blowing from the south southeast (11.8%), northwest (11.5%), and southeast (9.84%) with wind speeds between 0.2 m/s and 3.0 m/s (77.7%). Calm winds with wind speeds below 0.2 m/s occurred 4.73% during the July 2023 to June 2024 period. The maximum 1-hour average wind speed of 10.9 m/s was measured on June 15, 2024, at 23:00 blowing from the southeast.

At the Springbank AQMS the predominate wind direction during the 2023/2024 reporting year was blowing from the north northwest (15.5%), northwest (13.5%), and southeast (9.02%) with wind speeds between 0.5 m/s and 3.0 m/s (64.2%). Calm winds with wind speeds below 0.5 m/s occurred 16.6% during the July 2023 to June 2024 period. The maximum 1-hour average wind speed of 11.7 m/s was measured on November 11, 2023, at 12:00 blowing from the southwest and on May 7, 2024, at 11:00 blowing from the northwest.

At the Springbank Airport the predominate wind direction during the 2023/2024 reporting year was blowing from the northwest (18.3%), north northwest (9.82%), and west northwest (9.03%) with wind speeds between 0.5 m/s and 3.0 m/s (53.4%). Calm winds with wind speeds below 0.5 m/s occurred 4.00% of the time during the July 2023 to June 2024 period. The maximum 1-hour average wind speed of 18.6 m/s was measured on November 11, 2023, at 12:00 blowing from the west southwest. The Springbank AQMS and Springbank Airport show similar prevailing wind directions, but the wind speeds tend to be higher at the airport.

Ambient Temperature

There is a bit less variability in the ambient temperature between the sites with the annual average ambient temperature being around 4.2°C at the sites that monitored for all twelve months. The lowest ambient temperature of -40.5°C was recorded at the Springbank Airport on January 12, 2024, at 10:00. The maximum ambient temperature of 33.7°C was measured at Site 1 and Site 2 on August 15, 2023, at 15:00 hours.

Figure B.3.27 (Appendix B.3) shows the frequency distribution of the temperatures at each site over the 2023/2024 reporting year. It should be noted that Calaway Park was deployed primarily during the late spring to middle of the fall so shows a bias to the higher temperature range. Overall, in the region the temperature tends to be between -10.0°C and 15.0°C (81.2%) during the July 2023 to June 2024 period. The temperatures above 15.0°C (6.61%) occurred less often than temperatures below -10.0°C (9.38%).

Relative Humidity

Like ambient temperature, there was small fluctuation of the relative humidity at the monitoring sites. The lowest relative humidity of 9.0% was measured at the Springbank AQMS on September 16, 14:00. The relative humidity of greater than 90% occurred between 12.9% to 19.4% of the valid monitoring hours at the sites. As shown in Figure B.3.28 (Appendix B.3) most of the time the relative humidity was above 50% during July 2023 to June 2024.

Atmospheric Pressure

Figure B.3.29 (Appendix B.3) shows the frequency distribution of the atmospheric pressure measured the monitoring sites during 2023/2024 reporting year. There is little variation between the measurements between the sites except for the measurements at Calaway Park which are likely due to the reduced deployment time and being deployed mainly during the warmest part of the year. The annual average atmospheric pressure was between 87.3 kPa and 88.1 kPa at the monitoring sites. The lowest atmospheric pressures were typically measured during cooler winter months with the higher atmospheric pressures occurring in the warmer months.

Solar Radiation

Solar radiation was only monitored at the Springbank AQMS. Figure B.3.30 (Appendix B.3) shows a box whisker plot of the monthly solar radiation data. The solar radiation was highest in June 2024 and the lowest in December 2023 and followed the typical diurnal pattern of being highest at the local noon hour and the lowest from dusk until sunrise. Over the six months of data collection the average solar radiation was 144 watts per square metre (W/m^2) during the 2023/2024 reporting year.

Precipitation

Precipitation was measured at the Springbank Airport and at the Springbank AQMS for the 2023/2024 reporting year. Figure B.3.31 (Appendix B.3) shows the time-series of the precipitation measured and the cumulative precipitation measured at the two sites. The maximum amount of hourly precipitation of 16.0 mm was measured at the Springbank Airport on July 17, 2023, at 14:00. The highest hourly precipitation of 13.2 mm at the Springbank AQMS was measured on July 10, 2023, at 22:00. During the monitoring period the Springbank Airport measured 755 mm of precipitation and the Springbank AQMS measured 167 mm of precipitation during the July 2023 to June 2024 period. The precipitation data from the Springbank Airport is higher than the nearby Calgary International Airport climate station that measured 349 mm of precipitation over the same period. The difference in measured precipitation between the ECCC climate stations and the Springbank AQMS can be attributed to differences in instrumentation and setup between the sites as well as micrometeorogical differences.

Results Summary

As shown in in the previous section the measured NO_2 concentrations measured at the Springbank AQMS were less than the 1-hour and annual average NO_2 AAAQO. When compared to the regional stations operated by AEPA and CRAZ the Springbank AQMS was below those stations located in the City of Calgary and was like the more rural regional monitoring station operating in the City of Airdrie and the City of High River.

The $PM_{2.5}$ concentrations measured at the Project did have some measured concentrations above the 1-hour average AAAQG and the 24-hour average AAAQO. This trend was similarly observed with the PM_{10} and TSP measured concentrations as discussed in the previous sections. The analysis tended to show that the primary source of particulate matter originated from combustion sources. There were several wildfires that were burning from late April until October of 2003 as well as May and June in 2024 in Alberta, British Columbia, the Yukon Territory, and the Northwest Territories that caused multiple wildfire smoke advisories in the Calgary Region and where the primary contributor to high measured $PM_{2.5}$ concentrations.

Figure B.3.32 (Appendix B.3) shows a pollution rose plot showing the 1-hour average $PM_{2.5}$ concentrations above the AAAQG associated with the wind direction measured at Site 1. This shows that the highest concentrations originated from sources located east southeast and north northwest of Site 1, but the majority of the high concentration events were from sources located east southeast of Site 1. The figure also shows a scatter plot of the wind speed and the 1-hour average $PM_{2.5}$ concentrations measured at the site. Most of the $PM_{2.5}$ concentrations measured above the AAAQG are associated with wind speeds between 0.2 m/s and 3 m/s. The highest 1-hour average $PM_{2.5}$ concentration of 136 µg/m^3 is associated with a wind speed of 1.17 m/s with winds blowing from the north northwest on September 4, 2023, at 08:00. Most of the Project emission sources would be located to the east, north, and northeast of the site.

Figure B.3.33 (Appendix B.3) shows a pollution rose plot showing the 1-hour average $PM_{2.5}$ concentrations above the AAAQG associated with the wind direction measured at Site 2. This shows that the highest concentrations originated from sources located north northwest and north northeast of Site 2, but the majority of the high concentration events were split between sources located in the east southeast and southeast of Site 2. The figure also shows a scatter plot of the wind speed and the 1-hour average $PM_{2.5}$ concentrations measured at the site. Most of the $PM_{2.5}$ concentrations measured above the AAAQG are associated with wind speeds between 0.2 m/s and 3.36 m/s. The highest 1-hour average $PM_{2.5}$ concentration of 132 µg/m^3 is associated with a wind speed of 1.33 m/s with winds blowing from the north northeast on September 4, 2023, at 08:00. This site is the closest site to the active construction activities, so it also has the highest probability of detecting concentrations of $PM_{2.5}$ originating from the Project sources operating west, north, and northeast of the monitoring site.

Figure B.3.34 (Appendix B.3) shows a pollution rose plot showing the 1-hour average $PM_{2.5}$ concentrations above the AAAQG associated with the wind direction measured at Site 3. This shows that the highest concentrations originated from sources located north, east northeast, and northwest of Site 3, but the majority of the high concentration events were split between sources located in the east southeast, north, and southeast of Site 3. The figure also shows a scatter plot of the wind speed and the 1-hour average $PM_{2.5}$ concentrations measured at the site. Most of the $PM_{2.5}$ concentrations measured above the AAAQG are associated with wind speeds between 0.3 m/s and 3 m/s with one event where the wind speed was 4.56 m/s. The highest 1-hour average $PM_{2.5}$ concentration of 125 µg/m^3 is associated with a wind speed of 0.67 m/s blowing from the east northeast on May 11, 2024 at 21:00. The Project emission sources would be located to the east and southeast of the site.

Figure B.3.35 (Appendix B.3) shows a pollution rose plot showing the 1-hour average $PM_{2.5}$ concentrations above the AAAQG associated with the wind direction measured at Calaway Park. This shows that the highest concentrations originated from sources located north of Calaway Park. The majority of the high concentration events were split between sources located in the south southeast and southeast of Calaway Park. The figure also shows a scatter plot of the wind speed and the 1-hour average $PM_{2.5}$ concentrations measured at the site. Most of the $PM_{2.5}$ concentrations measured above the AAAQG are associated with wind speeds between 0.1 m/s and 2 m/s. The highest 1-hour average $PM_{2.5}$ concentration of 141 µg/m^3 is associated with calm wind conditions on September 4, 2023, at 07:00. The Project emission sources would be located approximately 4.5 km southwest of the Calaway Park site so likely these measured concentrations are not associated with particulate matter sources from the Project.

Figure B.3.36 (Appendix B.3) shows a pollution rose plot showing the 1-hour average $PM_{2.5}$ concentrations above the AAAQG associated with the wind direction measured at the Springbank AQMS. This shows that the highest concentrations originated from sources located east, east northeast, south southeast, and west northwest of the Springbank AQMS. The majority of the high concentration events were split between sources located in the southeast, northwest, and east southeast the Springbank AQMS. The figure also shows a scatter plot of the wind speed and the 1-hour average $PM_{2.5}$ concentrations measured at the site. Most of the $PM_{2.5}$ concentrations measured above the AAAQG are associated with wind speeds between 0.5 m/s and 5.3 m/s and calm winds. The highest 1-hour average $PM_{2.5}$ concentration of 202 µg/m^3 is associated with a wind speed of 1.92 m/s with winds blowing from the east on May 11, 2024, at 21:00. The Project emission sources would be located approximately 4.2 km west southwest of the Springbank AQMS site so likely these measured concentrations are not associated with particulate matter sources from the Project.

Overall, the particulate matter concentrations measured in the northern wind sectors are likely due long-range transport of wildfire smoke from northern Alberta, British Columbia, Yukon Territory, and the Northwest Territories during the wildfire season in 2023. There were likely some particulate emissions in the area around the Project that can be from construction activities occurring near Site 1 and Site 2 as well as other sources of particulate located in the region. The Calaway Park and Springbank AQMS sites were likely more influenced by emissions occurring in the region from agricultural and other activities occurring near the sites with the majority likely from the wildfire smoke events.

IAAC Approval Condition 6.4 & 7.10 – Verification of the Accuracy of the Environmental Assessment

The AQMP was designed to collect the information for a verification study and was reviewed by ECCC and Health Canada. Specific to each sub-condition:

- Monitoring locations were located at the perimeter of the planned Project area as per the AQMP. These three sites around the Project area are being operated throughout the construction phase and are equipped with EBAM stations to monitor $PM_{2.5}$, PM_{10}, and TSP and have been operating since June 2022. Specifically, these sites are located at:
  - Site 1: between the permanent access road and diversion channel.
  - Site 2: south of the dry dam construction site.
  - Site 3: east side of dry dam area near borrow source sites.
- The Calaway Park station was established at the west side of the park in consultation with Calalta, the owner and operator of the , The site is equipped with EBAM stations to monitor $PM_{2.5}$ and TSP while the park is open to the public. The monitoring program started in June 2022 and removed at the end of October. This site has operated each subsequent year from early May to early October.
- Meteorological parameters of wind speed, wind direction, ambient temperature, relative humidity, and atmospheric pressure are being collected at each of the three monitoring sites and the Calaway Park site at instrument height (i.e., approximately 2 m above ground surface).
- The location of the Springbank AQMS site at the Lions Soccer Park was discussed with Rocky View County and Springbank Park for all Seasons prior to deployment and commissioning in July 2023. The AQMS is equipped with ambient air quality analyzers to monitor NO_2 and $PM_{2.5}$. The meteorological parameters of wind speed, vertical wind speed, and wind direction are measured at 10 m above ground level. The other meteorological parameters of ambient temperature, relative humidity, atmospheric pressure, solar radiation, and precipitation at approximately 3 m above ground level.
- Meteorological data is being collected from the Springbank Airport site that is operated by Navigation Canada and ECCC have been downloaded daily and monthly from the ECCC historical weather website to supplement the monitoring program.

- $PM_{2.5}$ and NO_2 hourly average concentrations from the regional stations operated by CRAZ and AEPA have been downloaded daily from the CRAZ website and monthly from the AEPA Air Data Warehouse for comparison to the Project monitoring data.
- The 1-hour average $PM_{2.5}$ concentrations are being evaluated with the AAAQG (80 µg/m^3). The 24-hour average $PM_{2.5}$ and TSP concentrations are being evaluated with the AAAQO (29 µg/m^3 and 100 µg/m^3 respectively. The annual average TSP concentrations are evaluated using the AAAQO (60 µg/m^3). The 1-hour and annual average NO_2 concentrations are being evaluated using the AAAQO of 159 ppb and 24 ppb respectively.
- As there are no Alberta objective or guidelines or CAAQS for PM_{10}, a 24-hour average concentration of 50 µg/m^3 is being used to evaluate the PM_{10} concentrations. This value is used by other jurisdictions in Canada. It will not be used as an enforceable criterion but to determine whether the concentrations are considered elevated.
- CAAQS are part of the evaluation of the $PM_{2.5}$ and NO_2 ambient air quality data collected by the EBAM stations and Springbank AQMS.
- The results of the evaluation of the AAAQO, AAAQG, or CAAQS are used to determine the application of mitigation strategies or changes to the air quality monitoring network using adaptive management.
- Monthly site visits are being conducted for all the Project sites to conduct calibration and maintenance activities. Additional site visits are conducted as needed to address any power, communication, or instrumentation issues.
- Data collected at project monitoring sites undergoes initial QA/QC to identify any quality issues. The data undergoes further QA/QC processing prior to reporting as per the AMD Chapter 6.
- Raw and Level 0 QA/QC data is stored at the Bureau Veritas (BV) data center. Data is sent via email to Stantec daily and monthly over the course of the monitoring program. The original data files, status updates from BV, and processed data files are stored on Stantec's fileservers.

IAAC Approval Condition 6.5 & 7.11 – Indigenous Group Plain Language Bi-Annual Reporting

The twice annual air quality report, capturing the January 2023 to December 2023 period, was distributed to Indigenous groups on August 23, 2024.

IAAC Approval Condition 7.5 – Fugitive Dust Emission Mitigation

Speed limits were implemented as per the AQMP on roads within the Project construction areas. Volker Stevin regularly cleans the highway to remove dirt and dust using street sweepers.

The heavy haul roads have a speed limit of 50 km/h except for during extreme hot, dry, and windy conditions or wet conditions after rain and snowmelt events where the haul road speed limit is reduced. The speed limits were monitored by the Contractor's safety team and the foreman on site. Light duty vehicle service roads had a speed limit of 30 km/h.

Water trucks applied water on the project roads 24 hours a day, seven days a week during the warm months. During high winds or if increased generation of dust is observed, additional water mitigation is applied, and vehicle speed limits are imposed. Table 4.8 shows the volume of water applied to the Project roads between July 2023 to June 2024. Water was not applied if the ground was frozen, or snow covered or if the air temperature was below 0°C.

Table 4.8 Summary of Monthly Water Mitigation Applied to Haul and Light-duty Roads

Month	Volume of Water Applied (m^3)
July 2023	11,020
August 2023	9,796
September 2023	0
October 2023	0
November 2023 [1]	0
December 2023 [1]	0
January 2024 [1]	0
February 2024 [1]	0
March 2024 [1]	0
April 2024 [1]	0
May 2024	2,080
June 2024	12,202

Note:
1. Roads were frozen or snow covered.

Dugouts were used to store water in the Project construction area for soil conditioning and dust mitigation. This water is sourced from the Elbow River, groundwater wells, precipitation, and overland water flow; see Section 4.3.4 for details on the dugouts.

Stockpiles and other disturbed surfaces were monitored for dust generation and when necessary re-contoured and track-packed to limit wind erosion, silt fencing was also used to limit dust generation from disturbed soils. These areas have been left to naturally re-vegetate to minimize erosion and suppress dust generation from the loose sediment.

A dust complaint was made in September 2023. Upon investigation, it was determined that the dust complaint was associated with hot, dry, and windy conditions and were associated with Project vehicle traffic during these conditions. Project personnel were advised to reduce their speed near and within the construction site and calcium chloride was applied to suppress the dust. Calcium chloride was applied in August 2023 (58,222 L), and June 2024 (84,137 L) on Township Road 242, the main office parking lot, and Range Road 41.

The construction office is powered by the local power grid and all light towers were switched to solar power in May 2023. The generators and other equipment at the Diversion Inlet were switched from diesel fuel to propane in October 2022. All this equipment is now electrically powered. Two diesel generators were stored as back-up in the event the propane generators failed; however, they were never used.

4.9.2 Noise

During the 2023/2024 reporting year, TEC received no noise complaints and as a result, noise monitoring was not conducted.

There were no blasting activities during the 2023/2024 reporting year.

4.10 ARCHAEOLOGICAL AND HERITAGE RESOURCES

In accordance with IAAC approval condition 9.2 and as required by AACSW, archaeological impact assessment studies are ongoing and nearing completion during the 2023/2024 reporting year; site-specific archaeological field studies were conducted, and conditional HRA approval was received for one site that was previously recorded and impacts mitigated, including hand excavation. The remaining required hand excavations were completed during the 2023/2024 reporting year. The remaining AACSW requirements relative to archaeological field studies, including construction monitoring, will be completed in the next reporting year.

As required by IAAC approval condition 9.3 and 9.9, an Archaeological and Heritage Resource Management Plan was developed in late 2021 with involvement from Indigenous communities and AACSW.

4.10.1 *Historical Resources Act* Section 31 Chance Finds

During the 2023/2024 reporting year, five *Historical Resource Act* Section 31 Finds (HRA Section 31 Finds) were identified by the Indigenous Monitors. As required and detailed in the Archaeological and Heritage Management Plan, the HRA Section 31 Find procedure was initiated and adhered to until it was determined that the buffer could be removed, and construction activities could re-start in the HRA Section 31 Find areas. No further activities were required for these finds.

For one HRA Section 31 find identified by Indigenous Monitors on June 5, 2023, additional activities were necessary. The HRA Section 31 Find Procedure as detailed in the Archeological and Heritage Resource Management Plan was initiated. A field assessment was conducted by an archaeologist with Indigenous Monitors in attendance and participating in identifying additional items of interest. The HRA Find was determined to be protected under the HRA and further assessment was required (including shovel testing) to determine the extent of HRA Section 31 Find boundary. Shovel testing was conducted by an archaeologist with the Indigenous Monitors in attendance. Results of the shovel testing were communicated to AACSW who determined that construction avoidance of the archaeological site or further assessment (i.e. hand excavation) was required. A semi-permanent fence was installed at the June 5, 2023 buffer to facilitate avoidance so that no inadvertent impacts occurred during construction. The buffer will be maintained by Indigenous Monitors until further notice will be removed after construction completion.

For one HRA Section 31 Find identified by Indigenous Monitors on April 12, 2024, additional activities were necessary. The HRA Section 31 Find Procedure as detailed in the Archeological and Heritage Resource Management Plan was initiated. A field assessment was conducted by an archaeologist with Indigenous Monitors in attendance and participating in identifying additional items of interest. The HRA Find was determined to be protected under the HRA and further assessment was required (including shovel testing) to determine the extent of HRA Section 31 Find boundary. Shovel testing was conducted by an archaeologist with the Indigenous Monitors in attendance. Results of the assessment were communicated to AACSW who determined that no further assessment was required. The buffer was removed by the Indigenous Monitors and regular construction activities continued in the area.

4.10.2 Cultural Awareness Training

The Prime Contractor, who is responsible for the provision of all labor and materials, construction, and commissioning of the SR1, as part of their Construction contract, are required to organize cultural awareness sessions to comply with IAAC approval condition 9.4. In order for new hires and existing staff who have not attended a previous session to attend Indigenous Cultural Awareness sessions, the Prime Contractor, working collaboratively with Community Futures Treaty 7, Tsuut'ina Nation (due to proximity to the Project), Treaty 6 Nations and Métis Nation of Alberta District 4 (formally recognized as Region 3), aim to schedule quarterly sessions. Community Futures Treaty 7, Treaty 6 Nations and Métis Nation of Alberta District 4 have been provided opportunities to facilitate or provide the training. Two sessions were provided during the 2023/2024 reporting year.

4.10.3 Palaeontology

As per IAAC approval condition 9.7 and as required by AACSW, palaeontological construction monitoring was completed where required during the 2023/2024 reporting year by a qualified palaeontologist. As per IAAC approval condition 9.7.1 and 9.7.2 monitoring occurred during bedrock excavation of the Diversion Inlet (including the Debris Deflection Barrier) and Diversion Channel (including the Emergency Spillway, Diversion Outlet and Grade Control Structure). Monitoring of fluvial sediment excavations was undertaken at the low-level outlet, Diversion Channel, and Emergency Spillway. During the 2023/2024 reporting year, nine fossil sites were reported to the Royal Tyrrell Museum of Palaeontology. Additional mitigation was required by the Royal Tyrrell Museum of Palaeontology at one site, consisting of intensive collection and documentation. After the necessary work occurred, construction was allowed to continue.

4.11 LAND USE PLANNING

The following is an update on the work completed during the 2023/2024 reporting year specific to conditions 8.8, 8.11, 8.12 and 8.14.

Condition 8.8 Develop a Land-Use Plan

- A draft land-use plan was prepared in the fall of 2023 and completed in January 2024.
- Engagement on the draft land-use plan was held from February 12, 2024, to April 14, 2024. *(Condition 2.4.2: 30-day Consultation was met.)*
    - Public Engagement: 30 days, included an online survey and opportunity for written feedback.
    - First Nations Engagement: minimum 60 days (February 12, 2024, to April 14, 2024). Included an online survey, opportunity for 1:1 meetings, and written feedback.
        - Five First Nations requested 1:1 meetings with the land-use planning project team.
- The land-use planning process adhered to the Updated Draft Guiding Principles and Direction for Future Land Use document that was approved as part of the Springbank Off-stream Reservoir Project application process.
    - Additional land-use access and restrictions were included in the land-use plan to ensure the primary use is for flood mitigation and safety is paramount.
    - Feedback on First Nations priority to exercise Treaty rights and traditional uses, and additional public secondary land use, was considered in the land-use plan.
    - GoA staff contributed to the development of policies within the plan, ensuring they align with Alberta legislation and regulations.
- Approval of the final land-use plan is anticipated this summer.
    - Transportation and Economic Corridors sent a letter to IAAC in June 2024 providing notification of this timeline.

Condition 8.11 Establish a First Nations Land Use Advisory Committee (FNLUAC)

- The GoA established this committee, called the First Nations Land Use Collaboration Committee (FNLUCC), to discuss elements for consideration in the land-use plan that prioritize First Nations-use for exercising Treaty Rights to hunt, fish, and trap for food, and the practice of traditional use activities, while ensuring appropriate safety measures are in place for use of the reservoir area.
- From July 1, 2023, to June 30, 2024, the committee held:
    - An online meeting to review the preliminary draft land-use plan and discuss final process (August 2023).
    - A multi-day meeting to further discuss access and activity use items and review a preliminary draft land-use plan (September 2023).
    - A single-day meeting to review the draft land-use plan (March 2024). This meeting was held during the public engagement.
    - A single-day meeting to provide an overview of changes to the draft land-use plan and to provide information on the transition to plan implementation (May 2024).
        - All meetings have documented notes that were shared with committee members. Additional phone calls and follow-up emails were also used to communicate with committee members.
- Members of the First Nations Land Use Collaboration Committee will have the opportunity to participate in a First Nations Land Use Plan Implementation Committee once the plan has been approved by the Honourable Rebecca Schulz, Minister of Environment and Protected Areas.
    - Agriculture and Irrigation will be overseeing this implementation committee and anticipated to commence work in mid-late fall 2024.

Condition 8.12 Include Indigenous Groups

- Eleven Treaty 7 First Nations and Treaty 6 First Nations identified in the IAAC Decision Statement participated in the First Nations Land Use Collaboration Committee.
    - Two First Nations (Sunchild and O'Chiese) not included in the IAAC Decision statement, were invited to participate on the First Nations Land Use Collaboration Committee. These two nations did not participate in the committee this reporting year, but were provided updates and information on the project.

- The IAAC identified four additional Indigenous communities for inclusion in the land-use planning process (Ktunaxa Nation Council, Foothills Ojibway First Nation, Métis Nation of Alberta - Region 3, and Métis Nation of British Columbia). These communities were invited to participate in the Joint Land Use Advisory Committee with members of the First Nations Land Use Collaboration Committee, local municipal governments, non-governmental organizations, local landholders, and other stakeholders.
    - This committee completed their work and submitted a recommendations report to the GoA in January 2023, and were invited to provide feedback on the draft land-use plan during the 30-day public engagement period.
    - An in-person meeting with the Joint Land Use Advisory Committee was held on February 22, 2024, to provide an overview of the draft land-use plan. Members of the First Nations Land Use Collaboration Committee also attended.

Condition 8.14 Develop a Follow-Up Program

- The Preliminary Approach for Monitoring and Evaluation of the Land Use Plan submitted to IAAC in May 2022 will be refined and aligned where necessary after approval of the final land-use plan.

5.0 REFERENCES

Alberta Environment and Parks (AEP). 2016. Air Monitoring Directive Chapter 6: Ambient Data Quality. Retrieved August 17, 2023, from Government of Alberta; Alberta Environment and Protected Areas (AEPA; formerly known as Alberta Environment and Parks (AEP)), Environmental Monitoring and Compliance; Air Monitoring Directive Web Page: https://open.alberta.ca/dataset/9f75b54e-641a-4d9d-885f-e87e973321b4/resource/eb4cc6dd-686a-4865-bc40-fb77bb432766/download/amd-chapter6-dataquality-dec16-2016a.pdf

AEP. (2017). Air Monitoring Directive Chapter 4 : Monitoring Requirements and Equipment Technical Specifications. Retrieved September 29, 2021, from Govenment of Alberta; Alberta Environment and Protected Areas (AEPA; formerly known as Alberta Environment and Parks (AEP)), Environmental Monitoring and Compliance; Air Monitoring Directive Web Page. https://open.alberta.ca/dataset/9f75b54e-641a-4d9d-885f-e87e973321b4/resource/c8fb1379-3df7-4332-be9b-1b029eb16fd9/download/amd-chapter4-monitoring-jun26-2017b.pdf

AEP. 2018. Ambient Air Monitoring Directive Chapter 7: Calibration. Retrieved August 17, 2023, from Government of Alberta; Alberta Environment and Protected Areas (AEPA; formerly known as Alberta Environment and Parks (AEP), Environmental Monitoring and Compliance; Air Monitoring Directive Web Page: https://open.alberta.ca/dataset/9f75b54e-641a-4d9d-885f-e87e973321b4/resource/7097f017-a8e0-457d-8764-e03056d259ee/download/amd-chapter7-calibration-oct03-2018.pdf

Alberta Environment and Protected Areas (AEPA). 2024. Alberta Ambient Air Quality Objectives and Guidelines. Retrieved September 3, 2024, from Open Alberta; Publications; Alberta Environment and Protected Areas (AEPA); Alberta Ambient Air Quality Objectives and Guidelines Web Site: https://open.alberta.ca/dataset/09a63fe8-11ae-420e-9008-82aa4db4824a/resource/094dae9e-b6f9-4de9-86c7-a651019f3aab/download/epa-ambient-air-quality-objectives-and-guidelines-2024.pdf

Birds Canada. 2023. Nesting Calendar Query Tool. Available at: https://naturecounts.ca/apps/rnest/index.jsp?lang=EN

Bamola, S., Goswami, G., Dewan, S., Goyal, I., Agarwal, M., Dhir, A., & Lakhani, A. 2024. Characterizing temporal variability of PM2.5/PM10 ratio and its correlation with meteorological variables at a sub-urban site in the Taj City. Urban Climate, 53(101763). doi: https://doi.org/10.1016/j.uclim.2023.101763

BC ENV. 2019. Provincial Air Quality Objective Information Sheet: British Columbia Ambient Air Quality Objectives. Retrieved May 10, 2024, from British Columbia Government; Environment and Climate Change Strategy (BC ENV); Air, Land, and Water; Air; Air Quality Management; Regulatory Framework; Objectives and Standards Web Site: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/aqotable.pdf

CBC. 2024. Environment Canada issues special air quality statement for Calgary. Canadian Broadcasting Corporation (CBC) News Calgary. Retrieved September 5, 2024, from https://www.cbc.ca/news/canada/calgary/calgary-special-air-quality-statement-environment-canada-1.7090456

CCME. 2012. Guidance Document for the Achievement Determination for the Canadian Ambient Air Quality Standards for Fine Particulate Matter. Retrieved September 29, 2021, from Canadian Council of Ministers of the Environment (CCME); Resources; Air Quality; AQMS Web Site: https://ccme.ca/en/res/pn1483_gdad_eng-secured.pdf

CCME. 2019. Guidance Document on Air Zone Management. Retrieved September 29, 2021, from Canadian Council of Ministers of the Environment (CCME); Resources; Air Quality; AQMS Web Site: https://ccme.ca/en/res/guidancedocumentonairzonemanagement_secured.pdf

CCME. 2020. Guidance Document on Achievement Determination for Canadian Ambient Air Quality Standards for Nitrogen Dioxide. Retrieved September 29, 2021, from Canadian Council of Ministers of the Environment (CCME); Resources; Air Quality; AQMS Web Site: https://ccme.ca/en/res/gdadforcaaqsfornitrogendioxide_en1.0.pdf

CCME. 2021. Canadian Ambient Air Quality Standards (CAAQS). Retrieved September 30, 2021, from Canadian Council of Ministers of the Environment (CCME); Canada's Air Web Site: https://ccme.ca/en/air-quality-report#slide-7

DFO (Fisheries and Oceans Canada). 2020a. Government of Canada, fisheries and Oceans Canada. Retrieved September 28, 2023, from Government of Canada; Fisheries and Oceans website: https://www.dfo-mpo.gc.ca/pnw-ppe/codes/screen-ecran-eng.html.

DFO. 2020b. Recovery Strategy for the Bull Trout (*Salvelinus confluentus*), Saskatchewan-Nelson Rivers populations, in Canada [Final]. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa. vii + 131 pp.

DFO, 2024. Aquatic species at risk map. Aquatic species at risk map (dfo-mpo.gc.ca) Accessed on September 9, 2024.

GoA. 2021. Special Provision – Turbidity. Available at: https://www.alberta.ca/system/files/custom_downloaded_images/trans-turbidity-monitoring-sp.pdf

GOC. 2024. Species at risk public registry. https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html Accessed on September 9, 2024.

Health Canada. 2024. Guidelines for Canadian Drinking Water Quality—Summary Table. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.

Hunt, S. 2024. Air quality statement issued for Calgary Sunday morning as soccer games cancelled. CTV News Calgary. Retrieved September 5, 2024, from https://calgary.ctvnews.ca/air-quality-statement-issued-for-calgary-sunday-morning-as-soccer-games-cancelled-1.6883927

Impact Assessment Agency of Canada (IAAC) Annual Report – 2022/2023 Reporting Year. 2022-2023. Springbank Off-Stream Reservoir Project.

LaZerte, S. E., & Albers, S. (2018). weathercan: Download and format weather data from Environment and Climate Change Canada. The Journal of Open Source Software, 3(22), 571. Retrieved from https://doi.org/10.21105/joss.00571

Natural Resources Canada (NRCan). 2023. Canada's record-breaking wildfires in 2023: A fiery wake-up call. Retrieved May 10, 2024, from Government of Canada; Natural Resources Canada (NRCan); The Office of the Chief Scientist; Simply Science; Articles Web Site: https://natural-resources.canada.ca/simply-science/canadas-record-breaking-wildfires-2023-fiery-wake-call/25303

Paige, C. 2020. Alberta Landholder's Guide to Wildlife Friendly Fencing. Alberta Conservation Association, Sherwood Park, Alberta. 68 pp.

Tran, C. 2024. 'Learning to live with fire': New Study Details Impact of 2023 Wildfire Season. Retrieved May 10, 2024, from Edmonton Journal; News; Local News Web Site: https://edmontonjournal.com/news/local-news/learning-to-live-with-fire-wildfire-alberta-canada-report

Zhao, D., Chen, H., Yu, E., & Luo, T. 2019. PM2.5/PM10 Ratios in Eight Economic Regions and Their Relationship with Meteorology in China. Advances in Meteorology, 2019(5295726). doi: https://doi.org/10.1155/2019/5295726

APPENDIX A
IAAC APPROVAL CONDITIONS CONCORDANCE TABLE

Table A.1 IAAC Approval Conditions Concordance Table

	Condition #	Summary of Condition	Annual Report Section
Definitions and General Conditions	**1.1 to 1.37**	Definitions	Definitions were reviewed and adhered to in the 2022/2023 Annual Report
	2.1 to 2.3	General conditions	General conditions were reviewed and adhered to in the 20222023/2024 Annual Report
Consultation	**2.4**	2.4 The Proponent shall, where consultation is a requirement of a condition set out in this Decision Statement: 2.4.1 provide a written notice of the opportunity for the party or parties being consulted to present their views and information on the subject of the consultation; 2.4.2 provide all information available and relevant to the scope and the subject matter of the consultation and a period of time agreed upon with the party or parties being consulted, not to be less than 30 days for consultation pertaining to Current use of lands and resources for traditional purposes, Physical and cultural heritage and structures, sites or things of historical, archaeological, paleontological or architectural significance, and Species at risk, and not less than 15 days for other consultation activities, to prepare their views and information; 2.4.3 undertake an impartial consideration of all views and information presented by the party or parties being consulted on the subject matter of the consultation; and 2.4.4 advise in a timely manner the party or parties being consulted on how the views and information received have been considered by the Proponent, including a rationale for why the views have, or have not, been integrated.	3.1, 4.11
	2.5	The Proponent shall, where consultation with Indigenous groups is a requirement of a condition set out in this Decision Statement, communicate with each group with respect to the manner to satisfy the consultation requirements referred to in condition 2.4, including methods of notification, the type of information and the period of time to be provided when seeking input, the process to be used by the Proponent to undertake impartial consideration of all views and information presented on the subject of the consultation, and the period of time and the means to advise groups of how their views and information were considered by the Proponent.	3.1
Follow-up requirements	**2.6**	The Proponent shall, where a follow-up program is a requirement of a condition set out in this Decision Statement, determine, as part of the development of each follow-up program and in consultation with the party or parties being consulted during the development, the following information: 2.6.1 the methodology, location, frequency, timing and duration of monitoring associated with the follow-up program; 2.6.2 the scope, content and frequency of reporting of the results of the follow-up program; 2.6.3 the frequency at which the follow-up program must be updated; 2.6.4 the levels of environmental change relative to baseline that would require the Proponent to implement modified or additional mitigation measure(s), including instances where the Proponent may require Designated Project activities to be stopped; and 2.6.5 the technically and economically feasible mitigation measures to be implemented by the Proponent if monitoring conducted as part of the follow-up program shows that the levels of environmental change referred to in condition 2.6.4 have been reached or exceeded.	TEC has reviewed and is in compliance with condition 2.6 (2.6.1 through 2.6.5). TEC developed monitoring programs and will revise them, as required (i.e., if there is an operation event and/or every 10 years)
	2.7	The Proponent shall update the information determined for each follow-up program pursuant to condition 2.6 during the implementation of each follow-up program, at the minimum frequency determined pursuant to condition 2.6.3 and in consultation with the party or parties being consulted during the development of each follow-up program.	Condition acknowledged. Follow-up programs were not updated during this reporting period. Follow-up programs will be updated as per the timing in each plan.
	2.8	The Proponent shall provide the follow-up programs referred to in conditions 3.17, 3.18, 3.19, 3.20, 4.11, 6.4, 7.8, 7.9, 7.10, 8.13, 8.14 and 9.9 to the Agency and to the party or parties being consulted during the development of each follow-up program prior to the implementation of each follow-up program. The Proponent shall also provide any update made pursuant to condition 2.7 to the Agency and to the party or parties being consulted during the development of each follow-up program within 30 days of the follow-up program being updated.	Condition acknowledged. Follow-up programs were not updated during this reporting period. Follow-up programs will be updated as per the timing in each plan.

	Condition #	Summary of Condition	Annual Report Section
Follow-up requirements (cont'd)	**2.9**	The Proponent shall, where a follow-up program is a requirement of a condition set out in this Decision Statement: 2.9.1 implement the follow-up program according to the information determined pursuant to condition 2.6; 2.9.2 conduct monitoring and analysis to verify the accuracy of the environmental assessment as it pertains to the particular condition and/or to determine the effectiveness of any mitigation measure; 2.9.3 determine whether modified or additional mitigation measure(s) are required based on the monitoring and analysis undertaken pursuant to condition 2.9.2; and 2.9.4 if modified or additional mitigation measures are required pursuant to condition 2.9.3, develop and implement these mitigation measure(s) in a timely manner and monitor them pursuant to condition 2.9.2.	Condition acknowledged. Follow-up programs will be implemented according to the information determined pursuant to condition 2.6, monitoring and analysis conducted to verify accuracy of the environmental assessment as it pertains to the condition(s). If modified or additional mitigation measures are required pursuant to condition 2.9.3, mitigation measure(s) will be reviewed and revised in a timely manner and monitored pursuant to condition 2.9.2.
Annual reporting	**2.10**	Where consultation with Indigenous groups is a requirement of a follow-up program, the Proponent shall discuss the follow-up program with each group and shall determine, in consultation with each group, opportunities for their participation in the implementation of the follow-up program, including the conduct of monitoring, the analysis and reporting of follow-up results and whether modified or additional mitigation measure(s) are required, as set out in condition 2.9	Condition 2.10 has been reviewed and where possible, Indigenous labour will be recruited to assist with efforts to conduct regulatory follow-up monitoring for the Project. Indigenous monitors that were retained during the 2023/2024 reporting year is provided in Section 4.5.1.
	2.11	The Proponent shall prepare an annual report that sets out, for that reporting year (see sub-sections 2.11.1 - 2.11.8)	2.1, 3.0, Table 3.1, 3.1
	2.12	The first reporting year for which the Proponent shall prepare an annual report pursuant to condition 2.11 shall start on the day the Minister of the Environment issues the Decision Statement to the Proponent pursuant to subsection 54 (1) of the *Canadian Environmental Assessment Act, 2012*.	The condition was adhered to in the first annual report (2021/2022) submitted to the Agency on October 31, 2022.
	2.13	The Proponent shall submit to the Agency and the First Nation Land Use Committee referred to in condition 8.11 the annual report referred to in condition 2.11, including a plain language executive summary in both official languages, no later than October 31 following the reporting year to which the annual report applies.	See Executive Summary
Information Sharing	**2.14**	The Proponent shall keep these documents publicly available for 15 years following their publication	The documents will be publicly available for 15 years, following their publication
	2.15	When the development of any plan is a requirement of a condition set out in this Decision Statement, the Proponent shall submit the plan to the Agency prior to construction, unless otherwise required through the condition.	Condition acknowledged. TEC developed and provided the plans required prior to the start of construction to IAAC in advance of construction. The plans submitted to IAAC were captured in the 2021/2022 Annual Report. 3; 3.1, 4.4
Change in Proponent	**2.16**	The Proponent shall notify the Agency and Indigenous groups in writing no later than 30 days after the day on which there is any transfer of ownership, care, control of Management of the Designated Project in whole or in part	As required, TEC will notify the Agency and Indigenous groups in writing no later than 30 days after the day on which there is any transfer of ownership, care, control of Management of the Designated Project in whole or in part.

	Condition #	Summary of Condition	Annual Report Section
Change to the Designated Project	**2.17**	If the Proponent is proposing to carry out the Designated Project in a manner other than described in condition 1.5, the Proponent shall notify the Agency in writing in advance. As part of the notification, the Proponent shall provide: 2.17.1 a description of the proposed change(s) to the Designated Project and the environmental effects that may result from the change(s); 2.17.2 any modified or additional measure to mitigate any environmental effect that may result from the change(s) and any modified or additional follow-up requirement; and 2.17.3 an explanation of how, taking into account any modified or additional mitigation measure referred to condition 2.18.2, the environmental effects that may result from the change(s) may differ from the environmental effects of the Designated Project identified during the environmental assessment.	This condition is acknowledged. The Agency will be notified in writing, in advance, should the Designated Project be proposed to be carried out in a manner other than described in condition 1.5. and will provide information as described in condition 2.17.1 through 2.17.3
	2.18	The Proponent shall submit to the Agency any additional information required by the Agency about the proposed change(s) referred to in condition 2.18, which may include the results of consultation with Indigenous groups and relevant authorities on the proposed change(s) and environmental effects referred to in condition 2.18.1 and the modified or additional mitigation measures and follow-up requirements referred to in condition 2.18.2	This condition is acknowledged. The Agency will be provided any additional information regarding proposed change(s) referred to in condition 2.18, which may include the results of consultation with Indigenous groups and relevant authorities on the proposed change(s) and environmental effects referred to in condition 2.18.1 and the modified or additional mitigation measures and follow-up requirements referred to in condition 2.18.2
Fish and fish habitat	**3.1**	The Proponent shall develop, prior to construction, and implement and maintain during all phases of the Designated Project, measures to control erosion and sedimentation within the project development area in a manner consistent with the *Fisheries Act* and its regulations.	4.1.1, 4.2, 4.3.1, 4.3.2, 4.7.1.2
	3.2	The Proponent shall inspect all erosion and sediment control measures installed within the project development area pursuant to condition 3.1 including during flood operation and post flood operation, except when not feasible for safety reasons, and document and repair any defective or damaged control measure as soon as technically feasible such that any impacts to fish and fish habitat resulting from the defective or damaged control measures are minimized or avoided.	4.2
	3.3	The Proponent shall isolate in-water construction activities and shall use temporary access structures for any in-stream construction activity.	4.3
	3.4	The Proponent shall maintain machinery and construction equipment in working order and inspect all machinery and construction equipment for the presence of drips and leaks daily. If the presence of drips or leaks is found on any machinery or equipment, the Proponent shall remove the equipment or machinery from service immediately and not return it to service until the repairs have been completed by a certified mechanic.	4.1, 4.4
	3.5	The Proponent shall inspect all vehicles machinery and construction equipment before it enters the project development area for the presence of invasive alien species and noxious weeds, taking into account Alberta's Decontamination protocol for work in or near water: quick reference guide. The Proponent shall remove all invasive alien species or noxious weeds found on any machinery or equipment before it enters the project development area.	4.1, 4.7.1.1
	3.6	The Proponent shall not deposit any debris in watercourses that may cause adverse environmental effects on fish and fish habitat during all phases of the Designated Project and shall remove, after each flood, debris accumulated at the debris deflector identified in Figure 5 of the environmental assessment report.	4.2, 4.3.1
	3.7	The Proponent shall implement measures to allow sediment to settle before releasing dewatering discharge from construction and post-flood maintenance activities into a water body.	4.2, 4.3.2
	3.8	The Proponent shall remove, during construction, the topsoil from the diversion channel and store it for later use in the restoration of the diversion channel prior to operation.	4.1.1.1
	3.9	The Proponent shall finalise, prior to construction, in consultation with Indigenous groups and to the satisfaction of Fisheries and Oceans, an offsetting plan related to the bull trout (*Salvenlinus confluentus*) and the fish population of the Elbow River. When finalising the plan, the Proponent shall include the adaptive offset measures approach proposed in its Conceptual Offset Measures Plan (Canadian Impact Assessment Registry Reference Number 80123, Document Number 1366). The Proponent shall implement the plan. The Proponent shall submit any approved offsetting plan(s) to the Agency prior to implementation.	4.8.4.5
	3.10	The Proponent shall, for any fish habitat offsetting measure(s) proposed in any offsetting plan(s) referred to in condition 3.9 that may cause adverse environmental effects not considered in the environmental assessment, develop and implement measures to mitigate those effects. The Proponent shall submit these measures to the Agency before implementing them.	4.8.4.5

	Condition #	Summary of Condition	Annual Report Section
Fish and fish habitat (cont'd)	**3.11**	The Proponent shall conduct in-water project activities, including debris removal from the water diversion system, outside of the Government of Alberta restricted activity periods, unless required for safety or emergency reasons. If in-water project activities are required during of the Government of Alberta restricted activity periods for safety or emergency reasons, the Proponent shall develop additional mitigation measures.	Permission was received from the GoA to work in the RAP at Unnamed Creek (Low-Level Outlet channel) during the 2023/2024 reporting year. See Section 4.3.3 and 4.8.4.2.
	3.12	The Proponent shall maintain fish passage in the Elbow River during all phases of the Designated Project. In doing so, the Proponent shall maintain flows downstream of the bypass channel.	Section 3.0, Table 3.1, and Section 4.8.4.2. Fish passage will continue to be maintained during all phases of the Project.
	3.13	The Proponent shall install, prior to operation and in consultation with Transport Canada and Fisheries and Oceans Canada, rock v-weirs between the service spillway and low-level outlet to mitigate the effects of the Designated Project on fish passage in the Elbow River stream.	Section 3.0, Table 3.1, and Section 4.8.4.2
	3.14	The Proponent shall design, install and operate the temporary water intake system used during construction in fish-bearing waterbodies in a manner which mitigates the incidental capture of fish by entrainment and impingement of fish through the use of an appropriately sized fish screen, taking into account Fisheries and Oceans Canada's Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater and in a manner consistent with the Fisheries Act and its regulations.	Not applicable during the 2023/2024 reporting year. This condition will be adhered to during post-flood operation, as necessary.
	3.15	The Proponent shall construct and maintain graded drainage areas within the reservoir during post-flood operation to prevent stranding of fish during release of stored floodwater from the reservoir. In doing so, the Proponent shall re-grade areas of the reservoir during post-flood operation as necessary.	Not applicable during the 2023/2024 reporting year. This condition will be adhered to during post-flood operation, as necessary.
	3.16	The Proponent shall develop and implement, prior to operation, a protocol to rescue juvenile and adult fish during post-flood operation. See 3.16.1 to 3.16.4 for conditions specific to the protocol.	Not applicable during the 2023/2024 reporting year. This condition will be adhered to during post-flood operation, as necessary.
	3.17	The Proponent shall develop and implement a follow-up program to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures as it pertains to fish passage in the Elbow River. See 3.17.1 to 3.17.3 for conditions to be included in the program.	Table 3.1; 4.8.4.2
	3.18	The Proponent shall develop and implement a follow-up program to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures as it pertains to fish rescue. See 3.18.1 to 3.18.2 for conditions to be included in the program.	Table 3.1, Not applicable during the 2023/2024 reporting years as this condition pertains to flood operations.
	3.19	The Proponent shall develop and implement a follow-up program to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures as it pertains to water quality. See sub-sections 3.19.1 to 3.19.6 for conditions to be included in the program.	4.8.1
	3.20	The Proponent shall develop and implement a follow-up program to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures as it pertains to channel morphology. As part of the follow-up program, the Proponent shall monitor channel morphology of the Elbow River and outlet channel during post-flood operation.	Not applicable during the 2023/2024 reporting year. This condition will be adhered to during post-flood operation, as necessary.
Migratory Birds	**4.1**	The Proponent shall carry out the Designated Project in a manner that protects migratory birds and avoids harming, killing or disturbing migratory birds or destroying, disturbing or taking their nests or eggs. In this regard, the Proponent shall take into account Environment and Climate Change Canada's *Guidelines to reduce risk to migratory birds*. The Proponent's actions when carrying out the Designated Project shall be in compliance with the *Migratory Birds Convention Act, 1994, the Migratory Birds Regulations and with the Species at Risk Act*.	4.7.2.2
	4.2	The Proponent shall give preference to the use of existing access roads and disturbed areas for temporary workspaces and transportation activities over building new access roads and temporary workspace in undisturbed areas, and shall revegetate any area where native vegetation was removed for temporary workspace.	This condition is acknowledged, existing roads and trails have been utilized to the extent possible. Approved construction areas were also utilized for work areas and temporary workspaces.

	Condition #	Summary of Condition	Annual Report Section
Migratory Birds (cont'd)	**4.3**	The Proponent shall control the lighting required for Designated Project activities throughout all phases of the Designated Project, including its direction, duration of use, intensity, spectrum colour and brightness, to mitigate the adverse effects of the Designated Project on migratory birds and species at risk caused by sensory disturbances due to light, while complying with operational health and safety requirements.	4.1
	4.4	The Proponent shall identify, in consultation with Indigenous groups and relevant authorities, dates of breeding season for migratory birds and notify the Agency of these dates prior to construction.	Condition is acknowledged and captured in the WMMP; 3.1
	4.5	The Proponent shall develop, prior to construction, in consultation with Environment and Climate Change Canada and taking into account Environment and Climate Change Canada's Description of Residence for bank swallow (Riparia riparia) in Canada, measures to mitigate the adverse environmental effects on bank swallow (Riparia riparia) attributed to the Designated Project. The Proponent shall establish a schedule for the implementation of the measures and shall, as part of these measures: 4.5.1 maintain foraging habitat within 500 metres of bank swallow residences. If it is not technically feasible for the Proponent to maintain a distance of 500 metres, the Proponent shall provide a rationale to relevant authorities and develop and implement additional mitigation measures, in consultation with relevant authorities, to avoid effects on bank swallow. The Proponent shall submit these measures to the Agency prior to implementing them; 4.5.2 install, prior to construction, and in consultation with Environment and Climate Change Canada, artificial nesting structures in suitable habitat to compensate for the loss of nesting sites within the project development area and identified in Appendix H, Figure 3- 1, of the Environmental Impact Statement. The Proponent shall perform maintenance on the nesting structures annually and maintain their accessibility and integrity during all phases of the Designated Project and shall ensure the presence of foraging habitat within 500 metres of the artificial nesting structures. If it is not technically feasible for the Proponent to ensure the presence of foraging habitat within a distance of 500 metres, the Proponent shall provide a rationale to relevant authorities and develop and implement additional mitigation measures, in consultation with relevant authorities, to avoid effects on bank swallow. The Proponent shall submit these measures to the Agency prior to implementing them; 4.5.3 maintain the slope of topsoil, soil and sediment stockpiles located within the project development area and not used as artificial nesting structures in accordance with condition 4.5.2 at less than 70 degrees; and 4.5.4 demonstrate how any other offsetting measures implemented by the Proponent will compensate for the adverse environmental effects on bank swallow (Riparia riparia) attributed to the Designated Project in the project development area.	Table 3.1; 4.7.2.4
	4.6	The Proponent shall conduct vegetation removal, and any other activity that could potentially disturb migratory birds, within the project development area outside of the breeding season(s) for migratory birds identified in condition 4.4. If vegetation removal or the conduct of other disturbance activity outside of the breeding season(s) is not technically feasible during any given year, the Proponent shall develop and implement additional mitigation measures, in consultation with relevant authorities, to avoid harm to migratory birds and their nests or eggs. The Proponent shall submit these measures to the Agency prior to implementing them.	4.7.2.2
	4.7	The Proponent shall remove debris in the off-stream reservoir within seven days after the draining of the reservoir. If it is not technically feasible for the Proponent to remove debris within seven days after the draining of the reservoir, the Proponent shall provide a rational to Indigenous groups and relevant authorities and develop and implement additional mitigation measures, in consultation with relevant authorities, to avoid harm to migratory birds and their nests or eggs. The Proponent shall submit these measures to the Agency prior to implementing them.	Not applicable during the 2023/2024 reporting year. Following operation, condition 4.7 will be complied with.
	4.8	For any active migratory bird nests identified during construction or operation, the Proponent shall establish and implement, in consultation with relevant authorities, mitigation measures to avoid destroying, disturbing or taking the nest(s), including by implementing a disturbance setback buffer during construction and dry operation and by following the approach outlined in the Response to Information Request Round 2 Package 4 -01 to -04, IR4-03 (Canadian Impact Assessment Registry Reference Number 80123, Document Number 1311) during flood operation.	4.7.2.2
	4.9	The Proponent shall develop and implement, in consultation with Indigenous groups and relevant authorities, a protocol to prevent harm to migratory birds, including migratory birds species at risk identified in Table 3 of the environmental assessment report, within the project development area. The Proponent shall develop the protocol prior to construction and implement it prior to flood operation. The protocol shall include: 4.9.1 flood forecasting undertaken prior to inventories conducted in accordance with condition 4.10; and 4.9.2 measures to rescue migratory birds chicks and eggs.	Not applicable during the 2023/2024 reporting year; protocol captured in the WMMP.
	4.10	The Proponent shall conduct, in consultation with Indigenous groups, inventories of potential migratory bird habitat, including the collection of information on breeding bird densities and the presence of ground nesting birds, as well as mapping of important habitat features, shrub lands, wetlands and grassland within the project development area every five years starting the first year of operation, and update the migratory bird protocol referred to in condition 4.9 based on the results of the inventories.	Not applicable during the 2023/2024 reporting year; protocol captured in the WMMP

	Condition #	Summary of Condition	Annual Report Section
Migratory Birds (cont'd)	**4.11**	The Proponent shall develop, prior to construction and in consultation with Indigenous groups and relevant authorities, a follow-up program to verify the accuracy of the environmental assessment and to determine the effectiveness of all mitigation measures to avoid harm to migratory birds, including migratory birds that are listed species at risk, their eggs and nests. The follow-up program shall include the mitigation measures used to comply with conditions 4.1 to 4.10. As part of the development of the follow-up program, the Proponent shall identify performance indicators that shall be used by the Proponent to evaluate the effectiveness of mitigation measures. The Proponent shall implement the follow-up program during all phases of the Designated Project. As part of the follow-up program, the Proponent shall: 4.11.1 monitor, annually during construction, for the first three years of operation and every five years thereafter, bank swallow use of the project development area.	Condition is acknowledged and captured in the WMMP; 4.7.2.2, 4.7.2.4
Species at Risk	**5.1**	The Proponent shall conduct pre-construction surveys to determine the presence of little brown myotis (*myotis lucifugus*) roosting sites in the project development area. The Proponent shall establish, in consultation with Indigenous groups and relevant authorities, buffer zones around little brown myotis (*myotis lucifugus*) active roosts identified during the pre-construction surveys or found by the Proponent or brought to the attention of the Proponent by an Indigenous group during any phase of the project. The Proponent shall maintain the buffer zones until it is determined the roosts are no longer active.	4.7.2.1
	5.2	The Proponent shall conduct, prior to construction breeding habitat surveys for the northern leopard frog (*Lithobates pipiens*), western toad (*Anaxyrus boreas*), and western tiger salamander (*Ambystoma mavoritium*) within the project development area.	4.7.2.1
	5.3	For any construction activity within 100 metres of breeding habitat identified under condition 5.2 for the northern leopard frog (*Lithobates pipiens*), western toad (*Anaxyrus boreas*), or western tiger salamander (*Ambystoma mavoritium*) during the breeding season, the Proponent shall develop, prior to construction and in consultation with Indigenous groups and relevant authorities, measures to prevent northern leopard frog (*Lithobates pipiens*), western toad (*Anaxyrus boreas*), and western tiger salamander (*Ambystoma mavoritium*) from accessing the active construction areas. See sub-sections 5.3.1 and 5.3.2 for measures.	Not applicable during the 2023/2024 reporting year; no breeding wetlands for the three species were identified during pre-construction surveys; 4.7.2.1; 4.7.2.2
	5.4	If the results of the monitoring conducted in accordance with condition 5.3.2 identify the presence of northern leopard frog (Lithobates pipiens), western toad (Anaxyrus boreas), or western tiger salamander (Ambystoma mavoritium) in active construction areas within 100 metres of their breeding habitat, the Proponent shall implement additional species-specific mitigation measures in consultation with Indigenous groups and relevant authorities.	Not applicable during the 2023/2024 reporting year; no breeding wetlands for the three species were identified during the 2023/2024 reporting year; 4.7.2.1; 4.7.2.2
	5.5	The Proponent shall develop and implement, in consultation with Indigenous groups and relevant authorities, a protocol to prevent the mortality of amphibians, including northern leopard frog (*Lithobates pipiens*), western toad (*Anaxyrus boreas*), and western tiger salamander (*Ambystoma mavoritium*) during flood operation within the reservoir footprint. The Proponent shall develop the protocol prior to construction, taking into account the flood forecasting undertaken in accordance with condition 4.9.1. The protocol shall include measures to rescue and relocate northern leopard frog (*Lithobates pipiens*), western toad (*Anaxyrus boreas*), and western tiger salamander (*Ambystoma mavoritium*) to suitable habitat outside the reservoir footprint.	Not applicable during the 2023/2024 reporting year; protocol captured in the WMMP
	5.6	The Proponent shall implement the Designated Project in a manner that avoids adverse environmental effects of the Designated Project on wetlands and wetland functions. To avoid adverse effects, the Proponent shall maintain wetlands and their functions over minimizing adverse effects on wetlands and their functions. When the loss of wetlands and their functions cannot be avoided, the Proponent shall mitigate the adverse effects on wetlands and their functions instead of compensating for affected wetlands and their functions.	Not applicable during the 2023/2024 reporting year. The loss of wetlands or their function were not observed during the 2023/2024 reporting year; 4.7.1.3
	5.7	In the case of the adverse environmental effects of the Designated Project on wetlands and their functions located in the project development area that cannot be avoided or mitigated pursuant to condition 5.6, the Proponent shall develop, in consultation with Indigenous groups, Environment and Climate Change Canada and other relevant authorities, and taking into account the Alberta Wetland Policy, a wetland replacement plan to compensate for the loss of wetlands and their functions.	Not applicable during the 2023/2024 reporting year. The loss of wetlands or their function were not observed during the 2023/2024 reporting year; 4.7.1.3
	5.8	The Proponent shall direct during construction any drainage pathway, constructed or modified as part of the Designated Project, away from wetlands and shall identify prior to construction wetlands where drainage pathway should not be directed during operation. The Proponent shall provide a map of the wetlands to be avoided to the Agency prior to construction.	4.3.1; 4.7.1.3
	5.9	The Proponent shall submit to the Agency, prior to construction, a map of all wetlands that will be permanently removed for the construction of the Designated Project and shall not grub vegetation when undertaking construction work in wetlands except for those wetlands that will be permanently removed.	4.7.1.3

	Condition #	Summary of Condition	Annual Report Section
Species at Risk (cont'd)	**5.10**	The Proponent shall maintain a distance of 100 metres from any water body and wetland when undertaking vehicle, machinery, and equipment cleaning, fueling, and maintenance, when storing substances with the potential to cause harmful effects to the receiving environment, including fuel and lubricant storage tanks, and when undertaking maintenance activities in the off-stream reservoir. If it is not technically feasible for the Proponent to maintain a distance of 100 metres, the Proponent shall provide a rationale to relevant authorities and develop and implement additional mitigation measures, in consultation with relevant authorities, to avoid effects on species at risk. Additional mitigation measures shall include the use of secondary containment. The Proponent shall submit these measures to the Agency prior to implementing them.	4.1.1.2, 4.1.1.3, 4.7.1.3
Atmospheric Environment	**6.1**	See specific condition regarding vehicles and emission standards	4.9.1
	6.2	The Proponent shall develop, prior to construction, and implement, during construction, a no-idling policy for all vehicles within the project development area. The Proponent shall require that all persons abide by this policy, unless not technically feasible or not feasible for health or safety reasons. The Proponent shall submit the policy to the Agency prior to construction.	4.9.1
	6.3	The Proponent shall develop, prior to construction and in consultation with relevant authorities, and implement during all phases of the Designated Project, measures to maintain baseline air quality and prevent exceedance of the Canadian Council of Ministers of the Environment' Canadian Ambient Air Quality Standards.	4.9.1
	6.4	The Proponent shall develop, prior to construction, and implement during all phases of the Designated Project, a follow-up program to verify the accuracy of the environmental assessment and determine the effectiveness of mitigation measures as it pertains to adverse changes to air quality attributed to the Designated Project. See 6.4.1 to 6.4.6 for conditions to include in the program.	4.9.1
	6.5	The Proponent shall provide Indigenous groups with the results of the follow-up program referred to in condition 6.4 in plain language at a minimum twice annually, at a time determined in consultation with Indigenous groups.	4.9.1
Human Health	**7.1**	The Proponent shall not exceed the noise limits set out in the United States Environmental Protection Agency Office of Noise Abatement and Control document titled Information on levels of environmental noise requisite to protect public health and welfare with an adequate margin of safety for short-term noise exposure during construction.	4.9.2
	7.2	For any blasting activities required for the Designated Project, the Proponent shall take into account Environment and Climate Change Canada's Environment Code of Practice for Metal Mines for the control of noise and vibration from blasting and thresholds and mitigation measures for blasting noise identified in Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise.	4.9.2
	7.3	The Proponent shall develop, prior to construction and in consultation with Indigenous groups, a protocol for receiving complaints related to exposure to noise attributable to the Designated Project. The Proponent shall provide the protocol to the Agency prior to construction and shall implement it during construction. As part of the implementation of the protocol, the Proponent shall respond to any noise complaint attributed to any component of the Designated Project within 48 hours of the complaint being received and shall implement any corrective action, if required to reduce exposure to noise, in a timely manner.	This condition was complied with, and the protocol provided to the Agency prior to construction.
	7.4	The Proponent shall develop a communication plan in consultation with Indigenous groups. The Proponent shall develop the communication plan prior to construction and shall implement and keep it up to date during all phases of the Designated Project. See 7.4.1 - 7.4.3 for conditions to include in the plan.	This condition was complied with, and the plan provided to the Agency prior to construction.
	7.5	The Proponent shall implement, during all phases of the Project, measures to mitigate fugitive dust emissions attributable to the Designated Project. As part of the measures, the Proponent shall: 7.5.1 establish speed limits on Designated Project roads during all phases of the Designated Project and require that all persons abide by these speed limits; and 7.5.2 apply dust suppressant on the Designated Project permanent access roads and parking areas during all phases of the Designated Project. The Proponent shall select, in consultation with relevant authorities, dust suppressants with the least potential effects on human health and the environment.	4.9.1
	7.6	The Proponent shall decommission and plug off water wells located within the project development area that are not used to monitor groundwater quality pursuant to condition 7.9.1, prior to the start of operation.	This condition was complied with, and an update was provided in the 2021/2022 annual report
	7.7	The Proponent shall monitor, at a minimum twice prior to construction and weekly during flood operation, total mercury and methylmercury levels in the Elbow River upstream of the diversion system, in the off-stream reservoir, and in the low-level outlet downstream of the off-stream reservoir outlet gate, unless not feasible for safety reasons.	4.8.1
	7.8	The Proponent shall develop, in consultation with Indigenous groups and relevant authorities, a follow-up program to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures as it pertains to contamination of country food. See 7.8.1 to 7.8.4 for conditions to be included in the program.	4.8.1

	Condition #	Summary of Condition	Annual Report Section
Human Health (cont'd)	**7.9**	The Proponent shall develop prior to operation, and implement, in consultation with Indigenous groups and relevant authorities, a follow-up program to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures as it pertains to drinking water quality. See 7.9.1 to 7.9.3 for conditions that need to be included in the plan.	4.8.2; Appendix B.2
	7.10	The Proponent shall develop, prior to construction and in consultation with Indigenous groups and relevant authorities, a follow-up program to verify the accuracy of the environmental assessment and to determine the effectiveness of all measures to mitigate fugitive dust emissions attributable to the Designated Project.	4.9.1
	7.11	The Proponent shall provide Indigenous groups with the results of the follow-up program referred to in condition 7.10 in plain language at a minimum twice annually, at a time determined in consultation with Indigenous groups.	4.9.1
Current use of lands and resources for traditional purposes	**8.1**	The Proponent shall undertake, in consultation with Indigenous groups and relevant authorities, progressive reclamation of areas disturbed by the Designated Project, including bank and riparian areas. In doing so, the Proponent shall: 8.1.1 identify agronomic plant species and plant species native to the regional assessment area to use for revegetation, including plant species suitable as habitat for migratory birds and native seed mix suitable for wetlands; 8.1.2 revegetate the portions of the diversion channel excavated through soil and the earthen dam embankment free of rip rap; 8.1.3 reclaim non-native plant areas to equivalent baseline land functions after construction and during post flood operation; and 8.1.4 reclaim the surface drainage patterns of the area after construction.	3.1, 4.7.1.2; The seed mixes are identified in the Vegetation and Wetland Mitigation, Monitoring and Revegetation Plan. The Plan was sent to Indigenous groups prior to the start of construction for their review and feedback.
	8.2	The Proponent shall manage noxious weeds and invasive alien species as necessary to promote successful revegetation that includes traditional plant establishment and growth. In doing so, the Proponent shall not use herbicide within 30 metres of wetlands and waterbodies in the project development area.	4.7.1.2
	8.3	The Proponent shall conduct pre-construction surveys to determine the presence of grizzly bear (Ursus arctos) western population active dens in the project development area. The Proponent shall establish, in consultation with Indigenous groups and relevant authorities, no-work buffer zones around grizzly bear western population active dens identified during the pre- construction surveys or found by the Proponent or brought to the attention of the Proponent by an Indigenous group during any phase of the Designated Project. The Proponent shall maintain the buffer zones from their establishment and until the active den is no longer occupied.	4.7.2.1; This condition was complied with, and reported in the 2021/2022 annual report
	8.4	The Proponent shall follow the timing restrictions on industrial activities identified in the Alberta's Recommended Land Use Guidelines: Key Wildlife and Biodiversity Zones when undertaking construction and maintenance activities in the Key Wildlife and Biodiversity Zone identified along the Elbow River. 8.4.1 If it is not economically or technically feasible for the Proponent to follow the timing restrictions on industrial activities identified in the Alberta's *Recommended Land Use Guidelines: Key Wildlife and Biodiversity Zones*, develop and implement additional mitigation measures, in consultation with Environment and Climate change Canada and other relevant authorities. The Proponent shall submit these measures to the Agency prior to implementing them.	Appendix B.1
	8.5	The Proponent shall install and maintain, during construction and operation, one underpass under Highway 22 where it crosses the diversion channel and wildlife friendly fences to provide passage for grizzly bear western population (*Ursus arctos*) and ungulates. The Proponent shall install the wildlife friendly fences as identified in Figure IR 15-1 submitted in the Response to Information Requests Round 1 Package 2 (Canadian Impact Assessment Registry Reference Number 80123, Document Number 1260), taking into account Alberta Conservation Association *Landholder's Guide to Wildlife Friendly Fencing*, to prevent access by livestock and allow safe passage for wildlife. The Proponent shall maintain the fences during all phases of the Designated Project.	4.7.2.2; This condition is acknowledged. Some Wildlife friendly fencing was installed and reported on in the 2022/2023 Annual Report.
	8.6	The Proponent shall maintain navigation on the Elbow River during all phases of the Designated Project. The Proponent shall establish and maintain a portage route around the diversion system gate and the service spillway locations to maintain navigation on the Elbow River during construction of these project components and install safety signage to signal the presence of the diversion system gate and location of the portage route until such time that the portage route is no longer required to maintain navigation on the Elbow River.	This condition is acknowledged. The creation of a temporary portage route on the Elbow River (for the duration of construction), including the installation of signage was established during the 2022/2023 Annual Reporting Year and remains in place.
	8.7	The Proponent shall provide the Agency and Indigenous groups with the final project design within seven days of its finalization and shall consult with Indigenous groups at least 60 days in advance of construction activities to understand locations and timing needed to allow Indigenous groups to catalogue, harvest and transplant traditional and medicinal plants present within the project development area, in a culturally appropriate way.	This condition was completed and reported on in the 2021/2022 annual report

	Condition #	Summary of Condition	Annual Report Section
Current use of lands and resources for traditional purposes (cont'd)	**8.8**	The Proponent shall start developing, prior to construction and complete at the latest 1 year prior to start of operation, in consultation with Indigenous groups, a Land Use Plan to support Indigenous groups' use of the project development area, and implement the plan during all phases of the Designated Project. The Proponent shall submit the final plan to the First Nation Land Use Advisory Committee referred to in condition 8.11, First Nations and the Agency within seven days of its finalization. See sub-section 8.8.1 to 8.8.4 for conditions to be captured in the plan.	4.11
	8.9	The Proponent shall establish, in consultation with First Nations, a staging area for traditional use activities in close proximity to the land use areas identified in condition 8.8. The Proponent shall allow and provide sufficient space within the staging area for the construction of semi-permanent structures. The Proponent shall provide maps to the Agency and First Nations of the staging area prior to construction.	This condition was completed, and the maps were sent directly to First Nations and IAAC prior to the start of construction.
	8.10	The Proponent shall provide unimpeded access for First Nations to the staging area identified in condition 8.9, except during the flood operation, when access to the staging area may be prohibited for safety reasons and if not possible for maintenance purposes. The Proponent shall communicate to First Nations the closure of the staging area when required for safety reasons and during flood season	This condition is acknowledged; First Nations will have unimpeded access to the staging area unless access to the staging area is impeded by flood operations.
	8.11	The Proponent shall establish, prior to construction and in consultation with First Nations, and maintain, throughout construction and operation, a First Nation Land Use Advisory Committee (the committee) to support the development and implementation of the plan identified in condition 8.8. When establishing the committee, the Proponent shall consult with each First Nation with respect to whether they wish to participate as members of the committee and shall prioritize the selection of representatives from First Nations who wish to participate as members in the committee. As part of the establishment of the committee, the Proponent shall co-develop Terms of Reference for the committee with First Nations and update the Terms of Reference every 10 years. The Proponent shall provide the completed Terms of Reference to the Agency prior to construction and any update within 30 days of the Terms of Reference being updated. See sub-sections 8.11.1 - 8.1.11-7 for Terms of Reference conditions.	4.11
	8.12	The Proponent shall include any Indigenous groups for which Aboriginal or Treaty Rights under section 35 of *The Constitution Act, 1982* are recognized by the Government of Alberta after the issuance of this Decision Statement in the Land Use Plan, the staging area and the First Nations Land Use Advisory Committee referred to in conditions 8.9, 8.10 and 8.11.	4.11
	8.13	The Proponent shall develop, prior to operation, and in consultation with Indigenous groups, a follow-up program to verify the accuracy of the environmental assessment as it pertains to natural re-vegetation of the drained reservoir during post-flood operation. See sub-sections 8.13.1 and 8.13.2 for items to include in the follow up program.	The follow-up program is contained in the Vegetation and Wetland Mitigation, Monitoring and Revegetation Plan and was provided to the Agency prior to construction.
	8.14	The Proponent shall develop, prior to construction and in consultation with Indigenous groups, a follow-up program to verify the accuracy of the environmental assessment and to determine the effectiveness of mitigation measures as it pertains to the adverse environmental effects of the Designated Project on the current use of lands and resources for traditional purposes. See sub-sections 8.14.1 - 8.14.5 for monitoring conditions.	4.11
Physical and cultural heritage and structures, sites or things of historical, archaeological, paleontological or architectural significance	**9.1**	The Proponent shall retain, prior to construction, the services of Indigenous monitors to observe, record, and report to the Proponent and Indigenous groups on the implementation, throughout construction, of requirements set out in this Decision Statement including the archeological and heritage management plan referred to in condition 9.3. Prior to retaining the services of Indigenous monitors, the Proponent shall consult with each Indigenous group with respect to whether they wish to participate as Indigenous monitor. When retaining the services of Indigenous monitors from each Indigenous group who wishes to participate, the Proponent shall determine, in consultation with these Indigenous groups, the scope, purpose and objectives of the participation of each Indigenous monitor and shall provide that information to the Agency	4.5.1
	9.2	The Proponent shall develop and implement, prior to construction and in consultation with Indigenous groups and Alberta Ministry of Culture, Multiculturalism and Status of Women, a historic resource impact assessment of the project development area. The Proponent shall apply the archaeological and heritage management plan pursuant to condition 9.3 to structures, sites, or things of historical, archaeological, paleontological, or architectural significance or physical or cultural heritage resources identified as part of the historic resource impact assessment.	4.10
	9.3	The Proponent shall develop, prior to construction and in consultation with Indigenous groups, Alberta Ministry of Culture, Multiculturalism and Status of Women, and implement, during construction and operation, an archaeological and heritage management plan for any structures, sites, or things of historical, archaeological, paleontological, or architectural significance or physical or cultural heritage resources within the project development area, including, but not limited to sites and things subject to the *Alberta Historical Act*. See sub-sections 9.3.1 - 9.3.4 for conditions to include in the plan.	4.10.1

	Condition #	Summary of Condition	Annual Report Section
Physical and cultural heritage and structures, sites or things of historical, archaeological, paleontological or architectural significance (cont'd)	**9.4**	The Proponent shall develop, prior to construction and in consultation with Indigenous groups, cultural awareness training for all employees associated with the Designated Project. The Proponent shall implement the training prior to the start of construction and during all phases of the Designated Project.	4.10.2
	9.5	The Proponent shall, prior to construction and in consultation with Indigenous groups, provide access to Indigenous groups to the project development area for the purpose of conducting ceremonies, to the extent that such access is safe.	This condition is acknowledged; access was and will be granted when access to the Project Development Area is safe.
	9.6	The Proponent shall provide the Agency and Indigenous groups with a map of the final construction site within seven days of its finalization	This condition was complied with, and a map of construction was provided to Agency and Indigenous groups prior to construction.
	9.7	The Proponent shall have a qualified individual conduct paleontological monitoring during construction when: 9.7.1 excavating bedrock for the diversion system; 9.7.2 excavating 4 metres of bedrock or greater, including for the emergency spillway; 9.7.3 excavating bedrock for new road alignments including on Highway 22; and 9.7.4 pipeline operators are using open cut methods for relocation of pipelines and utilities under the diversion channel.	4.10.3
	9.8	The Proponent shall strip and stockpile topsoil during construction and shall prevent mixing of topsoil with other soil horizons. The Proponent shall replace the topsoil during progressive reclamation pursuant to condition 8.1.	4.1.1.1; 4.7.1.2
	9.9	The Proponent shall develop, prior to construction and in consultation with Indigenous groups and Alberta Ministry of Culture, Multiculturalism and Status of Women, a follow-up program to verify the accuracy of the environmental assessment and to determine the effectiveness of all mitigation measures for effects to any structures, sites, or things of historical, archaeological, paleontological, or architectural significance or physical or cultural heritage resources. The Proponent shall implement the follow-up program during all phases of the Designated Project and submit the results of the follow-up program to Alberta Ministry of Culture, Multiculturalism and Status of Women.	4.10
Independent Environmental Monitor	**10.1**	The Proponent shall retain, prior to construction, the services of a third-party independent environmental monitor, who is a qualified individual as it pertains to environmental monitoring in Alberta, to independently observe and record on the implementation of the conditions set out in this Decision Statement during construction and to report findings to the Proponent and the Agency.	4.5.2
	10.2	The Proponent shall require the independent environmental monitor to report to the Proponent, in writing, about the implementation of any condition set out in this Decision Statement during construction. The Proponent shall also require the independent environmental monitor to recommend to the Proponent, in writing, which action(s) in their view should be taken by the Proponent with respect to the implementation of conditions set out in this Decision Statement during construction	4.5.2
	10.3	The Proponent shall require the independent environmental monitor to provide to the Agency, at a frequency to be determined in consultation with the Agency, the information reported to the Proponent pursuant to condition 10.2 at the same time that the Proponent receives that information.	4.5.2
	10.4	The Proponent shall require the independent environmental monitor to retain the information reported to the Proponent pursuant to condition 10.2 for five years following submission to the Agency pursuant to condition 10.3.	The independent environmental monitor's reports referenced in condition 10.2 are and will be maintained for five years following submission to the Agency.
Accidents and Malfunctions	**11.1**	The Proponent shall take all reasonable measures to prevent accidents and malfunctions that may result in adverse environmental effects and to mitigate any adverse environmental effect from accidents and malfunctions that do occur. See sub-sections 11.1.1 to 11.1.5 for measures.	4.4
	11.2	The Proponent shall consult, prior to construction, Indigenous groups on the measures to be implemented to prevent accidents and malfunctions.	4.4
	11.3	The Proponent shall develop an accident and malfunction response plan in relation to, and for the construction of the Designated Project and an accident and malfunction response plan in relation to, and for the operation of the Designated Project. The Proponent shall develop the accident and malfunction response plan in relation to, and for construction of the Designated Project prior to construction and the accident and malfunction response plan in relation to, and for the operation of the Designated Project prior to the first flood operation. See 11.3.1 to 11.3.6 for conditions that need to captured in the plan.	4.4
	11.4	The Proponent shall maintain the accident and malfunction response plan referred to in condition 11.3 up-to-date during all phases of the Designated Project. The Proponent shall submit any updated accident and malfunction response plan to the Agency and to the parties being consulted during the development of the plan within 30 days of the plan being updated	4.4

	Condition #	Summary of Condition	Annual Report Section
Accidents and Malfunctions (cont'd)	**11.5**	In the event of an accident or malfunction with the potential to cause adverse environmental effects, the Proponent shall immediately implement the measures appropriate to the accident or malfunction referred to in condition 11.3.2. See sub-sections 11.5.1 - 11.5.4 for measures.	4.4
	11.6	The Proponent shall develop, in consultation with Indigenous groups and potentially affected parties, a communication plan for accidents and malfunctions occurring in relation to the Designated Project, including accidents and malfunctions occurring within the project development area which may affect area(s) outside of the project development area. The Proponent shall develop the communication plan prior to construction and shall implement and keep it up-to-date during all phases of the Designated Project. See sub-section 11.6.1 to 11.6.3 for plan specifics.	This condition was completed, and the communication plan was sent directly to First Nations and IAAC prior to the start of construction.
Schedules	**12.1**	The Proponent shall submit to the Agency a schedule for all conditions set out in this Decision Statement no later than 60 days prior to the start of construction. This schedule shall detail all activities planned to fulfill each condition set out in this Decision Statement and the commencement and estimated completion month(s) and year(s) for each of these activities.	4.6
	12.2	The Proponent shall submit to the Agency a schedule outlining all activities required to carry out all phases of the Designated Project no later than 60 days prior to the start of construction. The schedule shall indicate the commencement and estimated completion month(s) and year(s) and duration of each of these activities.	4.6
	12.3	The Proponent shall submit to the Agency in writing an update to schedules referred to in conditions 12.1 and 12.2 every year no later than October 31.	As per condition 12.3, an update to the schedules referred to in conditions 12.1 and 12.2 will be provided to the Agency every year no later than October 31.
	12.4	The Proponent shall provide Indigenous groups with the schedules referred to in conditions 12.1 and 12.2, and any update to the initial schedule made pursuant to condition 12.3 at the same time the Proponent provides these documents to the Agency.	As per condition 12.4, the schedules identified in conditions 12.1 and 12.2 will also be provided to the Indigenous groups at the same time they are sent provided to the Agency.
Records	**13.1**	The Proponent shall maintain all records relevant to the implementation of the conditions set out in this Decision Statement. The Proponent shall provide the aforementioned records to the Agency upon demand within a timeframe specified by the Agency.	This condition is acknowledged. All records relevant to condition 13.1 will be provided to the Agency upon request.
	13.2	The Proponent shall retain all records referred to in condition 13.1 at a facility in Canada and shall provide the address of the facility to the Agency. The Proponent shall notify the Agency at least 30 days prior to any change to the physical location of the facility where the records are retained, and shall provide to the Agency the address of the new location.	This condition is acknowledged. All records referred to in condition 13.1 will be retained as per condition 13.2.

APPENDIX B
TECHNICAL MEMOS

B.1
Summary of 2022/2023 Remote Camera Monitoring Program

Springbank Off-Stream Reservoir Project
Remote Camera Monitoring Program - 2023/2024

October 2024

Prepared for:
Alberta Transportation and Economic Corridors

Prepared by:
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Appendix A Photos

Acronyms / Abbreviations

BA	before-after
EIA	environmental impact assessment
Hwy	Highway
IAAC	Impact Assessment Agency of Canada
LAA	local assessment area
PDA	Project development area
The Project	Springbank Off-Stream Reservoir Project
WMMP	Wildlife Mitigation and Monitoring Plan

1 Remote Camera Monitoring Program

1.1 Objectives

As stated in the Wildlife Mitigation and Monitoring Plan (WMMP) for the Springbank Off-Stream Reservoir Project (the Project), the objectives of the remote camera monitoring program are to evaluate potential Project effects on wildlife habitat use and movement as well as to evaluate the effectiveness of mitigation measures. Overall, the remote camera monitoring program is designed to monitor large and medium-sized mammals including species of cultural importance (e.g., deer [*Odocoileus* spp.], elk [*Cervus canadensis*], grizzly bear [*Ursus arctos*], coyote [*Canis latrans*], red fox [*Vulpes vulpes*]).

The remote camera monitoring program has been designed to answer two key questions:

1. Is there a measurable change in the relative abundance (photographic rate) of large and medium-sized mammals in the Local Assessment Area (LAA) during construction and dry operations compared to baseline/pre-construction?
2. What is the wildlife crossing success or crossing rate for permanent Project structures including the Highway (Hwy) 22 underpass, Hwy 22 culvert, diversion channel, floodplain berm, wildlife-friendly fencing, off-stream dam, and low-level outlet? (i.e., do mitigation measures facilitate wildlife movement in the LAA?)

The results presented in this annual report were collected during the 2023-2024 construction period and include data collected during all four seasons: spring 2023 (April 1 to May 31); summer 2023 (June 1 to August 31); fall 2023 (September 1 to November 30); and winter 2023/2024 (December 1 to March 31). The remainder of the 2024 data (spring, summer, fall) will be presented in the Year 4 Annual Report scheduled to be submitted in late 2025.

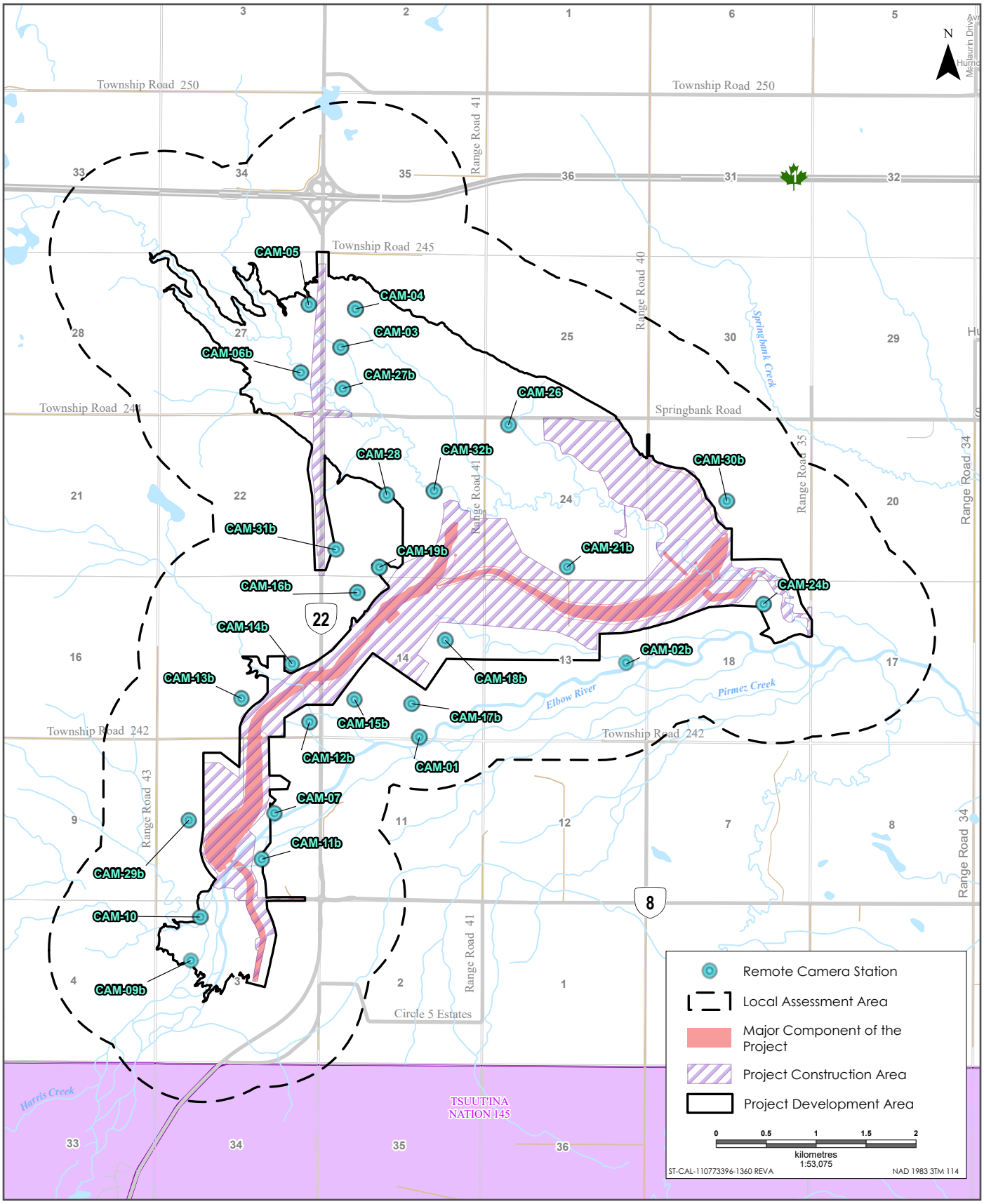
Mitigation measures proposed to reduce potential Project effects on wildlife movement due to Project permanent structures including the installation of wildlife-friendly fencing (key question 2) have yet to be implemented and analyses addressing key question 2 are not included in this annual report.

2 Methods

2.1 Site Selection

The remote cameras (Reconyx Hyperfire 2™) deployed during the 2021 pre-construction monitoring period were placed within the Project Construction Area (i.e., permanent Project structure footprint and temporary workspaces) and subsequently moved outside of the Project Construction Area during 2022 to avoid potential damage and excessive numbers of human/equipment detections during construction activities. Cameras were redeployed in similar habitat types outside the Project Construction Area where land access permitted. The locations and habitat types of 31 remote cameras initially deployed during the pre-construction period are described in Impact Assessment Agency of Canada (IAAC) 2021/2022 Annual Report (Year 1). Of the 31 remote cameras deployed during the 2021 pre-construction period, four remote cameras were not deployed during construction for various reasons including one due to elk damage, one due to suspected elk damage and/or vandalism and two remote cameras (CAM-20 and CAM-25) were not relocated outside the Project Construction Area because other suitable (i.e., similar habitat type) locations were not available. As such, 27 remote camera stations were deployed to collect wildlife monitoring data during the 2022 construction period. The locations of 27 remote camera monitoring stations remained the same as those reported in the IAAC 2022/2023 Annual Report (Year 2, Figure 1).

Cameras were deployed to maximize the probability of animal detection (habitat use, movement) in the Project Development Area (PDA) and LAA by installing them on wildlife and/or human trails, where possible. The cameras were installed on trees or fence posts in steel security enclosures, using swivels, lag bolts and cable locks, and were approximately 1.0 -1.5 m above ground with an unobstructed view of targeted field of view (e.g., wildlife trail). Remote cameras were set to high sensitivity to take five pictures per trigger with no delay between triggers. The location of each camera was recorded as well as surrounding vegetation, aspect, height, and presence of wildlife sign, including trails, tracks, and scat. Maintenance visits to clear vegetation around cameras, collect data and assess functionality (e.g., battery, memory cards, locks, trigger function) were completed approximately every three to four months.



Sources: Base Data - Government of Canada. Thematic Data - Government of Alberta

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.
9/9/2024

Stantec

ALBERTA TRANSPORTATION SPRINGBANK OFF-STREAM RESERVOIR PROJECT

Remote Camera Monitoring Stations 2023-2024 Construction

Figure 1

2.2 Data Analysis

All images collected during the 2023/2024 construction period were reviewed and classified to identify wildlife species using MapView™ Professional software or Timelapse version 2.3.0.9 (Greenberg 2021). Each image was manually classified by experienced observers to determine wildlife species as well as age (e.g., adult, juvenile, calf/fawn) and sex class when possible. False triggers (images without an animal present) (e.g., wind moving a tree branch) and construction equipment and/or vehicles were not included the data analyses.

Wildlife observations were compiled into independent detection events, which were defined as any image or series of images of each species (individual animal or group of animals) occurring greater than two minutes after the last image of the same species (ABMI 2024). Other domestic livestock (i.e., cows, horses) as well as humans (e.g., hiker, hunter, dog walkers, construction personnel) were recorded as events but not analyzed further.

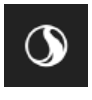
Some of the remote cameras malfunctioned due to battery failure or animals knocking the camera over and displacing the camera orientation, which reduced the number of operational days at certain monitoring stations. However, within each seasonal period, images were retained for analysis if there was a minimum of 30 monitoring days at a monitoring station, based on Kays et al. (2020) who reported detection rates stabilized between three to five weeks for most species and around 30 days for common wildlife species. Otherwise, the data were omitted for camera monitoring stations with less than 30 days of images during a seasonal period.

Naïve occupancy, defined as the proportion of sites with at least one species detection (Mackenzie et al. 2002, 2006) was calculated. In addition, a relative abundance index (i.e., photographic rate) was calculated by summing the count for each species over all independent events and dividing by the number of days the camera was operational and calculated as the number of detections per 100 camera-days (Palmer et al. 2018, Burton et al. 2021). Photographic rates (detections/100 camera-days) were calculated for all focal wildlife species detected within each season to account for potential seasonal differences in detection rates (Kays et al. 2020). Specifically, this annual report includes an analysis of photographic rates for all four seasons including spring (April 1 to May 31), summer, (June 1 to August 31), fall (September 1 to November 30) and winter (December 1 to March 31).

A comparison of photographic rates between pre-construction and two annual construction periods was limited to fall and winter because there were no spring and summer pre-construction remote camera data collected during 2021 for comparison. The non-parametric Friedman test was used to determine if there were significant differences ($P < 0.05$) between relative abundance estimates (photographic rates) calculated for three time periods including 2021 pre-construction, 2022-2023 construction and 2023-2024 construction. Kendall's W was used as a measure of effect size based on Cohens guidelines: <0.1 (trivial effect), 0.1 - < 0.3 (small effect), 0.3 - < 0.5 (moderate effect) and ≥ 0.5 (large effect). The Friedman test was used because the remote cameras were considered repeated measures and dependent samples. The construction phases (time periods) were considered the treatment groups (Year-Phase). The Friedman test requires a balanced design; and therefore, only those remote cameras that were operational across all three time periods were used in the analysis, which resulted in a reduced sample

size of n=18 (fall) and n=24 (winter). The Friedman test was used to determine significant differences in photographic rates for the three most abundant focal species including elk, white-tailed deer and coyote. If the Friedman test indicated a significant difference among the 3 time periods, Wilcoxon pair-wise comparisons were used to determine which groups (Year-Phase) differed ($P<0.05$). Statistical tests were completed using R version 4.1.3 (R Core Team 2022).

Only medium to large terrestrial mammals were included in the analysis of photographic rates. All other wildlife observations detected by remote cameras were recorded as incidentals (e.g., birds, raptors, skunk) and not included in the analysis of photographic rates. Mean elk group size was estimated for each season using the total number of elk observed at each camera station divided by the number of independent events.



3 Results

3.1 Survey Effort

Twenty-seven remote cameras were monitored in the LAA during the 2023-2024 construction period (April 1, 2023 to March 31, 2024). Construction activities that had potential to result in sensory disturbance (e.g., noise, artificial light) and wildlife displacement occurred throughout the Project Construction Area during 2023-2024 monitoring period. Specifically, earthworks (e.g., topsoil stripping and excavation) were completed at major Project components (e.g., diversion inlet structure along Elbow River, diversional channel and dam) as well as borrow pits during late summer/fall (September 2023) and spring (May 2024). Civil works were focused on Hwy 22 bridge and Township Road 242 bridge and structural construction activities continued at the diversion structure (rip-rap installation), low-level outlet, grade control structure, auxiliary spillway and emergency spillway, which occurred throughout the year including winter. Section 4.1 of the IAAC 2023/2024 Annual Report provides a detailed description of construction activities.

As stated previously, some of the remote cameras malfunctioned (e.g., battery failure, knocked off orientation) during the 2023-2024 construction period, which resulted in reduced seasonal survey effort at specific monitoring stations (Table 1). Overall, 24 of 27 (88.9.2%) cameras were operational during the entire 61-day spring monitoring period, with the remaining cameras were operational for 36, 59 and 47 days. Because these cameras were operational for more than 30 days they were retained for analysis. During summer, three cameras located along Elbow River were omitted from the analysis because they were knocked off orientation (i.e., compromised field of view) by black bears (CAM-07, CAM-09b, CAM 10), which resulted in 24 of 27 remote cameras (88.9%) operational during the 92-day monitoring period. During fall, 24 of 27 cameras (88.9%) were operational for the 91-day monitoring period with three remaining cameras operational for 72, 59 and 37 days. During winter, 22 of 27 cameras (81.5%) were operational during the 122-day monitoring period. The remaining five cameras collected data for 104, 98, 65, 42 and 38 days, which were retained for analysis (Table 1).

Remote cameras detected 9,220 independent events over 9,197 camera-days across all four seasons during the 2023-2024 construction period (April 1, 2023 to March 31, 2024) (Table 1). Of those, 83.1% of total detections were comprised of three species, including white-tailed deer (*Odocoileus virginiana*) (38.6%), elk (29.3%), and coyote (15.2%). Other focal wildlife species detected included mule deer (*Odocoileus hemionus*) (4.4%), unidentified deer (*Odocoileus* spp.) (1%), red fox (1.1%), moose (*Alces alces*) (1.1%) as well as black bear (*Ursus americanus*), cougar (*Puma concolor*) and wolf each comprising less than 1% of independent events. The remainder of independent events included other wildlife (e.g., birds, small mammals (e.g., white-tailed jackrabbit [*Lepus townsendii*], red squirrel [*Tamiasciurus hudsonicus*]) (4.3%), humans including vehicles and construction equipment (2.2%), cows (0.8%), and horses (0.4%) as well as unknown (unidentified) animals (0.6%).

Table 1 Summary of Seasonal Sampling Effort and Number of Independent Events Detected during 2023-2024 Construction

Season	Number of Cameras Operational[1]	Total Camera-Days[2]	Number of Independent Events[3]
Spring (April 1 to May 31)	27 (24)	1,606	2,005
Summer (June 1 to August 31)	24	2,208	3,726
Fall (September 1 to November 30)	27 (24)	2,352	1,994
Winter (December 1 to March 31)	27 (22)	3,031	1,495
Total		**9,197**	**9,220**

Notes:

1 Number of remote cameras operational for a minimum of 30 days in each season. Number in brackets represents the number of camera operational for the entire season (i.e., with no malfunctions).

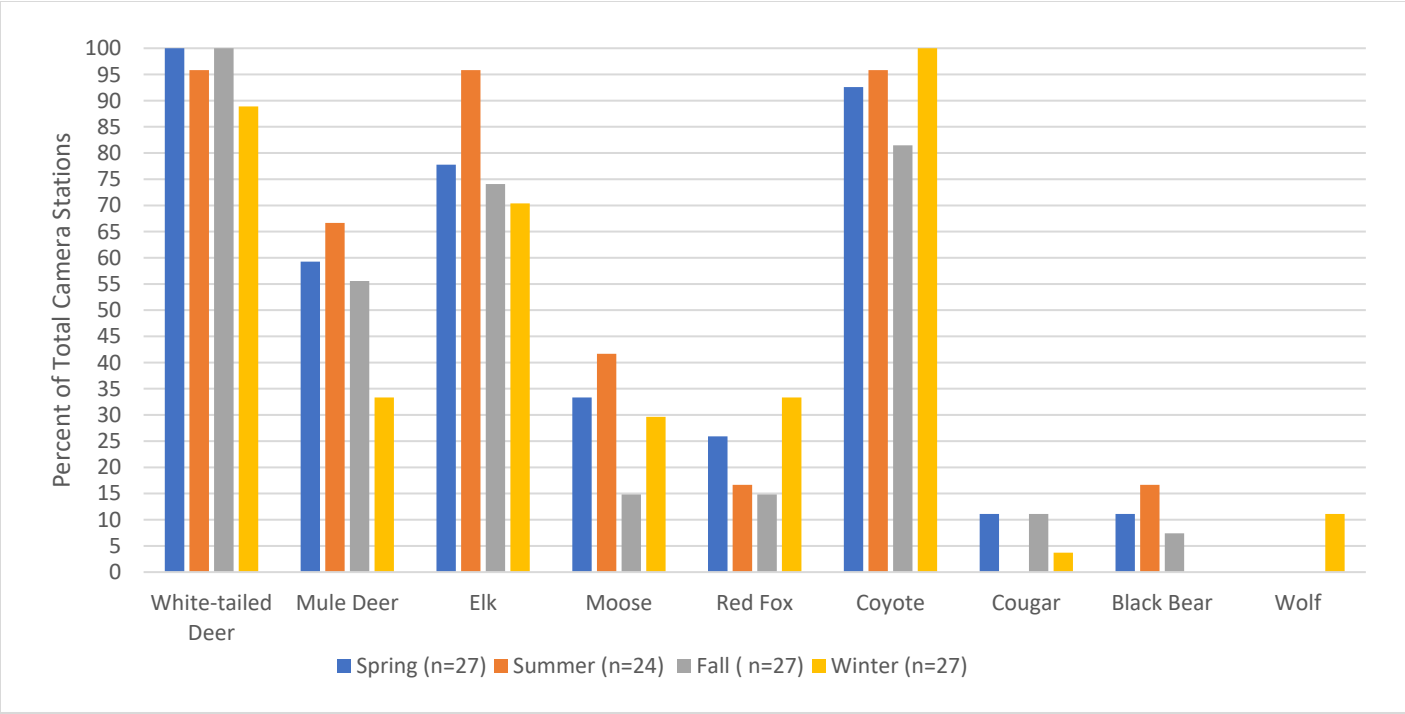
2 Total number of days cameras were active and operational (i.e. summed across cameras).

3 Total number of independent events (detections) defined as any image or series of images of each species (individual animal or group of animals) occurring greater than two minutes after the last image of the same species.

3.2 Naïve Occupancy

White-tailed deer were detected at all remote camera stations deployed during spring and fall, 23 of 24 (95.8%) in summer and 24 of 27 (89%) cameras during winter (Figure 2). Elk were detected at 78% of the camera stations during spring reaching a peak during summer (96%) and detected at relatively fewer camera stations during fall (74%) and winter (70%) (Figure 2). Similarly, mule deer, moose and black bear naïve occupancy was highest during summer compared to other seasons. The naïve occupancy estimate for coyote was relatively high throughout the year including spring (93%), summer (96%) and fall (82%) and highest during winter when coyote was detected at all (100%) remote camera stations (Figure 2). Cougar was detected during all seasons except summer; however, they were detected at relatively fewer remote camera stations compared to other species (Figure 2). Wolf (*Canis lupus*) was detected at three remote camera stations during winter (CAM-09b, CAM-10b and CAM-04). One individual was detected at CAM-09b and CAM-10 and two individuals at CAM-04. These are the first wolf occurrences detected during the SR1 remote camera monitoring program (2021-2024). Wolf was also not observed during the baseline remote camera monitoring program completed in 2016 to support the Environmental Impact Assessment (EIA; Stantec 2018).

Figure 2 **Naïve Occupancy Estimates for Focal Wildlife Species Detected during the Remote Camera Monitoring Program: 2023-2024 Construction Period**



Note:

n = number of remote cameras operational during each season.

3.3 Relative Abundance and Distribution

3.3.1 Summary of Seasonal Photographic Rates

Nine focal wildlife species were detected during the 2023-2024 construction period including the first detection of wolf during winter (Table 2). Grizzly bear was not detected at remote camera stations; however, black bear was detected during summer and fall in upland areas and along Elbow River. Overall, elk had the highest relative abundance index across all seasons followed by white-tailed deer and coyote (Table 2).

Although elk were detected at similar photographic rates during spring and summer, elk were detected less frequently during fall and winter (Table 2). Similarly, white-tailed deer photographic rates were also relatively higher during spring and summer compared to fall and winter. Coyote was detected more frequently during spring and winter compared to summer and fall, whereas mule deer and red fox photographic rates were relatively higher during winter compared to other seasons (Table 2).

Table 2 Relative Abundance of Wildlife Species by Season during 2023-2024 Construction

Season	Photographic Rate (Detections/100 Camera-Days)									
	Black Bear	**Wolf**	**Cougar**	**Coyote**	**Red Fox**	**Moose**	**Elk**	**Mule Deer**	**White-tailed Deer**	**Unidentified Deer**
Spring 2023 (n=27)	0.2	0	0.2	19.8	1.4	1.4	193.6	7.3	89.0	0.7
Summer 2023 (n=24)	0.3	0	0	12.6	0.3	1.9	223.8	6.5	87.1	1.9
Fall 2023 (n=27)	0.2	0	0.3	18.5	0.6	1.3	62.5	11.1	50.0	1.0
Winter 2023-2024 (n=27)	N/A	0.1	0.03	19.9	1.9	0.5	93.2	2.9	26.1	0.3

Notes:

n= number of remote camera operational during each season

N/A - not applicable

3.3.2 Summary of Photographic Rates by Season and Remote Camera Monitoring Station

3.3.2.1 Spring

During spring, photographic rates of white-tailed deer and elk were highest at CAM-30b located near the east end of the offstream dam and CAM-19b northwest of the diversion channel. Both species were also detected at high rates at CAM-24b north of the Elbow River and CAM-28 east of Hwy 22 (Figure 3). Except for CAM-01, elk were not detected frequently along Elbow River or close to construction activities at the bridge over the diversion channel (CAM-12, CAM-13b, CAM-14b) during spring (Figure 3). Cougar was also detected at CAM-28 east of Hwy 22 (mixed forest/shrubland) during spring 2023 (Appendix A, Photo A.1). Black bear was detected along Elbow River (CAM-09b, CAM-10) as well as east of Hwy 22 at CAM-31b.

3.3.2.2 Summer

During summer, photographic rates for some focal wildlife species increased (e.g., moose, elk) whereas other species were detected less frequently (e.g., coyote) (Table 2). Although elk and white-tailed deer were detected less frequently at CAM-19b and CAM-30b compared to spring, there was a substantial increase in elk activity at CAM-01 during summer along Elbow River and CAM-15b near the diversion channel construction activity (Figure 3). CAM-01 detected mixed groups of elk including calves moving north and south at this location whereas CAM-15b detected mixed groups of elk travelling and feeding in willow shrublands.

Female elk and their calves were detected at 16 of 24 (66.7%) remote cameras during June and/or July including at stations east and west of Hwy 22 near the Embankment Raise (CAM-04, CAM-05, CAM-06b) and near diversion channel construction activities (CAM-15b, CAM-16b, CAM-17b; Appendix A, Photo A.2). Female elk and calves were also detected at stations farther (> 500 m) from construction activities along Elbow River (CAM-01, CAM-02b) and CAM-28 (Appendix A, Photo A.3).

Cougar was detected at four camera stations during summer including three remote cameras deployed along Elbow River (CAM-01, CAM-9b and CAM-10; Appendix A, Photo A.4) as well as CAM-28 located east of Hwy 22.

During summer, black bear was detected along Elbow River at CAM-02, and CAM-11b as well as at monitoring stations located east (CAM19b) and west of Hwy 22 (CAM-05) near the Embankment Raise (Appendix A, Photo A.5) and CAM-14b near the diversion channel construction activities (Figure 3). It is worth noting that even though relative abundance estimates at CAM-07, CAM-09b and CAM-10 along Elbow River were not calculated for the summer season because they were knocked off orientation, which resulted in less than 30 days of monitoring, black bear was detected at all three of these cameras during summer.

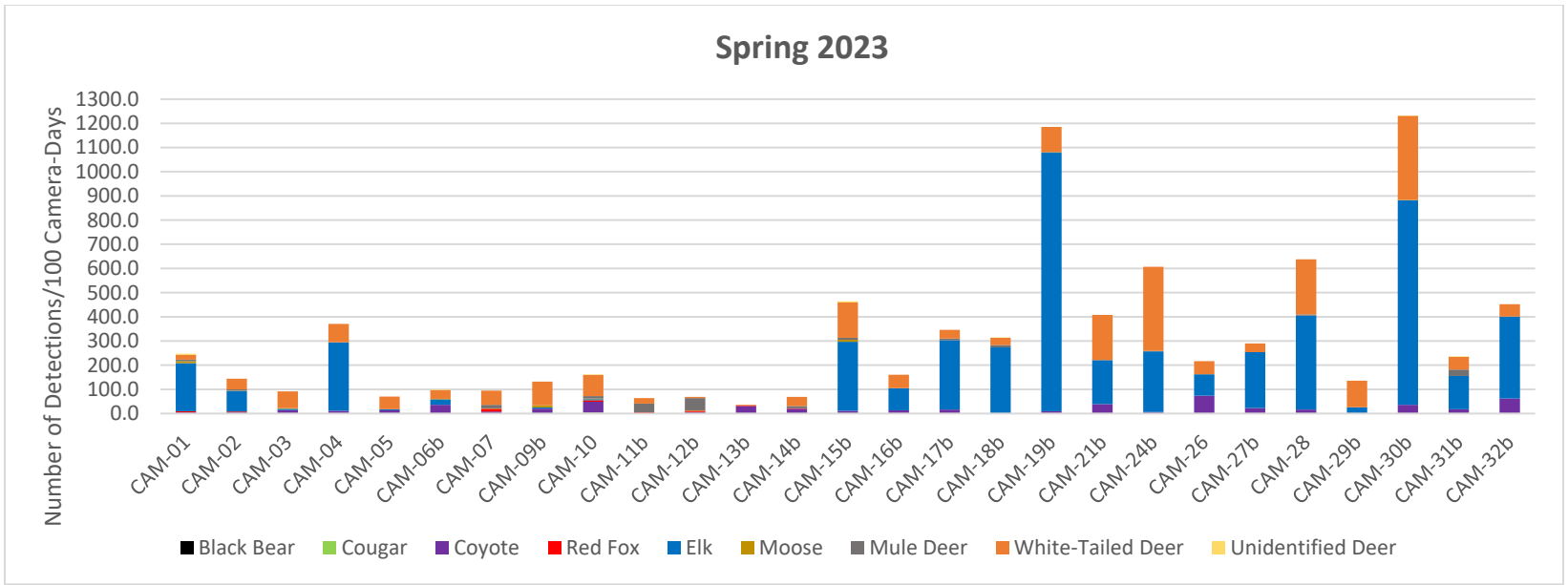
3.3.2.3 Fall

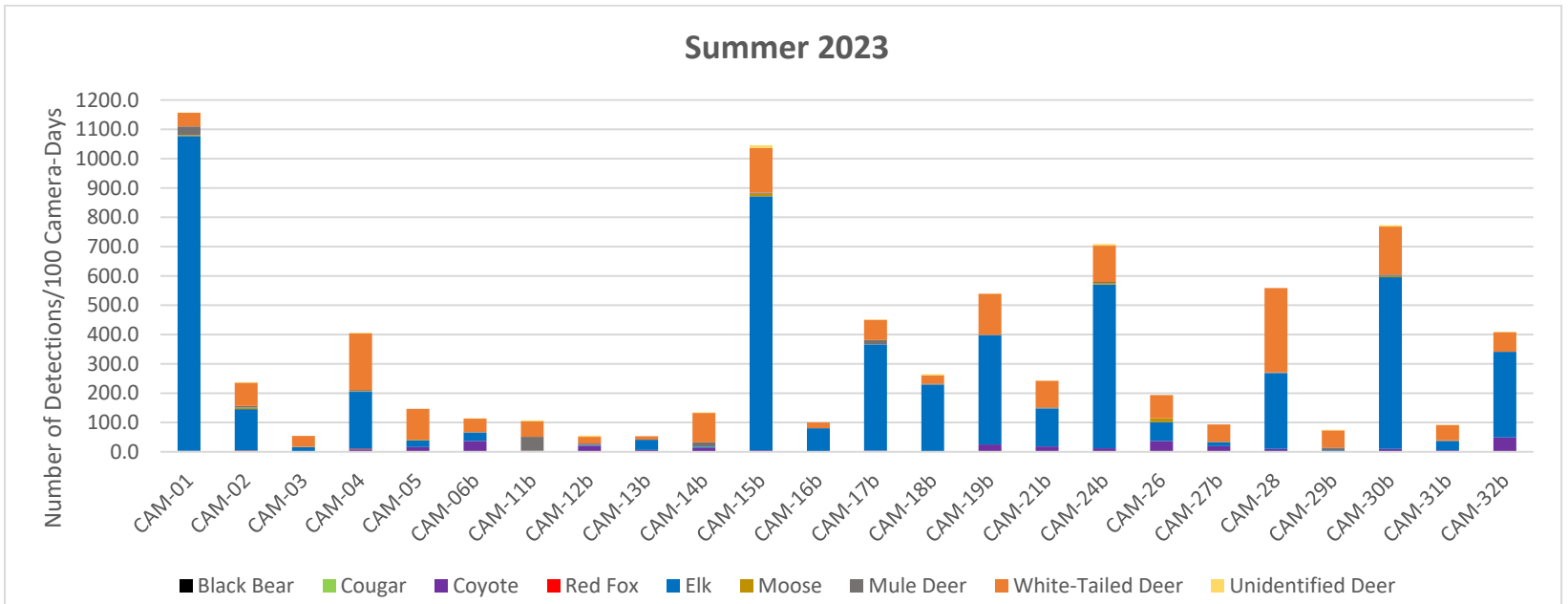
During fall, photographic rates for elk, white-tailed deer and moose decreased compared to spring and summer (Table 2; Figure 3). Elk herds were detected most frequently at CAM-30b, CAM-04, CAM-24b and CAM-15b (Figure 3). In contrast, mule deer (*Odocoileus hemionus*) detections increased during fall (Table 2), particularly at CAM-12b and CAM-14b west of Hwy 22 near diversion channel construction and haying activities (Figure 3; Appendix A, Photo A.6). Black bear was detected along Elbow River during fall at CAM-01 (Appendix A, Photo A.7) and CAM-11b near the diversion inlet.

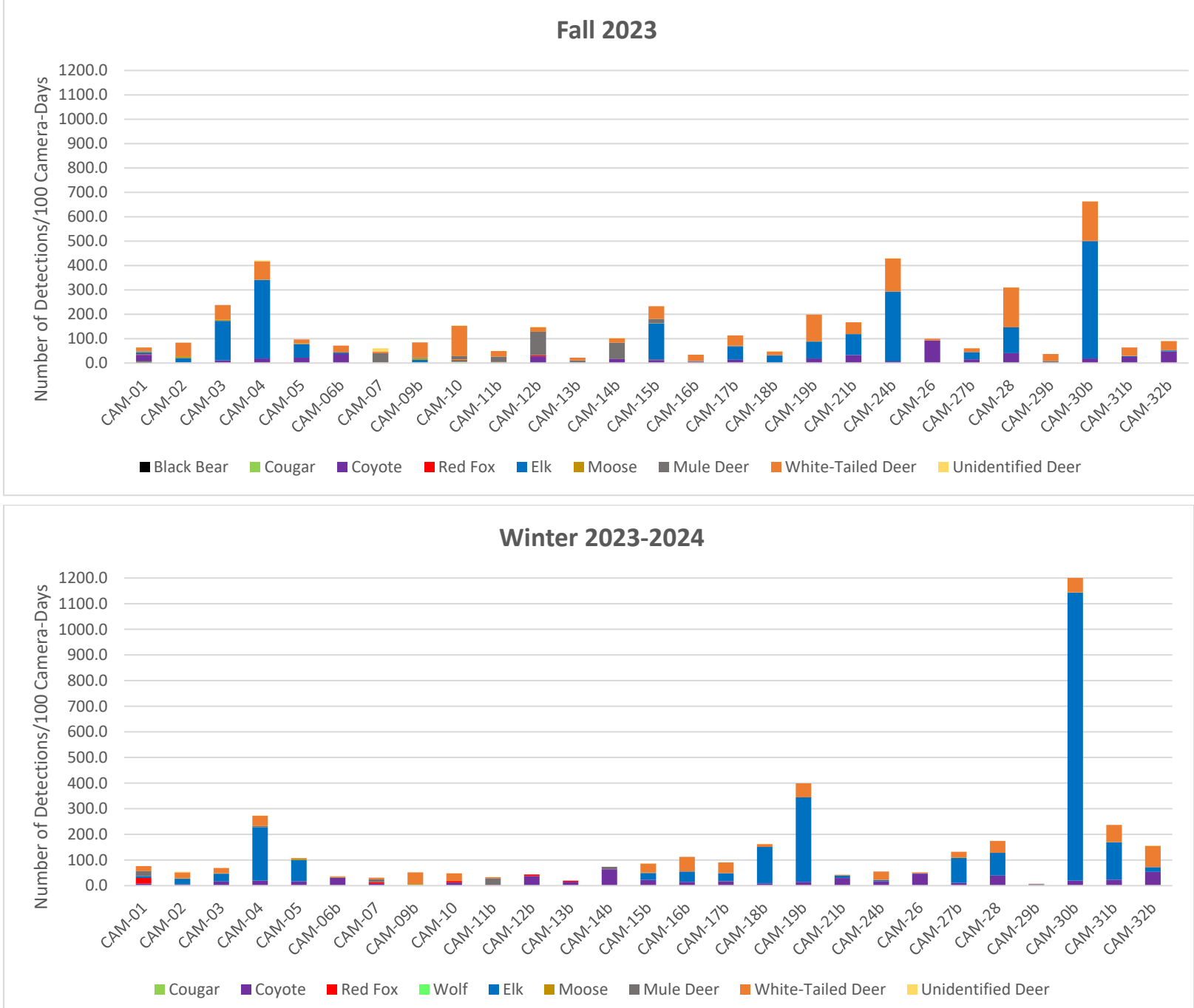
3.3.2.4 Winter

During winter, photographic rates for white-tailed deer and mule deer were relatively low compared to other seasons (Table 2). Elk photographic rates increased during winter compared to fall but were still lower compared to the relatively higher rates detected during spring and summer (Table 2; Figure 3). Except for CAM-01, elk were not detected along Elbow River during winter, but rather used upland areas (grassland/shrublands) extensively (e.g., CAM-04, CAM-19b, CAM-30b) (Figure 3). Similar to the 2022-2023 winter construction period, elk photographic rates were highest at CAM-30b during the 2023-2024 winter (Figure 3) when they were detected travelling through the adjacent aspen forest and feeding in grassland/tame pasture (Appendix A, Photo A.8). Coyote and red fox photographic rates also increased during winter (Table 2; Figure 3; Appendix A, Photo A.9). Wolf was detected during winter at CAM-9b (Appendix A, Photo A.10), CAM-10b and CAM-04, which represented the first detections recorded during the SR1 remote camera monitoring program.

Figure 3 **Relative Abundance (Number of Detections/100 Camera-Days) of Wildlife Species by Season at each Remote Camera Station during 2023-2024 Construction**







Mean group size of elk was 4.4, 3.2 and 4.8 during spring, summer and fall respectively. During winter, average groups size increased to 10.4; however, there was considerable variation among cameras (Table 3). Overall, the largest elk group sizes (> 80 individuals) within all seasons were detected at CAM-15b, CAM-19b, CAM-24b and CAM-30b where there are large open upland areas that provide preferred foraging opportunities (willow shrubland and grasslands).

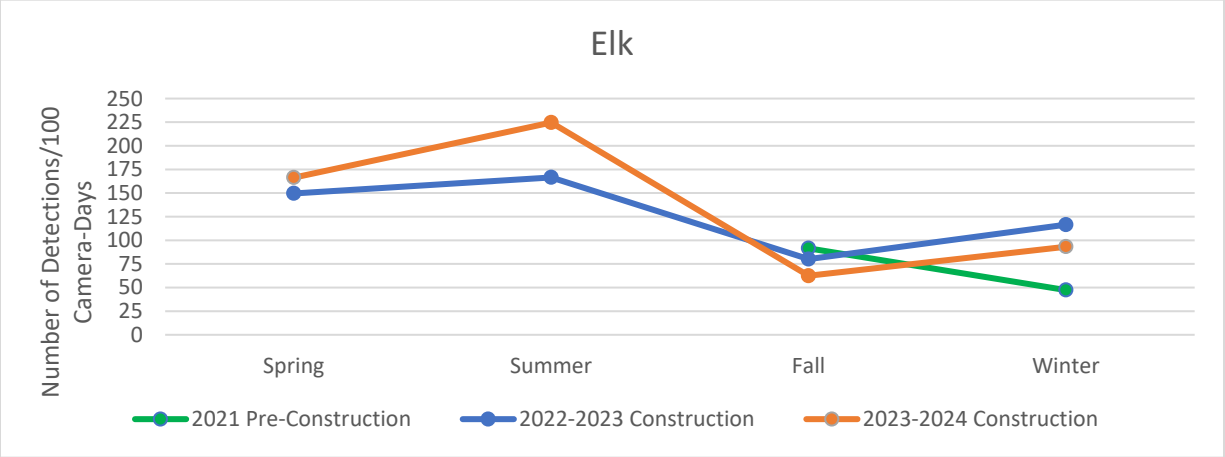
Table 3 Summary of Elk Group Size by Season during 2023-2024 Construction

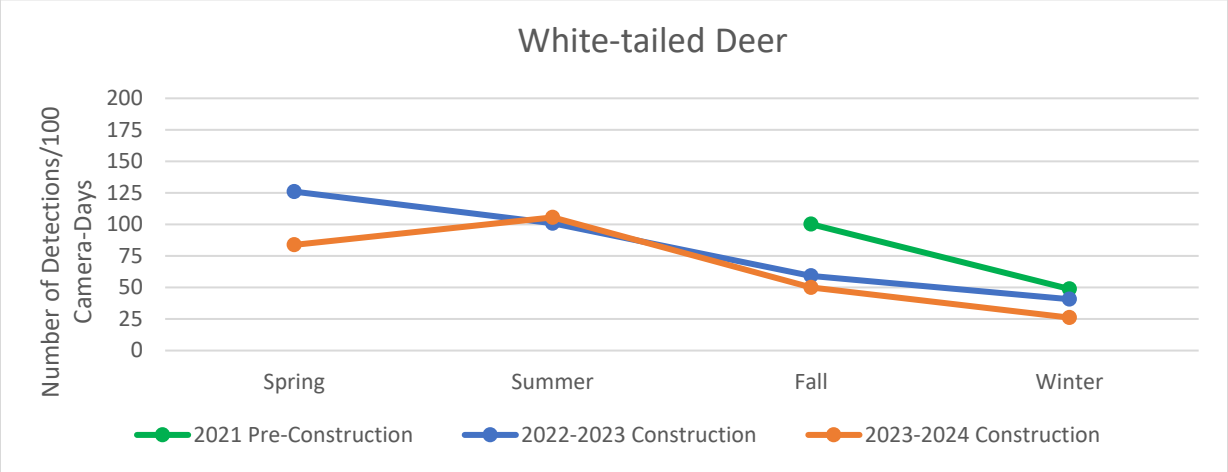
	Number of Groups Detected (Independent Events)	Number of Individuals Detected	Mean Group Size (±1SD)	Range (min-max)
Spring 2023	666	3,109	4.4 (8.6)	1-90
Summer 2023	1,551	4,932	3.2 (6.5)	1-104
Fall 2023	307	1,471	4.8 (10.1)	1-93
Winter 2023-2024	272	2,824	10.4 (19.0)	1-124

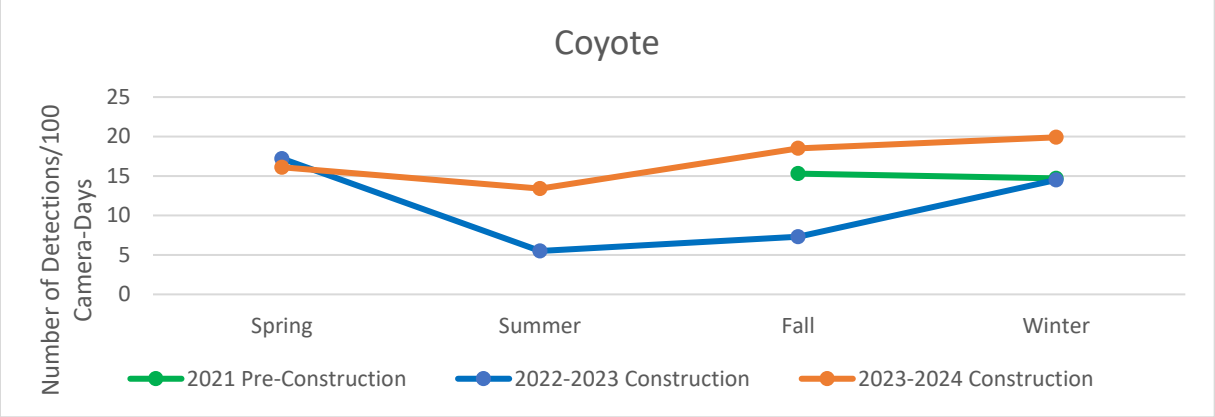
3.4 Pre-Construction and Construction

Seasonal photographic rates for elk, white-tailed deer and coyote during one year of pre-construction and two years of construction are provided in Figure 4. Overall, photographic rates during the 2021 pre-construction period indicated a relative decrease in winter abundance for both elk and white-tailed deer whereas coyote abundance was similar between fall and winter during the 2021 pre-construction period (Figure 4).

Figure 4 **Seasonal Trends in Relative Abundance (Number of Detections/100 Camera-Days) for Three Focal Wildlife Species Monitored during Pre-Construction and Construction Periods**







3.4.1 Comparison of Fall and Winter Photographic Rates by Project Phase

3.4.1.1 Fall

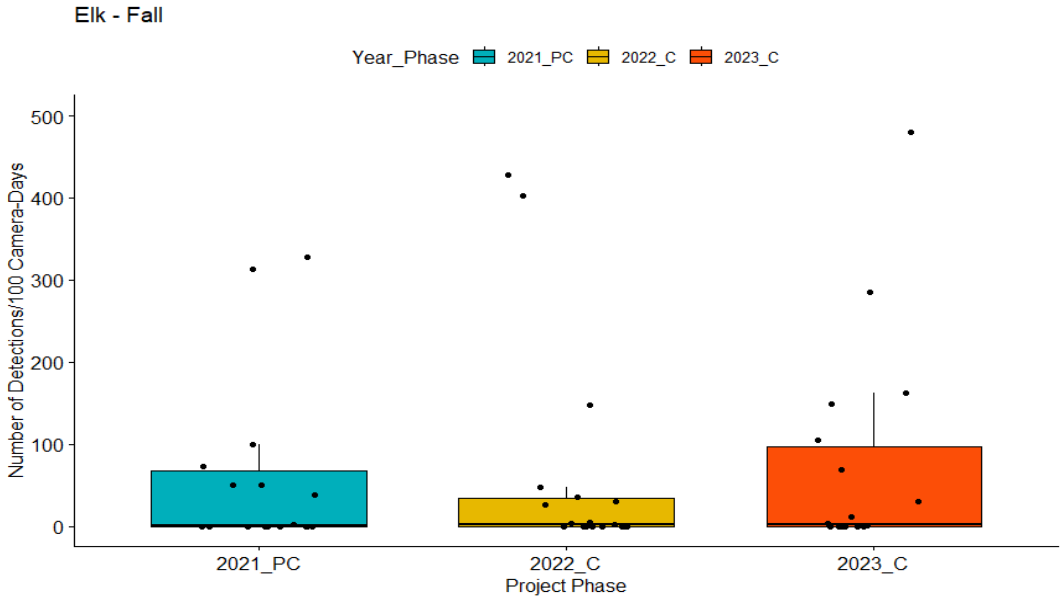
Based on the non-parametric Friedman test, a comparison of photographic rates before and after construction indicated there was no significant difference in elk (P=0.789; Figure 5) or white-tailed deer (P=0.999; Figure 6) fall photographic rates between 2021 pre-construction, 2022 construction[1] and 2023 construction periods. The magnitude of the effect sizes (Kendall W) was <0.1 indicating the differences were very small (trivial). Although the photographic rate for coyote declined during the 2022-2023 construction period compared to 2021 pre-construction, coyote detections increased during 2023-2024 construction to photographic rates slightly above 2021 pre-construction levels, which resulted in differences in photographic rates that approached significance (P= 0.054; effect size 0.162 or small effect) (Figure 7).

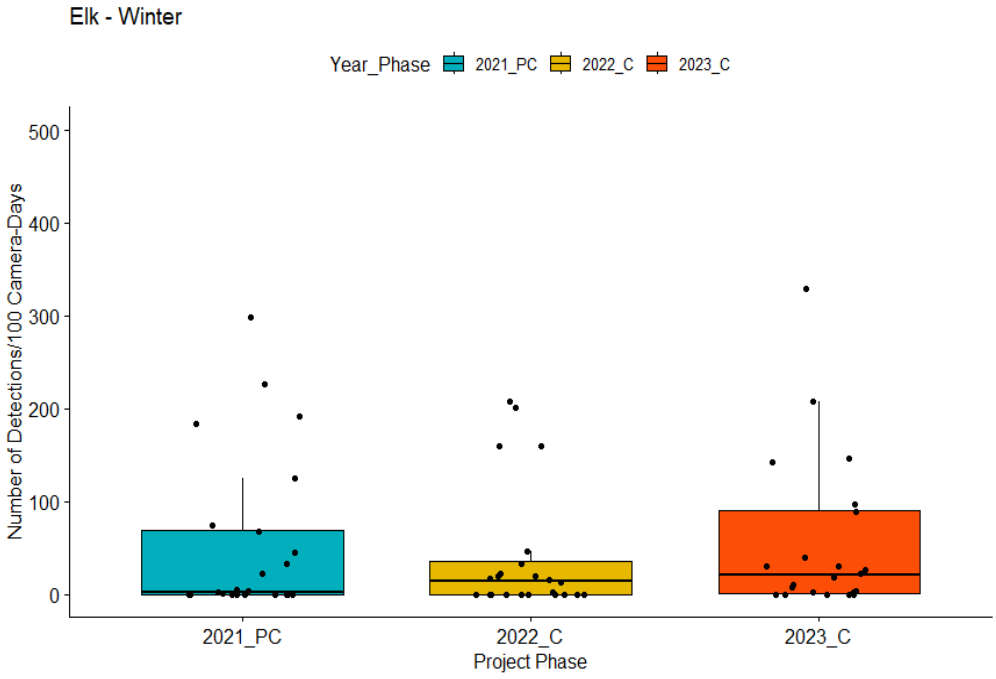
3.4.1.2 Winter

During winter, although elk relative abundance increased during construction compared to pre-construction, there was no significant difference in elk photographic rates (P=0.225; effect size < 0.1) between pre-construction and construction phases (Figure 5). White-tailed deer abundance decreased slightly during winter construction, however, there was no significant difference in winter photographic rates (P=0.575; effect size <0.1; Figure 6) between pre-construction and construction phases. There was a significant difference (positive trend) in photographic rates between construction phases (P=0.018; effect size = 0.166 or small effect) for coyote where winter photographic rates increased relative to 2021 pre-construction (Figure 7). Although the main difference in distributions was due to 2021 pre-construction and 2023-2024 winter construction periods, a multiple pair-wise comparison test with Bonferroni correction for year-phase indicated no significant difference (P=0.08).

[1] There was an error in the number of camera days reported in the IAAC 2022/2023 Annual Report (Year 2) for fall and winter. Those metrics were corrected for annual comparisons made in this Annual Report as follows: fall camera-days were changed from 2,557 to 2,366 and winter camera-days from 3,330 to 3,025. These changes resulted in very slight increases in photographic rates for some but not all focal wildlife species. These changes did not affect any conclusions in the IAAC 2022/2023 Annual Report (Year 2).

Figure 5 **Fall and Winter Photographic Rates for Elk during Pre-Construction (PC) and Construction (C) – Springbank Off-Stream Reservoir Project**

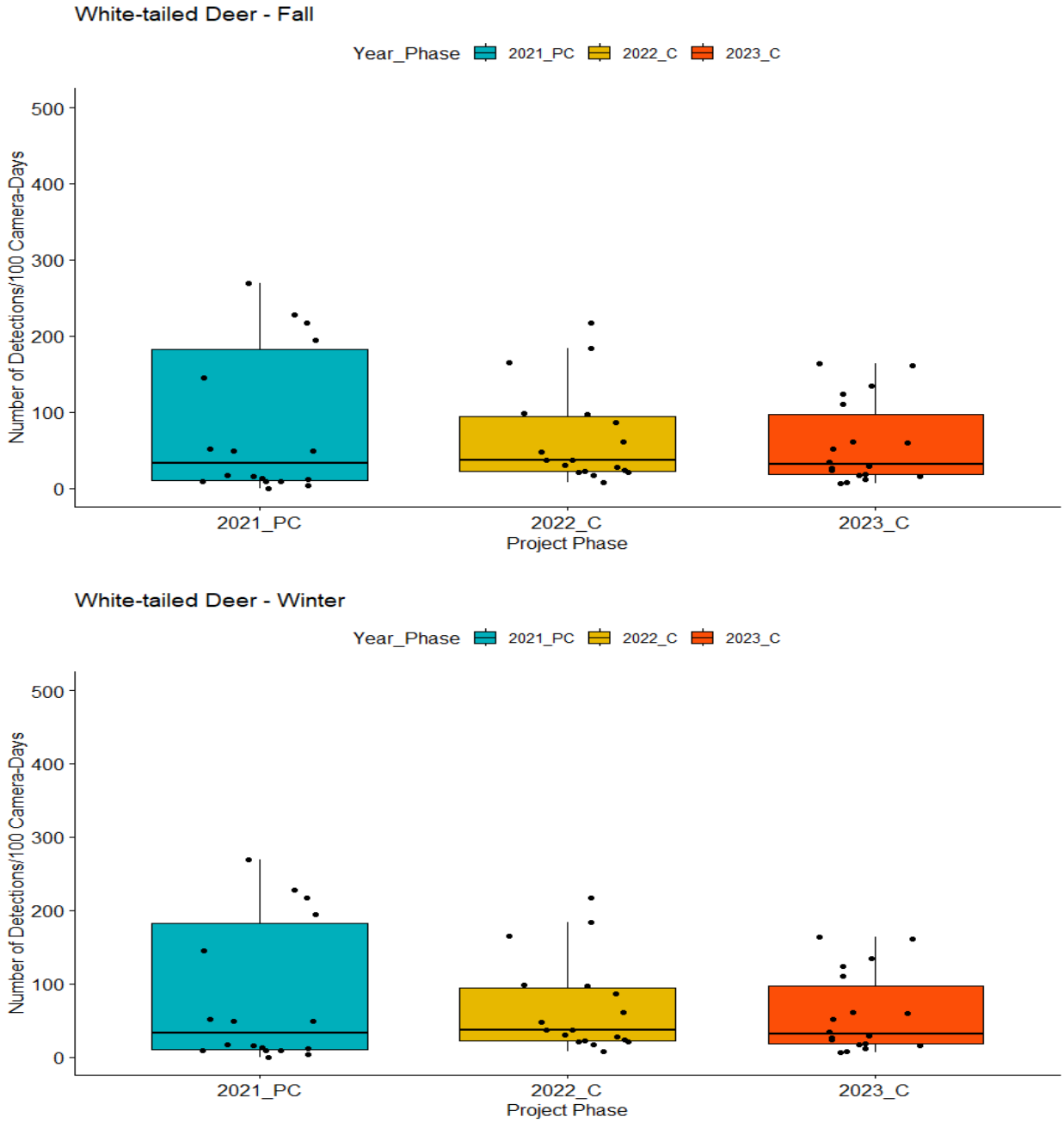




Note:

The bottom and top of the boxplot represents the 25th and 75th percentiles, the black line represents the median (middle) value, and the vertical bars represent the highest and lowest values excluding outliers. Points above or below vertical bars are outliers.

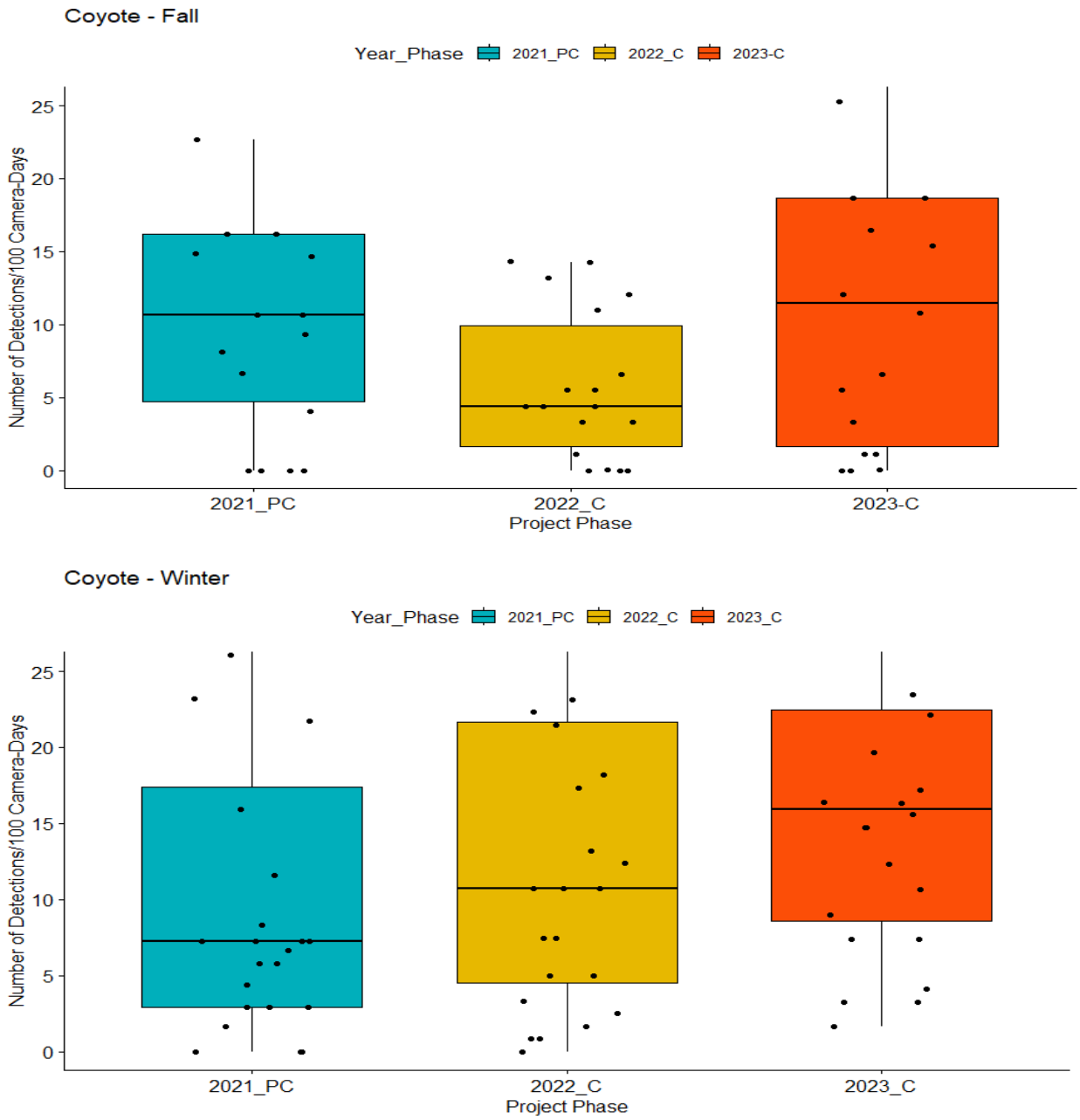
Figure 6 **Fall and Winter Photographic Rates for White-tailed Deer during Pre-Construction (PC) and Construction (C) – Springbank Off-Stream Reservoir Project**



Note:

The bottom and top of the boxplot represents the 25th and 75th percentiles, the black line represents the median (middle) value, and the vertical bars represent the highest and lowest values excluding outliers. Points above or below vertical bars are outliers.

Figure 7 **Fall and Winter Photographic Rates for Coyote during Pre-Construction (PC) and Construction (C) – Springbank Off-Stream Reservoir Project**



Note:

The bottom and top of the boxplot represents the 25th and 75th percentiles, the black line represents the median (middle) value, and the vertical bars represent the highest and lowest values excluding outliers. Points above or below vertical bars are outliers.

4 Discussion

Overall, the relatively high naïve occupancy estimates for white-tailed deer (>80%), elk (>70%) and coyote (>80%) indicated these three focal wildlife species remained relatively well distributed throughout the LAA during the 2023-2024 construction period. There was seasonal variation in occupancy for each species where white-tailed deer were detected at the most remote camera stations during spring (100%), elk during summer (96%) and coyote during winter (100%).

The highest photographic rates for elk and white-tailed deer occurred at CAM-15b, CAM-19b, CAM-24b and CAM-30b during spring and summer with continued high use at CAM-30b during winter. Relatively high photographic rates at these monitoring stations is consistent with previous monitoring years (Stantec Annual Report 2023) and likely reflect the preferred forage and cover present at these locations that are varying distances from construction activities. Elk were detected frequently at CAM-15b near diversion channel construction (approximately 150 m) and at CAM-24b near the low-level outlet (approximately 200 m). CAM-19b and CAM-30b are relatively farther from construction activities (250-400 m), however, elk were detected at CAM-30b frequently during burrow source construction activities along the eastern edge of the PDA. Although elk were not detected frequently along Elbow River, elk photographic rates at CAM-01 along Elbow River increased compared to 2022/2023 construction period. The relatively high percentage of cameras (67%) that detected elk calves during June and July was similar to 2022 (65%) (Stantec 2023 - IAAC 2022/2023 Annual Report), which indicates elk continued to use the LAA during the calf rearing period while construction activities occurred.

The relatively large increase in relative abundance for elk during fall and winter reflects how photographic rates were calculated (summing individuals) and the larger group sizes (e.g., 50-100) that typically occur during these seasonal periods (Hebblewhite and Pletscher 2002, Flowers 2019). Incidental observations by environmental monitors and construction personnel during construction also indicated that large herds of elk (e.g., 200-300) continue to use the LAA, particularly east of Hwy 22 (see Section 4.7.2.2 of Year 3 Annual Report).

Both white-tailed deer and elk appear to reduce their use of the PDA/LAA during winter, which was evident during the 2021 pre-construction period. However, only white-tailed deer continued this trend during the 2022-2023 and 2023-2024 construction periods. Overall, elk and coyote photographic rates have shown a relative increase during winter construction compared to pre-construction. However, only coyote photographic rates were significantly different during winter between 2021 pre-construction and 2023 construction. Although photographic rates of elk and white-tailed deer have varied by season and Project phase, a comparison of relative abundance indicated the differences were not statistically significant.

Overall, the number of focal wildlife species detected (species richness) during the 2021 pre-construction period (7) was similar to the 2023-2024 construction period (9) where seven wildlife species including cougar, coyote, red fox, elk, moose, white-tailed deer and mule deer continued to use the LAA. Black bear and wolf, which were not detected during 2021 pre-construction were detected during 2023 construction (summer/fall and winter respectively). Although grizzly bear was detected along Elbow River

during the 2016 pre-construction monitoring program (Stantec 2018), grizzly bear has not been detected during the 2021 pre-construction monitoring period or during 2022-2023 or 2023-2024 construction periods.

4.1 Data Limitations

Overall, the distribution and total number of remote cameras deployed to monitor wildlife use in the LAA during 2023-2024 construction is considered adequate to determine trends in annual wildlife occupancy and relative abundance during project phases (Shannon et al. 2014). However, the 2021 pre-construction period was limited to fall and winter, which will continue to limit the ability to detect changes in wildlife relative abundance during other seasons. In addition, the before-after (BA) study design does not account for temporal changes due to other confounding factors, which hampers interpretation of potential changes in wildlife use (Morrison et al. 2010).Nonetheless, the trends over two years of construction activities indicate focal wildlife species (i.e., white-tailed deer, elk and coyote) continue to use the LAA and other large carnivores (e.g., cougar, black bear, wolf) have also been detected albeit less frequently. Although the monitoring program is detecting overall trends in focal wildlife species relative abundance, quantifying statistically significant differences among years and phases will be limited by sample size.

The distribution of remote camera monitoring stations identified where elk and white-tailed deer have been detected in the LAA, however, the spacing of the cameras does not allow identification of specific movement paths between or among survey stations. Therefore, it is difficult to determine daily/seasonal movement patterns and whether any of the existing construction activities are creating potential physical or sensory barriers to movement. However, because elk and white-tailed deer were detected at a relatively high proportion of total remote camera stations in the LAA (>70%, > 80% respectively), suggests elk and white-tailed deer were able to access seasonal habitats within the LAA as evidenced by detections both north and south of the diversion channel, low-level outlet, off-stream dam construction activities as well as Elbow River (CAM-01).

Photographic rates of species should be interpreted with caution because they do not account for probability of detection (Burton et al. 2015, Caravaggi et al. 2020). However, the relatively open habitat conditions (agricultural land, grassland, open shrub) and camera placement along trails provided relatively consistent conditions across the majority of camera stations, which would reduce potential bias in detectability. Nonetheless, it is recognized there are species-specific differences in home range sizes, behaviour and movement patterns that can affect relative abundance indices (Burton et al. 2015). Overall, photographic rates were considered adequate to determine species occurrence at multiple cameras sites during the same monitoring period and study area (Muhly et al. 2011).

4.2 Future Monitoring

Overall, the remote camera data collected in during 2023/2024 construction period provided additional construction data that demonstrated spatial variation in wildlife species occurrence and relative abundance in the LAA. The remote camera monitoring program will continue to use the existing camera stations to provide monitoring results during 2024/2025 construction period. However, additional cameras will be considered to monitor wildlife response to wildlife-friendly fencing as fencing installation progresses. Future construction monitoring and 2024/2025 reporting will include additional seasonal data, where annual variation in trends may become apparent relative to baseline conditions and/or other monitoring years. As monitoring continues and sample sizes increase, more robust statistical analysis will be completed to quantitatively compare potential changes in photographic rates during pre-construction, construction, and eventually dry operations. Specifically, a modelling approach will be considered to account for seasonal and annual variation in photographic rates and/or occupancy using a generalized linear model that accounts for random effects (e.g. camera station) and offsets (camera-days) (Sollmann 2018, Klees van Bommel et al. 2022). Image recognition and classification software (e.g., MegaDetector [Microsoft Inc], Timelapse [Greenberg 2021) are also being explored to increase data processing efficiency.

5 References

ABMI (Alberta Biodiversity Monitoring Institute). 2024. WildTrax. Available at: https://wildtrax.ca/

Burton, A.C., E. Neilson, D. Moreira, A. Ladle, R. Steenweg, J.T. Fisher, E. Bayne, and S. Boutin. 2015. Wildlife camera trapping: a review and recommendations for linking surveys to ecological processes. Journal of Applied Ecology 52: 675-685.

Burton, C., R. Naidoo, M. Fennell, M. Procko, C. Sun, K. Taiden, C. Colton and A. Granados. 2021. Camera trap monitoring to assess wildlife responses to environmental change in BC Parks. Summary Progress Report for BC Parks. Available at: https://nrs.objectstore.gov.bc.ca/kuwyyf/camera_trap_monitoring_to_assess_wildlife_responses_to_environmental_change_in_bc_parks_2020_21_9938d8cfc7.pdf

Caravaggi, A., A.C. Burton, D.A. Clark, J.T. Fisher, A. Grass, S. Green, C. Hobaiter, T.R. Hofmeester, A.K. Kalan, D. Rabaiotti, and D. Rivet. 2020. A review of factors to consider when using camera traps to study animal behavior to inform wildlife ecology and conservation. Conservation Science and Practice 2(8): e239.

Flowers, M. 2019. Winter behavior of resident and migrant elk at Ya Ha Tinda Ranch. MS Thesis, University of Alberta.

Greenberg, S. 2021. Timelapse: An image analyzer for camera traps. Available at: https://saul.cpsc.ucalgary.ca/timelapse/pmwiki.php?n=Main.HomePage

Hebblewhite, M., and D. H. Pletscher. 2002. Effects of elk group size on predation by wolves. *Canadian Journal of Zoology* 80:800-809.

Kays, R., Arbogast, B. S., Baker-Whatton, M., Beirne, C., Boone, H. M., Bowler, M., et al. 2020. An empirical evaluation of camera trap study design: how many, how long and when? Methods in Ecology and Evolution 11: 700–713.

Klees van Bommel J., C. Sun, A.T. Ford, M. Todd, A. C. Burton. 2022. Coexistence or conflict: Black bear habitat use along an urban-wildland gradient. PLoS ONE 17(11): e0276448. https://doi.org/10.1371/journal.pone.0276448.

MacKenzie, D.I, J.D. Nichols, G.B. Lachman, S. Droege, and J.A. Royle. 2002. Estimating site occupancy rates when detection probabilities are less than one. Ecology 83: 2248–2255.

MacKenzie, D. I., J.D. Nichols, J.A., Royle, K.H. Pollock, L.L. Bailey, and J.E. Hines. 2006. Occupancy estimation and modeling: inferring patterns and dynamics of species occurrence. Academic Press, 2006.

Morrison, M.L., W.M. Block, M.D. Strickland, B.A Collier, and M.J. Peterson. 2010. Wildlife Study Design. Second Edition. Springer Series on Environmental Management. Pp 386.

Muhly T.B., C. Semeniuk, A. Massolo, L. Hickman, and, M. Musiani. 2011. Human activity helps prey win the predator-prey space race. PLoS ONE 6(3): e17050. doi:10.1371/journal.pone.0017050

Palmer, M.S., A. Swanson, M. Kosmala, T. Arnold, and C. Packer. 2018. Evaluating relative abundance indices for terrestrial herbivores from large-scale camera trap surveys. African Journal of Ecology 56: 791-803.

R Core Team. 2022. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

Shannon, G. J.S. Lewis and B.D. Gerber. 2014. Recommended survey designs for occupancy modeling using motion-activated cameras: insights from empirical data. PeerJ 2:3532; DOI 10.7717/peerj.532.

Sollmann, R. 2018. A gentle introduction to camera-trap data analysis. African Journal of Ecology 56:740–749. https://doi.org/10.1111/aje.12557

Stantec. 2018. Springbank Off-stream Reservoir Project. Environmental Impact Assessment. Volume 4: Appendix H. Wildlife and Biodiversity Technical Data Report.

Stantec. 2023. Impact Assessment Agency of Canada (IAAC) 2022/2023 Annual Report.

Appendices

Appendix A Photos

Photo A.1 Cougar detected at CAM-28 east of Hwy 22 (mixed forest/shrubland) during spring (April) 2023



Photo A.2 Group of elk (cows and calves) detected at CAM-17b near the diversion channel during summer (June) 2023



Photo A.3 Three elk cow-calf pairs detected at CAM- 28 during summer (June) 2023



Photo A.4 Cougar detected at CAM-10 along Elbow River during summer (August) 2023



Photo A.5 Black bear detected at CAM-05 west of Hwy 22 near Embankment Raise during summer (August) 2023



Photo A.6 Mule deer detected at CAM-12b north of Township Road 242 near the diversion channel during early fall (September) 2023



Photo A.7 Black bear detected at CAM-01 along Elbow River during fall (September) 2023



Photo A.8 Elk herd foraging/resting at CAM-30b during winter (January) 2023



Photo A.9 Red Fox detected at CAM-01 along Elbow River during winter (December) 2023



Photo A.10 Wolf detected at CAM-09b along Elbow River during winter (January) 2024



B.2
Groundwater

Springbank Off-stream Reservoir Project
2024 Groundwater Monitoring Report

October 2024

Prepared for:
Transportation and Economic Corridors

Prepared by:
Stantec Consulting Ltd.

Project/File:
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Stantec

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Acronyms / Abbreviations

%	percent
<	less than
>	greater than
°C	degrees Celsius
AD	Absolute difference
AEPA	Alberta Environment and Protected Areas
Alberta Tier 1 Guidelines	Alberta Tier 1 Soil and Groundwater Remediation Guidelines
AWWID	Alberta Water Well Information Database
BTEX	benzene, toluene, ethylbenzene, xylenes
CALA	Canadian Association for Laboratory Accreditation
cfu	colony forming unit
CGDWQ	Guidelines for Canadian Drinking Water Quality
Cv	coefficient of variation
DO	dissolved oxygen
DOC	dissolved organic carbon
E. Coli	Escherichia coli
EC	electrical conductivity
EIA	environmental impact assessment
GCDWQ	Guidelines for Canadian Drinking Water Quality
GWMP	Groundwater Monitoring Plan
HPC	heterotrophic plate counts
LAA	local assessment area
LTC	level, temperature and conductivity
m	metre
m BGL	metres below ground level
mg/L	milligrams per litre
mL	millilitre
mpn	most probable number
NRCB	Natural Resources Conservation Board
ORP	oxidation-reduction potential

PDA	Project development area
PS1	Parameter Suite 1
PS2	Parameter Suite 2
PS3	Parameter Suite 3
QA/QC	quality assurance/quality control
RPD	relative percent difference
SR1; the Project	Springbank Off-stream Reservoir Project
Stantec	Stantec Consulting Ltd.
TDR	Technical Data Report
TDS	total dissolved solids
TSS	total suspended solids
UCL	upper confidence limit
US EPA	United States Environmental Protection Agency

1 Introduction

This document describes the activities completed and results of the Groundwater Monitoring Program for the Springbank Off-stream Reservoir Project (SR1; the Project) in 2023 and 2024. This scope of the Groundwater Monitoring Program is based on the Stantec Consulting Ltd. (Stantec) Groundwater Monitoring Plan (GWMP) for the Project (Stantec 2021) and this report covers the monitoring period between July 1, 2023 and June 30, 2024.

The GWMP provides a summary of the Project, the hydrogeological framework, the potential interactions between groundwater and the Project and mitigation measures identified to provide context for the plan. A summary of the hydrogeological setting of the Project is provided in Appendix A of this report for reference. The GWMP was developed using a tiered approach that considers the potential Project interactions that could lead to effects on groundwater resources, which vary depending upon the specific location within the Project area and the lifecycle phase. The timing and level of comprehensiveness involved in the GWMP varies accordingly. Monitoring results are compared to relevant water quality guidelines and trigger values established in the GWMP. Once sufficient baseline data are gathered, data will also be compared to quantitative control limits and temporal trend analyses will be completed to identify potential Project effects.

Should the GWMP results exceed groundwater quantity or quality triggers, a conceptual groundwater response plan is also included in the GWMP that describes the actions that would be taken.

2 Background

The Project consists of the construction and operation of an off-stream reservoir to divert and retain a portion of Elbow River flows during a flood. The diverted water will be released back to Elbow River in a controlled manner after the flows in Elbow River decrease sufficiently to accommodate the release of water from the reservoir. The off-stream reservoir will not hold a permanent pool of water. The hydrogeological setting of the Project is presented in Appendix A to provide context for the GWMP.

2.1 Project Components

The primary Project components include:

- a diversion structure on the main channel and floodplain of Elbow River
- a diversion channel to transport diverted floodwater from the Elbow River to the off-stream reservoir
- a dam to temporarily retain the diverted floodwater in the reservoir
- a low-level outlet in the dam to return retained water through the existing unnamed creek and back to the Elbow River when the operator determines conditions are appropriate

2.2 Construction and Groundwater Effects Mitigation

A number of construction activities with potential to affect either groundwater quality or quantity occurred during the current reporting period, including:

- excavation a borrow area north of the dam starting in September 2023 and continuing through the reporting period
- excavation of the borrow area near the diversion outlet in SW24-24-4-W5M
- dewatering from two sumps adjacent to the diversion outlet's northeast retaining wall and southwest retaining wall structures
- the interception of the water course at SE15-24-4-W5M resulting in the ponding of water on the upgradient side with potential for increased infiltration/groundwater recharge upgradient and reduced infiltration and recharge downgradient
- dewatering from the construction of the diversion channel (potential to decrease groundwater level)
- diversion of surface water and groundwater from dugouts and water wells for soil conditioning/compaction, equipment cleaning and dust control (potential to decrease groundwater level)
- dam construction (potential to increase pore pressures/groundwater level)

The dewatering activities have the potential to affect groundwater levels in the vicinity of the activities, however, the water is being managed within the construction footprint and is reinfiltrated into the subsurface through retention ponds or through silt bags.

The primary Project components are being constructed and operated under four lifecycle phases. The groundwater monitoring program results presented in this report covers two of these lifecycle phases: a portion of the pre-construction baseline period, and the early stages of construction.

Construction dewatering of groundwater, where/when required, is being done locally and according to the terms and conditions of licences issued by Alberta Environment and Protected Areas (AEPA) (where applicable and if required) and best management practices. Best management practices will include, but are not limited to, the following:

- Water is discharged in a manner to avoid erosion using turbidity barriers, containment berms and settling ponds. Construction dewatering is done in accordance with the terms and conditions of *Water Act* approval and the federal *Fisheries Act* and *Canadian Navigable Waters Act*.
- Total suspended solids (TSS) levels are controlled using silt fences and turbidity barriers. TSS levels are monitored by carrying out frequent water quality testing.
- Construction dewatering is limited through construction planning.
- Existing water wells within the construction footprint have been decommissioned and plugged off to prevent groundwater contamination and additional wells within the reservoir footprint will be decommissioned prior to operation.
- Regional-scale effects on groundwater quantity can be mitigated by allowing seepage in the diversion channel (when it is dry) to infiltrate back into the subsurface, or flow back into Elbow River through existing surface water drainage pathways.

Effects on groundwater quantity as a result of construction dewatering will not be entirely mitigated at a local scale because dewatering deliberately seeks to temporarily lower the groundwater table in the Project development area (PDA) to facilitate construction. The amount of time required for construction dewatering is minimized through construction planning. Groundwater that is collected during dewatering is returned to the local watershed to mitigate regional-scale effects on groundwater quantity.

Groundwater that seeps into the diversion channel (when dry) remains within the watershed, although potentially travelling through a more tortuous route back to its discharge area. Regional-scale effects on groundwater quantity can be mitigated by allowing seepage in the diversion channel to infiltrate back into the subsurface, or flow back into Elbow River through surface water drainage pathways.

The secondary effects on groundwater quality related to changes in groundwater flow patterns will not be entirely mitigated because dewatering activities deliberately seek to lower the water table (and in turn affect groundwater flowpaths, potentially resulting in changes in groundwater quality). The amount of time required for construction dewatering is minimized through construction planning which in turn will limit the duration of the residual effects. Dewatering occurred in several areas during the current reporting period. The water was either pumped to dugouts or infiltration ponds, into silt bags or to ground surface with erosion and sediment controls in place.



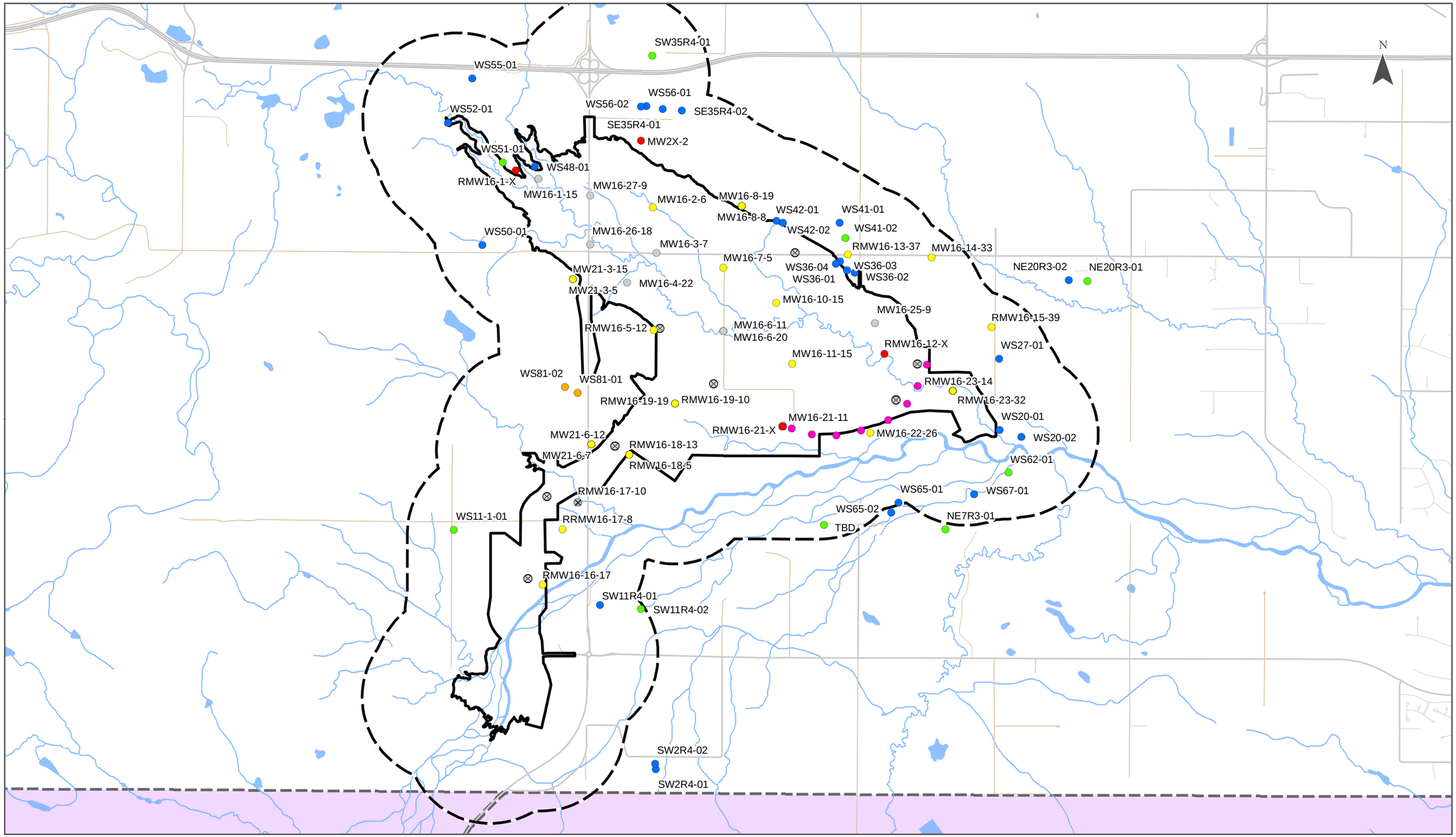
2.3 Groundwater Monitoring Well Network

2.3.1 Tiered Groundwater Monitoring Locations

Figure 2.1 presents the layout of the current groundwater monitoring network. The density and distribution of groundwater monitoring wells is based on the need to detect potential changes to groundwater levels and quality that could arise from interactions between the Project and groundwater resources. The siting of monitoring wells considered the expected extent of effects on groundwater for construction as well as dry and flood operations.

Simulation results from the numerical groundwater modeling completed as part of the environmental impact assessment (EIA) were reviewed to understand the potential areas over which effects on groundwater could be expected. Under dry operations, the simulated extent of potential effects will be limited to areas near the diversion channel, due to drawdown caused by incision of the channel through the water table. Under flood operations, effects on groundwater are expected to be limited to areas near the diversion channel and off-stream reservoir. In the case of both dry and flood operations, potential effects on groundwater are predicted to be limited to within the EIA local assessment area (LAA), with the potential exception of the area west of the diversion channel. Thus, monitoring wells sited within the LAA and west of the diversion channel will be able to detect change related to potential Project effects, should they occur.

Groundwater monitoring well locations were also selected to allow for characterization of “background” water quality in areas anticipated to be unaffected by Project interactions depending on the stage of Project. For example, Tier 2 and Tier 3 wells that are far removed from construction activities will continue to provide background data during the construction phase and operation phase up until the first operational flood event. Monitoring well locations were also selected based on the location of existing users of groundwater, such that some locations can provide “early warning” for changes in groundwater prior to those effects reaching existing groundwater users.



Sources: Base Data- Government of Alberta, Government of Canada. Thematic Data - Stantec Ltd.

- Project Development Area
- Local Assessment Area
- Tsuut'ina Nation Reserve

Groundwater Monitoring Network

- Tier 1 - pending installation
- Tier 2
- Tier 2 - pending installation
- Tier 2a
- Tier 3
- One-Time Domestic Well
- EIA Project Well
- Decommissioned or Destroyed

NAD 1983 3TM 114

0 1 2
kilometres

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ALBERTA TRANSPORTATION SPRINGBANK OFF-STREAM RESERVOIR PROJECT - 2023 GROUNDWATER MONITORING REPORT

Groundwater Monitoring Network
Figure 2.1

Three monitoring tiers have been established, based loosely around the associated geographic coverage:

- Tier 1 monitoring wells or piezometers will be shallow and located within or immediately adjacent to Project infrastructure (dam, diversion intake and channel). Piezometers or vibrating wire piezometers (for pore pressure monitoring) will be used for geotechnical monitoring within the Project components; however, this data will also be used to support the monitoring of potential effects to groundwater. Shallow monitoring wells will also be installed in this area in consultation with the dam engineering team prior to operations.
- Tier 2 monitoring wells are shallow and within or very near the wetted perimeter of the off-stream reservoir and diversion channel. They are installed in both the unconsolidated and shallow bedrock deposits. The Tier 2 wells also include nested pairs completed at different depths to monitor different stratigraphic units and potential changes in vertical hydraulic gradients. Nested monitoring well locations are indicated in Figure 2.1 (multiple well names at a given location). Note that Tier 2 wells installed in bedrock are only situated outside of the wetted perimeter to prevent potential vertical pathways for floodwater to enter bedrock aquifers.

  A subset of Tier 2a wells are also included specifically to monitor drawdown near the diversion channel during construction and dry operations to address Natural Resources Conservation Board (NRCB) approval condition 11.5 a[1].
- Tier 3 monitoring wells are situated beyond the area of predicted Project effects at locations of some of the closest potential receptors to the Project. These monitoring wells are, or will be, installed within unconsolidated or bedrock units depending upon local groundwater use and potential aquifers of interest. The main purpose of these monitoring wells is to provide early detection of potential effects on groundwater that are propagating outward from the LAA. These monitoring wells will also be potentially used as background monitoring wells to discriminate between changes to groundwater levels arising from a flood or precipitation event, versus those which can be attributed to operation of the Project.

Tier 1 locations will be finalized toward the end of the construction phase once the Project infrastructure is built. Tier 2 monitoring well locations have been finalized (pending land access in some cases) and the network is nearing completion. The current network includes 25 of 28 proposed Tier 2 wells in their final locations. The remaining three wells include:

- Drilling at or near location MW2X-2 (Figure 2.1) pending land access
- MW16-12-3 had to be decommissioned to accommodate dam construction and will be replaced following construction near location RMW16-12-X
- MW16-1-15 continues to be monitored but requires replacement outside of the wetted perimeter prior to the operation phase of the Project

[1]"monitor water levels in domestic water wells west of the diversion channel to the boundary of the local assessment area that may be impacted by dewatering during the Project construction. During flood and dryland operation, monitoring of the wells should be continued by the Operator for a minimum of five years or until it can be demonstrated that permanent lowering of the water level does not significantly impact yields from the water wells,"

Domestic water well owners within the modelled drawdown area west of the diversion channel were invited to be included in the Tier 2a monitoring well network, however, only one landowner (with two wells) chose to participate. A total of eight Tier 3 monitoring well locations have been established with land access pending for the remaining one (approximate location labeled TBD on Figure 2.1). At the time of this report, additional private landowners have not accepted invitations to participate and Rocky View County has indicated that they will not allow groundwater monitoring wells in the county road allowances. As such, it is uncertain if the remaining Tier 3 well can be installed at a location meeting the original intent.

In addition to the monitoring network, the locations of monitoring wells used in the EIA (herein referred to as “EIA Project Wells”) that will not be part of the long-term network are also presented. These monitoring wells have been decommissioned, or will be decommissioned prior to construction or operation, due to their location relative to the construction footprint or their completion relative to future operational flooding of the reservoir. The remaining EIA Project Wells continued to be monitored and sampled in 2023 and 2024 to gather additional baseline data. The data from these wells, along with previously collected data from the decommissioned monitoring wells, will also be included in the baseline dataset.

Landowners within the LAA and north of the Elbow River were also invited to participate in one-time baseline testing of their domestic water wells based on a commitment made during the NRCB EIA Hearing. These locations are labeled “One-Time Domestic Wells” in Figure 2.1.

In Figure 2.1, the Tier 1 monitoring wells will be within the dam structure. These wells would be expected to fall within an area where Project effects are expected (during dry and flood operations). Additional Tier 1 monitoring wells may be included near the diversion inlet and along the diversion channel. The locations will be finalized based on geotechnical and dam safety requirements.

In Figure 2.1, the Tier 2 monitoring wells are shown across much of the LAA, including some wells within the wetted area of the reservoir (i.e., the area of the reservoir that would be inundated during a design flood). These wells would be expected to fall within or very near to areas where Project effects are expected (during dry and flood operations). Previous wells installed to support the EIA that were completed in bedrock within the wetted perimeter will be decommissioned prior to dry operations. The remaining Tier 2 wells within the wetted perimeter are shallow and completed in the unconsolidated deposits and will remain in place during flood operations to monitor effects.

Tier 2a wells shown in Figure 2.1 fall within the potential construction and dry operations drawdown area near the diversion channel. Monitoring of the Tier 2a wells is voluntary and based on landowner participation.

In Figure 2.1, the Tier 3 monitoring wells are shown both north and south of Elbow River. These wells are situated in areas outside of the expected areas where Project effects could occur (however they could still detect effects from a flood or precipitation). Tier 3 wells near Elbow River (NE7-R3-01 and WS62-01) are screened within the alluvial deposits and thus are directly connected to Elbow River, and they would be expected to experience changes in levels or quality during and after a flood in response to changes in river stage. Changes in these wells would be associated with natural effects of a flood and could be used to help differentiate flood-related effects from those attributable to the Project. Other wells south of the

Project are situated in upland areas outside the alluvial deposits, and they would not be in direct communication with Elbow River.

The plan for the Tier 3 network was to use as many existing domestic wells as possible, however, because they require appropriate construction and are dependent on long-term access agreements, there are a few gaps remaining in the network and there is a need to find or install additional wells. Tier 3 wells will provide the ability to detect changes that could potentially propagate outward from the LAA in the direction of domestic and agricultural well users.

Existing domestic water wells for inclusion as Tier 3 monitoring wells were evaluated to verify that they were in appropriate locations, are screened at appropriate depths, are in good condition, and have good surface seal integrity. Ideally these wells would not be in use or near other wells in use such that water levels are not influenced by pumping, however, that is not the case for the current set of wells, but data logging pressure transducers have been installed in the Tier 3 wells to monitor water level variation due to pumping as well as potential interference from the Project.

2.3.2 Monitoring Well Development

Monitoring wells installed specifically for the Project to be included in the GWMP have been developed following completion. Development is conducted to remove drilling fluids (if used) and fine-grained materials from around the filter pack to improve the hydraulic efficiency of the filter pack and improve hydraulic communication between the filter pack and geologic formation. The objective of the well development is to provide more representative groundwater samples and improved hydraulic conductivity estimates.

2.4 Groundwater Monitoring Program

2.4.1 Analytical Parameter Suites

Analytical parameter suites were developed for the GWMP to enable characterization of potential changes in groundwater quality through both general measures of groundwater quality (e.g., electrical conductivity [EC]), and through measures of groundwater quality specific to a given chemical compound (e.g., nitrate).

Interactions between the Project and groundwater can include changes to groundwater quantity or flow patterns that can in turn affect groundwater quality. There is also potential for groundwater contamination related to construction activities or the quality of the water in the reservoir during flood operations. The parameter suites were chosen to include a broad range of analytes as well as general indicators of water quality such as pH, electrical conductivity and dissolved organic carbon. Other parameters such as hydrocarbons are aimed at accidental releases during construction or in presence in floodwater. Similarly bacteriological parameters are intended to address potential impacts from human or animal waste in the floodwater.

The parameter suite applied during the monitoring program varies depending upon the Project phase and monitoring tier. Three parameter suites have been defined for the GWMP:

- Parameter Suite 1 (PS1) includes temperature and electrical conductivity (measured insitu).
- Parameter Suite 2 (PS2) includes general potability parameters, major ions, bacteriological parameters, dissolved organic carbon (DOC).
- Parameter Suite 3 (PS3) includes those listed in PS2 as well as dissolved metals, nutrients, benzene, toluene, ethylbenzene, xylenes (BTEX), and F1 to F2 fraction hydrocarbons.

Parameter Suite PS3 is being used for the baseline period and into the construction period to gather detailed water quality data. The parameter suites to be measured on an ongoing, scheduled basis during project operations will be reduced to PS2 and PS1 as described in Section 2.4.3. Escalation to a higher parameter suite would still occur during a flood event or if the results from the lower, scheduled parameter suite suggest that further analysis is required. For example, should electrical conductivity (as part of PS1) exhibit an unexpectedly elevated reading, then analysis of PS2 could then be implemented to provide further information regarding which specific chemical parameter is contributing to the elevated electrical conductivity.

2.4.2 Frequency of Monitoring

The frequency of monitoring for measurement of groundwater levels and collection of groundwater samples for water quality analysis is dependent on:

- the phase of the Project under consideration. Project Phases requiring higher levels of monitoring comprehensiveness (e.g., baseline and flood operations) will have a higher frequency of monitoring events.
- the tier of monitoring well under examination. In general, monitoring wells within the Tier 1 category will have a higher frequency of monitoring relative to the Tier 3 monitoring wells.
- the parameter suite that is under examination. General or bulk parameters (PS1) will have a higher frequency of monitoring than PS2 or PS3.

The planned frequency of monitoring for groundwater levels and quality has been defined at three levels:

- near-continuous measurement (C) of levels and quality through data logging probes that automatically collect and record at high frequency intervals.
- intermittent (I) measurement of routine, scheduled monitoring at set frequency (e.g., semi-annually)
- event (E) based measurement in response to a flood or other operational event (e.g., maintenance) where groundwater could be affected. Monitoring frequency during operational flood events will be assessed based on accessibility, safety and other constraints.

2.4.3 Overview of Groundwater Monitoring Program

Figure 2.2 illustrates the implementation of Monitoring Tiers, Parameter Suites, and Monitoring Frequency into an overall program that provides varying levels of monitoring comprehensiveness over the Project Phases.

In general, the level of monitoring comprehensiveness varies as follows (highest to lowest):

- Flood and post-flood operations requires of the most comprehensive monitoring because this is when the most Project interactions are applicable and when effects on groundwater are most likely to be observable.
- Baseline monitoring requires a highly comprehensive monitoring that starts prior to construction of the Project. The comprehensive baseline monitoring is being extended for some monitoring locations to assess the natural variability of groundwater quantity and quality. For example, baseline monitoring at monitoring wells not situated near construction areas could extend at least until construction is completed or even further until flood operations occur, if necessary
- Construction monitoring requires medium comprehensive monitoring. This monitoring is more focused on Project interactions that could potentially arise in a localized area due to construction activities (e.g., monitoring around a particular location undergoing construction dewatering).
- Dry operations monitoring has less comprehensive monitoring and occurs during dry operations between floods. This lower level of monitoring reflects the fewer Project interactions that are applicable when the Project is not in operation and flood water is not being retained within the off-stream reservoir.

As the monitoring program progresses through construction, dry operation, and flood operation it will be adapted as necessary to address observed effects on groundwater levels and groundwater quality. Adaptations may include augmentation of the monitoring network and/or changes to the monitoring frequency or analytical parameters in these areas.

As of the end of the current monitoring period, the following monitoring Tier 2 wells have been sampled eight times and the baseline dataset is deemed complete at these locations:

- MW16-1-15
- MW16-2-6
- MW16-7-5
- MW16-8-8 and MW16-8-19
- MW16-10-15
- MW16-11-15
- MW16-22-26

Tier 2a and Tier 3 monitoring wells have been sampled between 3 and 6 times and, as such, baseline sampling will continue at these wells until 8 sampling events have been completed.

Figure 2.2 Overview Summary of Groundwater Monitoring Program

		Baseline (Highly Comprehensive)			
	Well Count	Frequency	PS1	PS2	PS3
Tier 1					
Tier 2	28	C	C	I	I
Tier 2a	2	C	C	I	I
Tier 3	9	C	C	I	I

		Construction (Medium Comprehensiveness)			
	Well Count	Frequency	PS1	PS2	PS3
Tier 1	TBD	C			
Tier 2	28	C	C	I	I
Tier 2a	2	C	C		
Tier 3	9	C	C		

		Dry Operations (Least Comprehensive)			
	Well Count	Frequency	PS1	PS2	PS3
Tier 1	TBD	C	C	I	
Tier 2	28	C	C	I	
Tier 2a	2	C	C		
Tier 3	9	C	C		

		Flood/Event Operations (Most Comprehensive)			
	Well Count	Frequency	PS1	PS2	PS3
Tier 1	TBD	C	C	E	E
Tier 2	28	C	C	E	E
Tier 2a	2	C	C	E	
Tier 3	9	C	C	E	

Frequency	C - Continuous
	I - Intermittent
	E - Event Based
Parameter Suite	PS1 - Temperature and EC
	PS2 - potability, major ions, bacteriological, DOC
	PS3 - dissolved metals, nutrients, BTEX, F1-F2 hydrocarbons

2.4.4 Groundwater Monitoring and Sampling Protocols

Data logging pressure transducers and multi parameter sondes are installed in Tier 2 and Tier 3 monitoring wells. This equipment measures and records near continuous (i.e. hourly) water level (pressure), temperature, and electrical conductivity (LTC loggers). Data logging pressure transducers (no electrical conductivity) were also installed at the Tier 2a monitoring wells. Near continuous pressure measurement will also be measured in Tier 1 wells using either pressure transducers or vibrating wire piezometers.

The following field procedures are used during monitoring to measure groundwater levels and to collect the groundwater samples:

- The depth to water at each monitoring well is measured and recorded.
- Each Tier 2 monitoring well is purged using its own dedicated inertial pump system or bailer until three well volumes are removed or until they are dry. Tier 3 domestic wells are purged using existing well pumps for a minimum of 15 minutes and until stabilization of field parameters (dissolved oxygen [DO], oxidation-reduction potential [ORP], pH, EC) is achieved.
- Water samples are collected into laboratory supplied containers within a day of purging (unless additional time is required for water level recovery) following laboratory instructions for filtering, preservation/treatment, and temperature moderation. Samples are labeled at the time of collection with the site number, the date of collection, and the analysis required.
- Field measurements of combustible headspace vapours, DO, ORP, pH, EC and temperature are collected at the time of sample collection.
- Quality assurance/quality control (QA/QC) samples are collected at a rate of approximately 10 percent (%) of the total samples. Duplicate samples for quality control are obtained by rinsing a clean container with formation water, discarding the rinse water and then collecting the required sample volume. The sample is split into two aliquots and placed into two different bottles with one bottle identified under a different sample name and the second bottle under the regular sample number. The laboratory is not informed of the nature of the sample. Demineralized water blanks are also collected during the sampling periods to determine bottle cleanliness and the effects of sample transport, handling, and collection techniques. QA/QC water samples are given realistic sample numbers and submitted as groundwater samples.

The samples are delivered to a Canadian Association for Laboratory Accreditation (CALA) accredited laboratory using standard chain of custody protocols. Chain of custody documents are included along with the laboratory reports in Appendix D.

3 2023-2024 Groundwater Monitoring Programs

The potential Project interactions that could lead to effects on groundwater resources vary depending upon the specific location and Project phase. The potential Project interactions for the baseline and construction phases included in this reporting period are described below.

During baseline data collection there was comprehensive baseline monitoring ongoing prior to Project disturbances. The baseline period will continue through construction and up until operation in areas in and around the reservoir where no construction activities will take place. The intent of baseline monitoring is to understand a wide range of hydrochemical parameters and their potential natural variability in location and time. The baseline monitoring program seeks to understand local seasonal variation in water levels and hydrochemistry and is intended to establish a point of comparison that can be used to assess changes that could be attributable to the Project in the future.

During construction, medium comprehensive monitoring is continuing to gather baseline data in some areas as noted above, as well as to monitor potential effects of construction activities that could lead to disturbances to the groundwater system such as construction dewatering or deep excavation along the diversion channel.

The following sections describe the groundwater monitoring network development and the monitoring that was completed during the 2023-2024 reporting period. The scopes of work for drilling and well installation and for groundwater monitoring were dependent on land access constraints related to private property access permissions, progression of construction and weather conditions for fieldwork.

3.1 August 2023 Well Installation

Monitoring well installation activities were completed on August 22 and 23, 2023 to continue to relocate monitoring wells outside of the construction footprint and to continue to establish the permanent monitoring network. Tier 2 monitoring well RRMW16-17-8 was relocated onto Alberta Transportation and Economic Corridors owned land and monitoring well RMW16-15-39 was installed to replace previously damaged Tier 2 well MW16-15-39.

The new well locations are presented in Figure 2.1 and the borehole log including lithological descriptions and monitoring well completion details are included in Appendix B.

3.2 October 2023 Groundwater Monitoring

The groundwater monitoring well networks were monitored and sampled between October 23 to 27, 2023. The October 2023 monitoring event included:

- 26 - Tier 2/Tier 2a wells
- 5 - EIA Project Wells
- 6 - Tier 3 wells

The monitoring wells included in the October 2023 monitoring event are summarized in Table 1. The EIA Project Wells continue to be monitored and sampled for baseline purpose as discussed in Section 2.3.1. Access restrictions, damaged or destroyed wells or inability to locate wells prevented monitoring and sampling of the remaining wells as noted in the table. Monitoring and laboratory analysis was completed as described in the sampling protocols in Section 2.4.4.

Data loggers were downloaded and calibrated in October 2023. Data logger pressure, temperature and electrical conductivity data are presented in Appendix C.

3.3 May 2024 Groundwater Monitoring and Surveying

The groundwater monitoring well networks were monitored and sampled between May 13-17, 2024. The monitoring event included:

- 26 - Tier 2/Tier 2a wells
- 5 - EIA Project Wells
- 7 - Tier 3 wells

The monitoring wells included in the May 2024 monitoring event are summarized in Table 1. Access restrictions, damaged or destroyed wells or inability to locate wells prevented monitoring and sampling of the remaining wells as noted in the table. Monitoring and laboratory analysis was completed as described in the sampling protocols in Section 2.4.4.

Data loggers were downloaded and calibrated in May 2024. Data logger pressure, temperature and electrical conductivity data are presented in Appendix C.

Replacement Tier 2 monitoring wells were also surveyed for horizontal coordinates and top of casing and ground elevation to support the interpretation of water level data for the monitoring program. The logger at WS41-2 was not downloaded because the well could not be accessed and the logger at WS81-2 could not be downloaded because mice had chewed the direct read cable inside the well casing and it was no longer functioning. The cable will be replaced during the fall 2024 monitoring program.

4 Results

4.1 Groundwater Levels

Data logger data are presented in Appendix C. Loggers had been installed in a number of wells in 2016 with quasi-continuous hourly measurements of pressure (head above logger) and temperature recorded from 2016 to 2024. The data from these monitoring wells (MW16-1-15, MW16-6-11, MW16-6-20, MW16-8-19 and MW16-18-10) show the natural water level fluctuation over the medium term (i.e., seasonal variation over 9 years). Groundwater levels varied by approximately 1.3 m and 3.2 m between minimum and maximum levels prior to the current monitoring period (i.e. 2016-2023) and showed similar ranges in variation between wells installed in shallow unconsolidated deposits and those installed deeper in bedrock. Within a given calendar year, observations to date indicate that the lowest groundwater levels were generally observed between February and April and the highest levels are generally observed between May and July.

Groundwater temperatures fluctuate in a regular pattern maintaining temperatures between approximately 3 and 7 °C throughout the year. A lag in temperature change is observed with the lowest temperatures observed in the summertime and the highest temperatures observed in the winter.

Electrical conductivity measured by the data loggers in 2023 and 2024 was relatively stable with some seasonal fluctuation. Shallow monitors such as MW16-7-5 had increased variability in EC values likely due to seasonal changes in meteoric recharge considering water level fluctuation is also greater in these monitoring wells.

In RMW16-16-17, EC values have shown significant increases and decreases following each of the monitoring events. Despite recalibration during monitoring events, there may be an issue with the EC sonde and its calibration. Sharp changes are also noted after monitoring /calibration events at RMW16-19-10.

Construction of the channel and dam and dewatering of areas near the Tier 2 monitoring network began in 2022 and continued through the current reporting period. Construction activities had the potential to affect the water levels in wells near the dam and diversion channel.

Changes in water levels near the diversion channel included:

- Water levels in Project Well MW16-6-11 decreased approximately 0.75 cm following the May 2021 groundwater monitoring event and continued to decrease until June 2023. The average water level remained lower in 2023 and 2024 with levels approximately 1.2 m lower compared to 2016 to 2021. Water levels have remained stable in the deeper nested monitoring well at this location (MW16-6-20). These nested EIA Project Wells are located approximately 150 m from the construction area for the diversion channel outlet. The decrease in water level is interpreted to be a result of construction dewatering for the outlet structure. Considering the deeper monitoring well is not affected, the decrease is not considered to be a result of groundwater extraction from the nearby well (GIC Well ID 1023594) which is completed at approximately 37 metres below ground level (m BGL).

- Tier 2 monitoring well RMW16-16-17 is located approximately 50 metres (m) hydraulically downgradient of the current diversion channel construction. Groundwater levels decreased approximately 1.8 m at this location between July 2023 and May 2024. These changes are interpreted to be the result of excavation and dewatering of the diversion channel.
- Nested Tier 2 monitoring wells RMW16-18-5 and RMW16-18-13 are located approximately 100 m hydraulically downgradient of the diversion channel construction and approximately 120 m from a dugout constructed to store water for the Project. Water levels decreased by approximately 3.3 m in both the shallow and deeper monitoring wells between July and October 2023 before rebounding approximately 1.6 m between October 2023 and February 2024. These changes are interpreted to be the result of excavation and dewatering of the diversion channel.
- Nested Tier 2 monitoring wells RMW16-19-10 and RMW16-19-19 are located approximately 100 m hydraulically downgradient of the diversion channel construction near the outlet end. Water levels in the shallow monitoring well decreased approximately 1 m between September 2023 and January 2024 before increasing between January and May 2024. Similar but more muted changes are observed in the deeper monitoring well. It is not clear whether the decreases are a continuation of previously observed decreasing trends or if they may be a result of construction activities.
- Nested Tier 2 monitoring wells MW21-6-7 and MW21-6-12 are located approximately 100 m hydraulically upgradient of the diversion channel construction. Drawdown began to be observed at this location in September 2023. Water levels in both the shallow and deep monitoring wells decreased approximately 3 m between September 2023 and February 2024 before increasing between February and May 2024. Decreased EC was observed during the drawdown period at MW21-6-7 whereas an increase in EC was observed at MW21-6-12. These changes are interpreted to be the result of excavation and dewatering of the diversion channel.
- Tier 2b monitoring wells WS81-01 and WS81-02 are located approximately 625 m and 775 m, respectively from the current diversion channel construction footprint. The water levels at WS81-01 were variable due to pumping but the maximum levels (i.e. non-pumping) decreased approximately 3.7 m between November 2023 and April 2024. Water levels then increased approximately 2.2 m between April and May 2024. There is a lot of fluctuation and noise in the data, however the late 2023 and early 2024 decreases appear similar to the drawdown observed closer to the channel and may be the result of Project effects. The water levels at WS81-02 could not be evaluated because mice had damaged the direct read cable. The cable will be replaced and data downloaded during the next monitoring event.

Changes in groundwater levels near the dam included:

- Tier 2 monitoring well MW16-21-11 is installed hydraulically downgradient near the west end of the dam. The well had been dry or had limited water over the historical monitoring record but could not be located during recent monitoring events including October 2023 and May 2024 and may have been damaged due to construction in the area. The well had been installed with the top of casing below the cultivation depth of the field making it difficult to locate. It is recommended that the well be replaced following construction in the area.

- Tier 2 monitoring well MW16-22-26 is located approximately 80 m hydraulically downgradient of the current dam construction footprint. Water levels increased by approximately 0.75 m between October 2022 and January 2023 and increased by approximately 1.8 m between July and November 2023. Water levels then decreased by approximately 1 m between December 2023 and May 2024 when the data logger was downloaded. While the increases are within the potential range of natural variation, the timing of the increase is not consistent with observations across the rest of the monitoring network where water levels are generally stable or decrease over those periods. As such, the increases are interpreted to be the result of a temporary increase in pore pressure related to construction of the dam.
- Tier 2 nested monitoring wells RMW16-23-7/RMW16-23-14/RMW16-23-32 were installed approximately 360 m hydraulically downgradient of the current dam construction footprint. Increases in pore pressure observed at MW16-22-26 were not observed at this location.

In addition to changes near the construction activities, there was also changes noted at MW16-8-19 located greater than 1.6 km from the current construction activities. Water levels at this monitoring well decreased approximately 0.5 m in June 2022 and have remained lower with intermittent drawdown of up to an additional 1.5 m. These changes are interpreted to be the result of the installation of a groundwater supply well (Alberta Water Well Information Database (AWWID) 1023570) installed by the landowner approximately 20 m from the monitoring well location in 2022.

Sporadic changes in water level, temperature and electrical conductivity were observed at monitoring well RMW16-13-37. This monitoring well is located greater than 500 m from the nearest construction and is unlikely to have been impacted by the Project. Considering the well is flush mounted near the shoulder of Springbank Road and nature of the readings, it is likely a surface seal integrity issue. The integrity will be evaluated during the next monitoring event and repairs will be made if possible.

4.1.1 Groundwater Level Triggers

Triggers for groundwater levels will be established based upon the expected variability defined during the baseline monitoring program for each individual monitoring well. As mentioned in previous sections, the baseline period is not strictly limited to pre-construction but is continuing through the construction period for some monitoring wells as discussed in Section 2.2. For example, some monitoring wells that are distal to the construction footprint will continue to gather baseline data up until the first operational flood event to account for longer term natural variability.

It is expected that some monitoring well locations will naturally have a higher variability than others. Monitoring wells that are installed near Elbow River and within the alluvial deposits will exhibit a seasonal trend similar to surface water, with additional precipitation event-based “spikes”. Monitoring wells that are installed in low permeability unconsolidated deposits or deeper into bedrock would exhibit a more muted seasonal variability since they are not directly influenced by the surface water flow regime.

Construction of the channel and dewatering of areas near the Tier 2 monitoring network began in 2022 and continued through the current reporting period. Construction activities had the potential to affect the water levels in wells discussed in Section 4.1. Water level measurements at wells located away from the current construction footprint are still considered part of the baseline with respect to groundwater levels.

Groundwater level triggers include:

- potential development of flowing artesian conditions during flooding or reservoir retention
- a decrease in water level in a well(s) resulting from construction dewatering or permanent drawdown near the diversion channel to the point where the pre-existing well(s) are no longer useable

Neither of the trigger conditions were observed at any of the Project or domestic monitoring wells in 2023 or 2024.

4.2 Groundwater Quality

4.2.1 Tier 2 and EIA Project Wells

Analytical data for the fall 2023 and spring 2024 monitoring events for the Tier 2 and EIA Project wells are presented in Table 2 and laboratory analytical reports are included in Appendix D for reference. Historical data are also presented in Table D.1 in Appendix D for reference.

The full analytical suite of parameters (PS3) described in Section 2.4.1 was analyzed for each monitoring well. Table 2 includes the Alberta Tier 1 Soil and Groundwater Remediation Guidelines (Alberta Tier 1 Guidelines) (AEPA 2023) for fine grained soils in an agricultural land use setting and the Guidelines for Canadian Drinking Water Quality (GCDWQ) (Health Canada 2023). Guidelines are provided only for comparison purposes and discussion. Guidelines requiring parameter specific calculations are based on average groundwater concentrations across the monitoring network.

A total of 13 Tier 2 and EIA Project wells completed in the unconsolidated deposits were sampled in October 2023 and May 2024. The total dissolved solids (TDS) concentrations in the unconsolidated deposits were similar to the historical results. Excluding new replacement well RRMW16-17-8, the TDS concentrations ranged from 580 to 5,900 milligrams per litre (mg/L) with an average concentration of 2,003 mg/L. RRMW16-17-8 was installed August 2023, adjacent to a wetland which is likely a groundwater discharge feature with evapotranspiration concentrating salts in the shallow subsurface. The TDS concentrations naturally exceed both referenced guidelines and are considered slightly to moderately saline. At four locations (MW16-2-6, MW16-10-15, RMW16-16-17, and RRMW16-17-8) the TDS concentrations exceeded the definition of “non-saline water” (TDS <4,000 mg/L) under the Alberta’s Water (Ministerial) Regulation. Elevated TDS had been observed historically at these locations and the latest results were consistent with historical results.

A total of 14 Tier 2 and EIA Project wells completed in bedrock were sampled in October 2023 and May 2024. The TDS concentrations in the bedrock deposits were similar to the historical (2016-2023) results and ranged from 250 to 4,800 mg/L with an average concentration of 1,445 mg/L. The bedrock TDS concentrations remain lower than in the surficial deposits but still exceed referenced guidelines in the monitoring wells sampled and are considered slightly saline. The dominant cations contributing to the TDS is sodium (calcium and magnesium to a lesser extent) and the dominant anions are sulphate and bicarbonate. Chloride concentrations are generally low, however, exceedances of the 100 mg/L Alberta Tier 1 Guideline have been noted at MW16-8-19 with concentrations within the range of historical results. An elevated chloride concentration of 220 mg/L was also noted in RMW16-13-37 located near the shoulder of Springbank Road. The elevated chloride may be the result of a surface seal integrity issue as discussed in Section 4.1 and the application of road salt.

Nutrient concentrations including ammonia, nitrate, nitrite, phosphate and total Kjeldahl nitrogen are analyzed because they are contaminants of potential concern in agricultural settings. Nitrate, nitrite and ammonia concentrations were low and below guidelines in all samples in October 2023 and May 2024. Phosphate concentrations were also low and/or below the laboratory detection limit in most samples.

Dissolved metals concentrations were generally within the range of expected concentrations for monitoring wells completed in glacial deposits and shallow bedrock in southern Alberta. Dissolved iron concentrations exceeded the 0.3 mg/L guideline at two locations with a maximum concentration 0.7 mg/L at MW21-3-15 in May 2024. Manganese concentrations exceeded the referenced guidelines (0.05 mg/L) during one or both monitoring events at all locations except MW16-8-8 and MW16-8-19 with values ranging from <0.004 to 2.9 mg/L. Selenium exceeded the 0.001 mg/L Alberta Tier 1 Guideline in four monitoring wells with concentrations similar to historical results and a maximum concentration of 0.0071 mg/L at MW16-8-19 in October 2023. Uranium concentrations exceeded the 0.01 mg/L guidelines at seven monitoring wells. Results were consistent with historical conditions and all uranium exceedances were in wells completed in unconsolidated deposits, which is not unexpected given the prevalence of uranium in the glacial material. Sporadic Alberta Tier 1 Guideline exceedances of aluminum, copper, strontium and zinc were also noted in the 2023 and 2024 analytical data as have been observed in the historical results.

Mercury is a contaminant of potential concern for dam reservoir areas due to the potential for methylmercury to form during the decomposition of organic matter. Dissolved mercury was below the laboratory detection limit in all samples in 2022 and 2023. Historical exceedances have been noted at RMW16-13-37, RMW16-17-10, MW16-22-26, MW16-23-14, and MW21-6-7. Total mercury was also analysed in all samples with concentrations ranging from <0.0000019 to 0.00075 mg/L which is within the range of historical results.

Hydrocarbon concentrations were below Alberta Tier 1 Guidelines at all monitoring wells in October 2023 and May 2024. Historical exceedances of F2 (C10-C16) fraction hydrocarbons had been observed at MW16-2-6. The concentration at MW16-2-6 exceeded the Alberta Tier 1 Guideline in May 2021 with a concentration of 5.9 mg/L but decreased and has remained below the guideline since 2022 and reported a concentration of 0.08 mg/L in May 2024.



Bacteriological parameters including Escherichia coli (E. Coli), fecal coliform, total coliforms, and heterotrophic plate counts (HPC) were enumerated for all samples. Sediment in the samples affected the detection limits for the bacteriological parameters as has also been the case for historical monitoring events. While the detection limits were not low enough to determine if the water is safe for human consumption in most samples, it does provide general information on the bacteriological levels and potential for pre-existing impacts in the shallow groundwater.

HPC's were included in the analytical suite to provide information on the level of bacteriological activity. HPC concentrations varied significantly from 2 colony forming unit (cfu)/100 millilitre (mL) at RMW16-23-32 to greater than 240,000 cfu/100 mL at RMW16-15-39. No spatial or depth correlation was evident in the HPC data. E. coli counts were generally below the detection limits (up to 100 most probable number (mpn)/100 mL) but were detected at MW16-11-14 in May 2024 (10 mpn/100 mL) and RMW16-13-37 1 mpn/100 mL). Total coliform bacteria ranged from <1 to 23,000 mpn/100 mL. Fecal coliform bacteria also exceeded guidelines at two locations with concentrations of up to 31 mpn/100 mL at RMW16-13-37, consistent with historical results.

4.2.2 Tier 2A, Tier 3 and One-Time Domestic Wells

The Tier 2a, Tier 3 and One-Time Domestic Wells are grouped together for the purposes of discussion considering they are domestic and or stock watering wells as opposed to monitoring wells installed specifically for the Project. Analytical data for the October 2023 and May 2024 monitoring events are presented Table 3 and laboratory analytical reports are included in Appendix D for reference.

TDS concentrations were lower in the Tier 2a, Tier 3 and domestic wells compared to the Tier 2 monitoring wells, averaging 730 mg/L in wells known to be completed in bedrock (some completion details are unknown) and 333 mg/L in wells completed in shallow alluvial deposits. The bedrock wells had similar major ion chemistry to the Tier 2 and EIA Project wells in the previous section. The dominant cations contributing to the TDS in the bedrock wells are sodium (calcium and magnesium to a lesser extent) and the dominant anions are sulphate and bicarbonate. In contrast, the groundwater in the alluvial deposits is calcium and magnesium bicarbonate type water.

Nutrient concentrations including ammonia, nitrate, nitrite, phosphate and total Kjeldahl nitrogen were generally low. Nitrate concentrations exceeded the 3.0 mg/L-N Alberta Tier 1 Guideline in WS81-01 in October 2023 and May 2024 and also exceeded the 10 mg/L-N Guidelines for Canadian Drinking Water Quality (CGDWQ) in the May 2024 sample with a concentration of 12 mg/L-N. Nitrate has historically been elevated at this location.

Dissolved metals concentrations were generally lower than in the Project wells in Section 4.2.1, however, exceedances of Alberta Tier 1 Guidelines were noted for copper, manganese, selenium, sodium and zinc in some samples. The only exceedances of the CGDWQ were for manganese (5 locations) and sodium (2 locations). Total and dissolved mercury concentrations were low or below laboratory detection limits in all samples.

Hydrocarbon concentrations were below their respective guideline concentrations at all Tier 2a, Tier 3 and One-Time Domestic Wells.

Bacteriological parameters including E. Coli, fecal coliform, total coliforms and HPC were enumerated for all samples. HPC concentrations varied widely from 1 cfu/100 mL at WS82-01 in October 2023 to >2,400 cfu/100 mL in the May 2024 samples from NE20-R3-01 and WS11-01. Total coliform bacteria ranged from <1 to >2,300 mpn/100 mL at WS11-1 in October 2023. E. coli and fecal coliforms were below laboratory detection limits in all samples except NE7-R3-01 which reported a E. coli count of 1 mpn/100mL in October 2023 and a fecal coliform count of 1 mpn/100 mL in May 2024.

4.2.3 Groundwater Quality Triggers

No Project related effects on groundwater quality were identified based on the review of the October 2023 and May 2024 groundwater monitoring program data.

After a sufficient baseline dataset has been established at a monitoring well (approximately eight monitoring events where possible), trigger values will be determined for parameters that are naturally present at detectible concentrations (e.g., chlorides) to identify changes in groundwater quality that fall outside of the baseline conditions for a given well. As of May 2024, monitoring wells have been sampled eight times or less. Upper confidence limit (UCL) values will be calculated for the eight monitoring wells with eight monitoring events listed in Section 2.4.3 and will be presented in the next monitoring report in 2025.

Triggers will be developed for each individual monitoring well and will be based on a calculated UCL. The baseline historical groundwater monitoring data for each well will be screened and outliers removed prior to the calculation of each UCL. Results that are more than two standard deviations above or below the mean of the historical data will be considered outliers. The UCL will be calculated as follows:

$$UCL = x + Z^*s$$

Where:

x = sample mean

Z = multiplier (a value of 4.5 is considered appropriate for groundwater monitoring [Gibbons 1999])

s = sample standard deviation

United States Environmental Protection Agency (US EPA 1989) indicated that the overall confidence levels for the control limits calculated using Z=4.5 is 95% based on a minimum of eight historical monitoring events.

Where the standard deviation is very large or very small, the coefficient of variation (Cv) will be calculated for the UCL as follows:

Where Cv < 0.05 UCL = 1.225*x

Where Cv > 0.5 UCL = 3.25*x

UCL values for parameters that are not naturally present in groundwater (e.g., BTEX, F1-F3 hydrocarbons) will be considered to be equal to the lesser of five times the laboratory reportable detection limit or the referenced guideline for that parameter.

UCL trigger values will not be determined for monitoring wells where impacts are currently above the relevant guidelines. Instead, triggers at monitoring wells in the affected areas will be based on increasing temporal trends in groundwater quality over four monitoring events. However, sampling frequency in relation to seasonal variation may also need to be taken into consideration.

Once the baseline data set has been established, non-parametric trend analysis will be conducted for each groundwater monitoring well to assess changes in groundwater quality that may be due to Project operations. Trend analysis will be conducted for select analytes that are most indicative of potential changes in groundwater quality related to Project operations. The results of the trend analysis will be included in the annual groundwater monitoring reports for the Project.

4.2.4 QA/QC Analytical Results

Four field duplicate sample sets, one field blank and one trip blank were prepared during each of the October 2023 and May 2024 monitoring events. The QA/QC samples were prepared to evaluate the precision or reproducibility of the analytical data between samples. The relative percent difference (RPD) between the sample and duplicate results was calculated for each sample or, when the parameter result was within five times the detection limit, the Absolute difference (AD) between the sample and duplicate was calculated. An RPD of 40% or less, or an AD of less than two times the detection limit, is considered acceptable for duplicate groundwater samples (CCME 2016).

The duplicate QA/QC analytical results are presented along with the analytical data in Table 2 and Table 3. Comparison of the duplicate sample results indicated that 99% (500 of 504 results) of the duplicate sample results meet the criteria referenced above. The four results that did not meet the criteria were all bacteriological which is a result of the inherent variability in culturing and enumerating bacterial samples. Overall, the reproducibility of the data is good and the analytical results are considered valid.

Field and trip blank sample results were below detection limits or within two times the detection limit except for dissolved molybdenum in the field blank (23-14) from October 2023 and the heterotrophic plate count in the trip blank (SR24-06) from May 2024. The reported molybdenum concentration in the field blank was 0.00092 mg/L compared to the detection limit of 0.0002 mg/L. The heterotrophic plate count in the trip blank was >2,400 mpn/100 ml, which indicates a potential issue with the laboratory cleanliness or procedure.

Laboratory QA/QC procedures and analysis are included with the analytical results in Appendix D. The quality assurance reports include analysis of matrix spikes, QC standards, blanks and calibration checks.

5 Conclusions and Recommendations

Groundwater monitoring network development and groundwater monitoring activities continued to be completed during the July 2023 to June 2024 reporting period. Monitoring well installation activities were completed in 2023 to continue to relocate monitoring wells outside of the construction footprint and to continue to establish the permanent monitoring network. Tier 2 monitoring well RRMW16-17-8 as relocated onto TEC owned land and monitoring well RMW16-15-39 was installed to replace previously damaged Tier 2 well MW16-15-39.

Groundwater monitoring and sampling was completed in October 2023 and May 2024. The monitoring and sampling included the Tier 2 monitoring wells, Tier 2a monitoring wells, Tier 3 domestic wells, and the legacy EIA Project wells.

The monitoring programs included measurement of groundwater levels, field parameters (DO, ORP, pH, EC) and downloading and calibration of data logging pressure transducers. The transducers are deployed to measure and record near continuous water level (pressure), temperature, and electrical conductivity at the Tier 2, Tier 2a and Tier 3 monitoring wells. Groundwater samples were collected and submitted to the laboratory for routine potability parameters, major ions, bacteriological parameters, DOC, dissolved metals, nutrients, BTEX, and F1 to F2 fraction hydrocarbons.

Construction of the dam and diversion channel and dewatering of a number of areas near the Tier 2 monitoring network continued throughout the current reporting period. Construction activities had the potential to affect the water levels in wells near the dam and diversion channel. Changes in water levels at monitoring wells near these areas included:

- Water levels at eight of the Tier 2 monitoring wells located near the diversion channel decreased between 1.0 and 3.3 m as a result of construction and dewatering of the channel. Most decreases were observed over the second half of 2023 with levels rebounding at some wells over the spring of 2024.
- The water levels at Tier 2b monitoring well WS81-01, located approximately 625 m from the current diversion channel construction footprint were variable due to pumping but the maximum levels (i.e. non-pumping) decreased approximately 3.7 m between November 2023 and April 2024. Water levels then increased approximately 2.2 m between April and May 2024. The late 2023 and early 2024 decreases appear similar to the drawdown observed closer to the channel and may be the result of Project effects.
- Tier 2 monitoring well MW16-22-26 is located approximately 80 m hydraulically downgradient of the current dam construction footprint. Water levels increased by approximately 0.75 m between October 2022 and January 2023 and increased by approximately 1.8 m between July and November 2023. Water levels then decreased by approximately 1 m between December 2023 and May 2024. As such, the increases are interpreted to be the result of a temporary increase in pore pressure related to construction of the dam. Increased pressure was not observed at nested monitoring wells RMW16-23-7/RMW16-23-14/RMW16-23-32 approximately 360 m hydraulically downgradient of the current dam construction footprint.

Changes in water levels that are potentially related to Project effects are limited to localized areas near the construction activities as anticipated in the EIA and water level trigger conditions (i.e., increases resulting in flowing artesian conditions or decreases such that existing wells are no longer useable) were not observed at any of the Project or domestic monitoring wells in 2023 or 2024.

Groundwater quality during the October 2023 and May 2024 monitoring events was consistent with historical results and, while there are numerous exceedances of the Alberta Tier 1 Guidelines (AEPA 2023) and the Guidelines for Canadian Drinking Water Quality (Health Canada 2023), no exceedances were attributed to Project effects. Therefore, Project effects on groundwater quality have not been identified at this point in the construction phase.

The following recommendations are made for the next monitoring period:

- continue semi-annual groundwater monitoring for potential construction related effects and as additional baseline data gathering away from construction areas
- establish the final Tier 3 monitoring location shown as “TBD” on Figure 2.1, if possible based on private landowner agreement
- replace the direct read cable for the data logger at WS81-02
- replace the data logger at MW16-8-8
- the next groundwater monitoring report should cover the period between July 1, 2024 and June 30, 2025

6 References

AEPA (Alberta Environment and Protected Areas). 2023. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division.

CCME (Canadian Council of Ministers of the Environment). 2016. Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment. Volume 1 Guidance Manual.

Fenton, M.M., E.J. Waters, S.M. Pawley, N. Atkinson, D.J. Utting, and K. Mckay. 2013. Surficial geology of Alberta; Alberta Energy Regulator, AER/AGS Map 601, scale 1:1 000 000

Glass, D.J. [editor]. 1990. Lexicon of Canadian Stratigraphy, Volume 4: Western Canada, including British Columbia, Alberta, Saskatchewan and southern Manitoba. Canadian Society of Petroleum Geologists, Calgary.

Gibbons, Robert D. 1999. Use of Combined Shewhart-CUSUM Control Charts for Groundwater Monitoring Applications. In Groundwater, Volume 37, No. 5. September-October, 1999.

Health Canada. 2023. Guidelines for Canadian Drinking Water Quality—Summary Table. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.

HCL (Hydrogeological Consultants Ltd.) 2002. M.D. of Rocky View No. 44 Part of the South Saskatchewan River Basin Tp 021 to 029, R25 to 29, W4M & Tp 023 to 029, R01 to 06, W5M Regional Groundwater Assessment. March 2002.

Jerzykiewicz, T. 1997. Stratigraphic Framework of the Uppermost Cretaceous to Paleocene Strata of the Alberta Basin. Bulletin 510. Geological Survey of Canada

Langenberg, C.W., F.J. Hein, K. Bieber, J. Losert, H. Berhane, and D.K. Cotterill. 2000. Regional geology of the Upper Blairmore Group and Bow Island Formation: a subsurface study in southwestern Alberta; Alberta Energy and Utilities Board, EUB/AGS Earth Sciences Report 2000-06, 68 p.

Moran, S. 1986. Surficial geology of the Calgary urban area; Alberta Research Council, ARC/AGS Bulletin 53, 57 p.

Pana, D.I., and R. Elgr. comp. 2013. Geology of the Alberta Rocky Mountains and Foothills; Energy Resources Conservation Board, ERCB/AGS Map 560, scale 1:500,000.

Prior, G.J., B. Hathway, P.M. Glombick, D.I. Pană, C.J. Banks, D.C. Hay, C.L. Schneider, M. Grobe, R. Elgr, and J.A. Weiss. 2013. Bedrock geology of Alberta; Alberta Energy Regulator, AER/AGS Map 600, scale 1:1 000 00

Stantec (Stantec Consulting Ltd.). 2019. Springbank Off-stream Reservoir Project Environmental Impact Assessment Hydrogeology Technical Data Report Update. Prepared for Alberta Transportation, May 2019.

Stantec. 2021. Springbank Off-stream Reservoir Project Groundwater Monitoring Plan. Prepared for Alberta Transportation, December 2021.

US EPA (United States Environmental Protection Agency). 1989. Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance. Office of Solid Waste Management Division, US EPA.

Waterline (Waterline Resources Inc.). 2011. Groundwater Evaluation and Monitoring Plan Elbow River Watershed Sub-regions Twps 018 to 024, Rges 29W4 to 09W5 Alberta. Prepared for Alberta Environment. Calgary, Alberta.

Tables

Springbank Off-stream Reservoir Project 2024 Groundwater Monitoring Report

October 2024

Table 1 Groundwater Monitoring Summary

Monitoring Well	Monitoring Tier	Unit
MW16-1-15	Tier 2	Bedrock
MW16-2-6	Tier 2	Unconsolidated
RMW16-5-12	Tier 2 (replacement)	Bedrock
MW16-7-5	Tier 2	Unconsolidated
MW16-8-8	Tier 2	Unconsolidated
MW16-8-19	Tier 2	Bedrock
MW16-10-15	Tier 2	Unconsolidated
MW16-11-15	Tier 2	Unconsolidated
MW16-12-3	Tier 2	Unconsolidated
RMW16-13-37	Tier 2	Bedrock
MW16-14-33	Tier 2	Bedrock
RMW16-15-39	Tier 2	Bedrock
RMW16-16-17	Tier 2 (replacement)	Bedrock
RRMW16-17-18	Tier 2 (replacement)	Unconsolidated
RMW16-18-5	Tier 2 (replacement)	Unconsolidated
RMW16-18-13	Tier 2 (replacement)	Bedrock
RMW16-19-10	Tier 2 (replacement)	Unconsolidated
RMW16-19-19	Tier 2 (replacement)	Bedrock
MW16-21-11	Tier 2	Bedrock
MW16-22-26	Tier 2	Unconsolidated
RMW16-23-7	Tier 2 (replacement)	Unconsolidated
RMW16-23-14	Tier 2 (replacement)	Bedrock
RMW16-23-32	Tier 2 (replacement)	Bedrock
MW21-3-5	Tier 2	Unconsolidated
MW21-3-15	Tier 2	Bedrock
MW21-6-7	Tier 2	Unconsolidated
MW21-6-12	Tier 2	Bedrock
WS81-01	Tier 2a	Bedrock
WS81-02	Tier 2a	Bedrock
NE20-R3-01	Tier 3	Bedrock
SW35-R4-01	Tier 3	Bedrock
NE7-R3-01	Tier 3	Unconsolidated (alluvial)
SW11-R4-02	Tier 3	Bedrock
WS11-01	Tier 3	Bedrock
WS41-02	Tier 3	Bedrock
WS51-01	Tier 3	Bedrock
WS62-01	Tier 3	Unconsolidated (alluvial)
MW16-3-7	EIA Project Well	Unconsolidated
MW16-4-22	EIA Project Well	Bedrock
MW16-6-11	EIA Project Well	Unconsolidated
MW16-6-20	EIA Project Well	Bedrock
MW16-25-9	EIA Project Well	Unconsolidated
	decomissioned monitoring wells	

X - monitored and sampled (where sufficient volume)
CNL - could not locate
NA - no access
NR - not required (one-time sampling completed)
ISV - insufficient volume for sample collection

Table 2 Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-1-15		MW16-2-6		RMW16-5-12	
Sample Date				27-Oct-23	14-May-24	23-Oct-23	15-May-24	23-Oct-23	15-May-24
Sample ID				MW16-1-15	MW16-1-15	MW16-2-6	MW 16-2-6	RMW16-5-12	RMW 16-5-12
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV
Laboratory Work Order				C387774	C434263	C386148	C435079	C386148	C435079
Laboratory Sample ID				CDB055	CNN527	CCP849	CNR021	CCP851	CNR022
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	Unconsolidated	Unconsolidated	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ						
Field Parameters									
Dissolved Oxygen, Field	mg/L	n/v	n/v	3.6	1.9	6.1	6.1	5.1	3.5
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**2,100[A]**	1.994	**6,534[A]**	6.534	858	0.732
Oxidation Reduction Potential, field	mV	n/v	n/v	85.3	-41.5	27.4	27.4	16.5	-7.7
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.33	7.58	**6.66[B]**	**6.66[B]**	7.16	7.74
Temperature, Field	deg C	n/v	≤15[B]	5.9	8.5	2.8	2.8	0.9	5.8
Calculated Parameters									
Anion Sum	meq/L	n/v	n/v	28	28	89	89	7.1	8.1
Cation Sum	meq/L	n/v	n/v	30	28	100	97	7.8	9.5
Hardness (as CaCO3)	mg/L	n/v	n/v	1,100	1,100	3,200	3,100	230	320
Ion Balance	%	n/v	n/v	3.7	-	5.4	-	5.0	-
Ion Balance % Difference	%	n/v	n/v	-	1.3	-	4.1	-	8.0
Nitrate	mg/L	13_f[A]	45[C]	<0.044	<0.44	<0.22	<0.22	0.22	<0.044
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.010	<0.10 MI	<0.050 Z8	<0.050 MI	0.049	<0.010
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**1,800[AB]**	**1,700[AB]**	**5,900[AB]**	**5,800[AB]**	380	440
BTEX and Petroleum Hydrocarbons									
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050 EC
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	0.80	<0.10	<0.10
Miscellaneous Inorganics									
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	2.4	2.5	3.2	4.0	1.2	1.3
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**2,100[A]**	**2,200[A]**	**6,100[A]**	**6,500[A]**	670	720
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.89	7.84	8.12	7.90	8.32	8.09
Anions									
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	330	330	460	660	310	360
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	400	400	560	800	370	440
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	≤500_j[B]	**1,000[AB]**	**990[AB]**	**3,800[AB]**	**3,700[AB]**	43	40
Chloride	mg/L	100[A]	≤250[B]	11	11	1.5	1.5	2.3	1.5
Nutrients									
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	0.0033	0.0043	0.0043	0.0034	0.0038
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.037	0.057	0.17	0.20	0.28	0.18
Nitrate (as N)	mg/L	3.0[A]	10[C]	<0.010	<0.10	<0.050	<0.050	0.049	<0.010
Phosphorus, Dissolved	mg/L	n/v	n/v	<0.0030	<0.0030 P2	<0.0030 P2	<0.0030 P2	0.010	<0.0030 P2
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.36	1.22	0.461	4.6	3.4	0.72
Nitrogen	mg/L	n/v	n/v	0.36 DB	1.2 DB	0.461	4.6	3.4 IF	0.72 DB
Metals, Dissolved									
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_a[B]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	0.00033	0.00037	0.00047	0.00056	0.00043	0.00039
Barium	mg/L	2.0[A]	2.0[C]	0.012	0.013	<0.010	<0.010	0.062	0.067
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.098	0.073	0.12	0.10	<0.10	0.10
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	0.000093	0.000053	0.00013	0.00012	<0.000020	<0.000020
Calcium	mg/L	n/v	n/v	260	240	430	420	49	69
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.0010	0.00084	0.0023	0.0020	0.00038	0.00035
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.0010	<0.0010	<0.0010	0.0012	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	<0.060	<0.060	***<0.30***	<0.060
Lead	mg/L	$0.007_{n3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	<0.020	0.021	0.12	0.12	<0.10	<0.020
Magnesium	mg/L	n/v	n/v	120	110	510	500	27	35
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.93[AB]**	**0.86[AB]**	**1.4[AB]**	**1.3[AB]**	**0.045[AB]**	**0.15[AB]**
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0022	0.0028	0.00080	0.00062	0.0018	0.0011
Nickel	mg/L	$0.17_{n3,e}$[A]	n/v	0.0011	0.0014	0.0063	0.0048	0.00095	0.00087
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.50	<0.10
Potassium	mg/L	n/v	n/v	4.2	4.0	9.0	8.3	9.5	6.8
Selenium	mg/L	0.0020[A]	0.05[C]	<0.00020	<0.00020	0.00027	<0.00080 MI	0.0010	0.00025
Silicon	mg/L	n/v	n/v	5.3	4.5	5.3	5.0	<2.5	3.0
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	170	160	**830[AB]**	**790[AB]**	67	70
Strontium	mg/L	n/v	7.0[C]	1.7	1.6	6.4	6.3	0.95	1.4
Sulfur	mg/L	n/v	n/v	390	330	1,400	1,400	15	14
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	0.0016	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0050	0.0042	**0.028[AC]**	**0.025[AC]**	0.0016	0.0014
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	<0.0030	0.0047	<0.0030	<0.0030
Metals, Total									
Mercury	mg/L	0.0000050[A]	0.001[C]	**0.0000241[A]**	**0.000132 DB[A]**	**0.0000088[A]**	**0.00027 DB[A]**	**0.000037[A]**	**0.000122 DB[A]**
Microbiological Parameters									
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<100 MI***	***<1.0***	***<100 SVH***	***<100 Z8***	***<100 MI***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<100 MI***	***<1.0***	***<100 MI SVH***	***<100 Z8***	***<100 MI***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	300	-	1,500	-	4,700 Z8	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	>12000 MI	-	2,400 SVH	-	4,800 SVH
Total Coliforms	mpn/100mL	n/v	0[D]	**1.0[D]**	***<100 MI***	**12[D]**	***<100 SVH***	***<100 Z8***	***<100 MI***

See notes on last page

Table 2 Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-7-5		MW16-8-8			MW16-8-19	
Sample Date				23-Oct-23	14-May-24	27-Oct-23	17-May-24	27-Oct-23	27-Oct-23	
Sample ID				MW16-7-5	MW16-7-5	MW16-8-8	MW16-8-8	MW16-8-19	23-12	
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	
Laboratory				BV	BV	BV	BV	BV	BV	
Laboratory Work Order				C386148	C434263	C387774	C435488	C387774	C387774	
Laboratory Sample ID				CCP852	CNN526	CDB048	CNT049	CDB047	CDB056	
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	
Lithology				Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Bedrock	Bedrock	
Sample Type	Units	2022 AEPA Tier 1	GCDWQ						Field Duplicate	RPD (%)
Field Parameters										
Dissolved Oxygen, Field	mg/L	n/v	n/v	6.2	4.5	3.5	8.1	1.7	-	-
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**2,876[A]**	2.577	**1,124[A]**	0.934	**1,267[A]**	-	-
Oxidation Reduction Potential, field	mV	n/v	n/v	-26.5	44.8	195.1	-15.5	204.0	-	-
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.05	7.10	7.29	7.27	7.04	-	-
Temperature, Field	deg C	n/v	≤15[B]	4.4	10.7	6.1	6.6	5.3	-	-
Calculated Parameters										
Anion Sum	meq/L	n/v	n/v	38	35	14	14	13	14	nc
Cation Sum	meq/L	n/v	n/v	39	35	15	15	17	15	nc
Hardness (as CaCO3)	mg/L	n/v	n/v	1,100	990	670	680	710	640	10%
Ion Balance	%	n/v	n/v	1.2	-	6.7	-	14	3.6	nc
Ion Balance % Difference	%	n/v	n/v	-	0.014	-	4.2	-	-	-
Nitrate	mg/L	13_f[A]	45[C]	<0.044	<0.044	1.4	2.6	2.6	2.6	0%
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.010	<0.010	0.31	0.59	0.60	0.59	2%
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	nc
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**2,400[AB]**	**2,200[AB]**	**780[AB]**	**750[AB]**	**750[AB]**	**760[AB]**	1%
BTEX and Petroleum Hydrocarbons										
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	nc
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	nc
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	nc
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	nc
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	nc
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	nc
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	nc
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	nc
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	nc
Miscellaneous Inorganics										
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	2.2	2.6	2.5	2.0 PRH	1.4	1.4	nc
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**2,800[A]**	**2,800[A]**	**1,100[A]**	**1,200[A]**	**1,200[A]**	**1,300[A]**	8%
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.16	7.90	7.73	7.73	7.82	7.82	nc
Anions										
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	nc
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	470	480	340	420	390	460	16%
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	570	590	420	510	470	560	17%
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	nc
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	nc
Sulfate	mg/L	$429_{n5,e}$[A]	≤500_j[B]	**1,400[AB]**	**1,200[AB]**	230	220	92	89	3%
Chloride	mg/L	100[A]	≤250[B]	4.6	3.5	66	25	**110[A]**	**110[A]**	0%
Nutrients										
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	nc
Orthophosphate (as P)	mg/L	n/v	n/v	0.0097	<0.0030	<0.0030	<0.0030	0.0040	<0.0030	nc
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.037	0.035	<0.015	<0.015	<0.015	<0.015	nc
Nitrate (as N)	mg/L	3.0[A]	10[C]	<0.010	<0.010	0.31	0.59	0.60	0.59	2%
Phosphorus, Dissolved	mg/L	n/v	n/v	0.015	0.0047	<0.0030	<0.0030 PRH	<0.0030 P2	<0.0030	nc
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.649	1.01	2.8	0.83	0.118	<0.020	nc
Nitrogen	mg/L	n/v	n/v	0.649	1.0 DB	3.1 DB	1.4 DB	0.71	0.60	17%
Metals, Dissolved										
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_a[B]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	nc
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	0.00068	<0.00060	<0.00060	<0.00060	nc
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	0.00054	0.00023	<0.00020	<0.00020	<0.00020	<0.00020	nc
Barium	mg/L	2.0[A]	2.0[C]	0.019	0.015	0.050	0.045	0.071	0.062	14%
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc
Boron	mg/L	1.0[A]	5[C]	0.13	0.093	0.030	0.040	0.045	0.033	nc
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	<0.000020	0.000057	0.000022	<0.000020	0.000028	0.000024	nc
Calcium	mg/L	n/v	n/v	180	160	150	150	170	150	13%
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc
Cobalt	mg/L	n/v	n/v	0.00093	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	nc
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	nc
Lead	mg/L	$0.007_{n3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	nc
Lithium	mg/L	n/v	n/v	0.068	0.060	<0.020	<0.020	<0.020	<0.020	nc
Magnesium	mg/L	n/v	n/v	160	140	71	77	71	66	7%
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.21 MSY[AB]**	**0.15[AB]**	0.010	0.0040	<0.0040	<0.0040	nc
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	0.0000025	<0.0000019	<0.0000019	<0.0000019	nc
Molybdenum	mg/L	n/v	n/v	0.0013	0.0010	0.0010	0.0016	0.00070	0.00063	nc
Nickel	mg/L	$0.17_{n3,e}$[A]	n/v	0.0031	0.0021	0.0010	0.00073	<0.00050	<0.00050	nc
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	nc
Potassium	mg/L	n/v	n/v	5.7 MSY	4.7	6.8	5.9	7.4	6.2	18%
Selenium	mg/L	0.0020[A]	0.05[C]	0.00039	<0.00020	**0.0022[A]**	**0.0024[A]**	**0.0071[A]**	**0.0073[A]**	3%
Silicon	mg/L	n/v	n/v	5.0	4.4	4.2	4.1	4.2	4.1	2%
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	**0.00042[A]**	<0.00010	<0.00010	<0.00010	nc
Sodium	mg/L	200[A]	≤200[B]	**390[AB]**	**350[AB]**	42	26	62	54	14%
Strontium	mg/L	n/v	7.0[C]	1.9	1.6	1.3	1.2	1.7	1.5	13%
Sulfur	mg/L	n/v	n/v	370	400	120	66	28	30	7%
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	nc
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	0.0037	0.0039	<0.0010	<0.0010	nc
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc
Uranium	mg/L	0.010[A]	0.02[C]	**0.014[A]**	**0.011[A]**	**0.014[A]**	**0.013[A]**	0.0057	0.0056	2%
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	nc
Metals, Total										
Mercury	mg/L	0.0000050[A]	0.001[C]	**0.0000062[A]**	**0.000050 DB[A]**	**0.000123[A]**	**0.000289 DB[A]**	<0.0000019	<0.0000019	nc
Microbiological Parameters										
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<100 Z8***	***<10 MI***	***<100 Z8***	***<100 MI***	***<1.0***	***<1.0***	nc
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<100 Z8***	***<10 MI***	***<100 Z8***	***<100 MI***	***<1.0***	***<1.0***	nc
Heterotrophic Plate Count	cfu/mL	n/v	n/v	710	-	900 Z8 SVH	-	13 SVH	18	**32%**
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	>4800 MI	-	>12000 MI	-	-	-
Total Coliforms	mpn/100mL	n/v	0[D]	**310 Z8[D]**	**62 MI[D]**	**6,300 Z8[D]**	**1,900 MI[D]**	***<1.0***	***<1.0***	nc

See notes on last page

Table 2 Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location					MW16-10-15			MW16-11-15			
Sample Date				17-May-24	23-Oct-23	14-May-24	25-Oct-23	14-May-24	14-May-24	
Sample ID				MW16-8-19	MW16-10-15	MW16-10-15	MW16-11-15	MW16-11-15	SR24-01	
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	
Laboratory				BV	BV	BV	BV	BV	BV	
Laboratory Work Order				C435488	C386148	C434263	C386944	C434263	C434263	
Laboratory Sample ID				CNT050	CCP853	CNN528	CCW515	CNN529	CNN530	
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	
Lithology				Bedrock	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	
Sample Type	Units	2022 AEPA Tier 1	GCDWQ						Field Duplicate	RPD (%)
Field Parameters										
Dissolved Oxygen, Field	mg/L	n/v	n/v	3.4	3.5	5.9	3.9	6.3	-	-
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	1.195	**4,569[A]**	4.251	**4,525[A]**	2.883	-	-
Oxidation Reduction Potential, field	mV	n/v	n/v	9.1	-5.6	24.6	-235.0	-39.2	-	-
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	**6.91[B]**	**6.87[B]**	**6.98[B]**	7.32	7.27	-	-
Temperature, Field	deg C	n/v	≤15[B]	5.0	0.8	8.7	2.6	9.8	-	-
Calculated Parameters										
Anion Sum	meq/L	n/v	n/v	15	64	59	40	39	37	nc
Cation Sum	meq/L	n/v	n/v	16	70	65	40	41	41	nc
Hardness (as CaCO3)	mg/L	n/v	n/v	680	2,600	2,400	1,300	1,300	1,300	0%
Ion Balance	%	n/v	n/v	-	4.9	-	0.31	-	-	-
Ion Balance % Difference	%	n/v	n/v	5.1	-	4.4	-	2.3	4.4	nc
Nitrate	mg/L	13_f[A]	45[C]	2.1	0.24	0.22	<0.22	<0.44	<0.22	nc
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.47	0.054 Z8	0.050 MI	<0.050 Z8	<0.10 MI	<0.050 MI	nc
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	nc
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**790[AB]**	**4,100[AB]**	**3,800[AB]**	**2,500[AB]**	**2,500[AB]**	**2,400[AB]**	4%
BTEX and Petroleum Hydrocarbons										
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	nc
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	nc
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	nc
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	nc
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	nc
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	nc
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	nc
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	nc
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	nc
Miscellaneous Inorganics										
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	1.4 PRH	1.6	2.7	2.8	2.6	2.7	4%
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,300[A]**	**4,300[A]**	**4,600[A]**	**3,000[A]**	**3,100[A]**	**3,100[A]**	0%
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.85	7.97	7.65	8.02	7.79	7.73	nc
Anions										
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	nc
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	470	490	510	360	410	410	0%
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	580	590	620	430	500	500	0%
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	nc
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	nc
Sulfate	mg/L	$429_{n5,e}$[A]	≤500_j[B]	92	**2,600[AB]**	**2,400[AB]**	**1,600[AB]**	**1,500[AB]**	**1,400[AB]**	7%
Chloride	mg/L	100[A]	≤250[B]	**120[A]**	2.6	2.9	1.3	<1.0	<1.0	nc
Nutrients										
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	nc
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	0.0043	<0.0030	<0.0030	<0.0030	<0.0030	nc
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	<0.015	0.42	0.44	0.39	0.46	0.46	0%
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.47	0.054	0.050	<0.050	<0.10	<0.050	nc
Phosphorus, Dissolved	mg/L	n/v	n/v	<0.0030 PRH	0.0057	0.0065	<0.0030	0.0030	0.0037	nc
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	<0.020	0.845	2.35	0.51	1.13	1.19	5%
Nitrogen	mg/L	n/v	n/v	0.49	0.899	2.4	0.51 DB	1.1 DB	1.2 DB	9%
Metals, Dissolved										
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_a[B]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	nc
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	nc
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	<0.00020	0.00026	0.00023	0.00025	0.00046	0.00053	nc
Barium	mg/L	2.0[A]	2.0[C]	0.062	<0.050 MSY	0.011	0.011	0.013	0.012	nc
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc
Boron	mg/L	1.0[A]	5[C]	0.047	0.38	0.20	0.10	0.10	0.10	0%
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	0.000025	0.00008	0.00014	0.000088[A]	0.000023	0.000026	nc
Calcium	mg/L	n/v	n/v	160	510	460	290	310	320	3%
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc
Cobalt	mg/L	n/v	n/v	<0.00030	0.0039	0.0038	0.0014	0.0013	0.0013	nc
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	***<0.30***	<0.060	<0.060	<0.060	<0.060	nc
Lead	mg/L	$0.007_{n3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	nc
Lithium	mg/L	n/v	n/v	0.023	<0.10	0.064	0.057	0.053	0.058	nc
Magnesium	mg/L	n/v	n/v	71	320	300	140	130	130	0%
Manganese	mg/L	0.020[A]	≤0.02[B]	<0.0040	**2.9[AB]**	**2.7[AB]**	**1.2[AB]**	**1.1[AB]**	**1.1[AB]**	0%
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	nc
Molybdenum	mg/L	n/v	n/v	0.0012	0.00065	0.0014	0.00050	0.00095	0.0031	nc
Nickel	mg/L	$0.17_{n3,e}$[A]	n/v	<0.00050	0.0077	0.0072	0.0024	0.0021	0.0020	nc
Phosphorus	mg/L	n/v	n/v	<0.10	<0.50	<0.10	<0.10	<0.10	<0.10	nc
Potassium	mg/L	n/v	n/v	6.5	11	10	5.9	5.7	5.8	2%
Selenium	mg/L	0.0020[A]	0.05[C]	**0.0066[A]**	<0.00020	0.00021	<0.00020	<0.00020	<0.00020	nc
Silicon	mg/L	n/v	n/v	4.2	5.5	5.1	4.8	4.5	4.5	0%
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc
Sodium	mg/L	200[A]	≤200[B]	58	**410[AB]**	**390[AB]**	**310[AB]**	**320[AB]**	**320[AB]**	0%
Strontium	mg/L	n/v	7.0[C]	1.5	**7.4[C]**	6.8	3.0	3.0	2.9	3%
Sulfur	mg/L	n/v	n/v	31	840	920	580	530	540	2%
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	nc
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	nc
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc
Uranium	mg/L	0.010[A]	0.02[C]	0.0053	**0.011[A]**	**0.012[A]**	0.0060	0.0053	0.0055	4%
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	0.0032	<0.0030	<0.0030	<0.0030	<0.0030	nc
Metals, Total										
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	**0.000049[A]**	**0.00021 DB[A]**	<0.0000019	**0.000054 DB[A]**	**0.000060 DB[A]**	nc
Microbiological Parameters										
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<100 Z8***	***<100 MI***	***<5.0 Z8***	**10 MI[D]**	***<10 MI***	nc
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<100 Z8***	***<100 MI***	***<5.0 Z8***	***<10 MI***	***<10 MI***	nc
Heterotrophic Plate Count	cfu/mL	n/v	n/v	-	2,600	-	3,900	-	-	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	1,200	-	>12000 MI	-	>4800 MI	>4800 MI	nc
Total Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<100 Z8***	***<100 MI***	***<5.0 Z8***	**52 MI[D]**	**52 MI[D]**	0%

See notes on last page

Table 2 Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				RMW16-13-37				RMW16-15-39	
Sample Date				24-Oct-23	24-Oct-23		13-May-24	24-Oct-23	13-May-24
Sample ID				RMW16-13-37	23-10		RRMW16-13-37	RMW16-15-39	RRMW16-15-39
Sampling Company				STANTEC	STANTEC		STANTEC	STANTEC	STANTEC
Laboratory				BV	BV		BV	BV	BV
Laboratory Work Order				C386477	C386477		C433947	C386477	C433947
Laboratory Sample ID				CCT431	CCT433		CNL872	CCT432	CNL871
Location Description				Tier 2	Tier 2		Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	RPD	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ		Field Duplicate	(%)			
Field Parameters									
Dissolved Oxygen, Field	mg/L	n/v	n/v	3.8	-	-	3.0	1.5	4.6
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	366	-	-	1.519	918	0.908
Oxidation Reduction Potential, field	mV	n/v	n/v	-151.4	-	-	-101.2	-209.8	-133.3
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.25	-	-	8.16	**8.63[A]**	**8.89[A]**
Temperature, Field	deg C	n/v	≤15[B]	3.4	-	-	7.6	2.1	8.6
Calculated Parameters									
Anion Sum	meq/L	n/v	n/v	4.6	4.5	nc	17	11	11
Cation Sum	meq/L	n/v	n/v	4.6	4.1	nc	18	12	11
Hardness (as CaCO3)	mg/L	n/v	n/v	69	64	8%	98	30	28
Ion Balance	%	n/v	n/v	0.053	4.2	nc	-	2.5	-
Ion Balance % Difference	%	n/v	n/v	-	-	-	2.0	-	1.4
Nitrate	mg/L	13_{f}[A]	45[C]	1.4	1.4	0%	0.11	0.052	0.096
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.32	0.32	0%	0.044	0.012	0.022
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	<0.033	<0.033	nc	0.061	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	250	240	4%	**990[AB]**	**660[AB]**	**650[AB]**
BTEX and Petroleum Hydrocarbons									
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	nc	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	nc	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	nc	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	nc	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	nc	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	nc	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	nc	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	nc	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	nc	<0.10	<0.10	<0.10
Miscellaneous Inorganics									
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	3.9	3.8	3%	3.4	7.3	7.1
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	420	410	2%	**1,700[A]**	**1,100[A]**	1,000
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.75	7.71	nc	8.18	8.47	**8.61[A]**
Anions									
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	nc	<1.0	7.9	9.5
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	180	170	6%	510	350 NF	400
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	220	210	5%	620	410	470
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	nc	<1.0	9.5	11
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	nc	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	$≤500_{j}$[B]	14	13	7%	49	140	130
Chloride	mg/L	100[A]	≤250[B]	26	27	4%	**220[A]**	42	22
Nutrients									
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.010	<0.010	nc	0.019	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	0.0087	0.0094	nc	0.0077	<0.0030	0.017
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.038	0.038	nc	0.88	0.58	1.3
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.32	0.32	0%	0.026	0.012	0.022
Phosphorus, Dissolved	mg/L	n/v	n/v	0.0085 P2	0.012	nc	0.013	<0.0030	0.015 P2
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.801	0.805	0%	1.28	0.941	3.2
Nitrogen	mg/L	n/v	n/v	1.12	1.13	1%	1.3	0.953	3.3
Metals, Dissolved									
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_{a}[B]	0.0059	0.028	nc	<0.0030	**0.077[A]**	**0.45[AB]**
Antimony	mg/L	0.0060[A]	0.006[C]	0.0017	0.0017	nc	0.0012	0.0041	0.0017
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	0.00028	0.00030	nc	0.00077	0.00075	0.0015
Barium	mg/L	2.0[A]	2.0[C]	0.054	0.055	2%	0.21	0.021	0.035
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.023	<0.020	nc	0.092	0.071	0.053
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	<0.000020	<0.000020	nc	<0.000020	<0.000020	<0.000020
Calcium	mg/L	n/v	n/v	23	21	9%	29	7.5	6.9
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	<0.00030	<0.00030	nc	<0.00030	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	0.0050	0.0019	nc	<0.0010	0.0064	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	nc	<0.060	<0.060	0.26
Lead	mg/L	$0.007_{n3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	nc	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	<0.020	0.020	nc	0.052	0.047	0.044
Magnesium	mg/L	n/v	n/v	2.9	3.0	3%	5.9	2.7	2.6
Manganese	mg/L	0.020[A]	≤0.02[B]	0.019	<0.0040	nc	**0.021[AB]**	**0.022[AB]**	0.0071
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	0.0000023	nc	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0071	0.0053	29%	0.027	0.032	0.026
Nickel	mg/L	$0.17_{n3,e}$[A]	n/v	0.0011	0.00096	nc	0.00077	0.00095	0.00056
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	nc	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	2.4	2.1	13%	3.5	6.3	4.3
Selenium	mg/L	0.0020[A]	0.05[C]	0.00048	0.00023	nc	0.00042	**0.0033[A]**	0.0012
Silicon	mg/L	n/v	n/v	1.6	1.7	nc	2.6	2.5	4.2
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	74	65	13%	**370[AB]**	**250[AB]**	**240[AB]**
Strontium	mg/L	n/v	7.0[C]	0.16	0.16	0%	0.44	0.11	0.11
Sulfur	mg/L	n/v	n/v	4.6	4.2	9%	14	47	37
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	nc	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	0.010	0.0097	3%	0.0046	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	0.0016	nc	<0.0010	<0.0010	0.0084
Uranium	mg/L	0.010[A]	0.02[C]	0.0014	0.0011	24%	0.0047	0.00098	0.0020
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	nc	0.0023	0.0030	0.0075
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	nc	<0.0030	<0.0030	<0.0030
Metals, Total									
Mercury	mg/L	0.0000050[A]	0.001[C]	**0.0000150[A]**	**0.0000174[A]**	15%	**0.000232 DB[A]**	**0.000052[A]**	**0.00056 DB[A]**
Microbiological Parameters									
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	**1.0[D]**	**5.0 Z8[D]**	nc	***<50 MI***	***<10 Z8***	***<100 MI***
Fecal Coliforms	mpn/100mL	n/v	0[D]	**31[D]**	**37 Z8[D]**	18%	***<50 MI***	***<10 Z8***	***<100 MI***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	>6000	>6000	nc	-	>6000	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	>120000 MI	-	>240000 MI
Total Coliforms	mpn/100mL	n/v	0[D]	**>2400[D]**	**>12000 Z8[D]**	nc	**6,200 MI[D]**	**52 Z8[D]**	***<100 MI***

See notes on last page

Table 2 Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				RMW16-16-17		RRMW16-17-8		RMW16-18-5	
Sample Date				23-Oct-23	13-May-24	23-Oct-23	13-May-24	27-Oct-23	16-May-24
Sample ID				RRMW16-16-17	RRMW16-16-17	RRMW16-17-8	RRMW16-17-8	RMW16-18-5	RMW16-18-5
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV
Laboratory Work Order				C386148	C433947	C386148	C433947	C387774	C435132
Laboratory Sample ID				CCP847	CNL870	CCP846	CNL869	CDB053	CNR327
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ						
Field Parameters									
Dissolved Oxygen, Field	mg/L	n/v	n/v	2.7	2.7	11.9	5.9	7.8	7.7
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**5,246[A]**	5.246	**6,521[A]**	10.95	**1,087[A]**	1.029
Oxidation Reduction Potential, field	mV	n/v	n/v	-114.2	-114.2	-98.6	61.5	100.7	1.7
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.01	7.01	**6.99[B]**	**6.77[B]**	7.69	7.30
Temperature, Field	deg C	n/v	≤15[B]	3.0	3.0	1.7	9.5	5.4	6.1
Calculated Parameters									
Anion Sum	meq/L	n/v	n/v	63	77	190	210	12	12
Cation Sum	meq/L	n/v	n/v	70	66	210	190	14	13
Hardness (as CaCO3)	mg/L	n/v	n/v	1,400	1,300	5,700	5,200	280	270
Ion Balance	%	n/v	n/v	5.8	-	4.3	-	8.4	-
Ion Balance % Difference	%	n/v	n/v	-	7.8	-	4.6	-	6.8
Nitrate	mg/L	13_f[A]	45[C]	<0.044	<0.22	0.41	<0.22	0.92	3.3
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.010	<0.050 MI	0.093 Z8	<0.050 MI	0.21	0.75
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**4,200[AB]**	**4,800[AB]**	**13,000[AB]**	**13,000[AB]**	**680[AB]**	**660[AB]**
BTEX and Petroleum Hydrocarbons									
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics									
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	1.9	2.6	22 DSM	23	1.5	2.0 PRH
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**4,900[A]**	**5,300[A]**	**12,000[A]**	**12,000[A]**	**1,100[A]**	**1,100[A]**
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.09	7.94	8.06	7.26	8.15	8.32
Anions									
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	4.5
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	680	720	830	940	390	370
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	830	880	1,000	1,200	480	440
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	5.4
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	$≤500_j$[B]	**2,300[AB]**	**3,000[AB]**	**8,500[AB]**	**9,100[AB]**	72	72
Chloride	mg/L	100[A]	≤250[B]	5.5	5.1	4.5	6.9	91	92
Nutrients									
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	<0.0030	0.0052	0.0049	<0.0030	<0.0030
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	1.5	1.6	0.51	0.56	0.018	0.032
Nitrate (as N)	mg/L	3.0[A]	10[C]	<0.010	<0.050	0.093	<0.050	0.21	0.75
Phosphorus, Dissolved	mg/L	n/v	n/v	<0.0030	<0.0030	<0.0030 P2	0.0057	<0.0030	<0.0030 PRH
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	1.83	2.11	2.10	2.74	5.1	0.94
Nitrogen	mg/L	n/v	n/v	1.83	2.1	2.19	2.7	5.3 DB	1.7
Metals, Dissolved									
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_a[B]	<0.0030	<0.0030	0.0059	<0.0030	0.0033	0.0038
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	0.0048	0.0022	0.00087	0.00072	0.00026	0.00025
Barium	mg/L	2.0[A]	2.0[C]	<0.010	<0.010	0.015	0.015	0.066	0.057
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.23	0.22	0.18	0.16	0.12	0.10
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	<0.000020	<0.000020	0.00014	0.00013	<0.000020	<0.000020
Calcium	mg/L	n/v	n/v	310	280	420	390	56	54
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.0021	0.0019	0.0070	0.0064	0.00044	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.0010	<0.0010	0.0028	0.0019	0.0010	0.0011
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	$0.007_{n3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.26	0.26	0.12	0.11	<0.020	<0.020
Magnesium	mg/L	n/v	n/v	160	150	1,100	1,000	33	33
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.61[AB]**	**0.40[AB]**	**2.7[AB]**	**2.5[AB]**	**0.13[AB]**	<0.0040
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0013	0.00062	0.0018	0.0016	0.0045	0.0022
Nickel	mg/L	$0.17_{n3,e}$[A]	n/v	0.0095	0.0049	0.0099	0.0093	0.0012	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	9.4	7.9	15	13	3.0	2.4
Selenium	mg/L	0.0020[A]	0.05[C]	<0.00020	<0.00080 MI	0.0011	0.00057	0.00053	**0.0026[A]**
Silicon	mg/L	n/v	n/v	5.0	4.6	5.7	5.2	5.0	3.6
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	**950[AB]**	**900[AB]**	**2,200[AB]**	**2,000[AB]**	190	180
Strontium	mg/L	n/v	7.0[C]	**7.7[C]**	**7.2[C]**	**10[C]**	**9.4[C]**	0.48	0.40
Sulfur	mg/L	n/v	n/v	870	780	2,900	2,700	23	24
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	0.0016	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	0.0021	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.00049	0.00030	**0.049[AC]**	**0.043[AC]**	0.0090	0.0066
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	<0.0030	0.0048	0.0045	<0.0030
Metals, Total									
Mercury	mg/L	0.0000050[A]	0.001[C]	***<0.000019***	***<0.00019 DB***	**0.000066[A]**	**0.00026 DB[A]**	**0.000129[A]**	**0.000558 DB[A]**
Microbiological Parameters									
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<100 Z8***	***<5.0 MI***	***<100 Z8***	***<50 MI***	***<100 Z8***	***<100 MI***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<100 Z8***	***<5.0 MI***	***<100 Z8***	***<50 MI***	***<100 Z8***	***<100 MI***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	500	-	26,000 Z8	-	2,800 Z8	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	1,600 MI	-	99,000 MI	-	4,400 MI
Total Coliforms	mpn/100mL	n/v	0[D]	***<100 Z8***	**38 MI[D]**	**610 Z8[D]**	**23,000 MI[D]**	***<100 Z8***	***<100 MI***

See notes on last page

Table 2 Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				RMW16-18-13		RMW16-19-10		RMW16-19-19	
Sample Date				27-Oct-23	16-May-24	27-Oct-23	16-May-24	27-Oct-23	16-May-24
Sample ID				RMW16-18-13	RMW16-18-13	RMW16-19-10	RMW16-19-10	RMW16-19-19	RMW16-19-19
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV
Laboratory Work Order				C387774	C435132	C387774	C435132	C387774	C435132
Laboratory Sample ID				CDB054	CNR328	CDB051	CNR329	CDB052	CNR330
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	Unconsolidated	Unconsolidated	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ						
Field Parameters									
Dissolved Oxygen, Field	mg/L	n/v	n/v	2.8	3.1	3.8	3.2	0.7	2.5
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,189[A]**	1.052	**2,360[A]**	2.673	**2,731[A]**	2.647
Oxidation Reduction Potential, field	mV	n/v	n/v	103.5	-23.9	111.5	35.4	-47.3	-78.8
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.99	7.45	7.17	**6.93[B]**	7.20	7.13
Temperature, Field	deg C	n/v	≤15[B]	6.0	11.8	7.3	10.1	5.2	10.2
Calculated Parameters									
Anion Sum	meq/L	n/v	n/v	11	12	26	38	33	35
Cation Sum	meq/L	n/v	n/v	13	14	32	39	35	36
Hardness (as CaCO3)	mg/L	n/v	n/v	130	200	810	1,100	520	550
Ion Balance	%	n/v	n/v	7.6	-	9.3	-	3.6	-
Ion Balance % Difference	%	n/v	n/v	-	7.0	-	0.49	-	0.47
Nitrate	mg/L	13_f[A]	45[C]	1.3	2.3	<0.044	0.068	<0.044	<0.044
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.28	0.52	<0.010	0.015	<0.010	<0.010
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**680[AB]**	**690[AB]**	**1,800[AB]**	**2,400[AB]**	**2,100[AB]**	**2,200[AB]**
BTEX and Petroleum Hydrocarbons									
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics									
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	1.5	1.6 PRH	3.2	4.3 PRH	3.3	3.3 PRH
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,100[A]**	**1,100[A]**	**2,400[A]**	**3,000[A]**	**2,700[A]**	**2,900[A]**
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.40	8.42	8.00	7.85	8.00	7.90
Anions									
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	3.3	8.6	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	360	400	390	500	530	580
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	430	460	480	610	640	710
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	4.0	10	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	≤500_j[B]	73	69	**890[AB]**	**1,400[AB]**	**1,100[AB]**	**1,100[AB]**
Chloride	mg/L	100[A]	≤250[B]	96	89	<1.0	1.8	<1.0	<1.0
Nutrients									
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	<0.0030	<0.0030	<0.0030	0.0036	<0.0030
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	<0.015	<0.015	0.14	0.089	1.1	1.0
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.28	0.52	<0.010	0.015	<0.010	<0.010
Phosphorus, Dissolved	mg/L	n/v	n/v	<0.0030	<0.0030 PRH	<0.0030	<0.0030 PRH	<0.0030 P2	<0.0030 PRH
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.142	0.281	1.65	0.422	1.52	1.28
Nitrogen	mg/L	n/v	n/v	0.43	0.80	1.6 DB	0.44	1.5	1.3
Metals, Dissolved									
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_a[B]	0.0037	0.0042	<0.0030	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	<0.00020	0.00028	<0.00020	<0.00020	0.00020	<0.00020
Barium	mg/L	2.0[A]	2.0[C]	0.033	0.046	<0.010	<0.010	<0.010	<0.010
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.14	0.12	0.12	0.12	0.12	0.13
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	<0.000020	<0.000020	0.000098	0.00012	<0.000020	<0.000020
Calcium	mg/L	n/v	n/v	30	41	200	260	120	130
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	<0.00030	<0.00030	0.00064	0.00046	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	0.0011	**0.015[A]**	<0.0010	<0.0010	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	$0.007_{n3,e}$[A]	0.005_{ALARA}[C]	<0.00020	0.00075	0.00082	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.020	<0.020	0.022	0.026	0.056	0.062
Magnesium	mg/L	n/v	n/v	13	23	75	96	52	55
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.10[AB]**	**0.12[AB]**	**0.75[AB]**	**0.62[AB]**	**0.33[AB]**	**0.31[AB]**
Mercury	mg/L	0.0000050[A]	0.001[C]	0.0000020	<0.0000019	0.0000020	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0038	0.0043	0.00093	0.00087	0.0012	0.0011
Nickel	mg/L	$0.17_{n3,e}$[A]	n/v	<0.00050	<0.00050	0.0014	0.0016[A]	<0.00050	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	1.2	1.4	6.7	6.5	5.4	5.4
Selenium	mg/L	0.0020[A]	0.05[C]	0.0010	0.0010	0.00043	0.0012	<0.00020	<0.00020
Silicon	mg/L	n/v	n/v	3.1	3.1	4.1	3.8	3.5	3.2
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	**250[AB]**	**220[AB]**	**360[AB]**	**400[AB]**	**560[AB]**	**560[AB]**
Strontium	mg/L	n/v	7.0[C]	0.21	0.28	1.6	1.8	1.9	1.8
Sulfur	mg/L	n/v	n/v	26	22	280	400	310	310
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0048	0.0057	0.010	**0.011[A]**	0.00090	0.00080
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	0.0091	<0.0030	<0.0030	<0.0030	<0.0030
Metals, Total									
Mercury	mg/L	0.0000050[A]	0.001[C]	**0.0000071[A]**	**0.0000288[A]**	**0.000132[A]**	**0.000398 DB[A]**	0.0000028	<0.0000019
Microbiological Parameters									
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<100 Z8***	***<100 MI***	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<100 Z8***	***<100 MI***	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	49	-	3,000 Z8	-	16	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	>2400	-	>24000 MI	-	21
Total Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	**5.2[D]**	***<100 Z8***	***<100 MI***	***<1.0***	**1.0[D]**

See notes on last page

Table 2 Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-22-26		RMW16-23-7		RMW16-23-13	
Sample Date				25-Oct-23	16-May-24	25-Oct-23	15-May-24	25-Oct-23	15-May-24
Sample ID				MW16-22-26	MW16-22-26	RMW16-23-7	RMW 16-23-7	RMW16-23-14	RMW 16-23-14
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV
Laboratory Work Order				C386944	C435132	C386944	C435079	C386944	C435079
Laboratory Sample ID				CCW514	CNR331	CCW511	CNR024	CCW512	CNR025
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ						
Field Parameters									
Dissolved Oxygen, Field	mg/L	n/v	n/v	2.2	5.2	2.9	2.9	1.2	1.2
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**2,293[A]**	1.882	**1,041[A]**	0.935	**1,355[A]**	1.355
Oxidation Reduction Potential, field	mV	n/v	n/v	-272.4	-110.1	-258.1	-17.7	-254.2	-254.2
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.88	8.03	7.68	7.17	7.35	7.35
Temperature, Field	deg C	n/v	≤15[B]	1.6	7.3	2.0	7.6	2.4	2.4
Calculated Parameters									
Anion Sum	meq/L	n/v	n/v	24	25	11	11	12	13
Cation Sum	meq/L	n/v	n/v	23	25	11	12	14	13
Hardness (as CaCO3)	mg/L	n/v	n/v	670	720	460	480	320	380
Ion Balance	%	n/v	n/v	2.2	-	1.0	-	7.0	-
Ion Balance % Difference	%	n/v	n/v	-	1.0	-	2.6	-	1.7
Nitrate	mg/L	13_f[A]	45[C]	0.089	0.18	<0.044	<0.044	<0.044	<0.044
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.020	0.076	<0.010	<0.010	<0.010	<0.010
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	<0.033	0.12	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**1,500[AB]**	**1,600[AB]**	**580[AB]**	**600[AB]**	**750[AB]**	**730[AB]**
BTEX and Petroleum Hydrocarbons									
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics									
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	1.4	1.2 PRH	0.97	1.4	1.4	1.3
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,900[A]**	**2,000[A]**	990	980	**1,100[A]**	**1,100[A]**
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.04	8.28	8.06	7.98	8.03	8.14
Anions									
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	170	180	330	330	350	380
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	210	220	400	400	430	460
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	$≤500_j$[B]	**970[AB]**	**1,000[AB]**	140	140	230	220
Chloride	mg/L	100[A]	≤250[B]	1.9	1.9	49	51	17	24
Nutrients									
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.010	0.035	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	0.0073	0.0050	<0.0030	<0.0030	<0.0030	<0.0030
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.58	0.57	0.046	0.042	0.66	0.48
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.020	0.040	<0.010	<0.010	<0.010	<0.010
Phosphorus, Dissolved	mg/L	n/v	n/v	0.0051 P2	<0.0030 P2 PRH	<0.0030	<0.0030	<0.0030	<0.0030
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.86	0.973	0.117	0.133	0.611	0.769
Nitrogen	mg/L	n/v	n/v	0.88 DB	1.0	0.12	0.13	0.61 NNA	0.77
Metals, Dissolved									
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_a[B]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	0.00096	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	0.00055	0.00048	<0.00020	<0.00020	<0.00020	<0.00020
Barium	mg/L	2.0[A]	2.0[C]	0.015	0.020	0.063	0.045	0.017	0.016
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.13	0.12	0.024	0.021	0.064	0.060
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	0.000081	0.000057	0.000021	<0.000020	0.000020	<0.000020
Calcium	mg/L	n/v	n/v	160	180	100	120	82	93
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.00044	0.00053	0.00072	0.00042	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	$0.007_{n3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.061	0.052	0.023	<0.020	0.041	0.034
Magnesium	mg/L	n/v	n/v	66	64	48	46	29	37
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.46[AB]**	**0.39[AB]**	**0.41[AB]**	**0.39[AB]**	**0.17[AB]**	**0.12[AB]**
Mercury	mg/L	0.0000050[A]	0.001[C]	0.0000028	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0027	0.0045	0.0012	0.0010	0.0014	0.0011
Nickel	mg/L	$0.17_{n3,e}$[A]	n/v	0.0012	0.0010	0.0014	0.00075	<0.00050	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	6.7	7.2	4.8	4.7	4.8	4.5
Selenium	mg/L	0.0020[A]	0.05[C]	0.00035	0.00034	0.00020	<0.00020	<0.00020	<0.00020
Silicon	mg/L	n/v	n/v	3.9	3.5	3.8	3.6	4.3	4.2
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	**210[AB]**	**230[AB]**	42	45	170	120
Strontium	mg/L	n/v	7.0[C]	3.0	3.0	0.70	0.70	1.0	0.96
Sulfur	mg/L	n/v	n/v	320	280	46	45	77	72
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	0.0048	0.0010	0.0016	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0022	0.0017	0.0022	0.0018	0.00028	0.00044
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	<0.0030	0.0030	<0.0030	<0.0030
Metals, Total									
Mercury	mg/L	0.0000050[A]	0.001[C]	**0.000037[A]**	**0.000054 DB[A]**	0.0000022	**0.0000149[A]**	<0.0000019	<0.0000019
Microbiological Parameters									
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<5.0 Z8***	***<2.0 MI***	***<2.0 Z8***	***<2.0 MI***	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<5.0 Z8***	***<2.0 MI***	***<2.0 Z8***	***<2.0 MI***	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	1,000	-	790	-	110	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	>4800 MI	-	>2400	-	330
Total Coliforms	mpn/100mL	n/v	0[D]	**10 Z8[D]**	**4.0 MI[D]**	**4.0 Z8[D]**	***<2.0 MI***	***<1.0***	***<1.0***

See notes on last page

Table 2 Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				RMW16-23-32					
Sample Date				25-Oct-23	25-Oct-23		15-May-24	15-May-24	
Sample ID				RMW16-23-32	23-11		RMW 16-23-32	SR24-03	
Sampling Company				STANTEC	STANTEC		STANTEC	STANTEC	
Laboratory				BV	BV		BV	BV	
Laboratory Work Order				C386944	C386944		C435079	C435079	
Laboratory Sample ID				CCW513	CCW516		CNR026	CNR028	
Location Description				Tier 2	Tier 2		Tier 2	Tier 2	
Lithology				Bedrock	Bedrock	RPD	Bedrock	Bedrock	RPD
Sample Type	Units	2022 AEPA Tier 1	GCDWQ		Field Duplicate	(%)		Field Duplicate	(%)
Field Parameters									
Dissolved Oxygen, Field	mg/L	n/v	n/v	1.8	-	-	1.8	-	-
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,224[A]**	-	-	1.083	-	-
Oxidation Reduction Potential, field	mV	n/v	n/v	-268.0	-	-	-57.7	-	-
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.90	-	-	7.82	-	-
Temperature, Field	deg C	n/v	≤15[B]	2.4	-	-	7.6	-	-
Calculated Parameters									
Anion Sum	meq/L	n/v	n/v	12	13	nc	13	13	nc
Cation Sum	meq/L	n/v	n/v	13	12	nc	14	13	nc
Hardness (as CaCO3)	mg/L	n/v	n/v	65	64	2%	71	69	3%
Ion Balance	%	n/v	n/v	1.0	0.93	nc	-	-	-
Ion Balance % Difference	%	n/v	n/v	-	-	-	2.7	1.7	nc
Nitrate	mg/L	13_{f}[A]	45[C]	0.056	0.082	nc	<0.044	<0.044	nc
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.013	0.019	nc	<0.010	<0.010	nc
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	<0.033	<0.033	nc	<0.033	<0.033	nc
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**700[AB]**	**710[AB]**	1%	**730[AB]**	**720[AB]**	1%
BTEX and Petroleum Hydrocarbons									
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	nc	<0.00040	<0.00040	nc
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	nc	<0.00040	<0.00040	nc
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	nc	<0.00040	<0.00040	nc
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	nc	<0.00080	<0.00080	nc
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	nc	<0.00040	<0.00040	nc
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	nc	<0.00089	<0.00089	nc
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	nc	<0.10	<0.10	nc
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	nc	<0.10	<0.10	nc
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	nc	<0.10	<0.10	nc
Miscellaneous Inorganics									
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	1.1	1.1	nc	1.5	1.2	nc
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,200[A]**	**1,200[A]**	0%	**1,200[A]**	**1,200[A]**	0%
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.28	8.44	nc	8.40	8.41	nc
Anions									
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	6.8	nc	3.9	4.8	nc
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	510	510	0%	540	530	2%
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	620	610	2%	650	640	2%
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	8.2	nc	4.7	5.8	nc
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	nc	<1.0	<1.0	nc
Sulfate	mg/L	$429_{n5,e}$[A]	$≤500_{j}$[B]	110	120	9%	100	100	0%
Chloride	mg/L	100[A]	≤250[B]	<1.0	<1.0	nc	<1.0	<1.0	nc
Nutrients									
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.010	<0.010	nc	<0.010	<0.010	nc
Orthophosphate (as P)	mg/L	n/v	n/v	0.0074	0.0073	nc	0.0074	0.0083	nc
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.76	0.83	9%	0.81	0.81	0%
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.013	0.019	nc	<0.010	<0.010	nc
Phosphorus, Dissolved	mg/L	n/v	n/v	0.0033 P2	0.0050 P2	nc	0.0061 P2	0.0056 P2	nc
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.809	0.866	7%	0.880	0.891	1%
Nitrogen	mg/L	n/v	n/v	0.82	0.88	7%	0.88	0.89	1%
Metals, Dissolved									
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_{a}[B]	<0.0030	<0.0030	nc	<0.0030	<0.0030	nc
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	nc	<0.00060	<0.00060	nc
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	0.00052	0.00049	nc	0.00046	0.00051	nc
Barium	mg/L	2.0[A]	2.0[C]	0.017	0.017	nc	0.020	0.017	nc
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	nc	<0.0010	<0.0010	nc
Boron	mg/L	1.0[A]	5[C]	0.074	0.076	nc	0.083	0.081	nc
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	<0.000020	<0.000020	nc	<0.000020	<0.000020	nc
Calcium	mg/L	n/v	n/v	16	16	0%	19	18	5%
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	nc	<0.0010	<0.0010	nc
Cobalt	mg/L	n/v	n/v	<0.00030	<0.00030	nc	<0.00030	<0.00030	nc
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.0010	<0.0010	nc	<0.0010	<0.0010	nc
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	nc	<0.060	<0.060	nc
Lead	mg/L	$0.007_{n3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	nc	<0.00020	<0.00020	nc
Lithium	mg/L	n/v	n/v	0.055	0.054	nc	0.063	0.064	nc
Magnesium	mg/L	n/v	n/v	5.9	5.9	0%	5.8	5.6	4%
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.022[AB]**	**0.022[AB]**	0%	**0.021[AB]**	**0.021[AB]**	0%
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	0.0000022	nc	<0.0000019	<0.0000019	nc
Molybdenum	mg/L	n/v	n/v	0.0022	0.0022	0%	0.0017	0.0016	6%
Nickel	mg/L	$0.17_{n3,e}$[A]	n/v	<0.00050	<0.00050	nc	<0.00050	<0.00050	nc
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	nc	<0.10	<0.10	nc
Potassium	mg/L	n/v	n/v	2.3	2.3	0%	2.8	2.7	4%
Selenium	mg/L	0.0020[A]	0.05[C]	<0.00020	<0.00020	nc	<0.00020	<0.00020	nc
Silicon	mg/L	n/v	n/v	3.4	3.5	3%	3.4	3.4	0%
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	nc	<0.00010	<0.00010	nc
Sodium	mg/L	200[A]	≤200[B]	**260[AB]**	**250[AB]**	4%	**280[AB]**	**270[AB]**	4%
Strontium	mg/L	n/v	7.0[C]	0.32	0.31	3%	0.33	0.32	3%
Sulfur	mg/L	n/v	n/v	38	39	3%	37	37	0%
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	nc	<0.00020	<0.00020	nc
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	nc	<0.0010	<0.0010	nc
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	nc	<0.0010	<0.0010	nc
Uranium	mg/L	0.010[A]	0.02[C]	0.00017	0.00016	nc	0.00014	0.00013	nc
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	nc	<0.0010	<0.0010	nc
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	nc	<0.0030	<0.0030	nc
Metals, Total									
Mercury	mg/L	0.0000050[A]	0.001[C]	0.0000023	<0.0000019	nc	<0.0000019	<0.0000019	nc
Microbiological Parameters									
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	nc	***<1.0***	***<1.0***	nc
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	nc	***<1.0***	***<1.0***	nc
Heterotrophic Plate Count	cfu/mL	n/v	n/v	2.0	1.0	nc	-	-	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	11	5.2	**72%**
Total Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	**1.0[D]**	nc	***<1.0***	**3.0[D]**	nc

See notes on last page

Table 2 Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW21-3-15		MW21-6-7		MW21-6-12	
Sample Date				26-Oct-23	16-May-24	26-Oct-23	16-May-24	26-Oct-23	16-May-24
Sample ID				MW21-3-15	MW21-3-15	MW21-6-7	MW21-6-7	MW21-6-12	MW21-6-12
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV
Laboratory Work Order				C387360	C435132	C387360	C435132	C387360	C435132
Laboratory Sample ID				CCY431	CNR326	CCY430	CNR324	CCY429	CNR325
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	Unconsolidated	Unconsolidated	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ						
Field Parameters									
Dissolved Oxygen, Field	mg/L	n/v	n/v	3.4	5.3	4.6	5.6	3.9	7.2
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,211[A]**	1.135	**1,440[A]**	1.446	**1,413[A]**	1.486
Oxidation Reduction Potential, field	mV	n/v	n/v	205.3	-14.7	64.7	13.1	73.8	-29.8
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.47	8.13	7.16	7.07	7.07	7.47
Temperature, Field	deg C	n/v	≤15[B]	6.1	6.2	6.6	5.5	6.5	6.2
Calculated Parameters									
Anion Sum	meq/L	n/v	n/v	14	14	15	16	15	18
Cation Sum	meq/L	n/v	n/v	16	15	22	20	21	20
Hardness (as CaCO3)	mg/L	n/v	n/v	16	43	460	410	410	410
Ion Balance	%	n/v	n/v	7.3	-	17	-	15	-
Ion Balance % Difference	%	n/v	n/v	-	3.5	-	9.5	-	6.3
Nitrate	mg/L	13_{f}[A]	45[C]	<0.044	0.31	0.056	0.42	<0.044	0.074
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.010	0.13	0.013	0.094	<0.010	0.017
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	<0.033	0.22	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**840[AB]**	**830[AB]**	**1,000[AB]**	**1,000[AB]**	**990[AB]**	**1,100[AB]**
BTEX and Petroleum Hydrocarbons									
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics									
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	1.9	2.5 PRH	3.4	2.9 PRH	2.6	2.5 PRH
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,300[A]**	**1,300[A]**	**1,400[A]**	**1,600[A]**	**1,400[A]**	**1,600[A]**
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	**8.66[A]**	**8.51[A]**	8.16	8.15	8.25	7.96
Anions									
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	23	18	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	500	530	460	470	440	530
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	560	610	570	570	540	650
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	28	21	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	$≤500_{j}$[B]	170	160	250	260	240	270
Chloride	mg/L	100[A]	≤250[B]	1.4	<1.0	32	48	52	61
Nutrients									
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.010	0.065	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	0.026	0.041	0.0034	<0.0030	<0.0030	0.0043
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.33	0.48	0.061	0.039	0.13	0.13
Nitrate (as N)	mg/L	3.0[A]	10[C]	<0.010	0.069	0.013	0.094	<0.010	0.017
Phosphorus, Dissolved	mg/L	n/v	n/v	0.027	0.021 PRH	<0.0030	<0.0030 PRH	<0.0030	<0.0030 PRH P2
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	<0.40	0.95	8.2	1.16	0.243	0.291
Nitrogen	mg/L	n/v	n/v	<0.40 DB NNA	1.1	8.2	1.3	0.24	0.31
Metals, Dissolved									
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_{a}[B]	**0.22[AB]**	**1.1[AB]**	<0.0030	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	***<0.012***	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	0.0019	<0.0040	0.00021	<0.00020	0.00059	0.00065
Barium	mg/L	2.0[A]	2.0[C]	0.021	0.19	0.027	0.025	0.016	0.014
Beryllium	mg/L	n/v	n/v	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.22	0.20	0.21	0.19	0.23	0.21
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	<0.000020	***<0.00040***	0.000032	0.000021	0.000034	<0.000020
Calcium	mg/L	n/v	n/v	5.8	17	120	110	110	110
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	<0.00030	<0.0060	0.00053	<0.00030	0.00044	0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	0.0013	***<0.020***	<0.0010	<0.0010	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	0.13	**0.70[AB]**	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	$0.007_{n3,e}$[A]	0.005_{ALARA}[C]	<0.00020	0.0044	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.038	<0.20	0.046	0.037	0.056	0.051
Magnesium	mg/L	n/v	n/v	0.48	<2.0	38	32	35	34
Manganese	mg/L	0.020[A]	≤0.02[B]	0.0041	**0.12[AB]**	**0.22[AB]**	0.0079	**0.084[AB]**	**0.076[AB]**
Mercury	mg/L	0.0000050[A]	0.001[C]	0.0000024	<0.0000019	0.0000021	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0026	<0.0040	0.0012	0.0019	0.0010	0.0019
Nickel	mg/L	$0.17_{n3,e}$[A]	n/v	0.00080	<0.010	0.0024	0.0011	0.0019	0.0014
Phosphorus	mg/L	n/v	n/v	<0.10	<1.0	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	0.73	<3.0	5.5	4.7	5.1	4.9
Selenium	mg/L	0.0020[A]	0.05[C]	0.00041	***<0.0040***	<0.00020	0.00037	<0.00020	<0.00020
Silicon	mg/L	n/v	n/v	4.2	<5.0	5.3	4.4	4.9	4.4
Silver	mg/L	0.00010[A]	n/v	<0.00010	***<0.0020***	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	**360[AB]**	**330[AB]**	**280[AB]**	**260[AB]**	**280[AB]**	**280[AB]**
Strontium	mg/L	n/v	7.0[C]	0.066	<0.20	1.2	1.2	1.7	1.7
Sulfur	mg/L	n/v	n/v	60	49	88	81	89	89
Thallium	mg/L	n/v	n/v	<0.00020	<0.0040	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.020	0.0017	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	0.0078	<0.020	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.00078	<0.0020	0.0081	0.0073	0.0064	0.0070
Vanadium	mg/L	n/v	n/v	0.0018	<0.020	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	**1.1[A]**	<0.0030	<0.0030	<0.0030	<0.0030
Metals, Total									
Mercury	mg/L	0.0000050[A]	0.001[C]	**0.0000334[A]**	**0.000216 DB[A]**	**0.000375[A]**	**0.00075 DB[A]**	<0.0000019	0.0000020
Microbiological Parameters									
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<10 Z8***	***<100 MI***	***<100 Z8***	***<100 MI***	***<100 Z8***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<10 Z8***	***<100 MI***	***<100 Z8***	***<100 MI***	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	>6000	-	1,100	-	47 SVH	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	>24000 MI	-	>24000 SVH	-	73 SVH
Total Coliforms	mpn/100mL	n/v	0[D]	***<10 Z8***	***<100 MI***	***<100 Z8***	***<100 MI***	***<100 Z8***	***<1.0***

See notes on last page

Table 2 Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-3-7		MW16-4-22		MW16-6-11	
Sample Date				23-Oct-23	14-May-24	23-Oct-23	15-May-24	27-Oct-23	17-May-24
Sample ID				MW16-3-7	MW16-3-7	MW16-4-22	MW 16-4-22	MW16-6-11	MW16-6-11
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV
Laboratory Work Order				C386148	C434263	C386148	C435079	C387774	C435488
Laboratory Sample ID				CCP848	CNN525	CCP850	CNR023	CDB049	CNT051
Location Description				EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well
Lithology				Unconsolidated	Unconsolidated	Bedrock	Bedrock	Unconsolidated	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ						
Field Parameters									
Dissolved Oxygen, Field	mg/L	n/v	n/v	3.0	23.4	4.2	2.6	4.5	7.2
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**2,549[A]**	1.487	**4,497[A]**	4.078	**3,147[A]**	3.078
Oxidation Reduction Potential, field	mV	n/v	n/v	37.5	28.9	-29.7	-68.3	108.7	12.6
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.27	7.74	**6.75[B]**	7.45	7.16	**6.90[B]**
Temperature, Field	deg C	n/v	≤15[B]	3.38	5.8	2.0	7.5	7.4	7.7
Calculated Parameters									
Anion Sum	meq/L	n/v	n/v	29	16	59	57	40	42
Cation Sum	meq/L	n/v	n/v	30	18	64	61	44	43
Hardness (as CaCO3)	mg/L	n/v	n/v	820	490	2,200	2,100	1,400	1,400
Ion Balance	%	n/v	n/v	1.6	-	4.0	-	4.9	-
Ion Balance % Difference	%	n/v	n/v	-	5.9	-	3.9	-	1.4
Nitrate	mg/L	13_f[A]	45[C]	<0.22	6.2	<0.22	<0.22	0.21	0.079
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.050 Z8	1.4	<0.050 Z8	<0.050	0.048	0.018
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**1,800[AB]**	**940[AB]**	**3,900[AB]**	**3,700[AB]**	**2,600[AB]**	**2,700[AB]**
BTEX and Petroleum Hydrocarbons									
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics									
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	2.1	3.0	4.5	5.5	2.2	2.9 PRH
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**2,400[A]**	**1,700[A]**	**4,400[A]**	**4,300[A]**	**3,300[A]**	**3,300[A]**
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.06	7.98	7.61	7.85	7.94	7.80
Anions									
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	370	190	480	480	350	370
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	460	240	590	580	430	460
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	≤500_j[B]	**1,000[AB]**	180	**2,400[AB]**	**2,300[AB]**	**1,600[AB]**	**1,600[AB]**
Chloride	mg/L	100[A]	≤250[B]	37	**290[AB]**	1.3	1.1	1.1	12
Nutrients									
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	0.0092	0.0086	<0.0030	<0.0030	0.0040	<0.0030
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.025	0.019	0.92	1.1	0.35	0.29
Nitrate (as N)	mg/L	3.0[A]	10[C]	<0.050	1.4	<0.050	<0.050	0.048	0.018
Phosphorus, Dissolved	mg/L	n/v	n/v	0.0061 P2	0.0081 P2	0.014	<0.0030	<0.0030 P2	<0.0030 PRH
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.450	0.97	1.20	1.22	19	1.42
Nitrogen	mg/L	n/v	n/v	0.450	2.4	1.20	1.2	19 DB	1.4 DB
Metals, Dissolved									
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_a[B]	0.0059	<0.0030	<0.0030	<0.0030	<0.0030	0.0064
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	0.00039	0.00030	0.0011	0.00096	0.00043	0.00042
Barium	mg/L	2.0[A]	2.0[C]	0.016	0.056	<0.010	0.014	0.012	0.016
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.10	0.031	0.12	0.12	0.12	0.13
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	0.000081	0.000044	0.000026	<0.000020	0.000075	0.0001
Calcium	mg/L	n/v	n/v	130	97	480	470	330	320
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.00078	<0.00030	0.00055	<0.00030	0.0015	0.0014
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.0010	0.0012	<0.0010	<0.0010	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	**0.42[AB]**	0.18	<0.060	<0.060
Lead	mg/L	$0.007_{n3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.053	0.026	0.088	0.11	0.050	0.049
Magnesium	mg/L	n/v	n/v	120	59	240	220	130	140
Manganese	mg/L	0.020[A]	≤0.02[B]	0.012	**0.020[B]**	**0.97[AB]**	**0.80[AB]**	**0.96[AB]**	**0.83[AB]**
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0011	0.0018	0.00087	0.00082	0.0010	0.013
Nickel	mg/L	$0.17_{n3,e}$[A]	n/v	0.0026	0.0016	0.0014	0.00054	0.0036	0.0037
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	4.7	3.9	10	9.4	7.9	7.7
Selenium	mg/L	0.0020[A]	0.05[C]	0.00024	0.00043	<0.00020	<0.00080 MI	0.00046	0.00022
Silicon	mg/L	n/v	n/v	4.1	2.9	4.9	4.8	4.3	4.3
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	**320[AB]**	190	**470[AB]**	**440[AB]**	**380[AB]**	**360[AB]**
Strontium	mg/L	n/v	7.0[C]	1.5	0.86	**7.1[C]**	6.9	3.1	2.8
Sulfur	mg/L	n/v	n/v	300	67	870	850	610	490
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	0.0018	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	**0.012[A]**	0.0043	0.0021	0.0021	0.0059	0.0056
Vanadium	mg/L	n/v	n/v	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	0.0033	0.0038	<0.0030	**0.067[A]**
Metals, Total									
Mercury	mg/L	0.0000050[A]	0.001[C]	0.0000022	**0.000047 DB[A]**	0.0000019	0.0000039	**0.000111[A]**	**0.00030 DB[A]**
Microbiological Parameters									
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<5.0 Z8***	***<10 MI***	***<2.0 Z8***	***<1.0***	***<100 Z8***	***<100 MI***
Fecal Coliforms	mpn/100mL	n/v	0[D]	**5.0 Z8[D]**	**10 MI[D]**	***<2.0 Z8***	***<1.0***	***<100 Z8***	***<100 MI***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	1,300	-	>6000	-	2,900 Z8	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	>4800 MI	-	21 SVH	-	>12000 MI
Total Coliforms	mpn/100mL	n/v	0[D]	**170 Z8[D]**	***<10 MI***	***<2.0 Z8***	**5.2[D]**	**2,000 Z8[D]**	**1,500 MI[D]**

See notes on last page

Table 2 Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-6-20					
Sample Date				27-Oct-23	27-Oct-23		17-May-24	17-May-24	
Sample ID				MW16-6-20	23-13		MW16-6-20	SR24-04	
Sampling Company				STANTEC	STANTEC		STANTEC	STANTEC	
Laboratory				BV	BV		BV	BV	
Laboratory Work Order				C387774	C387774		C435488	C435488	
Laboratory Sample ID				CDB050	CDB057		CNT052	CNT053	
Location Description				EIA Project Well	EIA Project Well		EIA Project Well	EIA Project Well	
Lithology				Bedrock	Bedrock	RPD	Bedrock	Bedrock	RPD
Sample Type	Units	2022 AEPA Tier 1	GCDWQ		Field Duplicate	(%)		Field Duplicate	(%)
Field Parameters									
Dissolved Oxygen, Field	mg/L	n/v	n/v	0.8	-	-	3.5	-	-
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**2,172[A]**	-	-	2.045	-	-
Oxidation Reduction Potential, field	mV	n/v	n/v	-58.8	-	-	-87.6	-	-
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.88	-	-	7.96	-	-
Temperature, Field	deg C	n/v	≤15[B]	3.8	-	-	5.7	-	-
Calculated Parameters									
Anion Sum	meq/L	n/v	n/v	22	23	nc	25	25	nc
Cation Sum	meq/L	n/v	n/v	26	26	nc	24	24	nc
Hardness (as CaCO3)	mg/L	n/v	n/v	230	220	4%	200	200	0%
Ion Balance	%	n/v	n/v	8.2	5.7	nc	-	-	-
Ion Balance % Difference	%	n/v	n/v	-	-	-	2.3	2.6	nc
Nitrate	mg/L	13_{f}[A]	45[C]	<0.044	<0.044	nc	<0.22	<0.22	nc
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.010	<0.010	nc	<0.050 MI	<0.050 MI	nc
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	<0.033	<0.033	nc	<0.033	<0.033	nc
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**1,500[AB]**	**1,600[AB]**	6%	**1,600[AB]**	**1,600[AB]**	0%
BTEX and Petroleum Hydrocarbons									
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	nc	<0.00040	<0.00040	nc
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	nc	<0.00040	<0.00040	nc
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	nc	<0.00040	<0.00040	nc
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	nc	<0.00080	<0.00080	nc
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	nc	<0.00040	<0.00040	nc
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	nc	<0.00089	<0.00089	nc
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	nc	<0.10	<0.10	nc
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	nc	<0.10	<0.10	nc
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	nc	<0.10	<0.10	nc
Miscellaneous Inorganics									
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	2.1	3.1 DSM	nc	2.2 PRH	2.2 PRH	nc
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**2,200[A]**	**2,200[A]**	0%	**2,200[A]**	**2,200[A]**	0%
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.30	8.41	nc	8.29	8.30	nc
Anions									
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	5.7	nc	<1.0	<1.0	nc
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	270	310	14%	290	290	0%
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	330	360	9%	350	350	0%
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	6.8	nc	<1.0	<1.0	nc
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	nc	<1.0	<1.0	nc
Sulfate	mg/L	$429_{n5,e}$[A]	$≤500_{j}$[B]	**790[AB]**	**820[AB]**	4%	**940[AB]**	**930[AB]**	1%
Chloride	mg/L	100[A]	≤250[B]	<1.0	1.1	nc	<1.0	<1.0	nc
Nutrients									
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.010	<0.010	nc	<0.010	<0.010	nc
Orthophosphate (as P)	mg/L	n/v	n/v	0.0032	0.0030	nc	<0.0030	<0.0030	nc
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	1.1	1.1	0%	1.1	1.1	0%
Nitrate (as N)	mg/L	3.0[A]	10[C]	<0.010	<0.010	nc	<0.050	<0.050	nc
Phosphorus, Dissolved	mg/L	n/v	n/v	<0.0030 P2	<0.0030 P2	nc	<0.0030 PRH	<0.0030 PRH	nc
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	1.31	1.45	10%	1.22	1.27	4%
Nitrogen	mg/L	n/v	n/v	1.3	1.5	14%	1.2	1.3	8%
Metals, Dissolved									
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_{a}[B]	<0.0030	<0.0030	nc	<0.0030	<0.0030	nc
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	nc	<0.00060	<0.00060	nc
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	<0.00020	<0.00020	nc	<0.00020	<0.00020	nc
Barium	mg/L	2.0[A]	2.0[C]	<0.050	0.011	nc	<0.010	<0.010	nc
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	nc	<0.0010	<0.0010	nc
Boron	mg/L	1.0[A]	5[C]	0.15	0.10	nc	0.12	0.12	0%
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	<0.000020	<0.000020	nc	<0.000020	<0.000020	nc
Calcium	mg/L	n/v	n/v	60	59	2%	53	52	2%
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	nc	<0.0010	<0.0010	nc
Cobalt	mg/L	n/v	n/v	<0.00030	<0.00030	nc	<0.00030	<0.00030	nc
Copper	mg/L	0.0070[A]	≤1.0[B]	0.0026	0.0030	nc	<0.0010	<0.0010	nc
Iron	mg/L	0.30[A]	≤0.3[B]	***<0.30***	<0.060	nc	<0.060	<0.060	nc
Lead	mg/L	$0.007_{n3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	nc	<0.00020	<0.00020	nc
Lithium	mg/L	n/v	n/v	<0.10	0.070	nc	0.069	0.064	nc
Magnesium	mg/L	n/v	n/v	19	17	11%	17	16	6%
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.11[AB]**	**0.097[AB]**	13%	**0.074[AB]**	**0.077[AB]**	4%
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	nc	<0.0000019	<0.0000019	nc
Molybdenum	mg/L	n/v	n/v	0.0022	0.0023	4%	0.0024	0.0024	0%
Nickel	mg/L	$0.17_{n3,e}$[A]	n/v	<0.00050	<0.00050	nc	<0.00050	<0.00050	nc
Phosphorus	mg/L	n/v	n/v	<0.50	<0.10	nc	<0.10	<0.10	nc
Potassium	mg/L	n/v	n/v	4.2	4.9	nc	4.0	4.0	0%
Selenium	mg/L	0.0020[A]	0.05[C]	<0.00020	<0.00020	nc	<0.00020	<0.00020	nc
Silicon	mg/L	n/v	n/v	3.9	3.4	nc	3.2	3.2	0%
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	nc	<0.00010	<0.00010	nc
Sodium	mg/L	200[A]	≤200[B]	**490[AB]**	**490[AB]**	0%	**460[AB]**	**450[AB]**	2%
Strontium	mg/L	n/v	7.0[C]	1.1	1.1	0%	1.0	1.0	0%
Sulfur	mg/L	n/v	n/v	330	250	28%	260	270	4%
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	nc	<0.00020	<0.00020	nc
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	nc	<0.0010	<0.0010	nc
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	nc	<0.0010	<0.0010	nc
Uranium	mg/L	0.010[A]	0.02[C]	<0.00010	<0.00010	nc	<0.00010	<0.00010	nc
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	nc	<0.0010	<0.0010	nc
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	nc	<0.0030	<0.0030	nc
Metals, Total									
Mercury	mg/L	0.0000050[A]	0.001[C]	0.0000030	0.0000033	nc	<0.0000019	<0.0000019	nc
Microbiological Parameters									
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	nc	***<1.0***	***<1.0***	nc
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	nc	***<1.0***	***<1.0***	nc
Heterotrophic Plate Count	cfu/mL	n/v	n/v	97 SC1	120	21%	-	-	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	1,600	1,700	6%
Total Coliforms	mpn/100mL	n/v	0[D]	**1,600[D]**	**770[D]**	**70%**	***<1.0***	***<1.0***	nc

See notes on last page

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Table 2 Groundwater Analytical Results - Tier 2 and EIA Project Wells

Notes:

2022 AEPA Tier 1	Alberta Environment and Protected Areas (AEPA). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch 189 pp.
A	Table 2. Alberta Tier 1 Groundwater Remediation Guidelines - Agricultural - Fine
GCDWQ	Health Canada (September 2022). Guidelines for Canadian Drinking Water Quality—Summary Table. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.
B	Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives/ Operational Guidelines
C	Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentration
D	Guidelines for Canadian Drinking Water Quality - Microbiological Parameters
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
a	This is an operational guidance value, designed to apply only to drinking water treatment plants using aluminum-based coagulants; it does not apply to naturally occurring aluminum found in groundwater. The operational guidance values of 0.1 mg/L applies to conventional treatment plants, and 0.2 mg/L applies to other types of treatment systems.
ALARA	as low as reasonably achievable
f	Guidelines only provided for Nitrate (as N). Nitrate guideline (as NO3) is calculated by multiplying the Nitrate (as N) guideline by 4.43.
j	High levels (above 500 mg/L) can cause physiological effects such as diarrhea or dehydration.
n1,e	See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.1 for further guidance on aquatic life pathway, standard varies with pH, long term guideline shown (see Table 1.1 for short term guideline). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
n2	See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.2 for further guidance on aquatic life pathway, standard varies with pH and temperature (see Table 1.2 for guideline and is for total ammonia (NH3 as N).
n3,e	See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.3 for further guidance on aquatic life pathway, standard varies with hardness, long term is shown (see Table 1.3 for short term). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
n4,e	Overall guideline value for ecological receptors only. See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.4 for further guidance on aquatic life pathway, standard varies with chloride, maximum nitrite-N is shown (see Table 1.4 for 30-day average). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
n4,e, g	Overall guideline value for ecological receptors only. See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.4 for further guidance on aquatic life pathway, standard varies with chloride, maximum nitrite-N is shown (see Table 1.4 for 30-day average). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines. Guidelines only provided for Nitrite (as N). Nitrite guideline (as NO2) is calculated by multiplying the Nitrite (as N) guideline by 3.29.
n5,e	Guideline for protection of aquatic life is below detection limit, groundwater monitoring is required. See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.7 for further guidance on aquatic life pathway, standard varies with hardness. Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
DB	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
DSM	Detection limits raised due to sample matrix
EC	Detection limit raised due to interferent.
IF	RDL raised due to sample matrix interference.
MI	Detection limits raised due to matrix interference.
MSY	Matrix spike exceeds acceptance limits due to matrix interference.
NF	Duplicate exceeds acceptance criteria due to sample non homogeneity.
NNA	Nitrogen < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.
P2	Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.
PRH	Sample filtered and preserved past method specified hold time
SC1	Spreader colony present. Quantitative colony reporting is not possible due to bacterial density.
SVH	Sample analyzed over hold time. Sample analysis is recommended within 24 hours of sampling.
Z8	Detection limit raised due to matrix interference.
RPD	Relative Percent Difference.
61%	RPD exceeds data quality objective of 30%.
nc	RPD is not calculated if one or more values is non detect or if one or more values is less than five times the reportable detection limit.

Table 3 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Sample Location				WS81-01				WS81-02	
Sample Date				25-Oct-23	15-May-24	15-May-24		25-Oct-23	15-May-24
Sample ID				WS81-1	WS81-01	SR24-02		WS81-2	WS81-02
Sampling Company				STANTEC	STANTEC	STANTEC		STANTEC	STANTEC
Laboratory				BV	BV	BV		BV	BV
Laboratory Work Order				C386944	C434936	C435079		C386944	C434936
Laboratory Sample ID				CCW510	CNQ415	CNR027		CCW509	CNQ416
Location Description				Tier 2a	Tier 2a	Tier 2a		Tier 2a	Tier 2a
Lithology				Bedrock	Bedrock	Bedrock	RPD	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ			Field Duplicate	(%)		
Field Parameters									
Dissolved Oxygen, Field	mg/L	n/v	n/v	3.5	5.6	-	-	1.6	1.9
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,317[A]**	1.223	-	-	**1,675[A]**	1.469
Oxidation Reduction Potential, field	mV	n/v	n/v	-209.3	14.2	-	-	-261.0	-109.2
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.19	7.21	-	-	7.48	7.63
Temperature, Field	deg C	n/v	≤15[B]	8.5	6.9	-	-	5.2	6.6
Calculated Parameters									
Anion Sum	meq/L	n/v	n/v	14	15	15	nc	18	18
Cation Sum	meq/L	n/v	n/v	15	15	16	nc	18	19
Hardness (as CaCO3)	mg/L	n/v	n/v	470	470	480	2%	240	270
Ion Balance	%	n/v	n/v	3.9	-	-	-	0.10	-
Ion Balance % Difference	%	n/v	n/v	-	0.92	2.2	nc	-	2.7
Nitrate	mg/L	13_f[A]	45[C]	**33[A]**	**52[AC]**	**47[AC]**	10%	0.12	4.0
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	7.5	12	11	9%	0.027	0.94
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	<0.033	<0.033	<0.033	nc	<0.033	0.14
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**790[AB]**	**840[AB]**	**840[AB]**	0%	**1,000[AB]**	**1,000[AB]**
BTEX and Petroleum Hydrocarbons									
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	nc	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	nc	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	nc	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	nc	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	nc	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	nc	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	nc	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	nc	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	nc	<0.10	<0.10
Miscellaneous Inorganics									
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	2.2	2.4	2.4	nc	3.0	2.6
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,300[A]**	**1,300[A]**	**1,300[A]**	0%	**1,600[A]**	**1,600[A]**
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.08	8.05	8.01	nc	8.37	8.18
Anions									
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	nc	7.2	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	420	420	420	0%	580	570
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	510	510	520	2%	700	700
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	nc	8.6	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	nc	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	$≤500_i$[B]	170	160	160	0%	270	270
Chloride	mg/L	100[A]	≤250[B]	54	90	84	7%	19	18
Nutrients									
Nitrite (as N)	mg/L	$0.60_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.010	nc	<0.010	0.044
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	0.0031	<0.0030	nc	<0.0030	<0.0030
Ammonia (as N)	mg/L	3.287_{n2}[A]	n/v	<0.015	<0.015	<0.015	nc	0.075	0.036
Nitrate (as N)	mg/L	3.0[A]	10[C]	**7.5[A]**	**12[AC]**	**11[AC]**	9%	0.027	0.89
Phosphorus, Dissolved	mg/L	n/v	n/v	<0.0030	<0.0030 P2	<0.0030	nc	<0.0030	<0.0030
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	<0.20	<0.25	<0.25	nc	0.254	<0.020
Nitrogen	mg/L	n/v	n/v	6.7 NN	8.9 NN	10 NN	12%	0.28	0.94
Metals, Dissolved									
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_a[B]	<0.0030	<0.0030	<0.0030	nc	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	nc	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	<0.00020	<0.00020	<0.00020	nc	<0.00020	<0.00020
Barium	mg/L	2.0[A]	2.0[C]	0.025	0.025	0.026	nc	0.036	0.042
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.13	0.14	0.14	0%	0.18	0.17
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	<0.000020	<0.000020	<0.000020	nc	<0.000020	<0.000020
Calcium	mg/L	n/v	n/v	91	99	100	1%	51	60
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	<0.00030	<0.00030	<0.00030	nc	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	**0.010[A]**	0.0049	0.0045	nc	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	<0.060	nc	<0.060	<0.060
Lead	mg/L	$0.0070_{n3,e}$[A]	0.005_{ALARA}[C]	0.00050	<0.00020	<0.00020	nc	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.041	0.045	0.047	nc	0.049	0.045
Magnesium	mg/L	n/v	n/v	59	55	56	2%	28	29
Manganese	mg/L	0.020[A]	≤0.02[B]	<0.0040	<0.0040	<0.0040	nc	**0.075[AB]**	0.016
Mercury	mg/L	0.0000050[A]	0.001[C]	0.0000032	<0.0000019	<0.0000019	nc	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0045	0.0042	0.0042	0%	0.0015	0.0018
Nickel	mg/L	$0.125_{n3,e}$[A]	n/v	0.00056	0.00061	0.00057	nc	<0.00050	0.00064
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	nc	<0.10	<0.10
Potassium	mg/L	n/v	n/v	2.3	2.2	2.3	4%	1.5	1.8
Selenium	mg/L	0.0020[A]	0.05[C]	**0.0025[A]**	**0.0022[A]**	**0.0026[A]**	17%	0.00059	0.0011
Silicon	mg/L	n/v	n/v	3.4	3.5	3.4	3%	3.2	3.1
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	130	130	140	7%	**300[AB]**	**300[AB]**
Strontium	mg/L	n/v	7.0[C]	1.3	1.2	1.3	8%	0.94	1.0
Sulfur	mg/L	n/v	n/v	53	50	48	4%	95	94
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	nc	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0036	0.0033	0.0032	3%	0.0049	0.0058
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	0.0087	0.011	0.0089	nc	<0.0030	0.0052
Metals, Total									
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	nc	0.0000020	<0.0000019
Microbiological Parameters									
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<1.0***	nc	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<1.0***	nc	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	2.0	-	-	-	1.0	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	57	36	**45%**	-	75
Total Coliforms	mpn/100mL	n/v	0[D]	**26[D]**	***<1.0***	***<1.0***	nc	***<1.0***	***<1.0***

See notes on last page

Table 3 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Sample Location				NE7-R3-01		NE20-R3-01		SW11-R4-02	
Sample Date				24-Oct-23	15-May-24	26-Oct-23	13-May-24	24-Oct-23	14-May-24
Sample ID				NE7R3-1	NE7-R3-01	NE20R3-2	NE20-R3-01	SW11R4-2	SW11-R4-02
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV
Laboratory Work Order				C386477	C434999	C387360	C433976	C386477	C434265
Laboratory Sample ID				CCT429	CNQ629	CCY428	CNL997	CCT428	CNN532
Location Description				Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
Lithology				Unconsolidated (alluvial)	Unconsolidated (alluvial)	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ						
Field Parameters									
Dissolved Oxygen, Field	mg/L	n/v	n/v	7.7	10.6	-	8.0	1.6	2.6
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	577	0.929	-	1.479	485	0.415
Oxidation Reduction Potential, field	mV	n/v	n/v	-122.1	6.6	-	80.4	-192.1	-72.7
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.36	7.56	-	7.33	8.15	8.22
Temperature, Field	deg C	n/v	≤15[B]	6.4	4.6	-	13.2	3.9	7.2
Calculated Parameters									
Anion Sum	meq/L	n/v	n/v	6.0	5.1	15	18	5.4	5.2
Cation Sum	meq/L	n/v	n/v	6.2	5.6	21	18	5.0	5.4
Hardness (as CaCO3)	mg/L	n/v	n/v	290	260	680	600	56	71
Ion Balance	%	n/v	n/v	1.7	-	15	-	3.9	-
Ion Balance % Difference	%	n/v	n/v	-	4.4	-	1.5	-	1.8
Nitrate	mg/L	13_{f}[A]	45[C]	1.4	4.2	0.65	5.0	<0.044	<0.044
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.32	0.94	0.15	1.1	<0.010	<0.010
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	320	280	**960[AB]**	**1,000[AB]**	290	290
BTEX and Petroleum Hydrocarbons									
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	0.0031	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics									
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	0.88	1.5	2.0	2.1 MSY	<0.50	<0.50
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	530	460	**1,400[A]**	**1,600[A]**	490	480
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.38	7.65	8.12	7.99	7.99	8.21
Anions									
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	5.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	220	190	390	430	210	190
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	260	230	480	530	250	230
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	5.9	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	$≤500_{i}$[B]	65	48	290	290	56	62
Chloride	mg/L	100[A]	≤250[B]	5.2	10	49	100	4.3	4.8
Nutrients									
Nitrite (as N)	mg/L	$0.60_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	0.0034	<0.0030	<0.0030	<0.0030	0.0032	0.0032
Ammonia (as N)	mg/L	3.287_{n2}[A]	n/v	<0.015	<0.015	0.65	0.12	0.18	0.19
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.32	0.94	0.15	1.1	<0.010	<0.010
Phosphorus, Dissolved	mg/L	n/v	n/v	<0.0030 P2	<0.0030	<0.0030	<0.0030	<0.0030 P2	<0.0030 P2
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.068	0.112	0.614	0.208	0.201	0.268
Nitrogen	mg/L	n/v	n/v	0.391	1.1	0.76	1.3	0.201	0.27
Metals, Dissolved									
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_{a}[B]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Barium	mg/L	2.0[A]	2.0[C]	0.13	0.099	0.018	0.021	0.074	0.078
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	<0.020	<0.020	0.059	0.049	0.032	0.029
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	<0.000020	<0.000020	0.000093	0.000022	<0.000020	<0.000020
Calcium	mg/L	n/v	n/v	81	71	150	130	14	19
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.0010	<0.0010	0.0028	0.0041	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	$0.0070_{n3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	<0.00020	0.00022	<0.00020	0.00020
Lithium	mg/L	n/v	n/v	<0.020	<0.020	0.059	0.040	0.021	<0.020
Magnesium	mg/L	n/v	n/v	21	19	77	69	5.0	6.0
Manganese	mg/L	0.020[A]	≤0.02[B]	<0.0040	<0.0040	**0.066[AB]**	0.0069	**0.059[AB]**	**0.057[AB]**
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	<0.0000019	0.0000023	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.00080	0.00067	0.00088	0.00077	0.0018	0.0017
Nickel	mg/L	$0.125_{n3,e}$[A]	n/v	<0.00050	<0.00050	0.0026	0.0015	<0.00050	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	4.5	3.4	7.2	6.5	0.84	0.92
Selenium	mg/L	0.0020[A]	0.05[C]	0.00068	0.00046	<0.00020	0.00034	<0.00020	<0.00020
Silicon	mg/L	n/v	n/v	3.0	2.5	4.7	4.0	3.8	3.7
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	7.1	8.3	160	140	89	90
Strontium	mg/L	n/v	7.0[C]	0.40	0.32	1.8	1.7	0.32	0.38
Sulfur	mg/L	n/v	n/v	21	14	110	98	18	19
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.00073	0.00061	0.0026	0.0034	<0.00010	<0.00010
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	**0.20[A]**	0.0089	**0.066[A]**	0.019	**0.036[A]**	0.028
Metals, Total									
Mercury	mg/L	0.0000050[A]	0.001[C]	0.0000035	<0.0000019	**0.0000056[A]**	<0.0000019	<0.0000019	<0.0000019
Microbiological Parameters									
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	**1.0[D]**	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	**1.0[D]**	***<1.0***	***<1.0***	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	66	-	16	-	890	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	170	-	>2400	-	1,000
Total Coliforms	mpn/100mL	n/v	0[D]	**31[D]**	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***

See notes on last page

Table 3 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Sample Location				SW35-R4-01		WS11-01		WS51-01
Sample Date				26-Oct-23	16-May-24	23-Oct-23	14-May-24	14-May-24
Sample ID				SW35R4-1	SW35-R4-01	WS11-1	WS11-01	WS51-01
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV
Laboratory Work Order				C387360	C435151	C386148	C434263	C434266
Laboratory Sample ID				CCY427	CNR363	CCP845	CNN524	CNN533
Location Description				Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ					
Field Parameters								
Dissolved Oxygen, Field	mg/L	n/v	n/v	2.6	1.9	5.0	5.8	2.5
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,361[A]**	1.274	**1,001[A]**	0.699	0.664
Oxidation Reduction Potential, field	mV	n/v	n/v	239.3	7.4	-173.0	11.0	-104.9
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.63	7.51	7.13	7.54	7.95
Temperature, Field	deg C	n/v	≤15[B]	6.9	7.1	2.7	6.8	6.9
Calculated Parameters								
Anion Sum	meq/L	n/v	n/v	15	16	9.1	9.4	9.0
Cation Sum	meq/L	n/v	n/v	18	16	11	9.5	9.0
Hardness (as CaCO3)	mg/L	n/v	n/v	96	82	270	250	190
Ion Balance	%	n/v	n/v	9.0	-	8.1	-	-
Ion Balance % Difference	%	n/v	n/v	-	1.8	-	0.87	0.0070
Nitrate	mg/L	13_f[A]	45[C]	6.7	5.8	0.57	<0.044	<0.044
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	1.5	1.3	0.13	<0.010	<0.010
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	0.068	<0.16	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**940[AB]**	**900[AB]**	490	470	**520[AB]**
BTEX and Petroleum Hydrocarbons								
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	0.0014	0.00065	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics								
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	1.2	1.4	2.5	1.8	1.1
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,400[A]**	**1,400[A]**	790	810	790
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	**8.67[A]**	8.15	8.12	8.04	7.91
Anions								
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	38	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	580	580	430	450	300
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	610	710	530	540	370
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	46	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	$≤500_i$[B]	170	170	10	15	140
Chloride	mg/L	100[A]	≤250[B]	4.6	5.7	5.5	3.8	<1.0
Nutrients								
Nitrite (as N)	mg/L	$0.60_{n4,e}$[A]	1[C]	0.021	<0.050 MI MSE	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	0.0086	0.0090	<0.0030	<0.0030	<0.0030
Ammonia (as N)	mg/L	3.287_{n2}[A]	n/v	0.19	0.18	0.23	0.25	0.26
Nitrate (as N)	mg/L	3.0[A]	10[C]	1.5	1.3	0.13	<0.010	<0.010
Phosphorus, Dissolved	mg/L	n/v	n/v	0.0060	0.0049 P2	0.062	0.0082	<0.0030
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.29	<0.20	0.631	0.448	0.388
Nitrogen	mg/L	n/v	n/v	1.8 DB	1.1 NN	0.761	0.45	0.39
Metals, Dissolved								
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_a[B]	<0.0030	<0.0030	0.0041	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	0.00049	0.00052	0.00060	0.00028	0.00070
Barium	mg/L	2.0[A]	2.0[C]	0.026	0.024	0.31	0.28	0.015
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.085	0.077	0.43	0.31	0.095
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Calcium	mg/L	n/v	n/v	24	22	58	54	57
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	0.0034	0.0012	<0.0010	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	$0.0070_{n3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.096	0.077	<0.020	<0.020	0.024
Magnesium	mg/L	n/v	n/v	8.6	6.9	30	29	11
Manganese	mg/L	0.020[A]	≤0.02[B]	0.011	0.013	**0.29[AB]**	**0.36[AB]**	**0.14[AB]**
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0047	0.0035	0.0061	0.0088	0.0052
Nickel	mg/L	$0.125_{n3,e}$[A]	n/v	<0.00050	<0.00050	0.0018	0.00058	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	3.3	2.9	6.1	4.8	1.1
Selenium	mg/L	0.0020[A]	0.05[C]	0.0018	0.0014	<0.00020	<0.00020	<0.00020
Silicon	mg/L	n/v	n/v	3.5	3.0	5.5	5.4	4.8
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	**380[AB]**	**330[AB]**	120	99	120
Strontium	mg/L	n/v	7.0[C]	0.35	0.35	2.9	2.7	0.52
Sulfur	mg/L	n/v	n/v	65	54	3.6	4.4	42
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.00057	0.00060	0.00013	0.00012	0.00015
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	0.020	0.015	<0.0030	<0.0030	<0.0030
Metals, Total								
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	0.0000022	<0.0000019	<0.0000019
Microbiological Parameters								
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<100 Z8***	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<100 Z8***	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	26	-	870 SVH	-	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	65	-	>2400	85
Total Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	**2,300 Z8[D]**	***<1.0***	***<1.0***

See notes on last page

Table 3 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Sample Location				WS62-01	
Sample Date				24-Oct-23	15-May-24
Sample ID				WS62-1	WS62-01
Sampling Company				STANTEC	STANTEC
Laboratory				BV	BV
Laboratory Work Order				C386477	C434999
Laboratory Sample ID				CCT430	CNQ628
Location Description				Tier 3	Tier 3
Lithology				Unconsolidated (alluvial)	Unconsolidated (alluvial)
Sample Type	Units	2022 AEPA Tier 1	GCDWQ		
Field Parameters					
Dissolved Oxygen, Field	mg/L	n/v	n/v	-	5.3
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	-	0.582
Oxidation Reduction Potential, field	mV	n/v	n/v	-	61.6
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	-	7.12
Temperature, Field	deg C	n/v	≤15[B]	-	3.5
Calculated Parameters					
Anion Sum	meq/L	n/v	n/v	6.4	7.1
Cation Sum	meq/L	n/v	n/v	6.6	7.6
Hardness (as CaCO3)	mg/L	n/v	n/v	310	360
Ion Balance	%	n/v	n/v	1.5	-
Ion Balance % Difference	%	n/v	n/v	-	3.1
Nitrate	mg/L	13_f[A]	45[C]	0.16	0.48
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.036	0.11
Nitrite	mg/L	$1.97_{n4,e,g}$[A]	3[C]	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	340	390
BTEX and Petroleum Hydrocarbons					
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10
Miscellaneous Inorganics					
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	0.76	1.6
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	580	620
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.09	7.73
Anions					
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	230	240
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	280	290
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	$≤500_i$[B]	77	100
Chloride	mg/L	100[A]	≤250[B]	5.8	5.0
Nutrients					
Nitrite (as N)	mg/L	$0.60_{n4,e}$[A]	1[C]	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	<0.0030
Ammonia (as N)	mg/L	3.287_{n2}[A]	n/v	<0.015	<0.015
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.036	0.11
Phosphorus, Dissolved	mg/L	n/v	n/v	<0.0030	<0.0030
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.072	0.154
Nitrogen	mg/L	n/v	n/v	0.108	0.26
Metals, Dissolved					
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_a[B]	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	<0.00020	<0.00020
Barium	mg/L	2.0[A]	2.0[C]	0.069	0.067
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	<0.020	<0.020
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	<0.000020	<0.000020
Calcium	mg/L	n/v	n/v	83	99
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	**0.048[A]**	**0.020[A]**
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060
Lead	mg/L	$0.0070_{n3,e}$[A]	0.005_{ALARA}[C]	0.00066	<0.00020
Lithium	mg/L	n/v	n/v	<0.020	<0.020
Magnesium	mg/L	n/v	n/v	25	26
Manganese	mg/L	0.020[A]	≤0.02[B]	0.0045	0.0044
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.00054	0.00045
Nickel	mg/L	$0.125_{n3,e}$[A]	n/v	<0.00050	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10
Potassium	mg/L	n/v	n/v	1.8	2.3
Selenium	mg/L	0.0020[A]	0.05[C]	0.00066	0.0015
Silicon	mg/L	n/v	n/v	3.1	2.8
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	7.6	8.2
Strontium	mg/L	n/v	7.0[C]	0.46	0.46
Sulfur	mg/L	n/v	n/v	26	31
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.00070	0.0012
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	**0.057[A]**	**0.050[A]**
Metals, Total					
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019
Microbiological Parameters					
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	8.0	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	35
Total Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***

See notes on last page

Table 3 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Notes:

2022 AEPA Tier 1	Alberta Environment and Protected Areas (AEPA). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch 189 pp.
A	Table 2. Alberta Tier 1 Groundwater Remediation Guidelines - Agricultural - Fine
GCDWQ	Health Canada (September 2022). Guidelines for Canadian Drinking Water Quality—Summary Table. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.
B	Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives/ Operational Guidelines
C	Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentration
D	Guidelines for Canadian Drinking Water Quality - Microbiological Parameters
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
a	This is an operational guidance value, designed to apply only to drinking water treatment plants using aluminum-based coagulants; it does not apply to naturally occurring aluminum found in groundwater. The operational guidance values of 0.1 mg/L applies to conventional treatment plants, and 0.2 mg/L applies to other types of treatment systems.
ALARA	as low as reasonably achievable
f	Guidelines only provided for Nitrate (as N). Nitrate guideline (as NO3) is calculated by multiplying the Nitrate (as N) guideline by 4.43.
j	High levels (above 500 mg/L) can cause physiological effects such as diarrhea or dehydration.
n1,e	See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.1 for further guidance on aquatic life pathway, standard varies with pH, long term guideline shown (see Table 1.1 for short term guideline). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
n2	See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.2 for further guidance on aquatic life pathway, standard varies with pH and temperature (see Table 1.2 for guideline and is for total ammonia (NH3 as N).
n3,e	See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.3 for further guidance on aquatic life pathway, standard varies with hardness, long term is shown (see Table 1.3 for short term). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
n4,e	Overall guideline value for ecological receptors only. See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.4 for further guidance on aquatic life pathway, standard varies with chloride, maximum nitrite-N is shown (see Table 1.4 for 30-day average). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
n4,e, g	Overall guideline value for ecological receptors only. See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.4 for further guidance on aquatic life pathway, standard varies with chloride, maximum nitrite-N is shown (see Table 1.4 for 30-day average). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines. Guidelines only provided for Nitrite (as N). Nitrite guideline (as NO2) is calculated by multiplying the Nitrite (as N) guideline by 3.29.
n5,e	Guideline for protection of aquatic life is below detection limit, groundwater monitoring is required. See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.7 for further guidance on aquatic life pathway, standard varies with hardness. Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
DB	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
MI	Detection limits raised due to matrix interference.
MSE	Matrix spike exceeds acceptance limits due to probable matrix interference.
MSY	Matrix spike exceeds acceptance limits due to matrix interference.
NN	Nitrogen < Nitrate: Both values fall within the method uncertainty for duplicates and are likely equivalent.
P2	Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.
SVH	Sample analyzed over hold time. Sample analysis is recommended within 24 hours of sampling.
Z8	Detection limit raised due to matrix interference.
RPD	Relative Percent Difference.
61%	RPD exceeds data quality objective of 30%.
nc	RPD is not calculated if one or more values is non detect or if one or more values is less than five times the reportable detection limit.

Appendices

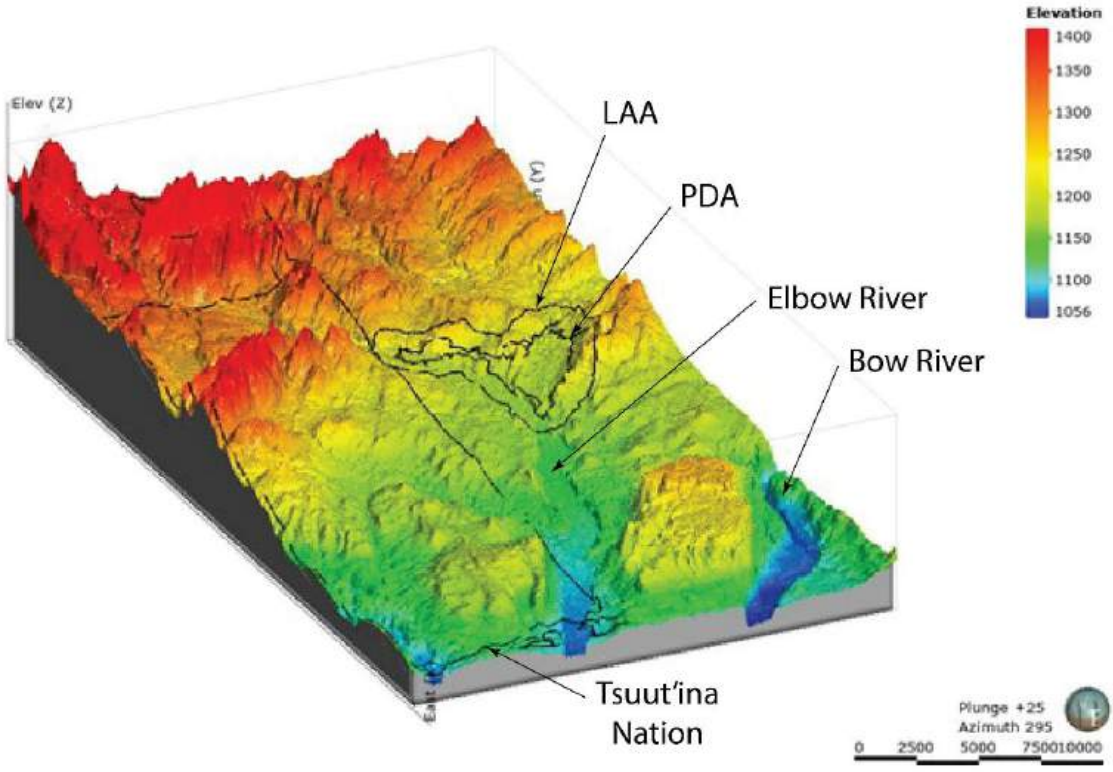
Appendix A Hydrogeological Setting

The hydrogeologic setting of the regional assessment area (RAA) is summarized below in order to provide context for the GWMP.

A.1 Regional Topography and Drainage

The ground surface topography of the RAA is depicted by the digital elevation model (DEM) in Figure A.1. Outlines of the Hydrogeology PDA/LAA used in the EIA and Tsuut'ina Nation Reserve are also shown as overlays for reference. Areas of higher elevation are denoted by red, and they grade down to areas of low elevation, denoted by blue as shown on the colour scale. The topographic elevation ranges from approximately 1,365 metres above sea level (m ASL) on the bedrock ridges in the southwest corner of the RAA to approximately 1,125 m ASL along Elbow River at the eastern boundary.

Figure A.1 Topography of the Regional Assessment Area



The topography on the north side of the RAA consists of a series of ridges and valleys that are oriented northwest to southeast. The topography of most of the RAA is generally controlled by the bedrock structure, particularly in the southwest, and to a lesser extent, the patterns of glacial sediment deposition modifying the topography in lower areas. Prominent ridges through the assessment area are a result of formations that are more resistive to weathering; the valleys in between the ridges are more easily weathered or recessive.

Near the modern river channels, fluvial erosion and deposition is the primary topographic control agent. Near Elbow River and Jumpingpound Creek, the terrain is incised with one or more fluvial terraces within the river valleys. Hummocky regions have low to moderate relief, with gentle slopes that vary between 2% and 15%. Areas with low relief are underlain by till or glaciolacustrine sediments, while areas of moderate relief are underlain by till and glaciofluvial sediments. Outcrops of bedrock occur along ridges in the lower areas of the RAA and are moderately weathered and fractured, but they are covered by a thick sequence of unconsolidated sediment.

A.2 Regional Hydrogeologic Setting

A.2.1 Conceptual Hydrostratigraphic Framework

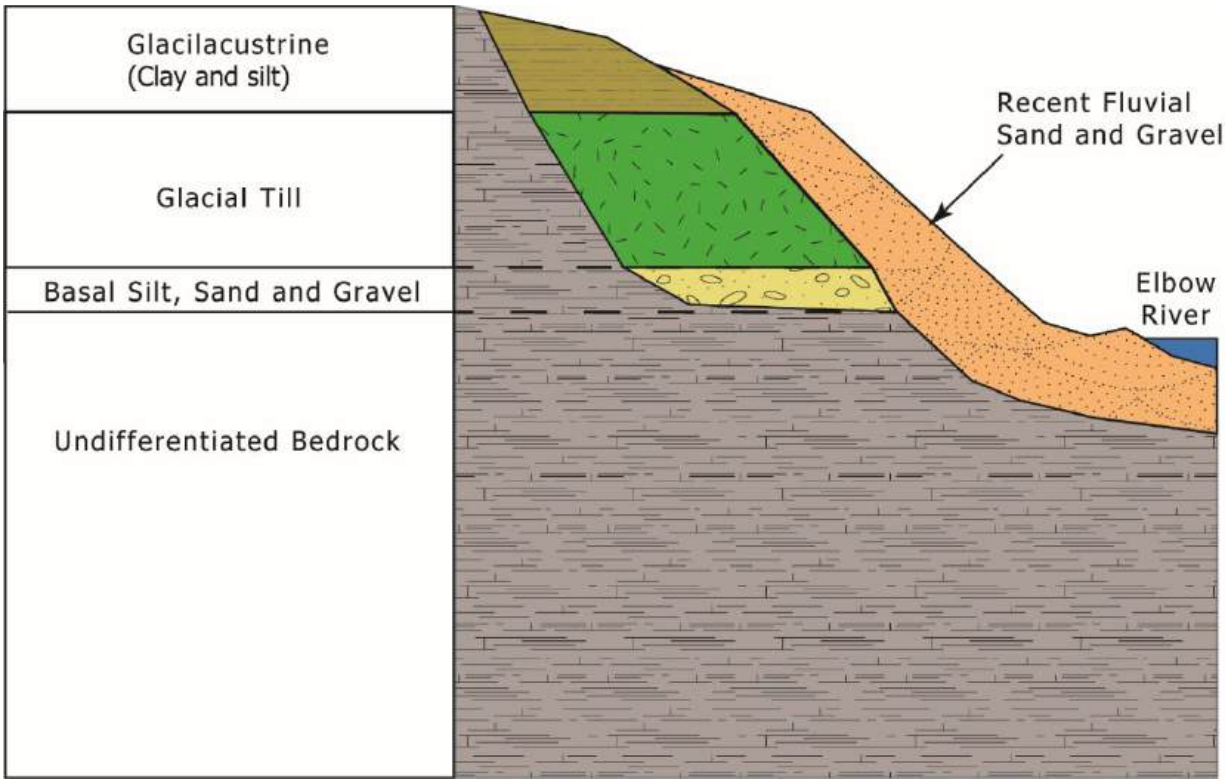
The conceptual hydrostratigraphic framework for the LAA and RAA is based on the three-dimensional conceptual site model (3D CSM) developed for the baseline groundwater assessment. Figure A.2 presents an oblique view of the 3D CSM looking from the east with the RAA boundary shown overlain on the model and air photograph for reference.

Figure A.2 Oblique Angle Overview of 3D CSM



A regional stratigraphic column that shows the generalized stratigraphy beneath the RAA is depicted in Figure A.3. Brief descriptions of each stratigraphic unit, and a discussion of the additional salient features of the area are presented in the following subsections.

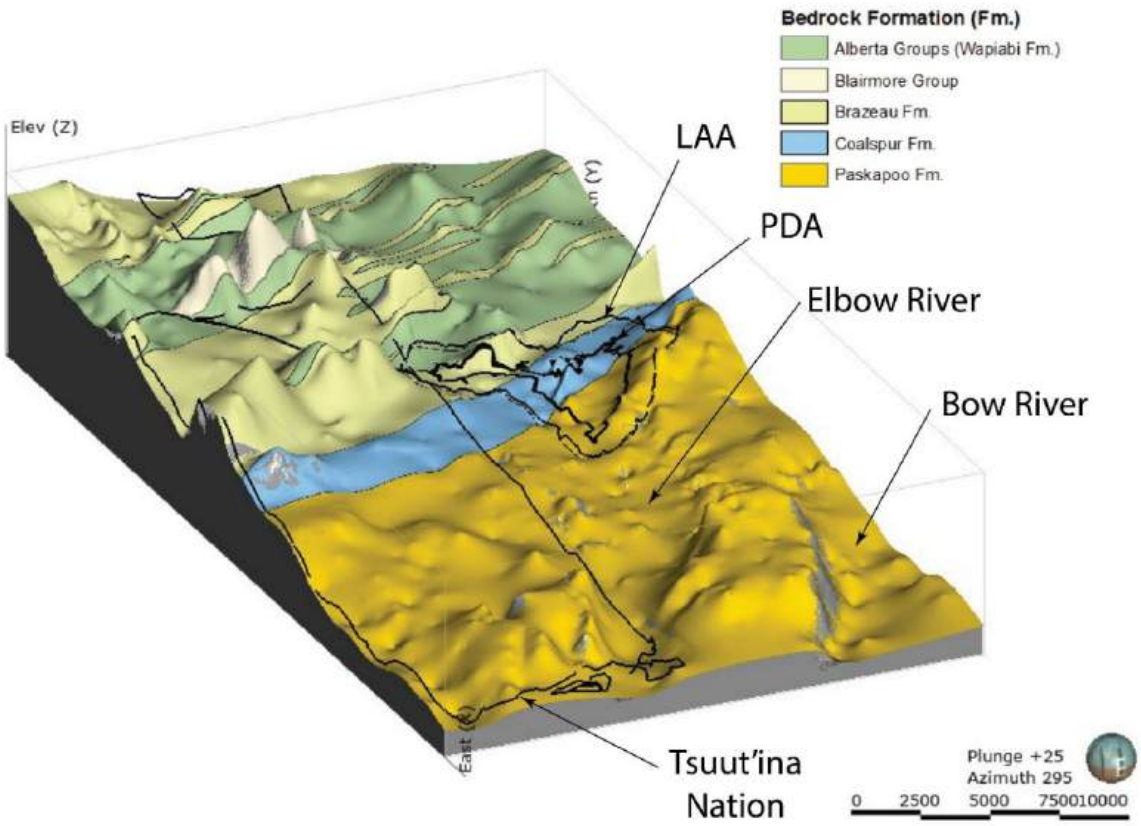
Figure A.3 Conceptual Regional Stratigraphic Column



A.2.2 Bedrock

The bedrock surface within the RAA was shaped by tectonism and associated formation of the Rocky Mountains to the west, glacial erosion/deposition, and erosional incision of modern-day river channels. The RAA is in the disturbed belt which forms a transitional zone (foothills) between the Rocky Mountains to the west and prairie to the east. Bedrock topography is depicted in Figure A.4.

Figure A.4 Bedrock Topography and Subcrop Formations



The bedrock units encountered beneath the quaternary deposits are presented below from oldest to youngest. This generally coincides with how they appear from west to east across the RAA except for the Blairmore Group:

- The lower Cretaceous Blairmore Group dominantly composed of fluvial sediments. The two fluvial formations belonging to the upper Blairmore Group include the Beaver Mines and Mill Creek formations (Langenberg et al. 2000). This unit subcrops over a small topographically elevated area in the southwest of the RAA.
- The upper Cretaceous-aged Wapiabi Formation of the Alberta Group is generally composed of shale and mudstone with minor siltstone, except for the Chungo and Marshybank Members, which are sandstone dominated (Pana and Elgr 2013).
- The upper Cretaceous-aged Brazeau Formation is composed primarily of sandstone and laminated siltstone, along with olive green mudstone and granule to pebble conglomerate in the lower part. The upper part is composed of greenish-grey to dark grey mudstone, siltstone and greenish-grey sandstone. Thin coal and coaly shale beds and thin bentonite layers also occur in the upper part (Prior et al. 2013).

- The Upper Cretaceous-to-Tertiary aged Coalspur Formation formed as a marginal marine fluvial infill of the foreland basin. The Coalspur Formation is composed of thinly bedded to massive sandstone, siltstone, light grey to olive green mudstone, shale, coaly shale, coal seams and minor volcanic tuff in the lower portions (Pana and Elgr 2013).
- The Tertiary-aged Paskapoo Formation is made up of thick tabular sandstone, siltstone and mudstone (Glass 1990). The sandstones are fine to coarse grained and are cliff forming. The Paskapoo Formation also contains a substantial amount of shale, carbonaceous shale, siltstone, rare coals seams and shell beds (Pana and Elgr 2013). In the central Rocky Mountains and foothills, the Paskapoo Formation is dominated by recessively weathering, grey to greenish-grey mudstone and siltstone with subordinate pale grey, thick- to thin-bedded, sandstone; minor conglomerate; mollusc coquina; and coal (Prior et al. 2013). The Paskapoo Formation is the primary bedrock aquifer in the Elbow River watershed. Due to the stratigraphy of the layers of sandstone and shale within this formation, multiple aquifers occur at various depths in the rock (Waterline 2011).

The approximate subcrop boundaries of the bedrock units are presented in Figure A.4 and are based on regional mapping by Pana and Elgr (2013), except for the contact between the Coalspur and Brazeau Formations. This contact was reinterpreted by Jerzykiewicz (1997) based on observation and description of the entrance conglomerate in outcrop along Highway 22. The entrance conglomerate marks the boundary between these two formations, and its presence was confirmed in the field Project-specific data gathering.

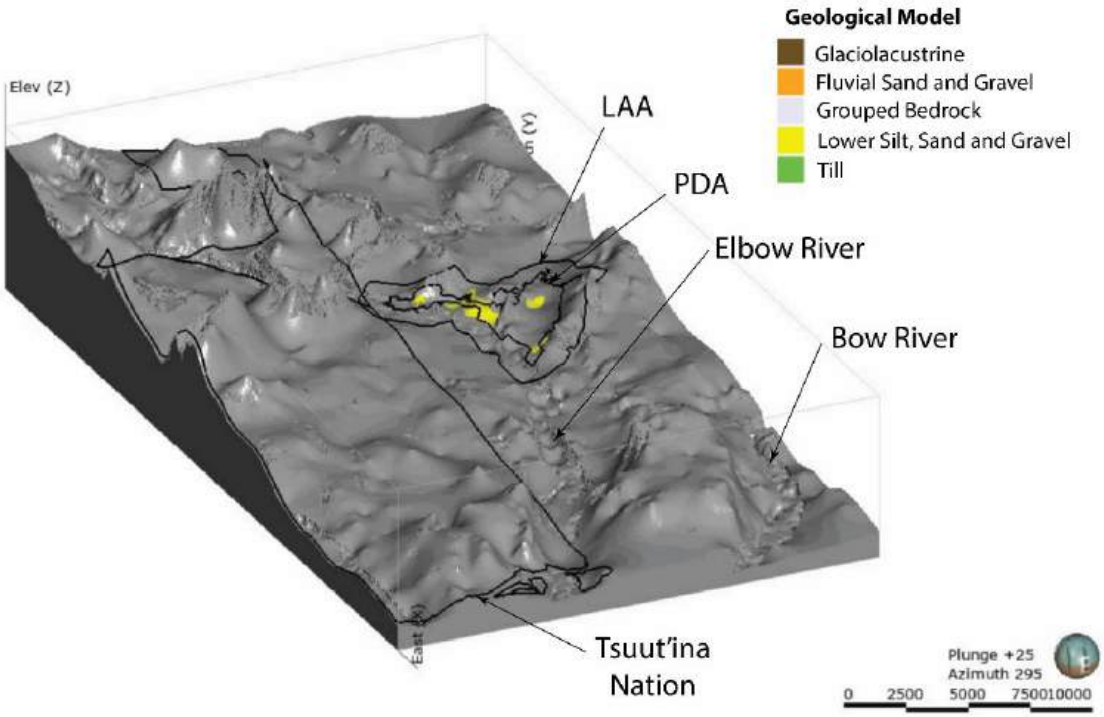
The bedrock descriptions from boreholes drilled to support the Project consist of varying thicknesses of alternating siltstone, sandstone mudstone and claystone. Generalized descriptions of each of these lithological units are as follows:

- Grey to brown, fine to medium-grained sandstone ranges from completely unlithified to well cemented and dry. Significant fracturing was noted in many intervals, with oxidation common along fracture planes. The upper sandstone beds beneath the unconsolidated deposits are highly weathered. Thicknesses of individual sandstone beds range from thin, centimetre-scale beds to a maximum of 15.3 m and an average thickness of 2.5 m.
- Grey to brown and, in some intervals, greenish-grey siltstone occurs and is extremely weak and friable to well cemented. It is highly fractured in some intervals, with oxidation along fracture planes. The average thickness of the interbedded siltstone beds is 2.5 m.
- Medium grey to brown claystone, generally blocky and not fissile-like shale, dry except where fractures are saturated occurs. Fracturing varies from completely unfractured to, more often, highly fractured with oxidation and alteration of clay along fractures. Claystone is interbedded with the other lithologies described above, with an average thickness of 1.9 m for each of the interbedded layers.

A.2.3 Basal Silt, Sand and Gravel

In some portions of the LAA, a coarser grained unit occurs above the bedrock at the base of the till. This unit is most prominent near the Elbow River valley and consists of a mixture of brown sand, silt and gravel with variable fines. The unit ranges in thickness from 0.9 to 4.2 m with an average of 2.4 m in the boreholes where it was encountered. The distribution of the basal silt, sand and gravel deposits is shown in yellow in Figure A.5. While this unit may be more widespread within the RAA than the distribution shown, the data density in the LAA was sufficient based on Project-specific data to allow correlation and mapping of this unit.

Figure A.5 Distribution of Basal Silt, Sand and Gravel



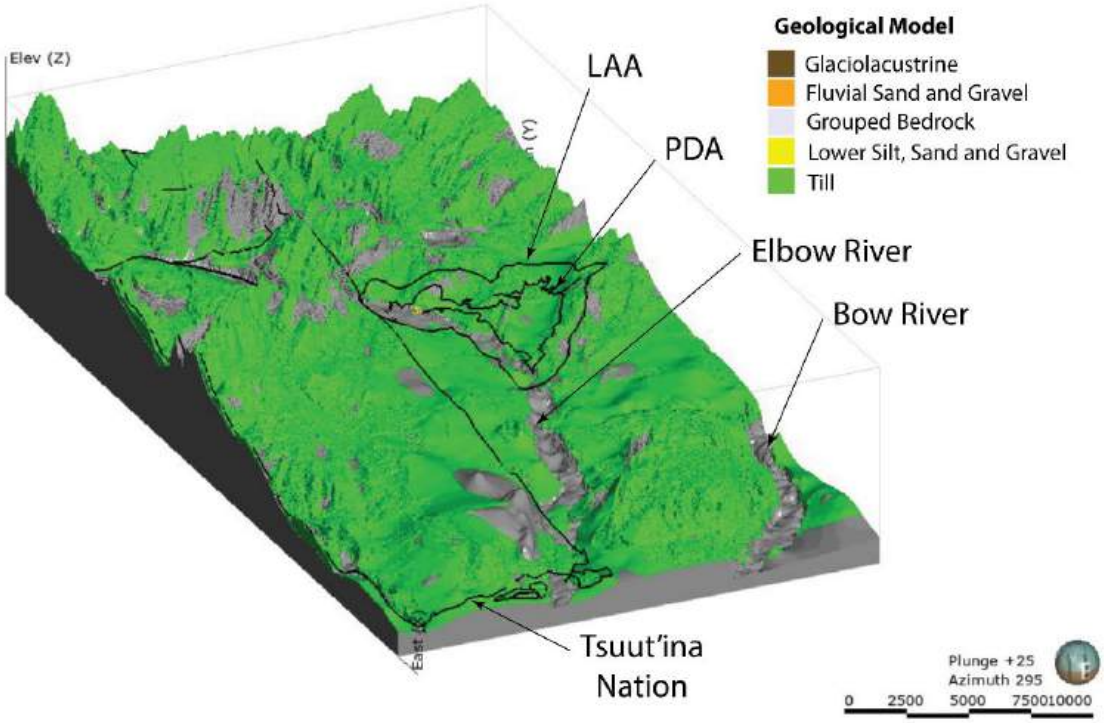
A.2.4 Till

The unconsolidated deposits present beneath the majority of the RAA consist of Pleistocene Age glaciolacustrine clay and till (Fenton et al. 2013; Moran 1986). In the RAA, the till material was deposited by glacial ice as basal or lateral moraines. Based on the field observations and laboratory grain size analyses completed as part of the geotechnical drilling program, the till in the LAA is composed of a heterogeneous mixture of approximately equal parts clay and silt, a lower proportion of sand, and minor gravel. Silt and sand lenses are also present within the heterogeneous matrix. The till is described as generally stiff to very stiff or hard, medium to high plastic clay with silt and more minor sand. Where present, the till ranges in thickness from 0.2 m to greater than 50 m with an average thickness of 10 m across the RAA.

Two main till sub-units are summarized as follows:

- Brown-grey subglacial till is dark brown to grey sandy, silty, clay with variable gravel. The till is hard with low to medium plasticity. The brown-grey subglacial till was encountered throughout the dam and diversion footprint. Cobble-sized clasts within the matrix were rounded to sub-rounded sandstones and carbonates.
- Upper brown till occurs above the subglacial till and is a massive, matrix-supported, olive brown to brown, medium plastic clay, clay and silt with sand content increasing with depth. This unit was encountered in boreholes in the dam footprint and eastern portion of the diversion channel.

Figure A.6 Distribution of Till



A.2.5 Glaciolacustrine Deposits

Glaciolacustrine clay overlies the till in the low-lying areas of the LAA. The silty clay was deposited in Glacial Lake Calgary, a proglacial lake formed by ice damming during the last deglaciation. The glaciolacustrine deposits have been named the Calgary Formation (Moran 1986).

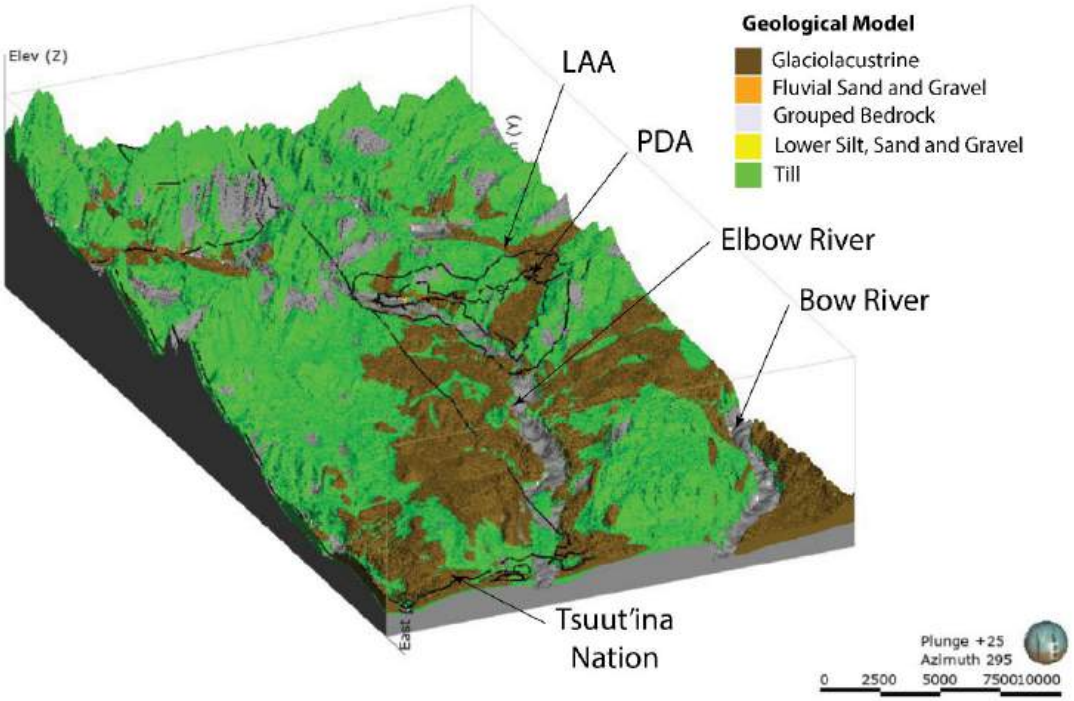
The distribution of this unit is presented in blue in Figure A.7. Outlines of the Tsuut'ina Nation Reserve and the Hydrogeology PDA/LAA are also shown as overlays for reference. Within the LAA, the glaciolacustrine clay averaged 5.3 m thick in the boreholes where it was encountered.

Based on the field observations and laboratory grain size analyses, the glaciolacustrine clay in the LAA is composed of 50-70% clay, 30-40% silt and a minor proportion of sand. Typical of a lacustrine deposit, the clay was found to be laminated with silt and fine sand. This layering has resulted in the following:

- relatively high hydraulic conductivities for silty clays (measured at $1.4x10^{-7}$ metres per second (m/s) and model calibrated at $5.1x10^{-6}$ m/s) and anisotropy ratios (horizontal hydraulic conductivity: vertical hydraulic conductivity) compared to the underlying till
- groundwater preferentially flows through the silt

The laminations and rhythmic bedding of the glaciolacustrine deposits can be observed along the banks of Elbow River in the RAA.

Figure A.7 Distribution of Glaciolacustrine Deposits



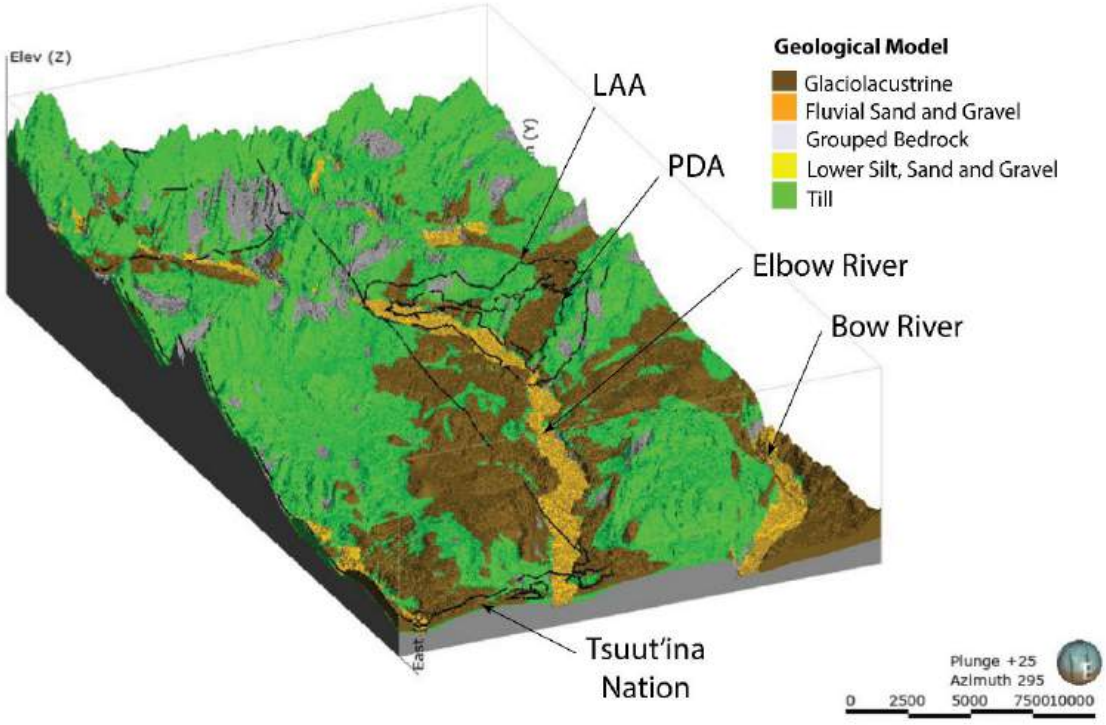
A.2.6 Recent Fluvial Deposits

Post-glacial fluvial channel sediments are in the Elbow River valley that extends across the RAA and in the Jumpingpound Creek channel in the western portion of the RAA. These sediments developed as the high-energy rivers, eroded and exported material from upstream areas and deposited coarse alluvium (sand and gravel) in the river channel. Localized areas of overbank deposits consisting of fluvial silt are also present (Moran 1986). The deposition of alluvium over Quaternary deposits or bedrock in the valleys resulted in the formation of alluvial aquifers, which are an important source of groundwater for the river and residents.

The alluvial aquifers provide temporary storage for water from Elbow River and Jumpingpound Creek during floods; the water is naturally released back into the rivers from bank storage after a flood recedes. Groundwater from the alluvial aquifer of Elbow River is essential in maintaining baseflow. Yields for the Elbow River alluvial aquifer range from 175 cubic metres per day (m^3/day) to 2,500 m^3/day (Waterline 2011).

Recent fluvial deposits are depicted in orange in Figure A.8. Outlines of the Tsuut'ina Nation Reserve and the Hydrogeology PDA/LAA are also shown as overlays for reference. The fluvial deposits in this area are brown and grey silty gravel with more minor sand, cobbles and boulders.

Figure A.8 Distribution of Recent Fluvial Deposits



A.3 Groundwater Flow

A.3.1 Groundwater Flow in the Unconsolidated Glacial Deposits

Groundwater levels within the surficial deposits generally follow the topography and range from 0 m BGL, where the water table intersects ground surface at springs and along stream and river banks, to approximately 8.0 m BGL. The corresponding groundwater elevations range from approximately 1,380 m ASL in the topographically elevated areas in the of the RAA southwest to 1,080 m ASL along the eastern boundary of the RAA.

There is high potential for perched water table development within the RAA because of the following landscape and geological controls:

- permeability contrast created by an unconsolidated sediment veneer over the bedrock
- steep land surface gradients and erosional unconformities that truncate hydrostratigraphic units within the RAA
- mapped contact springs that indicate perched conditions in topographically elevated areas.

Groundwater flow direction is interpreted to be toward Elbow River across the majority of the RAA, except for areas 1) northwest where shallow groundwater flows west toward Jumpingpound Creek, 2) areas along the north side of the RAA across the flow divide, and 3) in the Bow River watershed where groundwater flows north. Horizontal gradients beneath the LAA range from 0.003 in the central portion of the reservoir to 0.1 in the southern portion of the LAA that is adjacent to the Elbow River near the diversion structure.

As noted above, the unconsolidated sediment above bedrock is also thought to host-perched water tables in which groundwater flow is typically dictated by local-scale topography where the permeability contrast exists to support development of perched groundwater.

The average linear groundwater velocity in the unconsolidated glaciolacustrine deposits and till is estimated to range from less than 0.01 metres per year (m/year) to approximately 2.3 m/year. However, it should be noted that flow velocities through sand lenses within, or at the base of, the till could be higher.

A.3.2 Groundwater Flow in the Upper Bedrock Aquifers

The potentiometric surface elevation in the upper bedrock ranges from approximately 1,400 m ASL in the southwest to 1,080 m ASL at the base of the Elbow River valley along the eastern boundary of the RAA. The potentiometric surface elevation in the mountainous southwest area of the RAA is predicted above land surface between topographically elevated areas. This suggests the presence of locally perched bedrock aquifers in this area that are poorly hydraulically connected to the underlying regional bedrock aquifer.

Groundwater flow direction in the bedrock is dominantly controlled by the bedrock surface-topography. On the north side of Elbow River, the bedrock generally slopes towards the river, while being influenced by variation in the bedrock surface topography. There are some topographic low areas in the bedrock on the north side of the river that focus groundwater flow in the bedrock beneath the PDA and LAA before trending towards Elbow River. The bedrock topography is significantly more complex on the south side of Elbow River and the flow patterns in the bedrock demonstrate radial flow away from elevated bedrock features. Correspondingly, the surface water drainage features to Elbow River on the south side appear to act as groundwater discharge features that focus flow between topographically-elevated bedrock features.

Horizontal gradients in the upper-bedrock aquifers beneath the LAA range from 0.005 in the central portion of the proposed reservoir to 0.02 in the southern portion of the LAA adjacent to Elbow River near the diversion structure.

The average linear groundwater velocity in the shallow bedrock is estimated to range from less than 0.01 cm/year in the unfractured portions of the claystone bedrock to approximately 30 m/year in the more permeable sandstone in the areas of higher hydraulic gradient near the Elbow River.

A.4 Existing Groundwater and Surface Water Use

Groundwater use in the RAA is primarily from shallow bedrock aquifers with some wells also completed in the recent fluvial deposits along Elbow River. Regional mapping by HCL (2002) indicate yields from the bedrock aquifers in the disturbed belt range from 10 m^3/day to 75 m^3/day. Yields from wells completed in the recent fluvial deposits along Elbow River are expected to range from 175 m^3/day to 2,500 m^3/day (Waterline 2011).

The base of groundwater protection (BGP) is an estimate of the elevation of the base of the geological formation in which the groundwater is deemed useable with a total dissolved solids (TDS) concentration of less than 4,000 mg/L. West of the RAA, the BGP is defined as the base of the Paskapoo Formation; however, because the RAA lies within the disturbed belt of the Rocky Mountains, the AGS has set an arbitrary BGP of 600 m BGL.

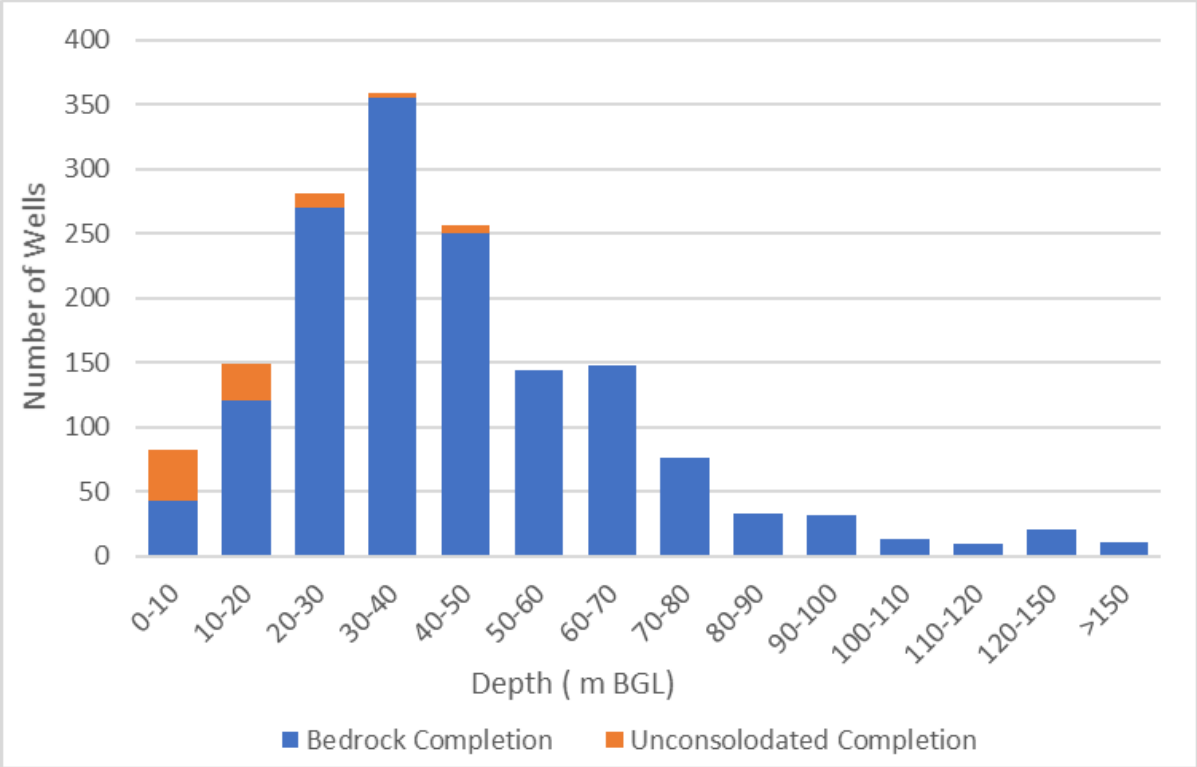
Water well drillers records for groundwater wells completed in the RAA were queried from the Alberta Water Well Information Database (AWWID). A total of 2,140 unique well records were identified within the RAA. A number of well record types were removed from the raw data such as abandoned test holes, dry holes, piezometers, and seismic test holes, which are not reflective of groundwater use. A total of 1,708 water well drilling records remained after removing irrelevant data. The proposed use of the wells associated with the AWWID drilling records within the expanded were as follows:

- 1,458 for domestic use
- 71 for stock use
- 75 for domestic and stock use
- 15 for commercial purposes

- 16 for industrial purposes
- 5 for irrigation purposes
- 9 for municipal use
- 59 for unknown use

Water well depths ranged from 1.5 m to 246 m BGL. Figure A.9 presents a histogram of the total depth recorded on the drilling records. The number of wells completed in bedrock and unconsolidated units are also summarized in the figure. A total of 83 well records were for wells installed in unconsolidated deposits with completion depths ranging from 0 to 50 m BGL. It is worth noting that many of the wells will not currently be in use considering the average age of the records is 33 years and some are as old as 80 years. Additional detail and mapping regarding groundwater use are presented in the Hydrogeology Technical Data Report (TDR) Update (Stantec 2019).

Figure A.9 Histogram of Water Well Depth in the RAA



A.5 Implications for the Groundwater Monitoring Plan

The following factors were considered during development of the GWMP based on the hydrostratigraphic framework and summary of groundwater use presented above:

- The hydrogeologic setting in the RAA is complex and consists of a series of unconsolidated deposits overlying bedrock. The GWMP describes monitoring of both unconsolidated and bedrock hydrostratigraphic units.
- The distribution of the unconsolidated units is highly variable across the RAA, but generally consist of low permeability (10^{-10} to 10^{-6} m/s) deposits in areas outside of river valleys. Higher permeability deposits are generally confined to the Elbow River valley and within some of the smaller tributary valleys. The GWMP considers the variable distribution of the unconsolidated deposits and describes monitoring in both permeable units (potential aquifers) and low permeability units (aquitards).
- Bedrock in the RAA is also variable and heterolithic, generally consisting of interbedded sequences of fine-and-coarse grained deposits varying from mudstones to sandstones. When the position of monitoring wells is better constrained, the completion interval for the monitoring well will need to carefully consider the lithology encountered during drilling/installation to reflect the uppermost interval most likely to be used domestic/agricultural use.
- Groundwater use for domestic and agricultural purposes in the RAA is sourced from both unconsolidated and bedrock units. However, use from the bedrock units dominates, particularly for wells with depths greater than 10 m. As such, the draft GWMP considers monitoring of the deeper bedrock units, particularly in areas distant from Project infrastructure, such that unexpected change in groundwater levels can be detected in hydrostratigraphic units currently being used for domestic and agricultural purposes.

Appendix B Borehole Logs

Monitoring Well: MW16-1-15 (GW1)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Hollow-stem auger (Track mounted)/ Coring
Client:	Alberta Transportation	**Date started/completed:**	19-May-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-33327.478
Contractor:	All Service Drilling Inc.	**Northing:**	5659967.274

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
0	0		SAND AND GRAVEL Fine to coarse grained	0.00
			SILT Medium brown, with clay, moist, high plastic	0.30
5			CLAY Medium brown, trace silt, moist, high plastic, few intermittent <150 mm thick silt lenses	1.52
10	2			
	4			
15			SILTY CLAY (TILL) Medium brown, with very fine to medium grained sand, some gravel, moist	4.88
20	6			
25	8			
			CLAY (TILL) Dark brown to dark grey, with gravel, some silt, low plastic	8.53
30	10			
35			SILTSTONE Grey to greenish grey, few fractures	10.06
40	12			
			SANDSTONE Medium grey, fine grained, moderate fracturing, minor oxidation and clay mineralization along fractures - @ 13.11 m: sand becomes interbedded with alternating grey and brown fine grained layers	12.19
45	14			
50				
	16			
55			End of Borehole	16.76

Diagram / Description:

- 0.805 m Stick-up
- Sand 0 to 1.83 m BGS
- Groundwater 3.70 m BGS May 19, 2016
- 254 mm diameter borehole from 0 to 10.06 m
- Bentonite
- Solid pipe 51 mm diameter Schedule 40 PVC
- 102 mm diameter borehole from 10.06 to 16.76 m
- Sand Sil 9 (4/10)
- Slotted pipe 51 mm diameter Schedule 40 PVC No. 10 slot

Screen Interval: 12.19 - 15.24 m BGS
Sand Pack Interval: 11.58 - 16.76 m BGS
Well Seal Interval: 1.83 - 11.58 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-1-15

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

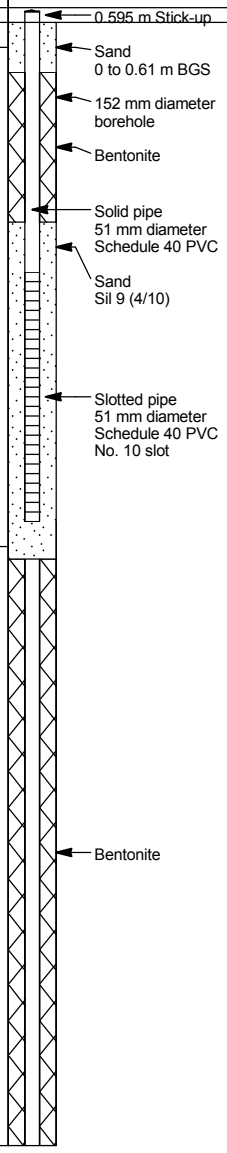
Monitoring Well: MW16-2-6 (GW2)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Solid-stem auger (Track mounted)
Client:	Alberta Transportation	**Date started/completed:**	26-May-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-31947.274
Contractor:	All Service Drilling Inc.	**Northing:**	5659623.886

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
0	0		Ground Surface	
			SOIL Black to dark brown, moist	0.00
			CLAY Brown to beige, some silt, moist, high plastic	0.30
5	2		- @ 2.13 m: becomes mottled beige and grey, silt content increases to 15-30%	
10	4		- @ 3.66 m: trace gravel and coal present	
20	6			
			SILT (TILL) Light brown, some fine grained sand stringers, with gravel and clay, moist, low plastic	6.40
25	8			
30	10			
35			- @ 10.67 m: grades to gravelly silt	
40	12			
45	14		End of Borehole	13.72

INSTALLATION DETAILS



Screen Interval: 3.05 - 6.10 m BGS
Sand Pack Interval: 2.44 - 6.55 m BGS
Well Seal Interval: 6.55 - 13.72 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-2-6

Stantec

Drawn By/Checked By: M. Kuhl / D. King

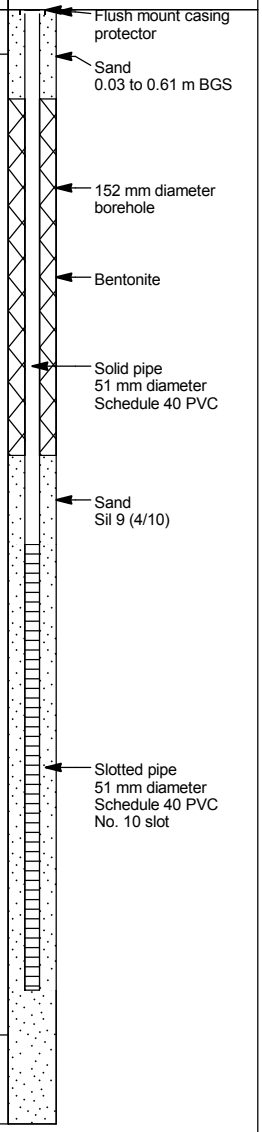
STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

Monitoring Well: MW16-3-7 (GW3)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Solid-stem auger (Truck mounted)
Client:	Alberta Transportation	**Date started/completed:**	29-Jul-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-31904.435
Contractor:	All Service Drilling Inc.	**Northing:**	5659073.461

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
			SAND AND GRAVEL (FILL)	0.00
			CLAY AND SILT Medium brown, moist, medium plastic	0.30
5	2		- @ 1.83 m: silt content decreases to 30-40%, high plastic	
10	4			
15			- from 5.18 to 6.10 m: layer of silt with clay, wet	
20	6			
			SILTY CLAY (TILL) Medium brown, some very fine grained sand, with gravel, dry to moist, low to medium plastic	7.01
25	8		End of Borehole	7.62



Screen Interval: 3.66 - 6.71 m BGS
Sand Pack Interval: 3.05 - 7.62 m BGS
Well Seal Interval: 0.61 - 3.05 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-3-7

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

Monitoring Well: MW16-4-22 (GW4)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Hollow-stem auger (Track mounted)/ Coring
Client:	Alberta Transportation	**Date started/completed:**	20-May-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-32259.324
Contractor:	All Service Drilling Inc.	**Northing:**	5658717.399

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
0	0		TOPSOIL	0.00
			CLAY Light to medium brown, with silt, moist, high plastic	0.30
5	2			
10	4			
15				
20	6			
			SILTY CLAY (TILL) Medium brown, some very fine to fine sand, with gravel, moist, high plastic	6.71
25	8		- @ 8.23 m: trace coal present	
30	10		- @ 9.45 m: sand component increases to 15-30% very fine to fine sand	
35			SILT AND CLAY (TILL) With very fine to fine sand, with gravel, dry to slighly moist, friable	10.97

Diagram / Description:

- 0.662 m Stick-up
- Sand 0 to 1.22 m BGS
- Bentonite
- Groundwater 2.38 m BGS May 20, 2016
- Cuttings and sand 1.83 to 4.88 m BGS
- 254 mm diameter borehole from 0 to 12.80 m
- Solid pipe 51 mm diameter Schedule 40 PVC
- Bentonite

Screen Interval: 18.59 - 21.64 m BGS
Sand Pack Interval: 18.29 - 21.95 m BGS
Well Seal Interval: 21.95 - 22.86 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-4-22

Stantec

Drawn By/Checked By: M. Kuhl / D. King

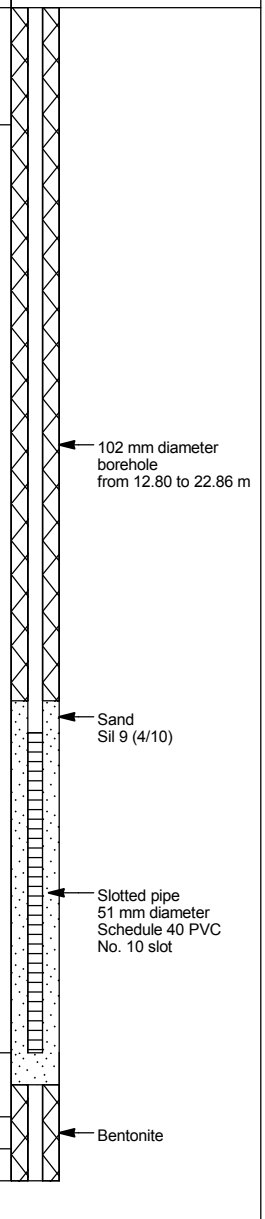
STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

Monitoring Well: MW16-4-22 (GW4)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Hollow-stem auger (Track mounted)/ Coring
Client:	Alberta Transportation	**Date started/completed:**	20-May-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-32259.324
Contractor:	All Service Drilling Inc.	**Northing:**	5658717.399

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			SILT AND CLAY (TILL) With very fine to fine sand, with gravel, dry to slighly moist, friable	
40	12			
			SANDSTONE Medium grey, very fine to fine grained, few fractures, some oxidation on fracture surfaces, no structure, massive	12.80
45	14			
			- @ 14.94 m: sandstone becomes slightly banded with alternating light grey and dark grey layers, no oxidation present	
50				
	16			
55				
			- @ 17.98 m: medium grained layers interbedded with finer grained layers become present	
60	18			
			- @ 20.12 m: sand begins to coarsen to medium grained sandstone, some clay along fractures	
65	20			
70				
			SILTSTONE Dark grey, highly fractured and altered - @ 21.95 m: clay mineralization along fractures	21.64
	22		SANDSTONE Medium grey, very fine grained	22.25
75			CLAYSTONE Dark grey to black, few fractures	22.56
			End of Borehole	22.86



Screen Interval: 18.59 - 21.64 m BGS
Sand Pack Interval: 18.29 - 21.95 m BGS
Well Seal Interval: 21.95 - 22.86 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-4-22

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

Monitoring Wells: RMW16-5-12

Project:	SR1/Springank	**Method:**	Soid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	30-Nov-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT/AK	**Easting:**	n/a
Contractor:	All Service Drilling	**Northing:**	n/a

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram	Description
-2	-0.5					Aboveground casing 0.76 m
0	0.0		Ground Surface TOPSOIL	0.00		50 mm solid PVC pipe packed in 10-20 filter sand
1	0.5		SANDY CLAY fine grained sand, some oxidation and organics, greyish brown, dry	0.30		
5	1.5					
6	2.0		SILTY SAND some gravel, trace clay, low plasticity, reddish brown, moist	1.80		
11	3.5		SANDSTONE fine to very fine sand, brown, dry	3.50		
15	4.5					50 mm solid PVC pipe packed in hydrated bentonite chips 0.3 to 8.7 m BGS
23	7.0					Water level 6.914 m BTOC 4-May-22

Screen Interval: 9.00 - 12.00 m BGS
Sand Pack Interval: 8.70 - 12.00 m BGS
Well Seal Interval: 0.30 - 8.70 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Wells: RMW16-5-12

Project:	SR1/Springank	**Method:**	Soid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	30-Nov-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT/AK	**Easting:**	n/a
Contractor:	All Service Drilling	**Northing:**	n/a

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
24	7.5		SANDSTONE fine to very fine sand, brown, dry		
26	8.0		SILTSTONE traces of coal, grey, wet	8.00	
28	8.5				
29	9.0		SANDSTONE very fine sand, silt seams, grey, dry	9.00	50 mm solid PVC pipe packed in 10-20 filter sand 8.7 to 9.0 m BGS
31	9.5				
33	10.0				
34	10.5				50 mm slotted PVC pipe packed in 10-20 filter sand 9.0 to 12.0 m BGS
36	11.0				
38	11.5				
39	12.0		End of Borehole	12.00	
41	12.5				
43	13.0				
44	13.5				
46	14.0				
47	14.5				
49	15.0				

Screen Interval: 9.00 - 12.00 m BGS
Sand Pack Interval: 8.70 - 12.00 m BGS
Well Seal Interval: 0.30 - 8.70 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: MW16-6-20 (GW6D)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Solid-stem auger (Truck mounted)
Client:	Alberta Transportation	**Date started/completed:**	26-Aug-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-31100.423
Contractor:	All Service Drilling Inc.	**Northing:**	5658133.938

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
			TOPSOIL	0.00
			SILT Light brown, some clay, moist to wet - @ 1.22 m: clay content begins to increase	0.30
5	2			
			SILTY CLAY Light brown to light grey, medium to high plastic, mottled	2.44
10	4			
15			- @ 4.88 m: clay content decreases to 15-30%, high plastic	
20	6			
25				
	8		SILTY CLAY (TILL) Medium brown, with very fine grained sand, some gravel, moist, medium plastic	7.92
30			- @ 9.14 m: silt content increases to > 40%	
	10			
35			CLAYSTONE - fom 10.36 to 18.90 m: light to medium grey, dry, medium to high plastic when wetted, some small intervals of soft clay fracture gouge throughout	10.36
40	12			
45	14			
50				
	16			
55				
60	18		- from 18.90 to 20.42 m: black to dark grey, dry	
65	20			
			SILTSTONE Light grey, weathered to silt	20.42
70			CLAYSTONE Dark grey, dry	21.34
	22			
75			End of Borehole	22.86
	24			

INSTALLATION DETAILS	
Diagram	Description
	Flush mount casing protector
	Sand 0.03 to 0.61 m BGS
	152 mm diameter borehole
	Bentonite seal
	Solid pipe 51 mm diameter Schedule 40 PVC
	Sand Sil 9 (4/10)
	Slotted pipe 51 mm diameter Schedule 40 PVC No. 10 slot

Screen Interval: 18.90 - 21.95 m BGS
Sand Pack Interval: 18.29 - 22.86 m BGS
Well Seal Interval: 0.61 - 18.29 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-6-20

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

Monitoring Well: MW16-7-5 (GW7)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Solid-stem auger (Truck mounted)
Client:	Alberta Transportation	**Date started/completed:**	28-Jul-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-31098.792
Contractor:	All Service Drilling Inc.	**Northing:**	5658895.242

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
			TOPSOIL	0.00
			SILTY CLAY Light to medium brown, moist, medium plastic	0.30
5	2			
10	4			
15			- from 4.57 to 5.18 m: trace fine grained sand, some gravel	
20	6			
			SILTY CLAY (TILL) With very fine to fine grained sand (oxidized), with gravel, dry to moist, low plastic	6.71
25	8			
30			End of Borehole	9.14
	10			

Diagram / Description:
- Flush mount casing protector
- Sand 0.05 to 0.61 m BGS
- 152 mm diameter borehole
- Bentonite
- Solid pipe 51 mm diameter Schedule 40 PVC
- Sand Sil 9 (4/10)
- Slotted pipe 51 mm diameter Schedule 40 PVC No. 10 slot
- Bentonite

Screen Interval: 2.13 - 5.18 m BGS
Sand Pack Interval: 1.83 - 5.19 m BGS
Well Seal Interval: 0.61 - 1.83 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-7-5

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

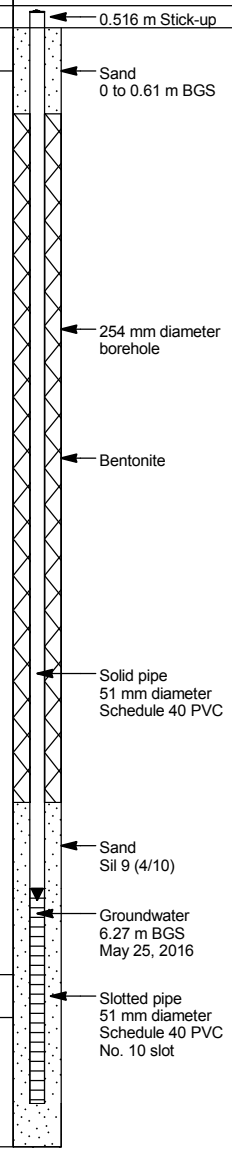
Monitoring Well: MW16-8-8 (GW8S)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Hollow-stem auger (Track mounted)
Client:	Alberta Transportation	**Date started/completed:**	25-May-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-30875.717
Contractor:	All Service Drilling Inc.	**Northing:**	5659641.119

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
0	0		SOIL Black, dry	0.00
			SILT (TILL) Brown to light brown, some gravel, with clay, dry, low plastic, friable	0.30
5	2			
			- @ 2.44 m: some very fine grained sand seams become present	
10	4		- @ 3.35 m: becomes moist	
15	6		- @ 5.79 m: red to orange, trace oxidized silt stringers	
20			SILT AND SAND Brown, very fine grained, saturated	6.71
			SILTY CLAY (TILL) Light to medium brown, with gravel, dry, low plastic	7.01
25	8		End of Borehole	7.92

INSTALLATION DETAILS



Screen Interval: 6.10 - 7.62 m BGS
Sand Pack Interval: 5.49 - 7.92 m BGS
Well Seal Interval: 0.61 - 5.49 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-8-8

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

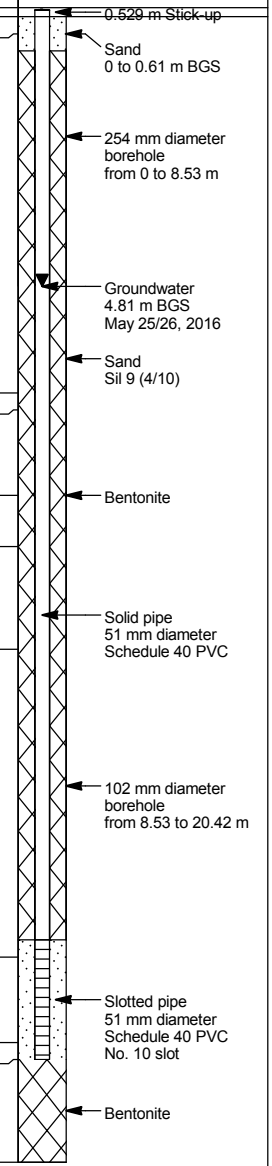
Monitoring Well: MW16-8-19 (GW8D)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Hollow-stem auger (Track mounted)/ Coring
Client:	Alberta Transportation	**Date started/completed:**	25-May-2016 / 26-May-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-30877.454
Contractor:	All Service Drilling Inc.	**Northing:**	5659641.18

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
0	0		Ground Surface	
			SOIL Black, dry	0.00 0.30
			SILT (TILL) Brown to light brown, some gravel, with clay, dry, low plastic, friable	
5	2			
			- @ 2.44 m: some very fine grained sand seams become present	
10	4		- @ 3.35 m: becomes moist	
15				
20	6		- @ 5.79 m: red to orange, trace oxidized silt stringers	
			SILT AND SAND Brown, very fine grained, saturated	6.71 7.01
25	8		SILTY CLAY (TILL) Light to medium brown, with gravel, dry, low plastic	
30			SILTSTONE Light brown to beige, dry, friable	8.53
	10		CLAYSTONE Light to medium grey, few fructures	9.45
35			- @ 10.36 m: becomes highly weathered, with abundant fractures, orangish brown clay mineralization along fracture surfaces	
			SILTSTONE Grey to dark grey, finely interbedded light and dark layers, unfractured	11.28
40	12			
45	14		- @ 14.02 m: thin very fine to fine grained sand layers become present	
50	16			
55			SANDSTONE Medium brown, fine grained, few fractures, minor oxidation and mineralization along fractures	16.76
	18			
60			CLAY Black, high plastic	18.29 18.59
			SILTSTONE Grey to greenish grey, dry, friable, clay alteration along fracture surfaces	
65	20			
			End of Borehole	20.42
70				

INSTALLATION DETAILS



Screen Interval: 16.46 - 18.59 m BGS
Sand Pack Interval: 16.46 - 18.59 m BGS
Well Seal Interval: 0.61 - 16.46 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-8-19

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

Monitoring Well: MW16-10-15 (GW10)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Solid-stem auger (Track mounted)
Client:	Alberta Transportation	**Date started/completed:**	10-Aug-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-30461.405
Contractor:	All Service Drilling Inc.	**Northing:**	5658478.167

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Diagram / Description
			Ground Surface		0.848 m Stick-up
0	0		TOPSOIL	0.00	
			SILTY CLAY Light to medium brown, moist, medium to high plastic, mottled	0.30	Sand 0 to 0.30 m BGS
5	2				152 mm diameter borehole
10	4		- below 3.66 m: some very fine grained sand, some gravel		
15					
			CLAYEY SILT Light grey to medium brown, moist, high plastic, mottled	5.49	Bentonite
20	6				
25	8				
30					
	10		CLAY (TILL) Medium brown, some very fine grained sand, some gravel, with silt, dry to moist, medium plastic	9.45	Solid pipe 51 mm diameter Schedule 40 PVC
35			- @ 10.97 m: gravel content increases to 15-30%		
40	12				Sand Sil 9 (4/10)
			CLAYEY SILT (TILL) Medium to dark grey, with very fine grained sand, some gravel, dry, low plastic	12.80	
45	14				Slotted pipe 51 mm diameter Schedule 40 PVC No. 10 slot
50			SILTSTONE Light to medium grey, dry	14.94	
	16				
55					
	18				Bentonite
60			End of Borehole	18.29	

Screen Interval: 12.19 - 15.24 m BGS
Sand Pack Interval: 11.89 - 18.14 m BGS
Well Seal Interval: 18.14 - 18.29 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-10-15

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

Monitoring Well: MW16-11-15 (GW11)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Solid-stem auger (Track mounted)
Client:	Alberta Transportation	**Date started/completed:**	30-Jun-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-30269.84
Contractor:	All Service Drilling Inc.	**Northing:**	5657742.889

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
0	0		Ground Surface	
			TOPSOIL	0.00
			CLAY Light to medium brown, with silt, moist, high plastic, mottled	0.30
5	2		- @ 2.13 m: silt content increases to 30-40%, mottled brown and grey	
10	4		- @ 2.74 m: silt content decreases back to 15-30%	
15				
20	6		- @ 5.79 m: clay content begins to decrease towards bottom of interval	
			SILT Medium brown, some clay, moist	6.40
25	8			
			SILT (TILL) Medium brown, with fine to medium grained sand, with gravel, some clay, moist	8.53
30	10			
35				
40	12		SILT Medium brown, some very fine grained sand, moist to wet	12.19
45	14			
			CLAY (TILL) Medium to dark grey, some very fine grained sand, some gravel, with silt, low plastic	14.63
50	16		End of Borehole	15.24

Diagram / Description:
- 0.588 m Stick-up
- Sand, 0 to 0.30 m BGS
- 152 mm diameter borehole
- Bentonite
- Solid pipe, 51 mm diameter, Schedule 40 PVC
- Sand, Sil 9 (4/10)
- Slotted pipe, 51 mm diameter, Schedule 40 PVC, No. 10 slot

Screen Interval: 11.58 - 14.63 m BGS
Sand Pack Interval: 10.97 - 15.24 m BGS
Well Seal Interval: 0.30 - 10.97 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-11-15

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

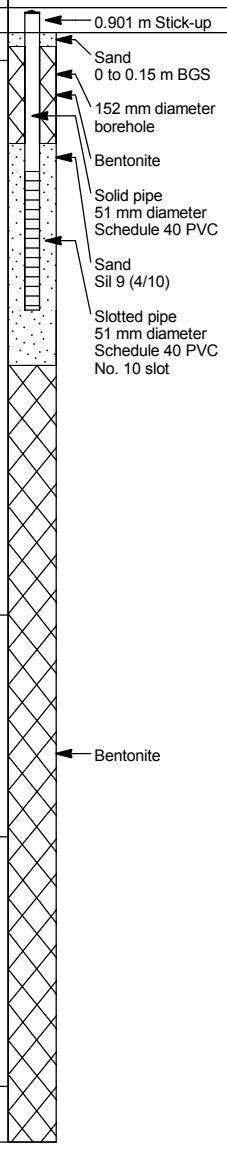
Monitoring Well: MW16-12-3 (GW12)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Solid-stem auger (Track mounted)
Client:	Alberta Transportation	**Date started/completed:**	19-Aug-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-29160.284
Contractor:	All Service Drilling Inc.	**Northing:**	5657858.348

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
0	0		Ground Surface	
			TOPSOIL	0.00
			CLAYEY SILT (TILL) Medium brown, moist, high plastic	0.30
5	2		- @ 1.83 m: sand content increases to 30-40%, fine to medium grained sand, some gravel	
10	4		- @ 2.74 m: sand content decreases to 15-30%	
15				
20	6		SANDY SILT (TILL) Medium brown, some gravel, with clay, dry to moist, crumbly	6.40
25	8			
30	10		SANDY CLAY (TILL) Medium to dark grey, some silt, dry to moist	8.84
35				
40	12		CLAYSTONE Light grey to brown, dry	11.58
			End of Borehole	12.19

INSTALLATION DETAILS



Screen Interval: 1.52 - 3.05 m BGS
Sand Pack Interval: 1.22 - 3.66 m BGS
Well Seal Interval: 0.15 - 1.22 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-12-3

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

Monitoring Well: RMW16-13-37

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	24-Aug-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	680595
Contractor:	All Service Drilling	**Northing:**	5660430

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
			Ground Surface		
			GRAVEL FILL	0.00	Flushmount well protector
2	1		SILTY CLAY TILL some sand, trace gravel and coal, oxidaiton staining, and white mineral precipitate, medium plasticity, brown, moist	0.30	50 mm solid PVC pipe packed in 10-20 filter sand
4					
6	2				
8					
10	3		- at 3.2 m BGS, increasing sand		
12			SANDY SILTY CLAY some gravel, brown, moist	3.50	
14	4				
16	5		- at 4.6 m BGS, some cobbles		
18					
20	6				
22	7				
24			- at 7.4 m BGS, sandstone chips		
26	8		SANDSTONE weathered	7.50	
28			- at 8.6 m BGS, auger refusal, switch to air rotary		
30	9		- at 9.0 m BGS, very fine grained, greyish brown to grey		
32	10				
34			MUDSTONE brown to dark brown, dry	10.40	
36	11				
38			SILTSTONE some weathering and oxidized fractures, grey to dark grey	11.50	
40	12				
42					

Screen Interval: 33.50 - 36.50 m BGS
Sand Pack Interval: 33.00 - 36.50 m BGS
Well Seal Interval: 0.30 - 33.00 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-13-37

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	24-Aug-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	680595
Contractor:	All Service Drilling	**Northing:**	5660430

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
44			SILTSTONE some weathering and oxidized fractures, grey to dark grey		
46	14				
48			very fine to fine grained, friable, grey to light grey, dry	14.70	
50	15		- at 15.5 m BGS, interbedded sitlstone, grey to dark grey		
52	16				
54					50 mm solid PVC pipe packed in hydrated bentonite chips 0.3 to 33.0 m BGS
56	17		MUDSTONE dark grey to dark brown, friable	17.00	
58					
60	18				
62	19				
64					
66	20				
68					
70	21				
72	22				
74					
76	23				
78					
80	24				Water level 24.275 m BTOC 4-May-22
82	25				
84			SILTSTONE grey to dark grey	25.20	

Screen Interval: 33.50 - 36.50 m BGS
Sand Pack Interval: 33.00 - 36.50 m BGS
Well Seal Interval: 0.30 - 33.00 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-13-37

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	24-Aug-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	680595
Contractor:	All Service Drilling	**Northing:**	5660430

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
86			SILTSTONE grey to dark grey		
88	27				
90					
92	28				
94			MUDSTONE light grey to grey, dry	28.50	
96	29				
98			SILTSTONE dark grey, interbeded with very fine grained sandstone	29.60	
100	30		at 30.1 m BGS, SANDSTONE		
102	31		MUDSTONE grey to light grey	30.70	
104					
106	32		- at 32.0 m BGS, grey to dark grey with black speckled sandstone, saturated		
108	33		- at 33.0 m BGS, brown to grey		50 mm solid PVC pipe packed in 10-20 filter sand 33 to 33.5 m BGS
110					
112	34				
114			SILTSTONE grey to dark grey, oxidized fractures	34.50	50 mm slotted PVC pipe packed in 10-20 filter sand 7.5 to 10.5 m BGS
116	35				
118	36		MUDSTONE grey to greenish grey	36.00	
120			End of Borehole	36.50	
122	37				
124	38				
126					

Screen Interval: 33.50 - 36.50 m BGS
Sand Pack Interval: 33.00 - 36.50 m BGS
Well Seal Interval: 0.30 - 33.00 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

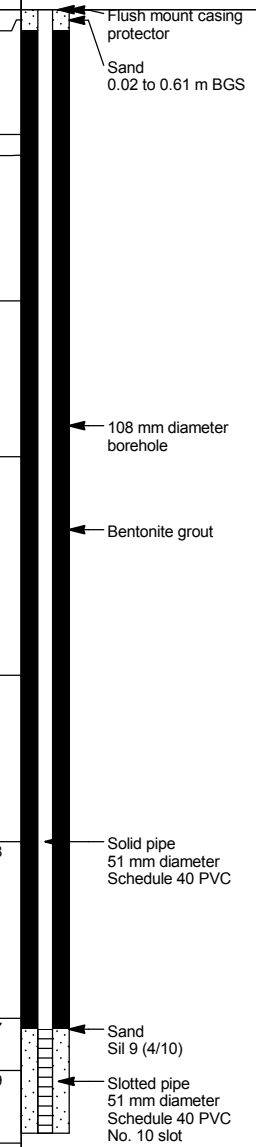
Monitoring Well: MW16-14-33 (GW14)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Air rotary auger (Truck mounted)
Client:	Alberta Transportation	**Date started/completed:**	09-Aug-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-28592.189
Contractor:	All Service Drilling Inc.	**Northing:**	5659018.428

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
			GRAVEL	0.00
5	2		CLAYEY SILT (TILL) Brown, some very fine grained sand, moist, medium plastic	0.30
10				
	4		SANDSTONE Light to medium brown, very fine grained sand, dry	3.66
15				4.27
20	6		CLAYSTONE Medium grey, dry	
25	8			
30			SANDSTONE Light to medium brown, very fine to fine grained	8.53
35	10			
40	12			
45	14		SILTSTONE Light grey, dry	13.11
50				
55	16			
60	18			
65	20		CLAYSTONE Medium grey to brown, dry	19.51
70				
75	22			
80	24		SILTSTONE Medium brown, saturated	24.38
85	26			
90				
95	28			
100	30		CLAYSTONE Light to medium grey	29.57
105	32		SILTSTONE Light to medium grey, saturated	31.09
110	34		CLAYSTONE Light to medium grey	33.22
115	36		End of Borehole	33.53

INSTALLATION DETAILS



Screen Interval: 29.88 - 32.93 m BGS
Sand Pack Interval: 29.87 - 32.93 m BGS
Well Seal Interval: 0.61 - 29.87 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-14-33

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

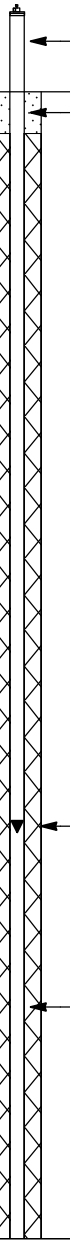
Monitoring Well: RMW16-16-17

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	25-Aug-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	677090
Contractor:	All Service Drilling	**Northing:**	565364

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)
	-0.5		Ground Surface	
0	0.0		TOPSOIL organics, black, dry	0.00
1			SILTY CLAY trace sand, white mineral precipitates, occasional lenses of silt and very fine sand, light brown, grey mottling, high plasticity	0.30
2	0.5			
3	1.0			
4				
5	1.5			
6			SILTY CLAY TILL some sand, trace gravel, white mineral precipitates, high plasticity, light brown with grey mottling, dry to moist	1.70
7	2.0			
8				
9	2.5			
10	3.0			
11			- at 3.3 m BGS, slight increase in silt and sand, medium plasticity	
12	3.5			
13				
14	4.0			
15	4.5			
16				
17	5.0			
18	5.5			
19				
20	6.0		- at 6.0 m BGS, colour changes to brown	
21			- at 6.2 m BGS, ioncreasing gravel, occasional cobble	
22	6.5			
23	7.0			
24				
25	7.5			
26	8.0			

INSTALLATION DETAILS



Screen Interval: 13.50 - 16.50 m BGS
Sand Pack Interval: 12.90 - 16.50 m BGS
Well Seal Interval: 0.30 - 12.90 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-16-17

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	25-Aug-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	677090
Contractor:	All Service Drilling	**Northing:**	565364

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
28	8.5		SILTY CLAY TILL some sand, trace gravel, white mineral precipitates, high plasticity, light brown with grey mottling, dry to moist		
29	9.0				
30					
31	9.5				
32					
33	10.0		- at 10.0 m BGS, some moisture		
34					
35	10.5				
36	11.0				
37					
38	11.5				
39			SANDSTONE very fine grained, weathered, friable, light brown to grey, weathered	11.80	
40	12.0				
41	12.5				
42					
43	13.0				50 mm solid PVC pipe packed in 10-20 filter sand 12.9 to 13.5 m BGS
44					
45	13.5				
46	14.0				
47					
48	14.5				
49	15.0		- at 15.0 m BGS, bery poor recovery		50 mm slotted PVC pipe packed in 10-20 filter sand 13.5 to 16.5 m BGS
50					
51	15.5				
52	16.0		- at 15.8 m BGS, saturated, auger refusal		
53					
54	16.5		End of Borehole	16.50	
55					
56	17.0				

Screen Interval: 13.50 - 16.50 m BGS
Sand Pack Interval: 12.90 - 16.50 m BGS
Well Seal Interval: 0.30 - 12.90 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-17-10

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	25-Aug-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	677476
Contractor:	All Service Drilling	**Northing:**	5657319

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
			Ground Surface		Aboveground casing 0.70 m
0	0.0		TOPSOIL organics, black, dry	0.00	50 mm solid PVC pipe packed in 10-20 filter sand
1	0.5		SILT AND CLAY trace fine sand, light brown, low to medium plasticity, dry	0.30	
5	1.5		CLAY trace silt, trace pockets of sand, olive with gray mottling, dry to moist	1.50	
7	2.0		SILTY CLAY TILL some sand, trace oxidation staining and white mineral precipitates, oilive with grey mottling, dry to moist	2.10	
13	4.0		SILT AND CLAY some sand, trace gravel, occasional cobble, brown to dark brown, medium plasticity, moist	3.90	50 mm solid PVC pipe packed in hydrated bentonite chips 0.3 to 7.8 m BGS
23	7.0				Water level 7.299 m BTOC 10-May-22

Screen Interval: 8.10 - 9.60 m BGS
Sand Pack Interval: 7.80 - 9.80 m BGS
Well Seal Interval: 0.30 - 7.80 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-17-10

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	25-Aug-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	677476
Contractor:	All Service Drilling	**Northing:**	5657319

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
26	8.0		SILT AND CLAY some sand, trace gravel, occasional cobble, brown to dark brown, medium plasticity, moist		50 mm solid PVC pipe packed in 10-20 filter sand 7.8 to 8.1 m BGS
28	8.5			8.60	
			SILT AND SAND fine grained sand, some clay and gravel, white mineral precipitates, green to brown, medium plasticity, moist to damp		50 mm slotted PVC pipe packed in 10-20 filter sand 8.1 to 9.6 m BGS
30	9.0				
31	9.5		SANDSTONE fine to very fine grained, weathered, very light grey, weathered	9.30	10-20 filter sand
33	10.0				Hydrated bentonite chips
34	10.5		End of Borehole	10.50	
36	11.0				
38	11.5				
39	12.0				
41	12.5				
42	13.0				
44	13.5				
45	14.0				
47	14.5				
48	15.0				
50	15.5				
51	16.0				
53					

Screen Interval: 8.10 - 9.60 m BGS
Sand Pack Interval: 7.80 - 9.80 m BGS
Well Seal Interval: 0.30 - 7.80 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

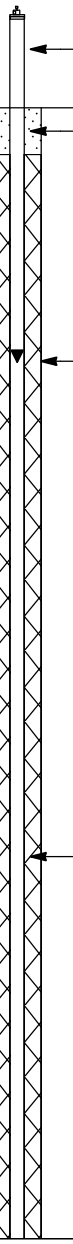
Monitoring Well: RMW16-18-13

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	26-Aug-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	678068
Contractor:	All Service Drilling	**Northing:**	5657928

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)
0	0.0		Ground Surface	
			TOPSOIL organics, black, dry	0.00
			SILTY CLAY TILL some sand, trace gravel, trace oxidation statining (light orange), brown, medium plasticity	0.20
			SANDY CLAY some gravel and cobbles, brown, dry	2.30
			SILT AND SAND some gravel, trace clay, brown, moist	3.20
			SILTSTONE very poor recovery, grey, weathered	4.70
			SANDSTONE grey to greenish grey,	5.30
				7.10

Diagram



Description

Screen Interval: 9.60 - 12.60 m BGS
Sand Pack Interval: 9.30 - 12.60 m BGS
Well Seal Interval: 0.30 - 9.30 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-18-13

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	26-Aug-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	678068
Contractor:	All Service Drilling	**Northing:**	5657928

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
24	7.5		MUDSTONE dark brown to dark grey - at 7.3 to 7.5 m BGS, oxidation and slight weathering		
25					
26	8.0		- at 7.85 m BGS, fracture		
27			- at 8.1 to 8.8 m BGS light grey clay, alogr multiple fractures		
28	8.5				
29			- at 8.8 m BGS, highly fractured and oxidized		
30	9.0				
31	9.5		SANDSTONE fine grained, slight oxidation, greenish grey to grey	9.20	50 mm solid PVC pipe packed in 10-20 filter sand 9.3 to 9.6 m BGS
32					
33	10.0		SILTSTONE greenish grey to grey, highly fractured with some silts and clays along fractured zones	9.90	
34	10.5				
35			- at 10.6 m BGS, no silts and clays		
36	11.0				
37			SANDSTONE greenish grey to grey	11.10	50 mm slotted PVC pipe packed in 10-20 filter sand 9.6 to 12.6 m BGS
38	11.5		SILTSTONE greenish grey to grey, well consolidated, highly fractured	11.50	
39	12.0				
40					
41	12.5		End of Borehole	12.60	
42	13.0				
43					
44	13.5				
45					
46	14.0				
47					
48	14.5				
49	15.0				

Screen Interval: 9.60 - 12.60 m BGS
Sand Pack Interval: 9.30 - 12.60 m BGS
Well Seal Interval: 0.30 - 9.30 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-18-5

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	23-Aug-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	678066
Contractor:	All Service Drilling	**Northing:**	5657928

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram	Description
			Ground Surface			Aboveground casing 0.73 m
0	0.0		TOPSOIL organics, black, dry	0.00		50 mm solid PVC pipe packed in 10-20 filter sand
1	0.5		SILTY CLAY TILL some sand, trace gravel, trace oxidation statining (light orange), brown, medium plasticity	0.20		
2	1.0					
3	1.0					
4	1.5					
5	1.5					Water level 1.71 m BTOC 5-May-22
6	2.0					
7	2.0					50 mm solid PVC pipe packed in hydrated bentonite chips 0.3 to 3.2 m BGS
8	2.5		SANDY CLAY some gravel and cobbles, brown, dry	2.30		
9	2.5					
10	3.0					
11	3.5		SILT AND SAND some gravel, trace clay, brown, moist	3.20		50 mm solid PVC pipe packed in 10-20 filter sand 3.2 to 3.5 m BGS
12	3.5					
13	4.0					
14	4.0					50 mm slotted PVC pipe packed in 10-20 filter sand 13.5 to 16.5 m BGS
15	4.5					
16	5.0		SILTSTONE very poor recovery, grey, weathered	4.70		
17	5.0					
18	5.5					Slough
19	5.5					
20	6.0		End of Borehole	6.00		
21	6.5					
22	6.5					
23	7.0					

Screen Interval: 3.50 - 5.00 m BGS
Sand Pack Interval: 3.20 - 5.00 m BGS
Well Seal Interval: 0.30 - 3.20 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-19-10

Project:	SR1/Springank	**Method:**	Soid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	29-Nov-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT/AK	**Easting:**	n/a
Contractor:	All Service Drilling	**Northing:**	n/a

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram	Description
-2	-0.5					Aboveground casing 0.76 m
0	0.0		Ground Surface			
			TOPSOIL sandy, brown, dry	0.00		50 mm solid PVC pipe packed in 10-20 filter sand
1	0.5		SILTY CLAY AND SAND brown, low plasticity, dry	0.50		
2						
3	1.0					
4						
5	1.5					
6						
7	2.0					
8	2.5		- at 2.5 m BGS, trace gravel, grey to brown, medium plasticity, moist			
9						
10	3.0					
11						
12	3.5					50 mm solid PVC pipe packed in hydrated bentonite chips 0.3 to 7.2 m BGS
13	4.0					
14						
15	4.5					
16						
17	5.0					
18	5.5					
19						
20	6.0					
21						
22	6.5					
23	7.0		SILTY CLAY some sand	6.90		Water level 7.035 m BTOC 6-May-22
24						50 mm solid PVC pipe packed in
25	7.5					

Screen Interval: 7.50 - 10.50 m BGS
Sand Pack Interval: 7.20 - 10.50 m BGS
Well Seal Interval: 0.30 - 7.20 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-19-10

Project:	SR1/Springank	**Method:**	Soid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	29-Nov-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT/AK	**Easting:**	n/a
Contractor:	All Service Drilling	**Northing:**	n/a

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
26	8.0		SILTY CLAY some sand		10-20 filter sand 7.2 to 7.5 m BGS
27					
28	8.5				
29					50 mm slotted PVC pipe packed in 10-20 filter sand 7.5 to 10.5 m BGS
30	9.0				
31					
32	9.5				
33	10.0		SANDSTONE finegrained, brown, wet	10.00	
34					
35	10.5		End of Borehole	10.50	
36	11.0				
37					
38	11.5				
39					
40	12.0				
41	12.5				
42					
43	13.0				
44					
45	13.5				
46	14.0				
47					
48	14.5				
49					
50	15.0				
51	15.5				
52					
53	16.0				

Screen Interval: 7.50 - 10.50 m BGS
Sand Pack Interval: 7.20 - 10.50 m BGS
Well Seal Interval: 0.30 - 7.20 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-19-19

Project:	SR1/Springank	**Method:**	Soid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	29-Nov-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT/AK	**Easting:**	n/a
Contractor:	All Service Drilling	**Northing:**	n/a

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram	Description
			Ground Surface			Aboveground casing 0.76 m
0	0		TOPSOIL sandy, brown, dry	0.00		50 mm solid PVC pipe packed in 10-20 filter sand
2	0.5		SILTY CLAY AND SAND brown, low plasticity, dry	0.50		
4	1					
6	2					
8	2.5		- at 2.5 m BGS, trace gravel, grey to brown, medium plasticity, moist			
10	3					
12	4					
14	4					
16	5					
18	5					Water level 5.824 m BTOC 6-May-22
20	6					
22	7					50 mm solid PVC pipe packed in hydrated bentonite chips 0.3 to 13.1 m BGS
24	7		SILTY CLAY some sand	6.90		
26	8					
28	9					
30						

Screen Interval: 17.50 - 19.50 m BGS
Sand Pack Interval: 13.10 - 19.50 m BGS
Well Seal Interval: 0.30 - 13.10 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-19-19

Project:	SR1/Springank	**Method:**	Soid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	29-Nov-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT/AK	**Easting:**	n/a
Contractor:	All Service Drilling	**Northing:**	n/a

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram	Description
34	10		SANDSTONE finegrained, brown, wet	10.00		
36	11					
38	12					
40						
42	13		SILTSTONE some sand and clay, grey, low plasticity, dry	13.00		
44						
46	14					
48						
50	15					50 mm solid PVC pipe packed in 10-20 filter sand 13.1 to 17.5 m BGS
52	16					
54						
56	17					
58			SANDSTONE fine grained, grey, moist	17.70		
60	18					
62	19		SILTSTONE some sand and clay, grey, low plasticity, moist	18.70		50 mm slotted PVC pipe pre-packed packed in filter sand 17.5 to 19.5 m BGS
64			End of Borehole	19.50		
66	20					

Screen Interval: 17.50 - 19.50 m BGS
Sand Pack Interval: 13.10 - 19.50 m BGS
Well Seal Interval: 0.30 - 13.10 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

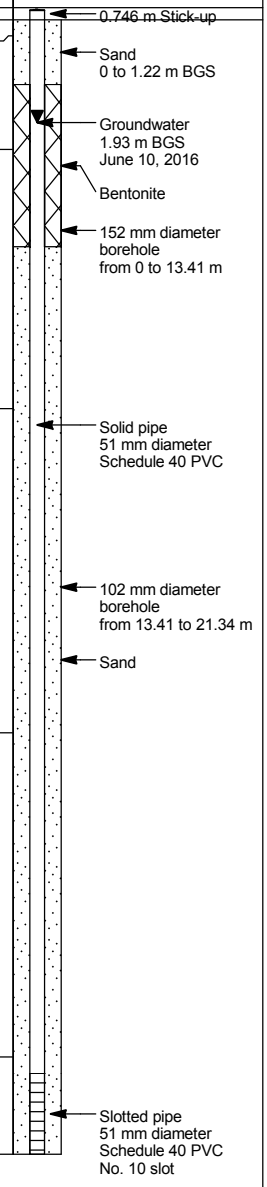
Monitoring Well: MW16-20-21 (D2)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Solid-stem auger
Client:	Alberta Transportation	**Date started/completed:**	10-Jun-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-31218.384
Contractor:	All Service Drilling Inc.	**Northing:**	5657498.57

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
0	0		Ground Surface	
			TOPSOIL	0.00
			SILTY CLAY Light brown, moist, medium plastic	0.30
5	2			
10	4		SILTY CLAY (TILL) Mottled brown and grey, with very fine sand lenses (tend to be orangish brown and oxidized), with gravel, moist	2.44
15				
20	6			
25	8		SILT Medium brown, with clay, moist, crumbly	7.32
30				
	10		- @ 9.45 m: beige, begins to contain some very fine sand lenses (150 mm thick) and some gravel, dry	
35				
40	12		- @ 11.58 m: silt becomes dark brown to grey	
45	14		SILTSTONE Medium to dark grey, highly fractured, edges of large fractures have been weathered to silt, smaller fractures exhibit oxidation	13.41
50				
	16			
55				
60	18			
65	20		SANDSTONE Grey to dark grey, very fine to fine grained, with weak cross-bedding, few fractures	19.51
70				
	22		End of Borehole	21.34
75				

INSTALLATION DETAILS



Screen Interval: 19.81 - 21.34 m BGS
Sand Pack Interval: 4.27 - 21.34 m BGS
Well Seal Interval: 1.22 - 4.27 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-20-20

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

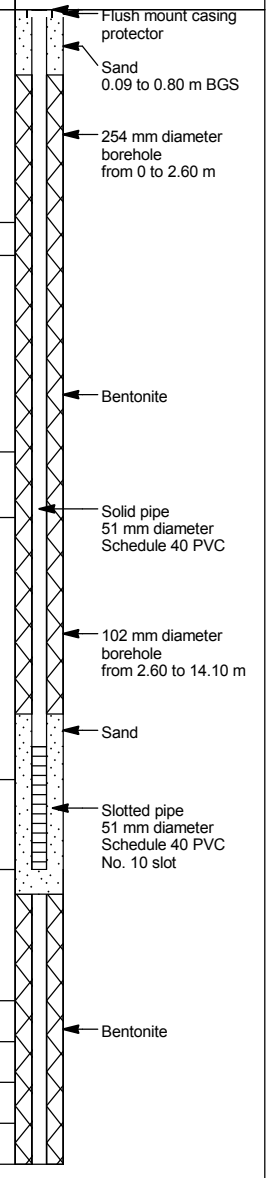
Monitoring Well: MW16-21-11 (D9)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Hollow-stem auger (Track mounted)/ Coring
Client:	Alberta Transportation	**Date started/completed:**	01-May-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-30383.805
Contractor:	All Service Drilling Inc.	**Northing:**	5656987.083

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
			OVERBURDEN	0.00
5	2			
			SANDSTONE Coarse grained, weathered, few fractures	2.60
10			MUDSTONE AND CLAYSTONE Interbedded, massive - mudstone: brown, friable, has been weathered to clay along fractured - claystone: grey to light grey, with minor fractures, oxidation on fractures	3.00
15	4			
			SANDSTONE Grey to brown, fine grained, well defined cross-bedding	5.40
20	6			
			SILTSTONE Grey to brown, highly fractured and weathered, portions are highly friable and weathered to clay	6.20
25	8			
30				
			SANDSTONE Grey to brown, medium grained, planar laminated, competent core	9.40
35	10			
			SILTSTONE Highly fractured with weathering to silt along fractures	10.50
40	12			
			SANDSTONE Fine grained, finely cross-bedded, few fractures with oxidation along fracture surfaces	12.10
			SILTSTONE Grey, highly fractured and weathered	12.60
			SANDSTONE Fine grained, finely cross-bedded, few fractures	13.10
45	14		SILTSTONE Highly fractured and friable	13.60
			End of Borehole	14.10

INSTALLATION DETAILS



Screen Interval: 9.00 - 10.50 m BGS
Sand Pack Interval: 8.60 - 10.80 m BGS
Well Seal Interval: 10.80 - 14.10 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-21-11

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

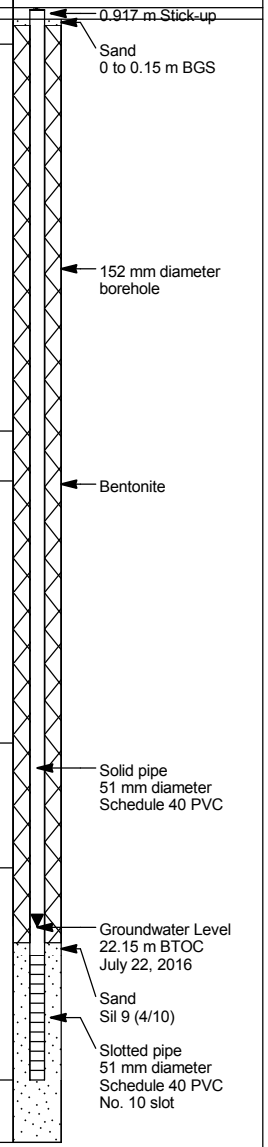
Monitoring Well: MW16-22-26 (D27)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Solid-stem auger (Track mounted)
Client:	Alberta Transportation	**Date started/completed:**	21-Jul-2016 / 22-Jul-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-29330.853
Contractor:	All Service Drilling Inc.	**Northing:**	5656907.343

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
0	0		~~Ground Surface~~	
			TOPSOIL	0.00
5	2		CLAY - from 0.61 to 2.44 m: beige to light brown, with silt, moist, high plastic	0.61
10	4		- from 2.44 to 10.06 m: medium brown, trace fine grained sand, trace gravel, some silt, medium plastic	
15				
20	6			
25	8			
30	10			
35			SILTY CLAY Medium brown, some very fine grained sand, trace gravel, medium plastic, minor oxidation within sand stringers - @ 11.28 m: sand content increases to 15-30%, gravel content increases to 5-15%	10.06
40	12		SANDY SILT Medium brown, with gravel, dry to moist, friable	11.28
45	14			
50				
	16		- below 15.85 m: dry	
55				
60	18		SANDY SILT (TILL) Medium to dark grey, some gravel, with clay, dry, medium plastic	17.68
65	20			
70			SILTY CLAY (TILL) Dark grey, with gravel, dry to moist, medium plastic	20.73
	22			
75				
80	24			
85	26		SILTSTONE Light to medium grey	25.91
90	28		End of Borehole	27.43
95				
	30			

INSTALLATION DETAILS



Screen Interval: 22.86 - 25.91 m BGS
Sand Pack Interval: 22.56 - 27.43 m BGS
Well Seal Interval: 0.15 - 22.56 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-22-26

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

Monitoring Well: RMW16-23-13

Project:	SR1/Springank	**Method:**	Air Rotary
Client:	Alberta Transportaiton	**Date started/completed:**	12-May-2022
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT/IM	**Easting:**	n/a
Contractor:	All Service Drilling	**Northing:**	n/a

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
			Ground Surface		
1			TOPSOIL darkbrown to black, moist	0.00	Flushmount casing 0.76 m
2	0.5		SILTY SAND trace gravel, light brown to grey, dry to moist	0.30	50 mm solid PVC pipe packed in 10-20 filter sand
3	1.0		SANDY CLAY TILL trace gravel, trace mineral precipitate, oxidation staining, low plasticity, light brown to brown,	0.90	
4					
5	1.5		- at 1.4 m BGS, cobble sized gravel - at 1.5 m BGS, increased gravel to approximately 30 percent		
6					
7	2.0				
8					
9	2.5				
10	3.0		SAND AND GRAVEL brown, dry	3.00	
11					
12	3.5				
13	4.0				Water level 4.09 m BTOC 13-May-22
14					
15	4.5		- at 4.5 m BGS, becomes moist		
16					
17	5.0				
18	5.5				50 mm solid PVC pipe packed in hydrated bentonite chips 0.3 to 11.1 m BGS
19					
20	6.0				
21			SANDSTONE fine grained, brown, poor recovery	6.20	
22	6.5				
23	7.0				
24			- at 7.2 m BGS, colour changes to grey, moist		
25	7.5		- at 7.7 m BGS, colour changes to brown		
26	8.0				
27					
28	8.5		- at 8.4 m BGS, Colour changes to grey, weathered		
29					
30	9.0		MUDSTONE grey, moist	9.00	
31	9.5				
32					

Screen Interval: 11.40 - 12.90 m BGS
Sand Pack Interval: 11.10 - 12.90 m BGS
Well Seal Interval: 0.30 - 11.10 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing

Stantec

Drawn By/Checked By: JD/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-23-13

Project:	SR1/Springank	**Method:**	Air Rotary
Client:	Alberta Transportaiton	**Date started/completed:**	12-May-2022
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT/IM	**Easting:**	n/a
Contractor:	All Service Drilling	**Northing:**	n/a

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram	Description
33						
34			SANDSTONE fine grained, trace silt, moist	10.30		
	10.5		MUDSTONE saturated, grey	10.50		
35						
36	11.0					
37						50 mm solid PVC pipe packed in 10-20 filter sand 11.1 to 11.4 m BGS
	11.5		SANDSTONE saturated, grey to brown	11.40		
38						
39	12.0					
40						50 mm slotted PVC pipe packed in 10-20 filter sand 11.4 to 12.9 m BGS
41	12.5		- at 12.4 to 12.5 m BGS, mudstone lens			
42						
	13.0		MUDSTONE saturated, grey to brown	12.90		Slough
43			SANDSTONE saturated, grey to brown	13.20		
44	13.5		End of Borehole	13.50		
45						
46	14.0					
47						
48	14.5					
49						
50	15.0					
51						
52	15.5					
53						
54	16.0					
55						
56	16.5					
57						
58	17.0					
59						
60	17.5					
61						
62	18.0					
63						
64	18.5					
65						
	19.0					
	19.5					

Screen Interval: 11.40 - 12.90 m BGS
Sand Pack Interval: 11.10 - 12.90 m BGS
Well Seal Interval: 0.30 - 11.10 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing

Stantec

Drawn By/Checked By: JD/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-23-32

Project:	SR1/Springank	**Method:**	Air Rotary
Client:	Alberta Transportaiton	**Date started/completed:**	13-May-2022
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT/IM	**Easting:**	681934
Contractor:	All Service Drilling	**Northing:**	5658853

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
			Ground Surface		
			TOPSOIL darkbrown to black, moist	0.00	Flushmount casing
			SILTY SAND trace gravel, light brown to grey, dry to moist	0.30	50 mm solid PVC pipe packed in 10-20 filter sand
2	1		SANDY CLAY TILL trace gravel, trace mineral precipitate, oxidation staining, low plasticity, light brown to brown, - at 1.4 m BGS, cobble sized gravel - at 1.5 m BGS, increased gravel to approximately 30 percent	0.90	
4					
6	2				
8					
10	3		SAND AND GRAVEL brown, dry	3.00	Water level 3.27 m BTOC 13-May-22
12					
14	4		- at 4.5 m BGS, becomes moist		
16					
18	5				
20	6		SANDSTONE fine grained, brown, poor recovery	6.20	
22					
24	7		- at 7.2 m BGS, colour changes to grey, moist - at 7.7 m BGS, colour changes to brown		
26	8				
28			- at 8.4 m BGS, Colour changes to grey, weathered		
30	9		MUDSTONE grey, moist	9.00	
32					
34	10		SANDSTONE	10.30	

Screen Interval: 29.50 - 31.00 m BGS
Sand Pack Interval: 29.20 - 31.00 m BGS
Well Seal Interval: 0.30 - 29.20 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-23-32

Project:	SR1/Springank	**Method:**	Air Rotary
Client:	Alberta Transportaiton	**Date started/completed:**	13-May-2022
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT/IM	**Easting:**	681934
Contractor:	All Service Drilling	**Northing:**	5658853

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
			fine grained, trace silt, moist	10.50	
36	11		MUDSTONE saturated, grey		
38			SANDSTONE saturated, grey to brown	11.40	
40	12		- at 12.4 to 12.5 m BGS, mudstone lens		
42	13		MUDSTONE saturated, grey to brown	12.90	
44			SANDSTONE saturated, grey to brown	13.20	
46	14				
48			SANDSTONE AND MUDSTONE intebedded dark grey mudstone and fine grained grey to blackish grey sandstones	14.30	50 mm solid PVC pipe packed in hydrated bentonite chips 0.3 to 29.2 m BGS
50	15				
52	16				
54					
56	17				
58					
60	18		MUDSTONE grey to dark grey	18.00	
62	19				
64					
66	20		- at 19.8 m BGS, becomes sturated, grey		
68			SILTSTONE grey to dark grey, saturated	20.40	
			SANDSTONE saturated, dark grey	20.70	

Screen Interval: 29.50 - 31.00 m BGS
Sand Pack Interval: 29.20 - 31.00 m BGS
Well Seal Interval: 0.30 - 29.20 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-23-32

Project:	SR1/Springank	**Method:**	Air Rotary
Client:	Alberta Transportaiton	**Date started/completed:**	13-May-2022
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT/IM	**Easting:**	681934
Contractor:	All Service Drilling	**Northing:**	5658853

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
70			SANDSTONE saturated, dark grey		
72	22		MUDSTONE saturated, grey to light grey	21.80	
74					
76	23				
78					
80	24				
82	25		SANDSTONE saturated, grey	24.60	
84			SILTSTONE saturated, black	25.30	
86	26		MUDSTONE saturated, grey	25.90	
			SILTSTONE saturated, dark grey	26.10	
88	27		MUDSTONE saturated, grey	26.50	
90			- at 27.6 m BGS, becomes weathered		
92	28		SILTSTONE saturated, brown to grey	28.00	
94					
96	29				50 mm solid PVC pipe packed in 10-20 filter sand 29.2 to 29.5 m BGS
98	30		SANDSTONE saturated, grey to greyish brown	29.50	50 mm slotted PVC pipe packed in 10-20 filter sand 29.5 to 31.0 m BGS
100					
102	31		MUDSTONE saturated, dark grey	31.00	

Screen Interval: 29.50 - 31.00 m BGS
Sand Pack Interval: 29.20 - 31.00 m BGS
Well Seal Interval: 0.30 - 29.20 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-23-32

Project:	SR1/Springank	**Method:**	Air Rotary
Client:	Alberta Transportaiton	**Date started/completed:**	13-May-2022
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT/IM	**Easting:**	681934
Contractor:	All Service Drilling	**Northing:**	5658853

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
104	32		SILTSTONE SHALE saturated, dark grey	31.70	Slough
			End of Borehole	32.00	
106					
108	33				
110					
112	34				
114					
116	35				
118					
120	36				
122					
124	37				
126					
128	38				
130					
132	39				
134					
136	40				
	41				

Screen Interval: 29.50 - 31.00 m BGS
Sand Pack Interval: 29.20 - 31.00 m BGS
Well Seal Interval: 0.30 - 29.20 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

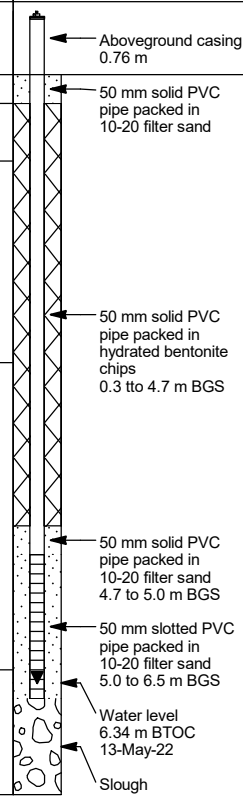
STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: RMW16-23-7

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	11-May-2022
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT/IM	**Easting:**	n/a
Contractor:	All Service Drilling	**Northing:**	n/a

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)
			Ground Surface	
0	0		TOPSOIL darkbrown to black, moist	0.00
2			SILTY SAND trace gravel, light brown to grey, dry to moist	0.30
4	1		SANDY CLAY TILL trace gravel, trace mineral precipitate, oxidation staining, low plasticity, light brown to brown, - at 1.4 m BGS, cobble sized gravel - at 1.5 m BGS, increased gravel to approximately 30 percent	0.90
6	2			
8				
10	3		SAND AND GRAVEL brown, dry	3.00
12	4			
14			- at 4.5 m BGS, becomes moist	
16	5			
18				
20	6		SANDSTONE fine grained, brown, poor recovery	6.20
22	7			
24			End of Borehole	7.50
26	8			
28				
30	9			
32	10			
34				
36	11			
38				
	12			



Screen Interval: 5.00 - 6.50 m BGS
Sand Pack Interval: 4.70 - 6.50 m BGS
Well Seal Interval: 0.30 - 4.70 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing

Stantec

Drawn By/Checked By: JL/DK

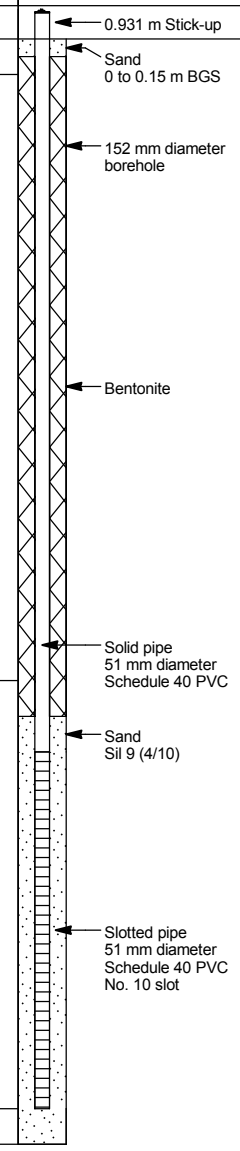
STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: MW16-25-9 (BS3)

Project:	Springbank Off-Stream Reservoir Project (SR1)	**Drilling method:**	Solid-stem auger (Track mounted)
Client:	Alberta Transportation	**Date started/completed:**	19-Aug-2016
Location:	Rocky View County, Alberta	**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	D. Nisbet	**Easting:**	-29274.736
Contractor:	All Service Drilling Inc.	**Northing:**	5658230.981

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
0	0		TOPSOIL	0.00
			SILTY CLAY Light to medium brown, moist, medium plastic, some mottling	0.30
5	2			
			- @ 2.74 m: silt content decreases to 15-30%	
10	4			
15			- @ 4.88 m: silt content increases to > 40% - below 5.18 m: trace gravel	
			SILT AND CLAY (TILL) Medium brown, some very fine grained sand, some gravel, moist, medium plastic	5.49
20	6			
25	8			
30			CLAYSTONE Light grey to brown, dry	9.14
	10		End of Borehole	9.45



Screen Interval: 6.10 - 9.14 m BGS
Sand Pack Interval: 5.79 - 9.45 m BGS
Well Seal Interval: 0.15 - 5.79 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

mm - millimetres
Coordinate System - NAD 1983 3TM 114
Completed as Well MW16-25-9

Stantec

Drawn By/Checked By: M. Kuhl / D. King

STANTEC BOREHOLE AND WELL V2 110773396_NEW.GPJ STANTEC - DATA TEMPLATE.GDT 17/1/16 MKUHL

Monitoring Well: MW21-3-5

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	27-Aug-2022
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	677301
Contractor:	All Service Drilling	**Northing:**	5660000

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram	Description
			Ground Surface			Aboveground casing 0.74 m
0	0.0		TOPSOIL some organics, brown to black, dry	0.00		50 mm solid PVC pipe packed in 10-20 filter sand
1	0.5		SILT AND SAND very fine sand, some clay, light brown to brown, low plasticity, dry	0.40		
5	1.5		CLAYEY SILT some sand, trace gravel, trace oxidaiton staining and white mineral precipitates, low plasticity	1.40		50 mm solid PVC pipe packed in hydrated bentonite chips 0.3 to 3.4 m BGS
13	4.0		SILTY SAND very fine sand, brown, moist	4.10		50 mm solid PVC pipe packed in 10-20 filter sand 3.4 to 3.7 m BGS
15	4.5		- at 4.9 m BGS, auger refusal, switch to coring			50 mm slotted PVC pipe packed in 10-20 filter sand 3.7 to 5.3 m BGS
16	5.0		MUDSTONE highly fractured and oxidized surfaces, greyish brown	4.90		
17			End of Borehole	5.30		

Screen Interval: 3.70 - 5.30 m BGS
Sand Pack Interval: 3.40 - 5.30 m BGS
Well Seal Interval: 0.30 - 3.40 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: MW21-3-15

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	26-Aug-2022
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	677300
Contractor:	All Service Drilling	**Northing:**	5660000

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram	Description
			Ground Surface			Aboveground casing 0.69 m
0	0.0		TOPSOIL some organics, brown to black, dry	0.00		50 mm solid PVC pipe packed in 10-20 filter sand
1	0.5		SILT AND SAND very fine sand, some clay, light brown to brown, low plasticity, dry	0.40		
2	1.0					
4	1.5		CLAYEY SILT some sand, trace gravel, trace oxidaiton staining and white mineral precipitates, low plasticity	1.40		
6	2.0					
8	2.5					
10	3.0					
12	3.5					
13	4.0		SILTY SAND very fine sand, brown, moist	4.10		
15	4.5					
16	5.0		- at 4.9 m BGS, auger refusal, switch to coring MUDSTONE highly fractured and oxidized surfaces, greyish brown	4.90		
18	5.5					
19	6.0		- at 6.0 m BGS, some clay and silt along fractures			50 mm solid PVC pipe packed in hydrated bentonite chips 0.3 to 11.8 m BGS
21	6.5					
23	7.0		- at 6.95 m BGS, thin clay layer			
24	7.5					
25						

Screen Interval: 12.40 - 15.40 m BGS
Sand Pack Interval: 11.80 - 15.40 m BGS
Well Seal Interval: 0.30 - 11.80 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: MW21-3-15

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	26-Aug-2022
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	677300
Contractor:	All Service Drilling	**Northing:**	5660000

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram	Description
26	8.0		MUDSTONE highly fractured and oxidized surfaces, greyish brown			
27			SILTSTONE highly oxidized, grayish green to grey - at 8.3 to 8.8 m BGS, extensive weathering and fractures, clays and silts in fractures	8.10		Water level 8.319 m BTOC 4-May-22
28	8.5					
29						
30	9.0		SANDSTONE very fine grained, greyish green to grey	8.90		
31	9.5					
32						
33	10.0		SILTSONE greenish grey to grey - at 9.8 to 10.1 m BGS, very weathered to poorly consolidated silts and some clays in fractures	9.80		
34						
35	10.5					
36	11.0		SANDSTONE very fine grained, grey to very light grey	10.90		
37						
38	11.5		SILTSTONE grey to dark grey, poorly consolidated	11.30		
39						
40	12.0		- at 12.1 to 12.3 m BGS, few fractures throughout			50 mm solid PVC pipe packed in 10-20 filter sand 11.8 to 12.4 m BGS
41	12.5		SANDSTONE fine grained, grey to very light grey, few fractures	12.40		
42						
43	13.0		- at 12.8 to 13.1 m BGS, thin layer of siltstone			
44						
45	13.5					
46	14.0		SILTSTONE grey to dark grey, thin coal layer to 14.1 m BGS - at 14.1 to 14.4 m BGS, poorly consolidated	13.90		50 mm slotted PVC pipe packed in 10-20 filter sand 12.4 to 15.4 m BGS
47						
48	14.5					
49						
50	15.0					
51	15.5		End of Borehole	15.40		
52						
53	16.0					

Screen Interval: 12.40 - 15.40 m BGS
Sand Pack Interval: 11.80 - 15.40 m BGS
Well Seal Interval: 0.30 - 11.80 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: MW21-6-7

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	27-Aug-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	677606
Contractor:	All Service Drilling	**Northing:**	5658026

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
-2	-0.5				Aboveground casing 0.77 m
0	0.0		Ground Surface		
1			TOPSOIL organics, black, dry	0.00	50 mm solid PVC pipe packed in 10-20 filter sand
2	0.5		SILT AND SAND some gravel, light brown, dry	0.40	
3	1.0		SILTY CLAY TILL some sand, and gravel, trace oxidaiton staining, light brown to brown, medium plasticity, dry	0.80	
4					
5	1.5				
6					
7	2.0				
8	2.5				50 mm solid PVC pipe packed in hydrated bentonite chips 0.3 to 4.7 m BGS
9					
10	3.0		SANDY CLAY trace siltstone and sandstone, low plasticity, moist	3.10	
11	3.5				
12					
13	4.0				Water level 3.929 m BTOC 4-May-22
14					
15	4.5				
16	5.0				50 mm solid PVC pipe packed in 10-20 filter sand 4.7 to 5.0 m BGS
17			SILTY SAND trace clay and gravel, light brown, damp, moist at bottom	5.10	
18	5.5				
19					50 mm slotted PVC pipe packed in 10-20 filter sand 5.0 to 6.5 m BGS
20	6.0				
21			SILTSTONE highly fractured, oxidated surfaces, weathered, friable	6.20	
22	6.5		End of Borehole	6.50	
23	7.0				

Screen Interval: 5.00 - 6.50 m BGS
Sand Pack Interval: 4.70 - 6.50 m BGS
Well Seal Interval: 0.30 - 4.70 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: MW21-6-12

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	27-Aug-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	677606
Contractor:	All Service Drilling	**Northing:**	5658026

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
			Ground Surface		Aboveground casing 0.73 m
0	0.0		TOPSOIL organics, black, dry	0.00	50 mm solid PVC pipe packed in 10-20 filter sand
1	0.5		SILT AND SAND some gravel, light brown, dry	0.40	
3	1.0		SILTY CLAY TILL some sand, and gravel, trace oxidaiton staining, light brown to brown, mediun plasticity, dry	0.80	
10	3.0		SANDY CLAY trace siltstone and sandstone, low plasticity, moist	3.10	Water level 3.92 m BTOC 5-May-22 50 mm solid PVC pipe packed in hydrated bentonite chips 0.3 to 8.87 m BGS
17	5.0		SILTY SAND trace clay and gravel, light brown, damp, moist at bottom	5.10	
20	6.0		SILTSTONE highly fractured, oxidated surfaces, weathered, friable	6.20	
22	6.5		- at 6.7 to 7.0 m BGS, colour changes to greenish grey		
23	7.0				

Screen Interval: 9.10 - 12.10 m BGS
Sand Pack Interval: 8.80 - 12.30 m BGS
Well Seal Interval: 0.30 - 8.80 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: MW21-6-12

Project:	SR1/Springank	**Method:**	Solid Stem Auger
Client:	Alberta Transportaiton	**Date started/completed:**	27-Aug-2021
Location:	Rockyview County	**Ground surface elevation:**	n/a
Number:	10773396.5210.215	**Top of casing elevation:**	n/a
Field investigator:	WT	**Easting:**	677606
Contractor:	All Service Drilling	**Northing:**	5658026

SUBSURFACE PROFILE | INSTALLATION DETAILS

Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram	Description
24	7.5		SILTSTONE highly fractured, oxidated surfaces, weathered, friable			
25						
26	8.0					
27			SANDSTONE very fine grained, grey to very light grey, oxidation of fractured surfaces	8.10 8.20		
28	8.5		MUDSTONE grey to very light grey, weathering, oxidaiton along fractures - at 8.6 to 8.9 m BGS, poorly consolidated			
29						
30	9.0		- at 8.9 to 9.7 m BGS consolidated			50 mm solid PVC pipe packed in 10-20 filter sand 8.8 to 9.1 m BGS
31	9.5					
32			- 9.7 to 10.1 m BGS, well cemented			
33	10.0		- 10.1 to 10.5 m BGS, weathered and poorly consolidated clays and silts			
34						
35	10.5					50 mm slotted PVC pipe packed in 10-20 filter sand 9.1 to 12.1 m BGS
36	11.0		- at 11.1 m BGS, well cemented			
37			SANDSTONE grey to very light grey, fossils	11.20		
38	11.5					
39			MUDSTONE brown to grey, slight weathering at upper contact	11.90		
40	12.0					10-20 filter sand
41	12.5		End of Borehole	12.30		
42						
43	13.0					
44						
45	13.5					
46	14.0					
47						
48	14.5					
49	15.0					

Screen Interval: 9.10 - 12.10 m BGS
Sand Pack Interval: 8.80 - 12.30 m BGS
Well Seal Interval: 0.30 - 8.80 m BGS

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

m BTOC - metres below top of casing
Locaiton coordinates are approximate

Stantec

Drawn By/Checked By: JL/DK

STANTEC BOREHOLE AND WELL V2 SPRINGBANK_LOGS_20220808.GPJ STANTEC - DATA TEMPLATE.GDT 8/11/22 JLAUTERMILCH

Monitoring Well: WS11-01

Project:	Springbank Offstream Reservoir Project (SR1)	**Method:**	Solid Stem Auger
Client:	Alberta Transportation	**Date started/completed:**	24-Nov-2022
Location:		**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	W.T.	**Easting:**	2272.481
Contractor:	All Service Drilling	**Northing:**	2252.153

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)
0	0.0		Ground Surface	
			TOPSOIL dark brown to black, moist	0.00
	0.5		SILTY SAND trace sand, brown, dry	0.40
			SILT AND CLAY trace sand, brown, dry -at 1.1 m BGS white mineral precipitates	0.70
5	1.5		SILTY CLAY some sand, trace gravel and cobbles, trace mineral precipitates and oxidation staining throughout, brown to olive, moist	1.50
10	3.0		SANDY SILT trace clay decreasing with depth, dark brown -saturated at 4.4 m BGS	3.20
15	4.5		SILTY CLAY trace sand and gravel, dark brown, moist to saturated	4.50
16	5.0		SANDSTONE very fine grained, light brown	5.00
20	6.0		-very fine sand to silt (siltstone), greyish brown at 6.0 m BGS	

INSTALLATION DETAILS

Diagram	Description
	Above Ground Casing 0.725 m AGS
	51 mm solid PVC pipe packed in bentonite 0.0 to 10.2 m BGS

Screen Interval: 10.50 - 12.00 m BGS
Sand Pack Interval: 10.20 - 12.00 m BGS
Well Seal Interval: 0.00 - 10.20 m BGS

Notes:
m BGS - metres below ground surface
n/a - not available

Soil strength (consistency) and plasticity terms are for descriptive purposes only and must not be used for design or construction purposes.

Drawn By/Checked By: D.K.

STANTEC BOREHOLE AND WELL V2 ALBERTA TRANSPORTATION SR1 BH LOGS_JULY2023_KY.GPJ STANTEC - DATA TEMPLATE.GDT 09/07/23 KIYOUNG

Monitoring Well: WS11-01

Project:	Springbank Offstream Reservoir Project (SR1)	**Method:**	Solid Stem Auger
Client:	Alberta Transportation	**Date started/completed:**	24-Nov-2022
Location:		**Ground surface elevation:**	n/a
Number:	110773396	**Top of casing elevation:**	n/a
Field investigator:	W.T.	**Easting:**	2272.481
Contractor:	All Service Drilling	**Northing:**	2252.153

SUBSURFACE PROFILE				INSTALLATION DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Stratigraphic Description	Depth (m BGS)	Diagram / Description
21	6.5		SANDSTONE very fine grained, light brown		
22					
23	7.0				
24					
	7.5				
25			SILTSTONE greyish brown, dry	7.50	
26	8.0				
27					
28	8.5				
29					
	9.0		SANDSTONE coal seam, moist to saturated	9.00	
30					
31	9.5		-very fine grained, dark brow, moist at 9.6 m BGS		
32					
33	10.0				
34					51 mm solid PVC pipe packed in 10-20 filter sand 10.2 to 10.5 m BGS
35	10.5		-fine to medium grained, grey, well consolidated at 10.5 m BGS		
36					
37	11.0				51 mm slotted PVC screen packed in 10-20 filter sand 10.5 to 12.0 m BGS
38					
39	11.5				
	12.0		-aguer refusal at 12.0 m BGS End of Borehole	12.00	
40					
41	12.5				
42					
43	13.0				

Screen Interval: 10.50 - 12.00 m BGS
Sand Pack Interval: 10.20 - 12.00 m BGS
Well Seal Interval: 0.00 - 10.20 m BGS

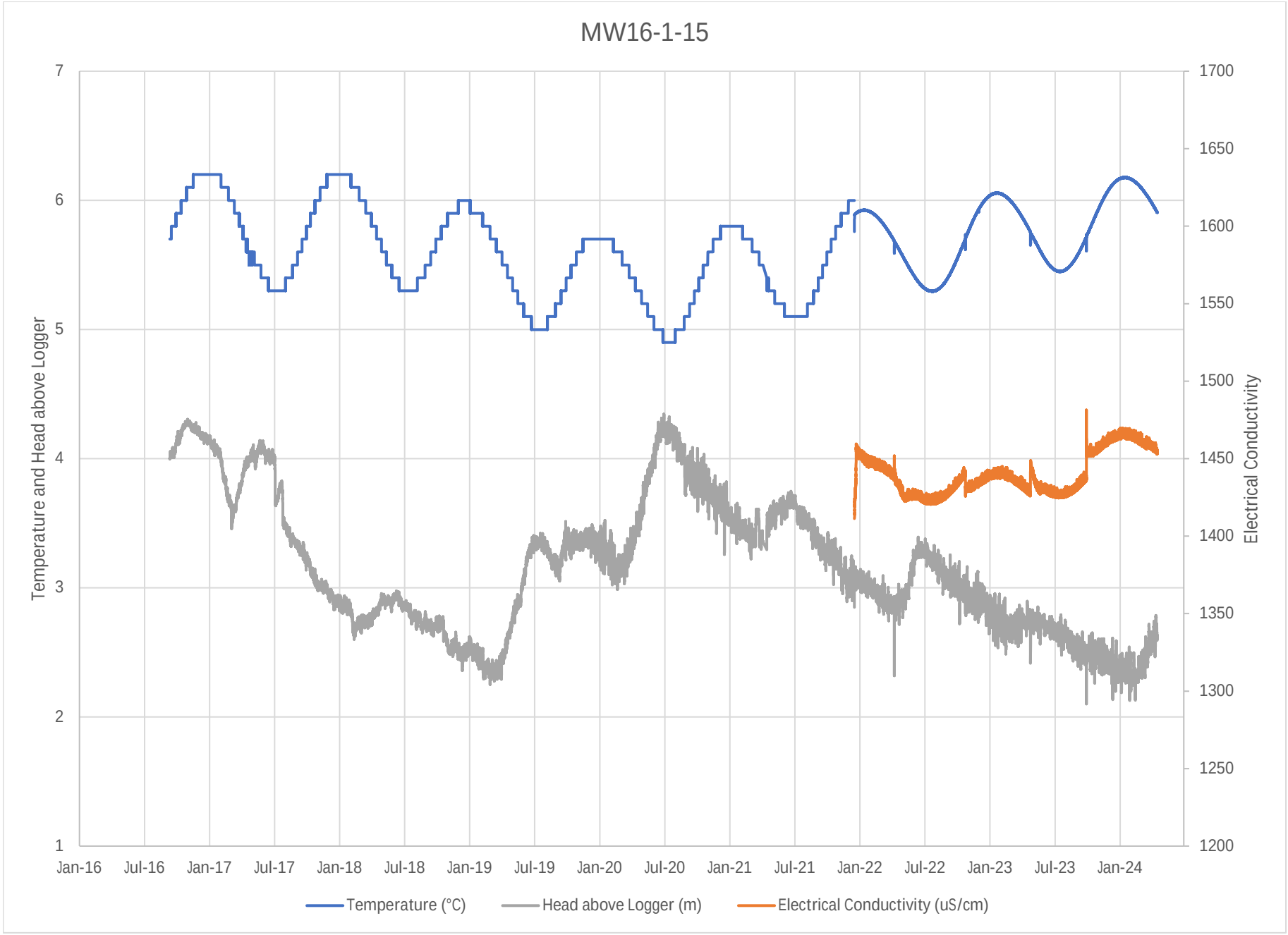
Notes:
m BGS - metres below ground surface
n/a - not available

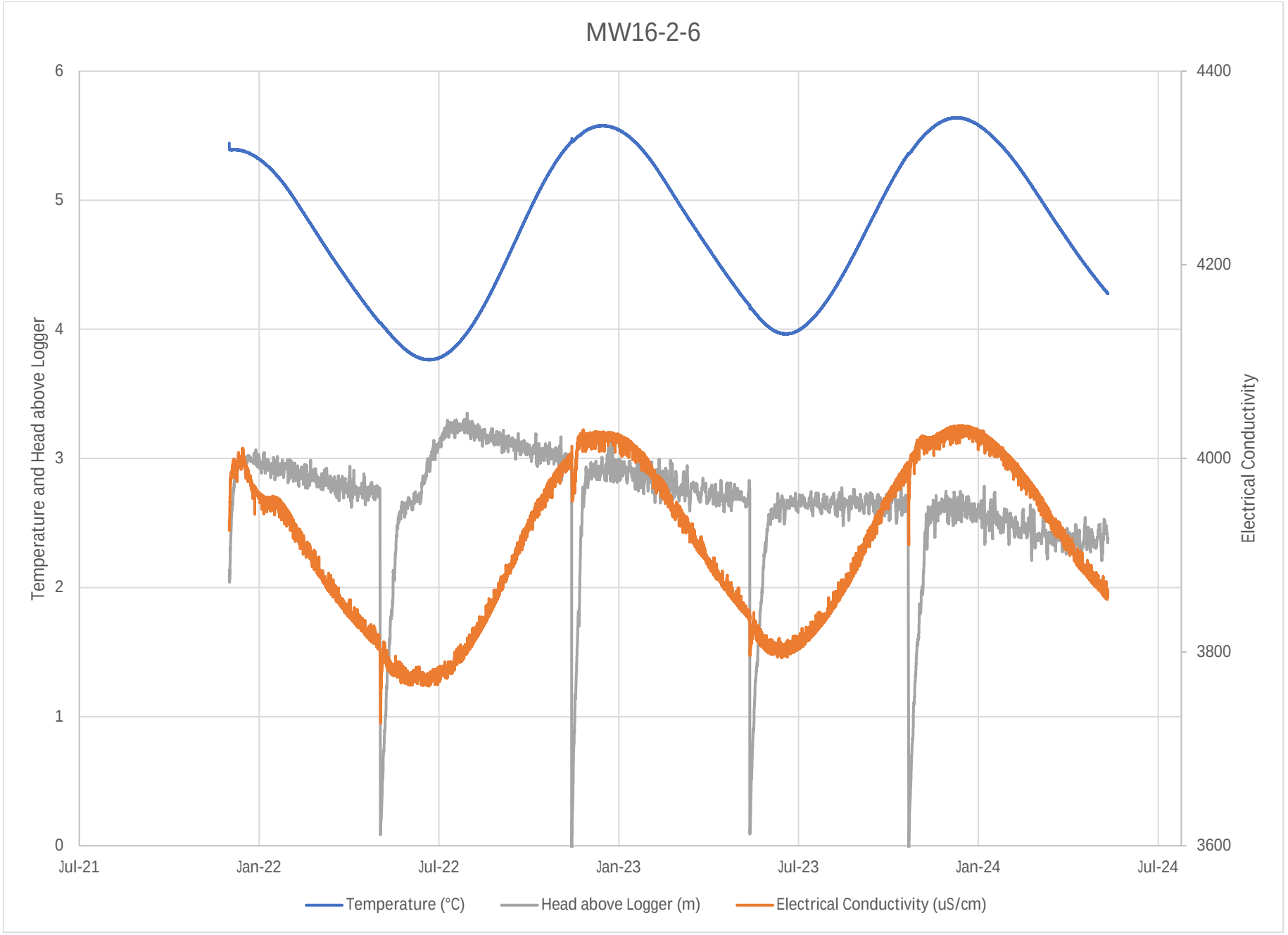
Soil strength (consistency) and plasticity terms are for descriptive purposes only and must not be used for design or construction purposes.

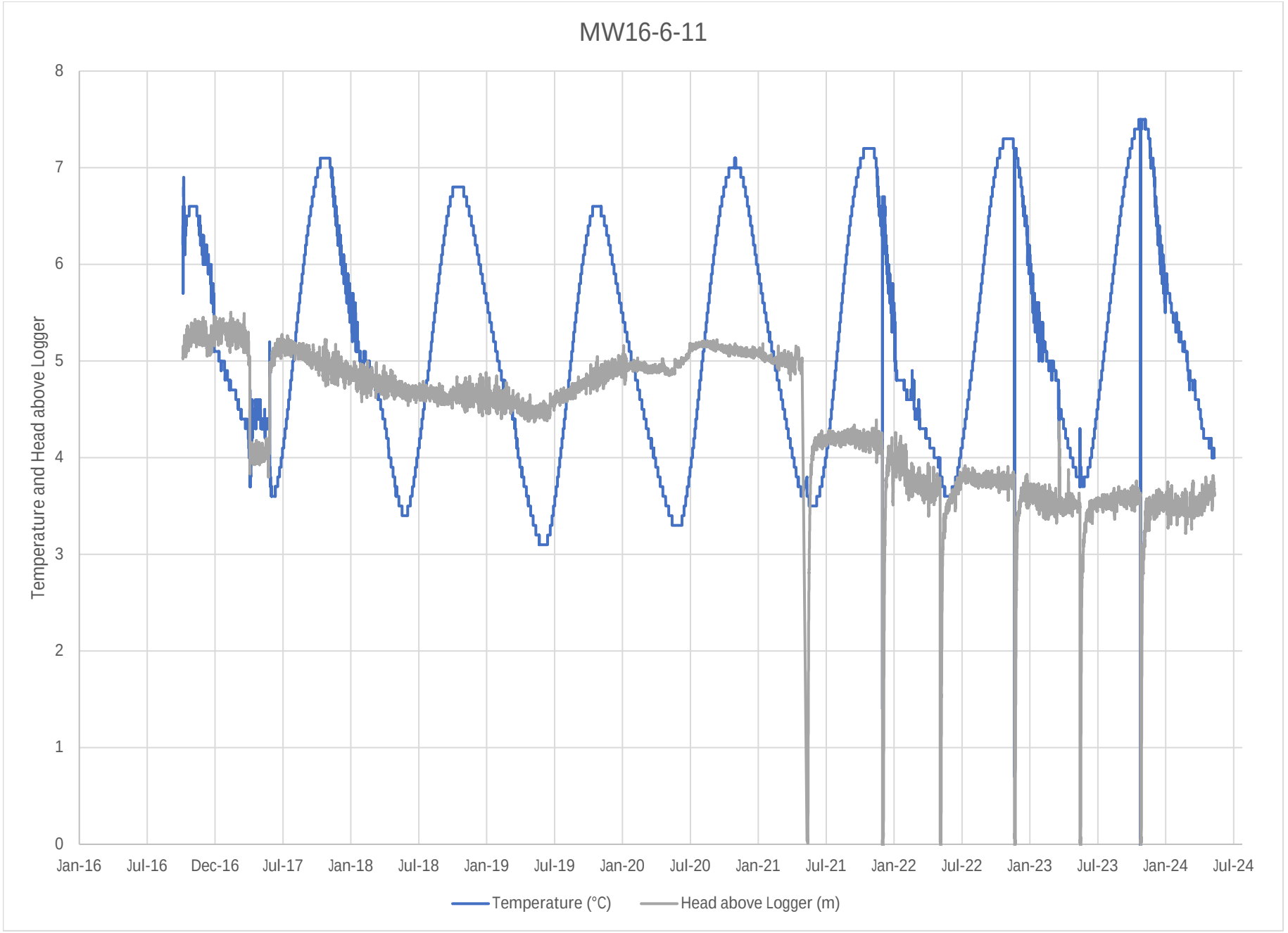
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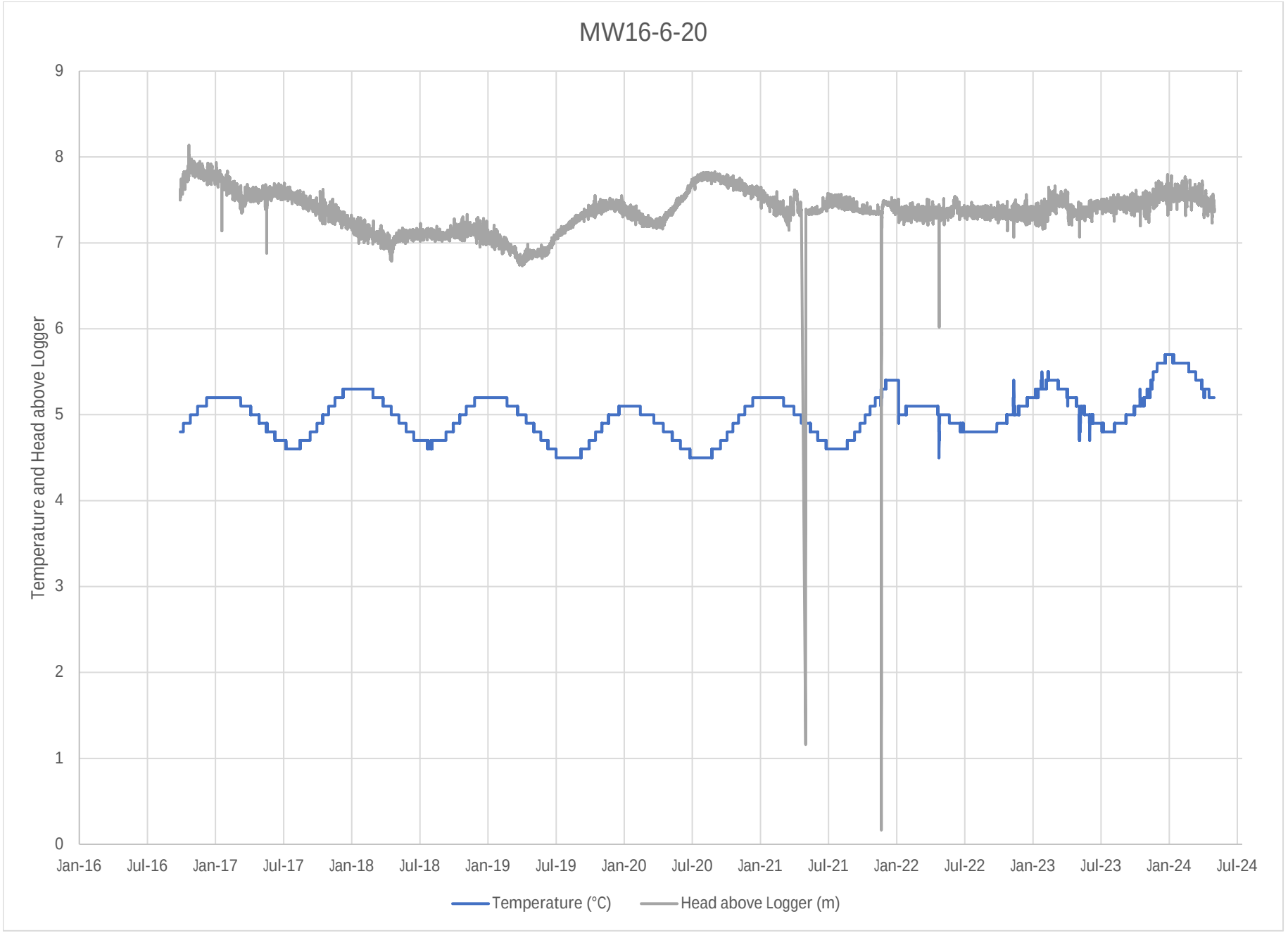
STANTEC BOREHOLE AND WELL V2 ALBERTA TRANSPORTATION SR1 BH LOGS_JULY2023_KY.GPJ STANTEC - DATA TEMPLATE.GDT 09/07/23 KIYOUNG

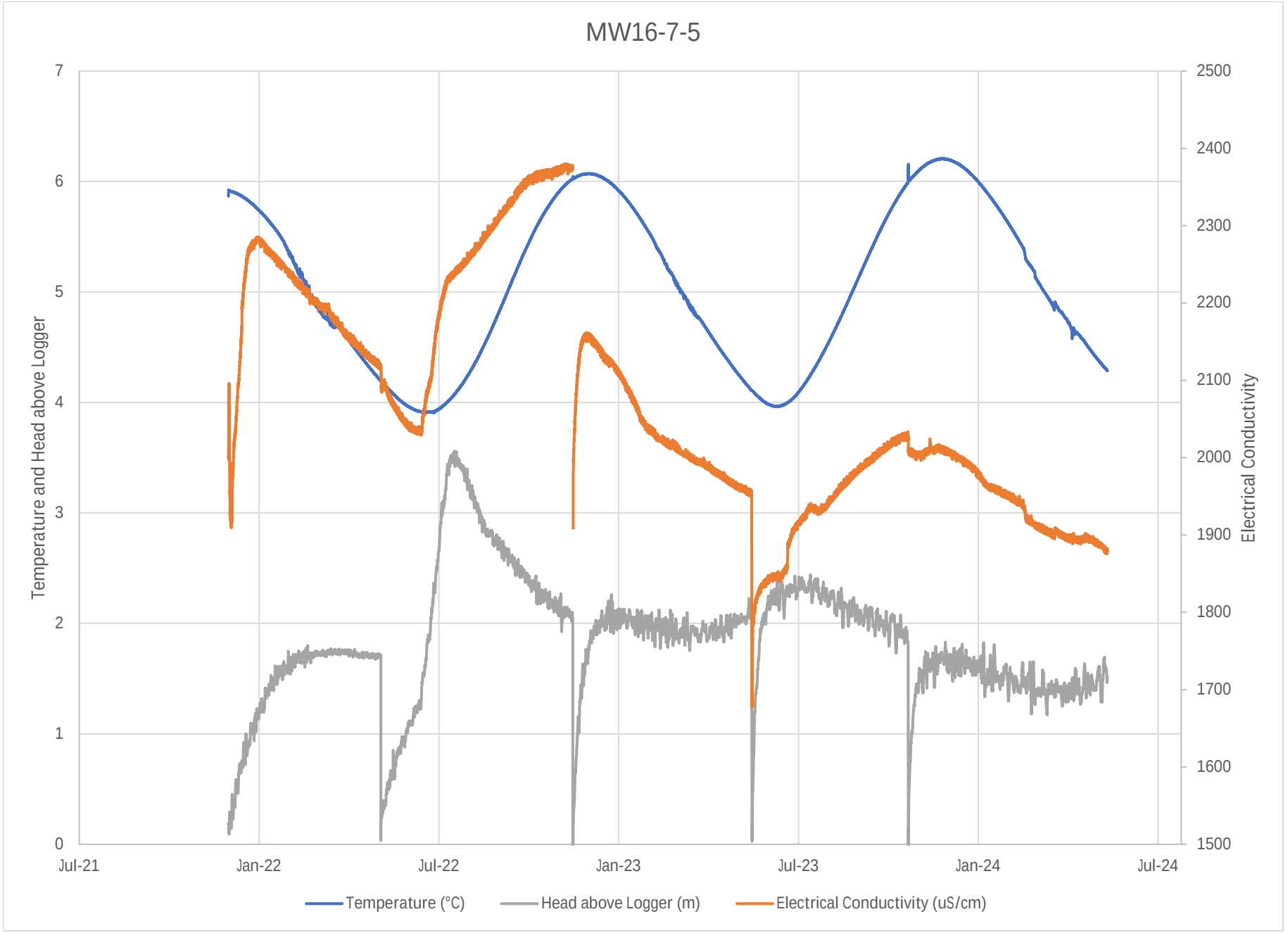
Appendix C Data Logging Pressure Transducer Data

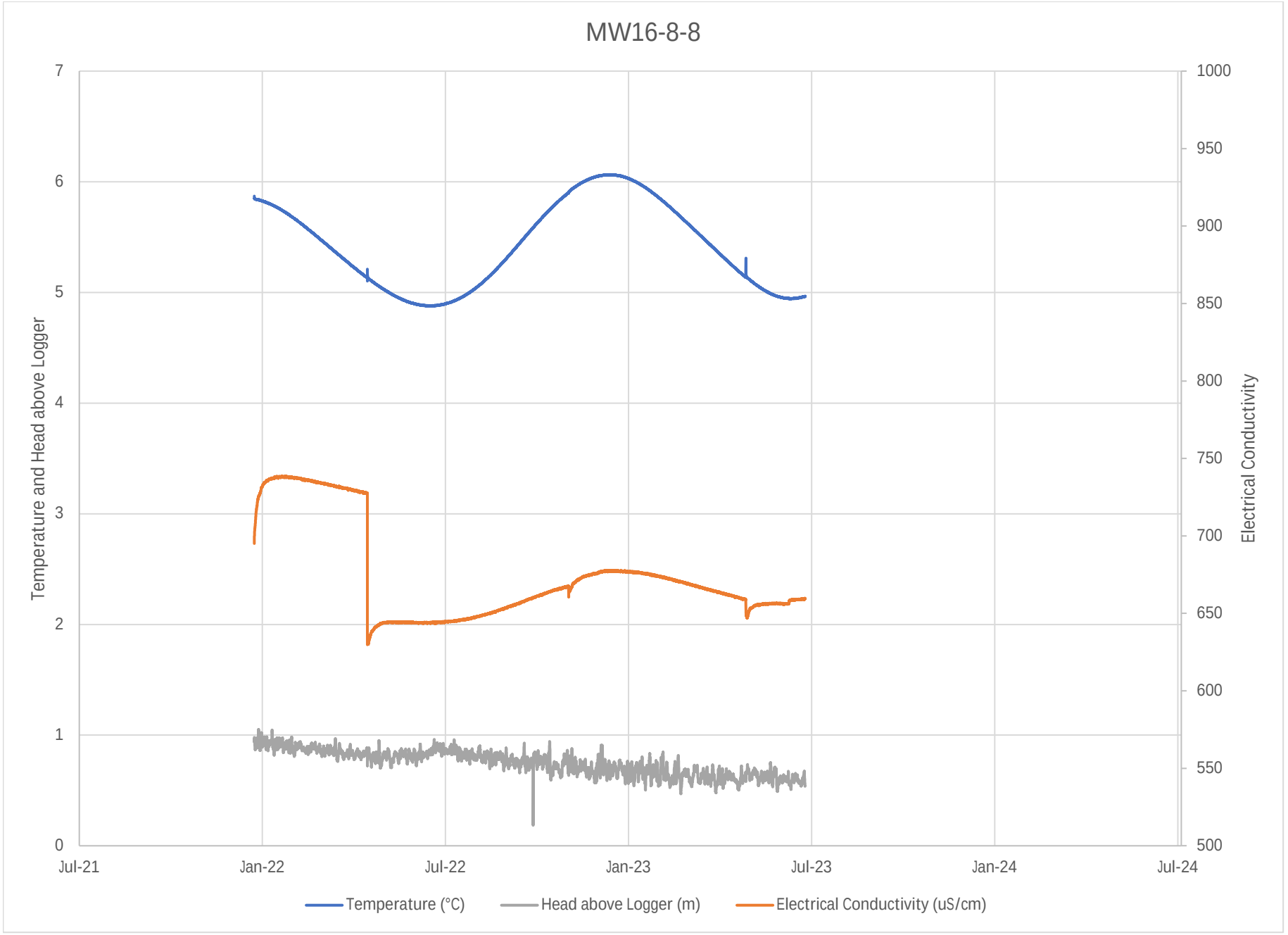

MW16-1-15
Temperature and Head above Logger
Electrical Conductivity
7
6
5
4
3
2
1
1700
1650
1600
1550
1500
1450
1400
1350
1300
1250
1200
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

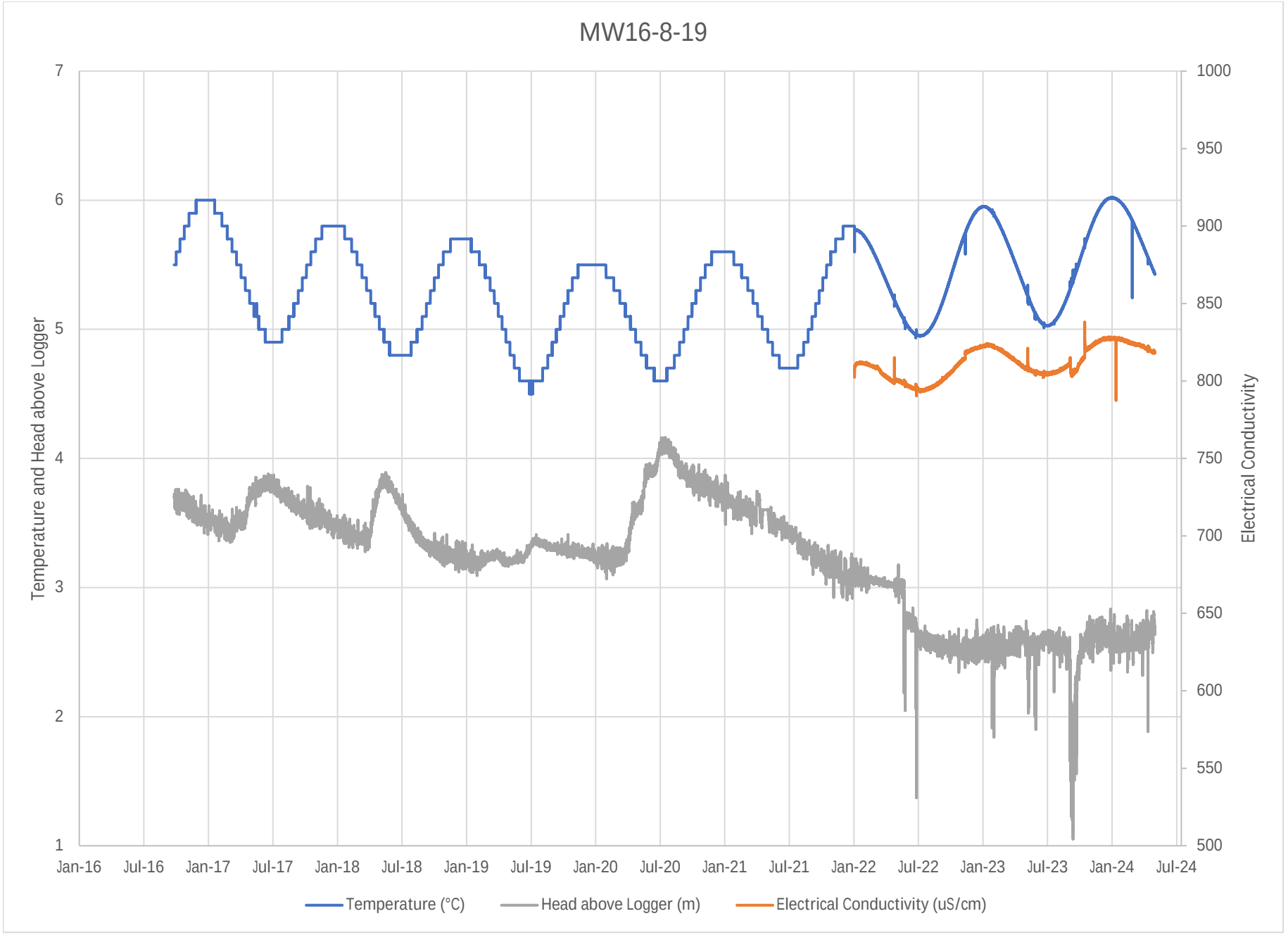

MW16-2-6
Temperature and Head above Logger
Electrical Conductivity
6
5
4
3
2
1
0
4400
4200
4000
3800
3600
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

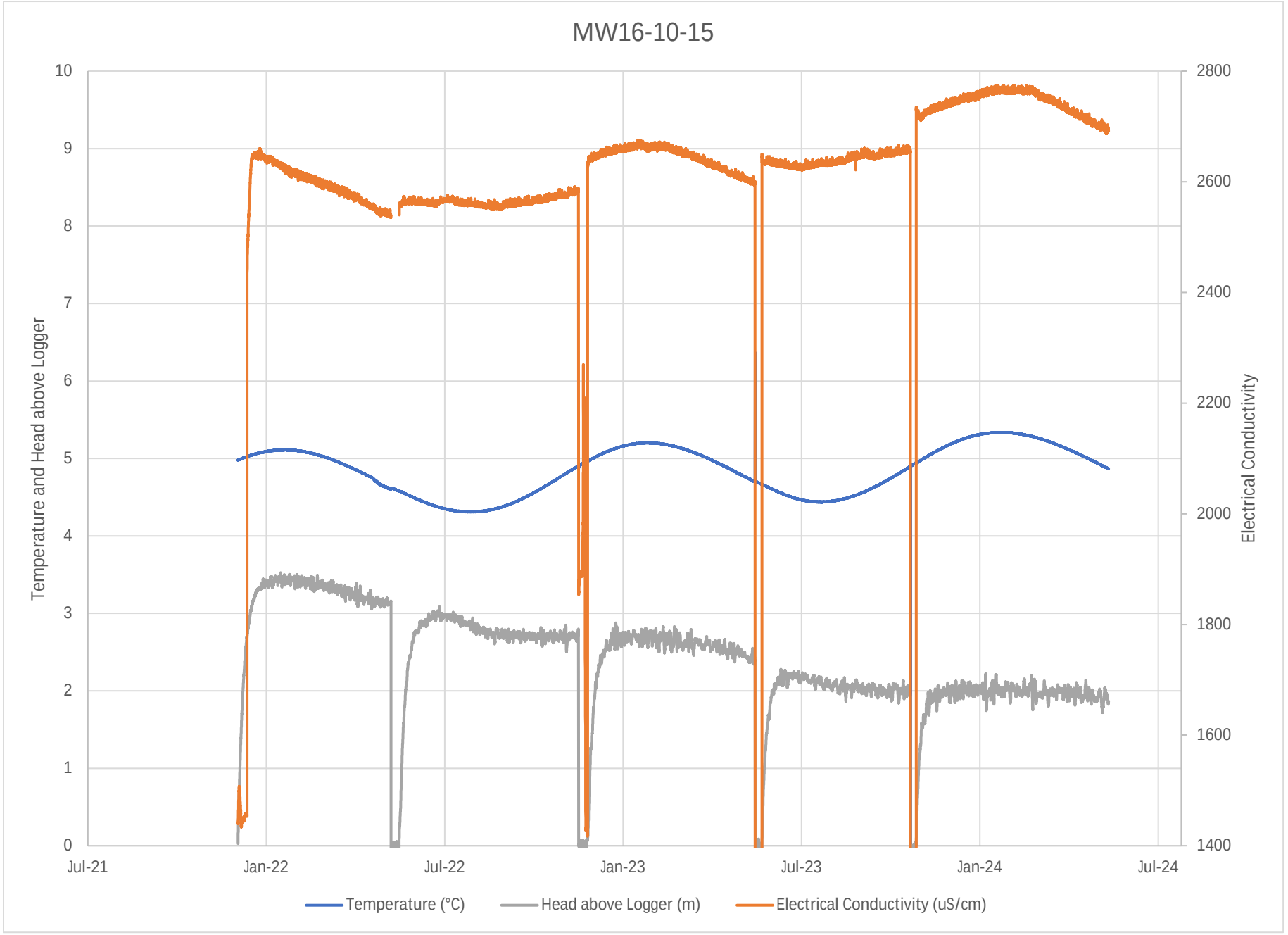

MW16-6-11
Temperature and Head above Logger
8
7
6
5
4
3
2
1
0
Jan-16
Jul-16
Dec-16
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)

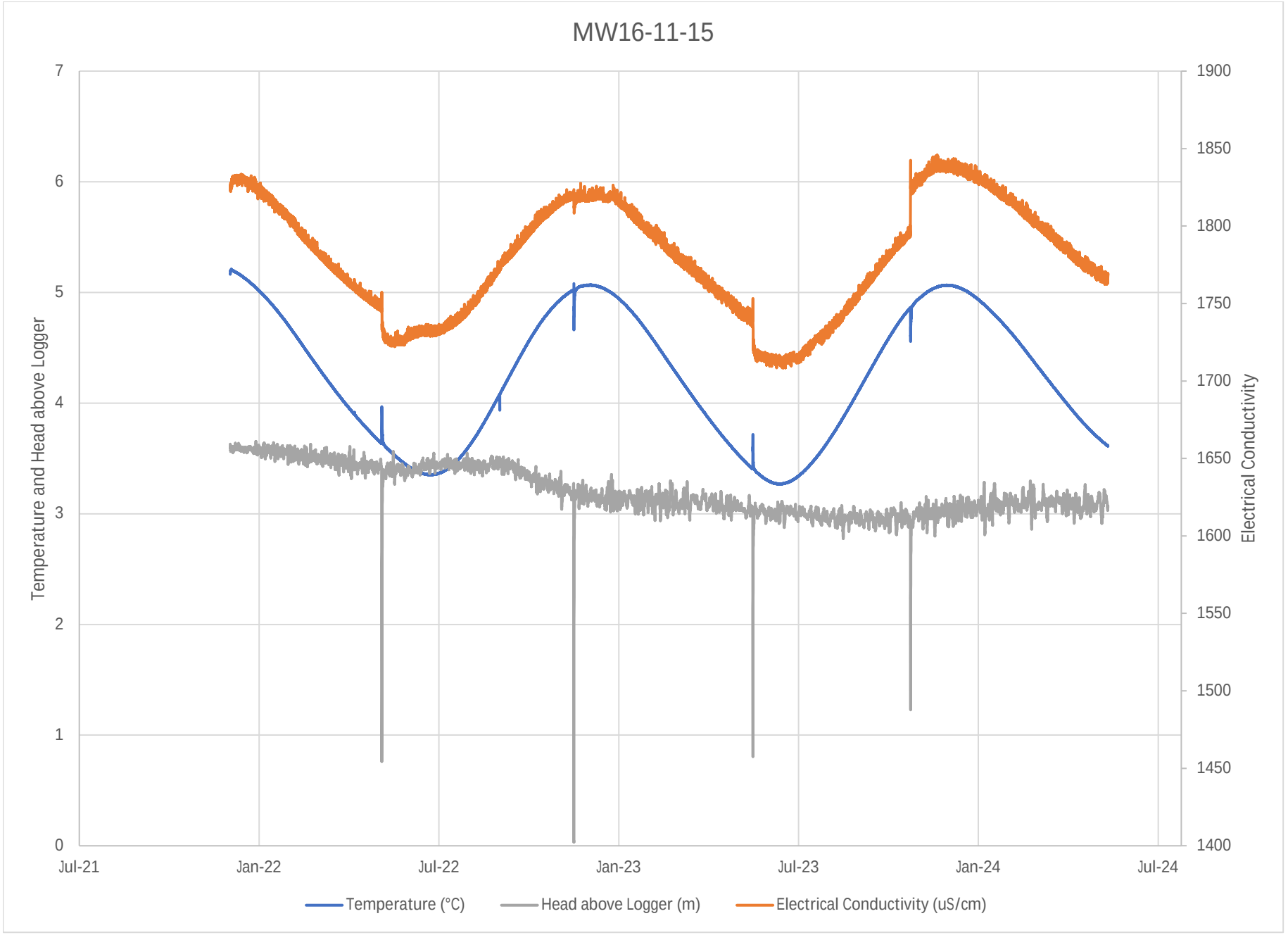

MW16-6-20
Temperature and Head above Logger
9
8
7
6
5
4
3
2
1
0
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)

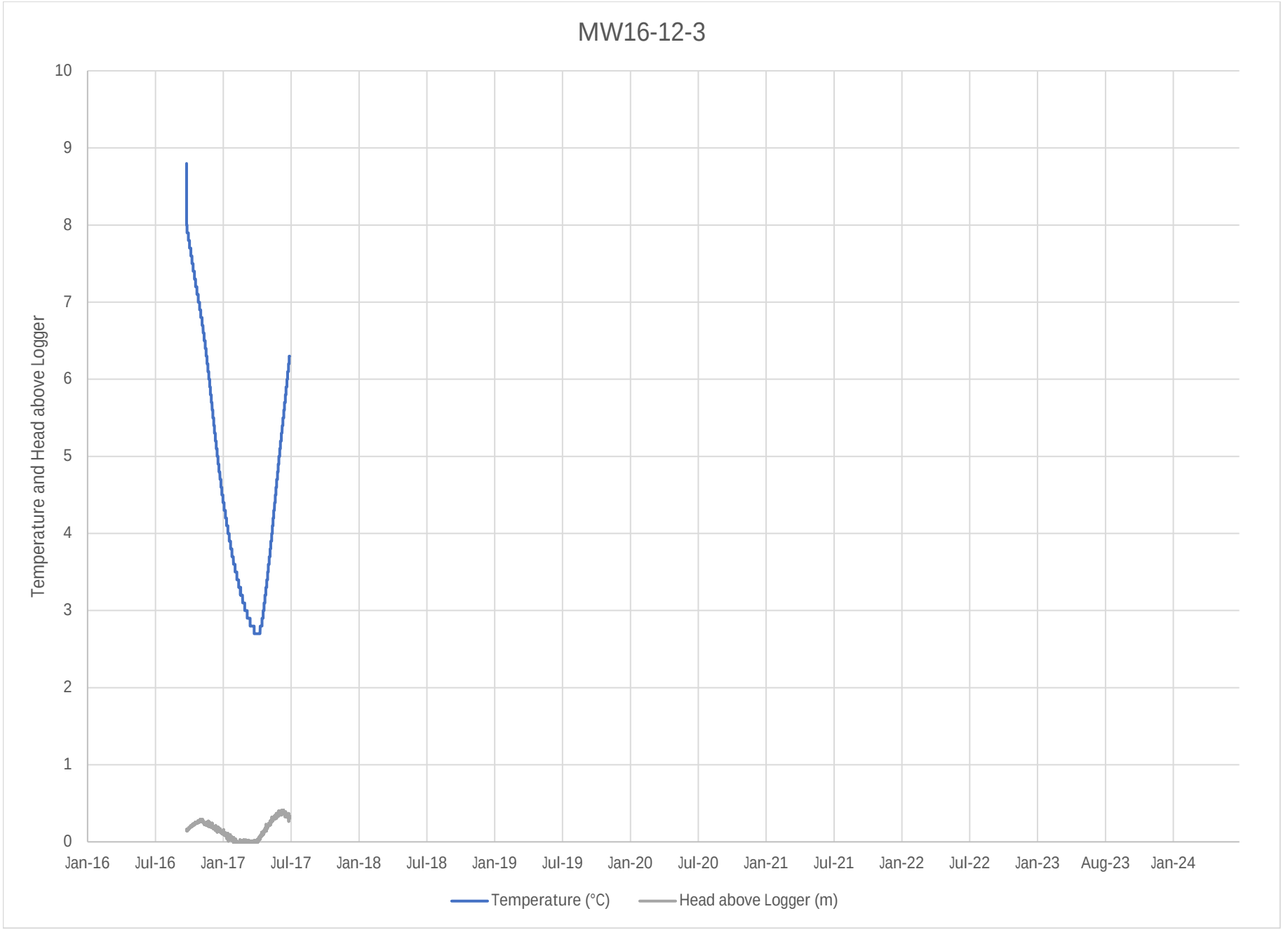

MW16-7-5
Temperature and Head above Logger
Electrical Conductivity
0
1
2
3
4
5
6
7
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

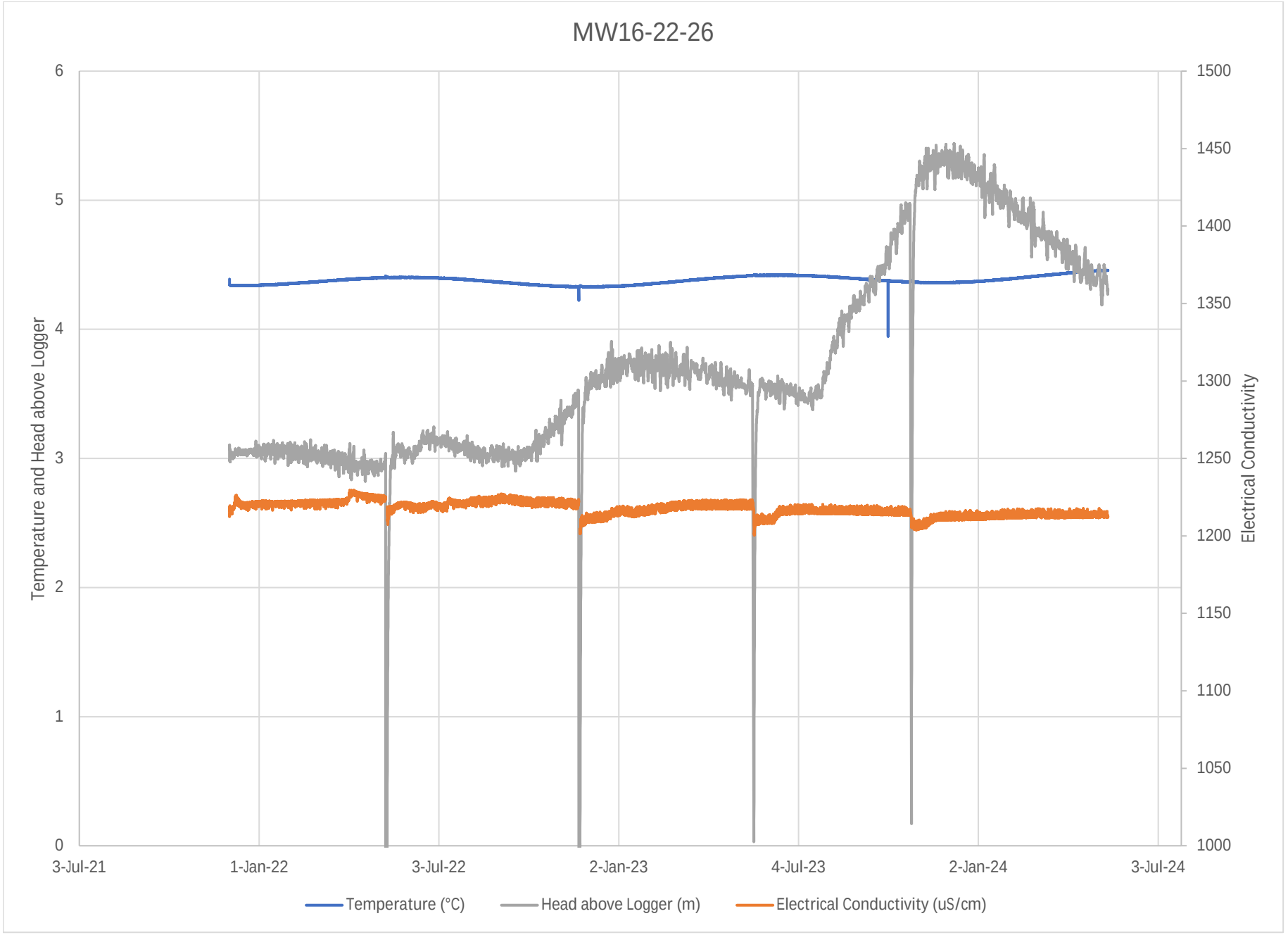

MW16-8-8
Temperature and Head above Logger
Electrical Conductivity
0
1
2
3
4
5
6
7
500
550
600
650
700
750
800
850
900
950
1000
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

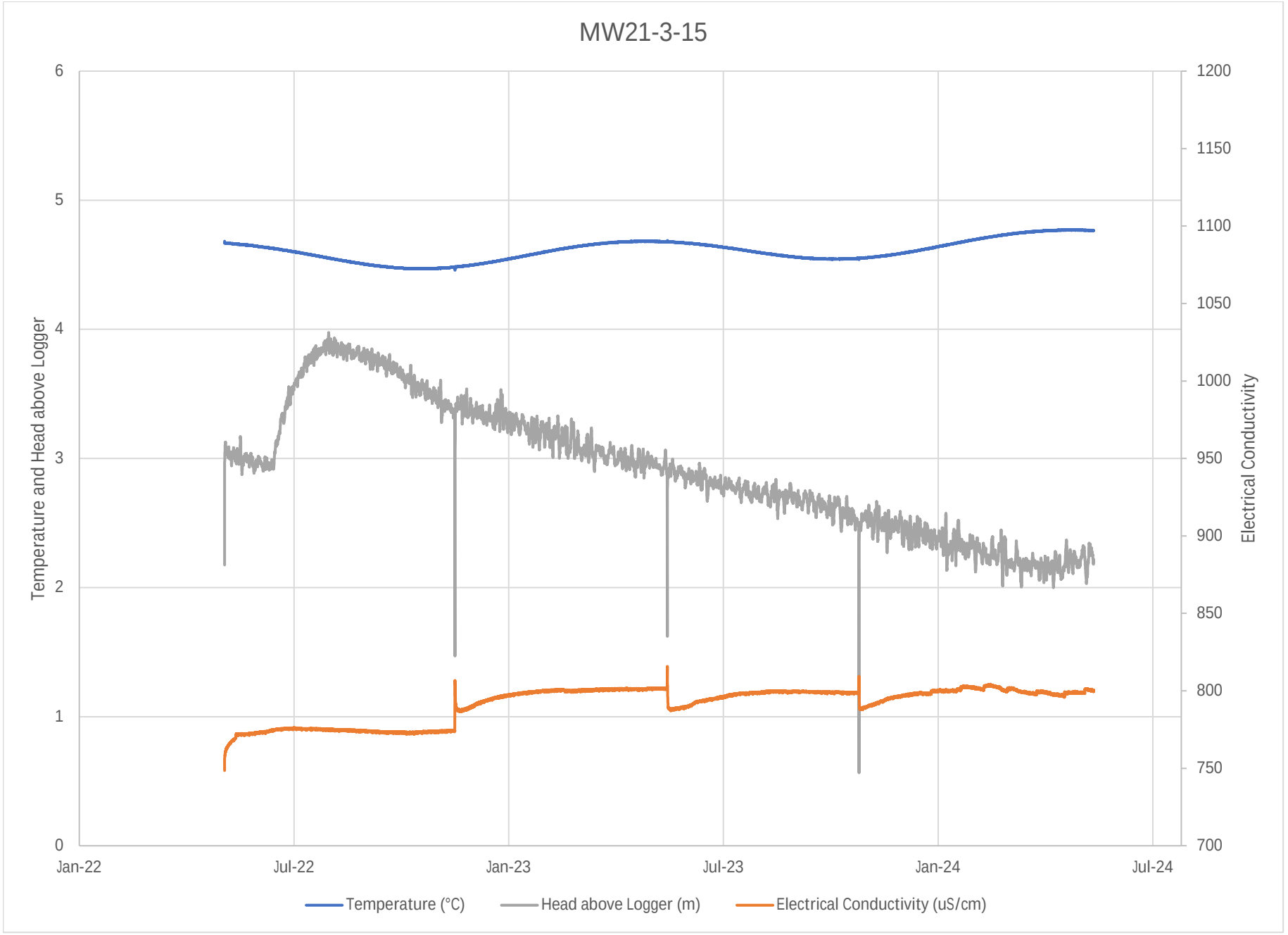

MW16-8-19
Temperature and Head above Logger
Electrical Conductivity
7
6
5
4
3
2
1
1000
950
900
850
800
750
700
650
600
550
500
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

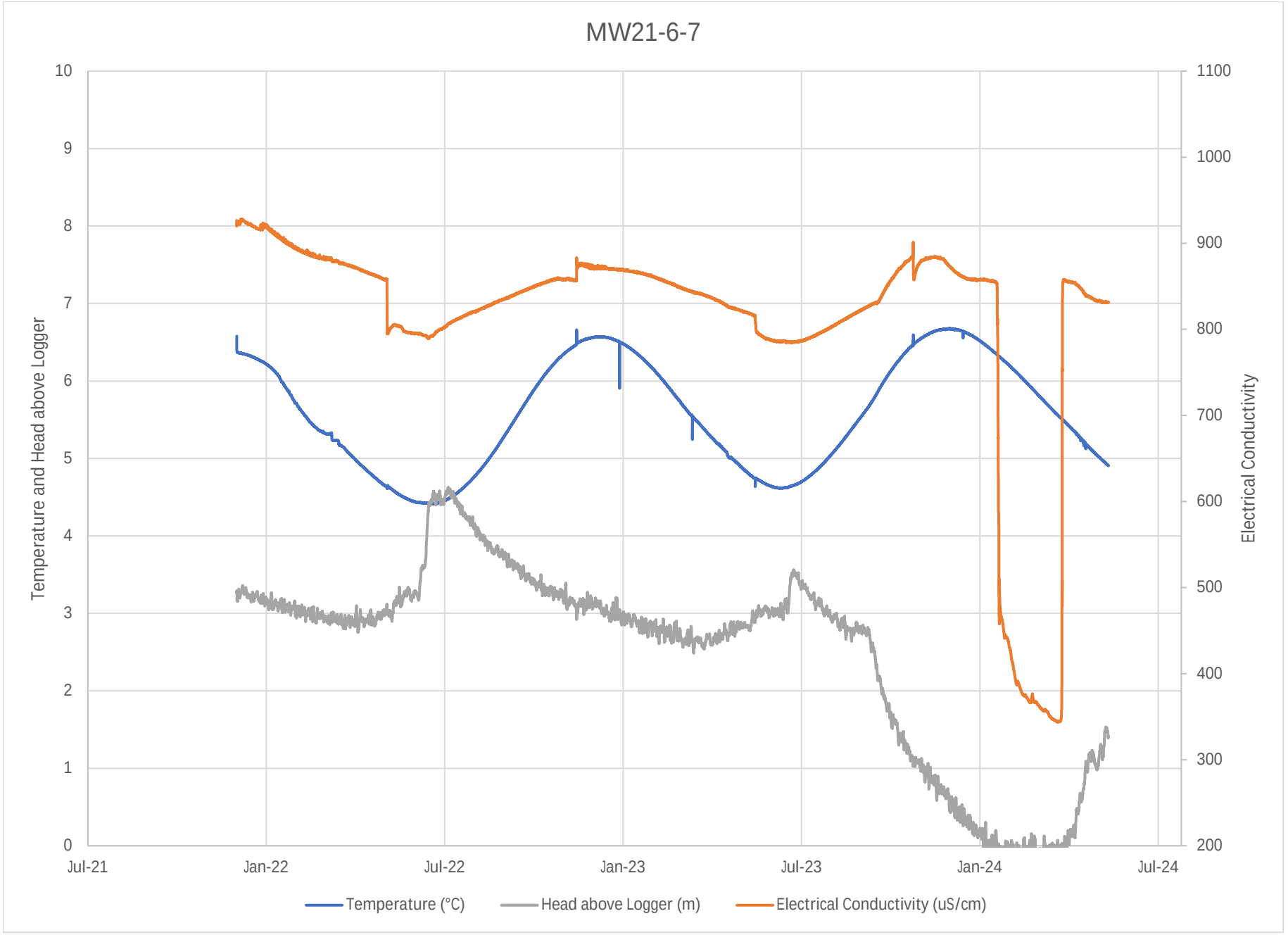

MW16-10-15
Temperature and Head above Logger
Electrical Conductivity
10
9
8
7
6
5
4
3
2
1
0
2800
2600
2400
2200
2000
1800
1600
1400
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

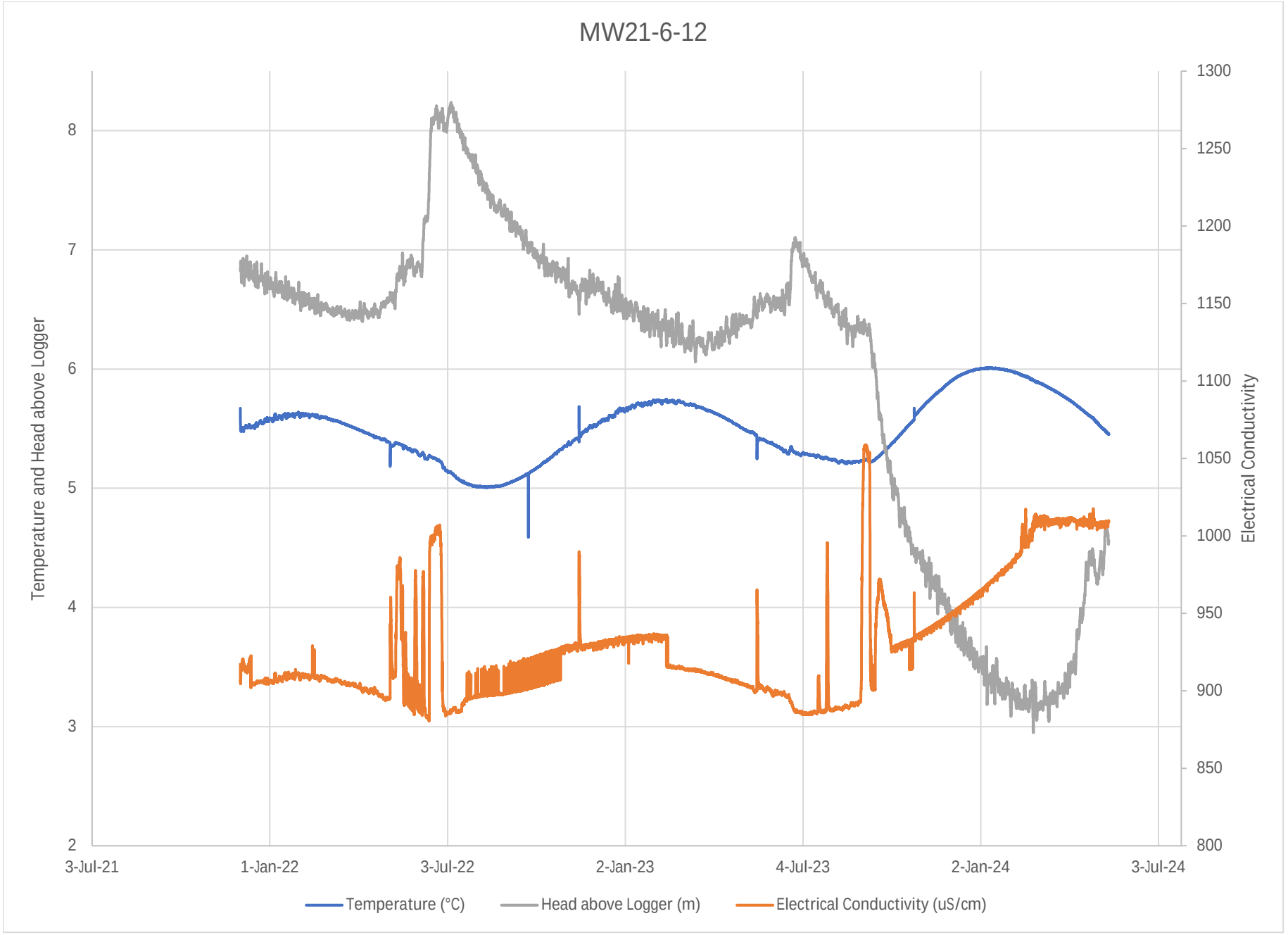

MW16-11-15
Temperature and Head above Logger
Electrical Conductivity
0
1
2
3
4
5
6
7
1400
1450
1500
1550
1600
1650
1700
1750
1800
1850
1900
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

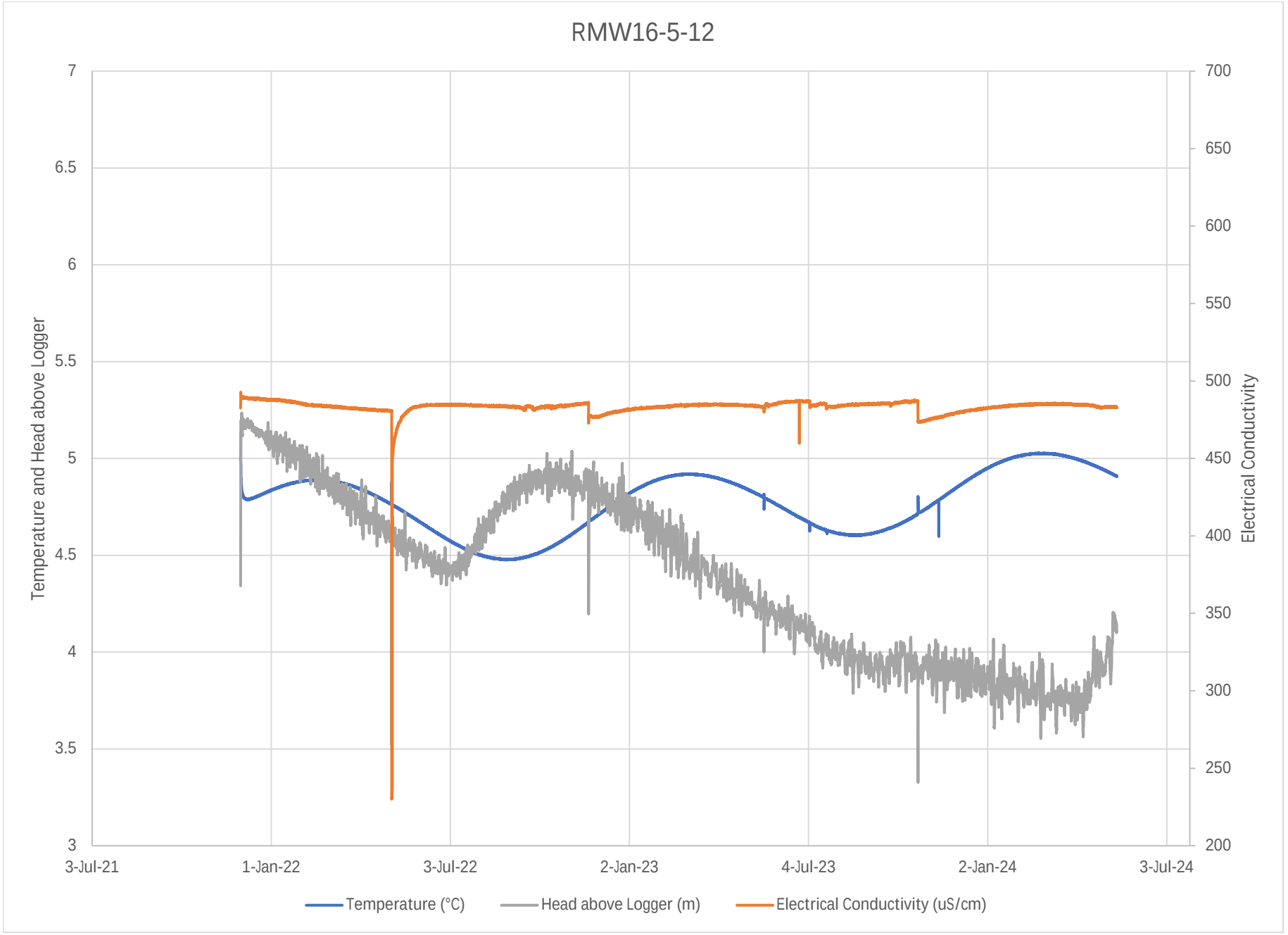

MW16-12-3
Temperature and Head above Logger
10
9
8
7
6
5
4
3
2
1
0
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Jul-21
Jan-22
Jul-22
Jan-23
Aug-23
Jan-24
Temperature (°C)
Head above Logger (m)

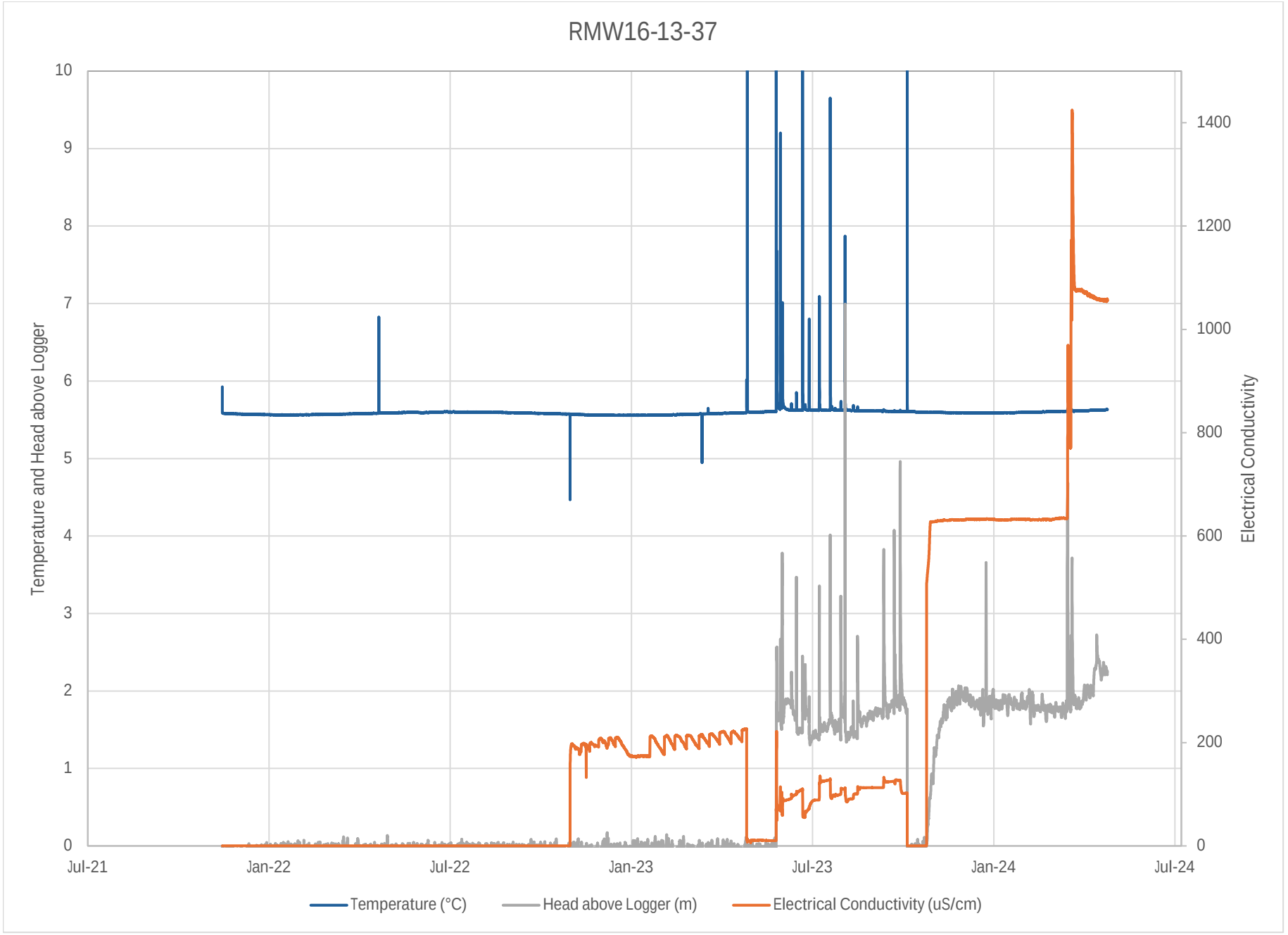

MW16-22-26
Temperature and Head above Logger
Electrical Conductivity
6
5
4
3
2
1
0
1500
1450
1400
1350
1300
1250
1200
1150
1100
1050
1000
3-Jul-21
1-Jan-22
3-Jul-22
2-Jan-23
4-Jul-23
2-Jan-24
3-Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

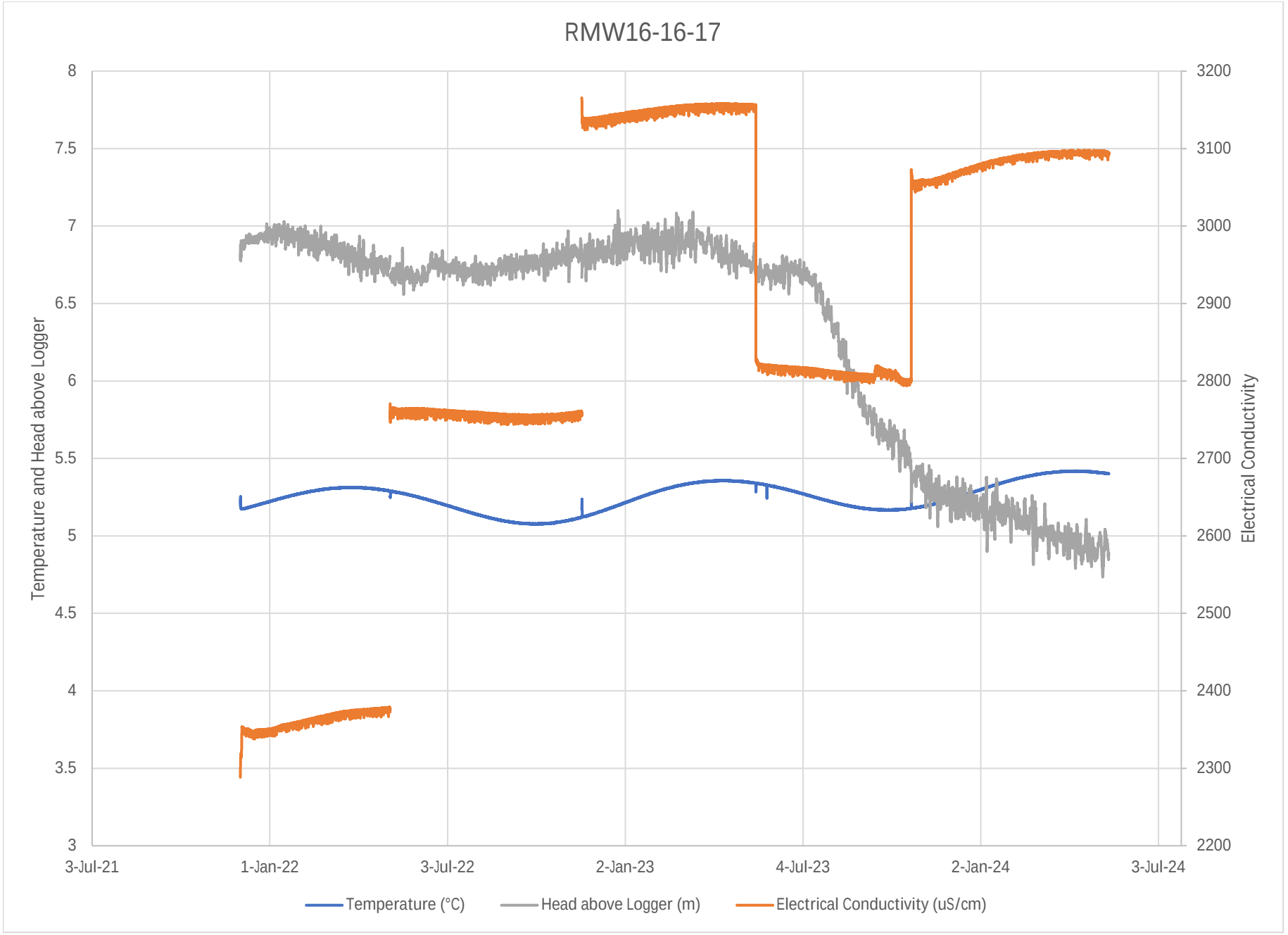

MW21-3-15
Temperature and Head above Logger
Electrical Conductivity
0
1
2
3
4
5
6
700
750
800
850
900
950
1000
1050
1100
1150
1200
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

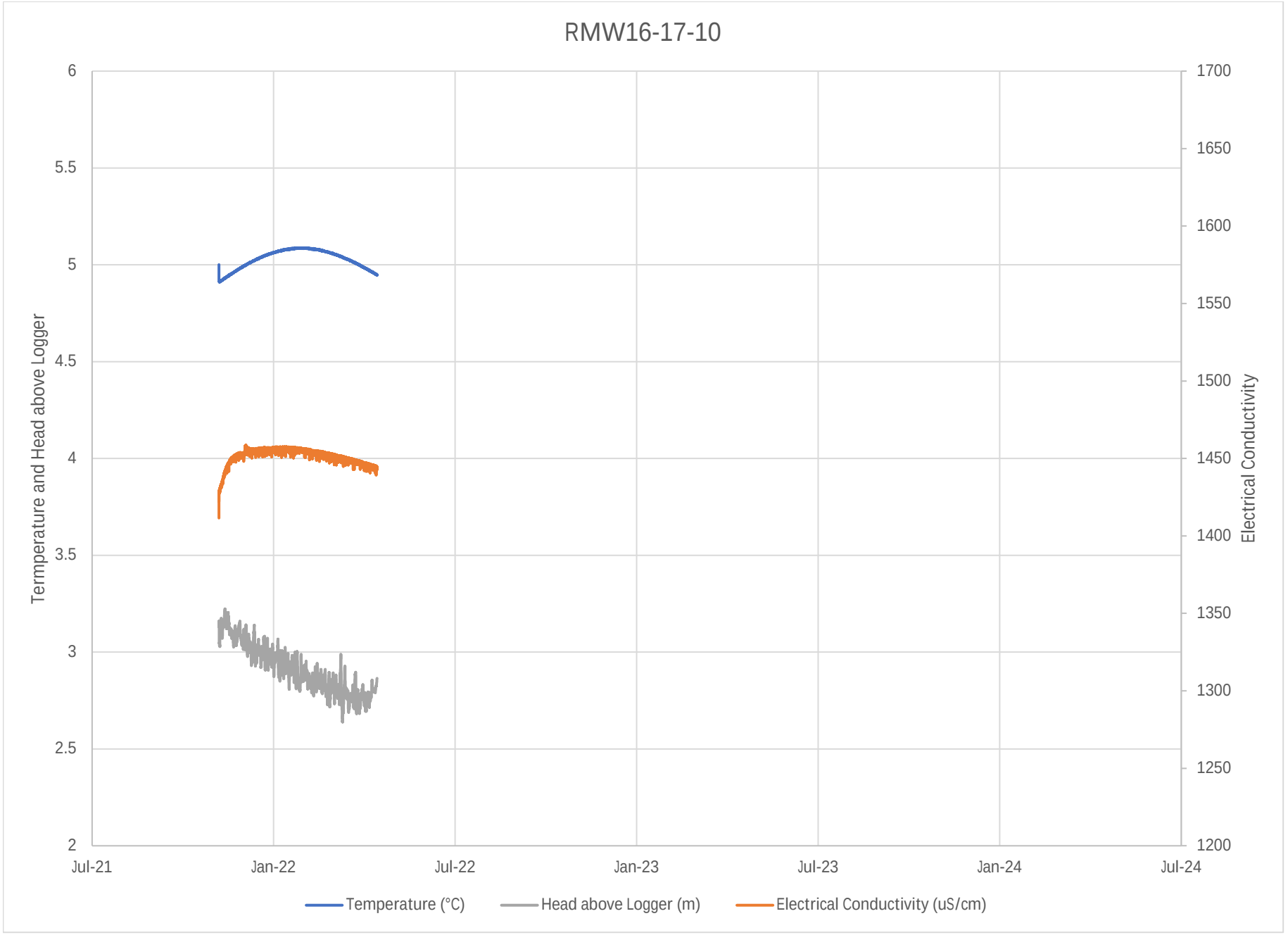

MW21-6-7
Temperature and Head above Logger
Electrical Conductivity
10
9
8
7
6
5
4
3
2
1
0
1100
1000
900
800
700
600
500
400
300
200
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

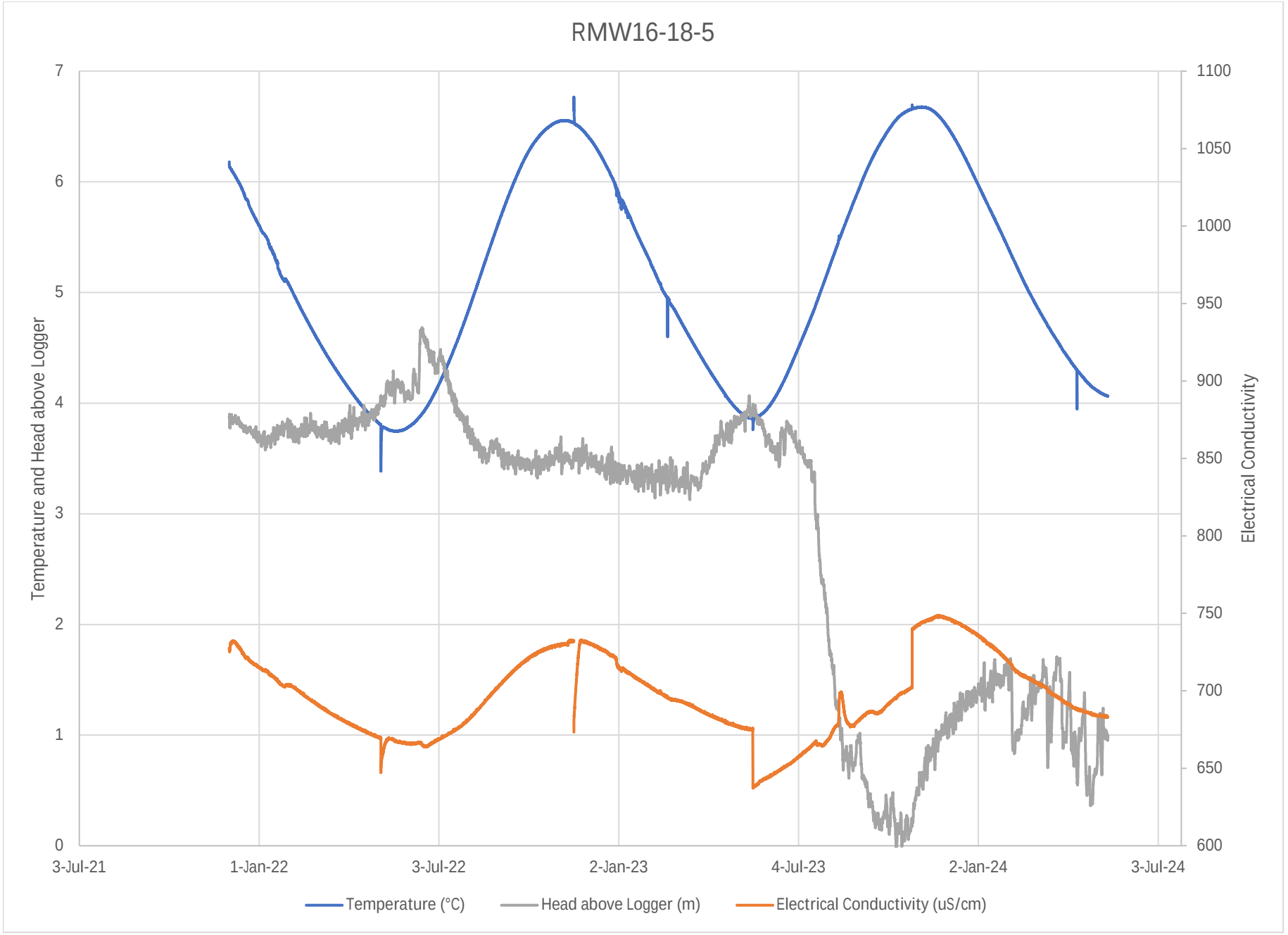

MW21-6-12
Temperature and Head above Logger
Electrical Conductivity
8
7
6
5
4
3
2
1300
1250
1200
1150
1100
1050
1000
950
900
850
800
3-Jul-21
1-Jan-22
3-Jul-22
2-Jan-23
4-Jul-23
2-Jan-24
3-Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

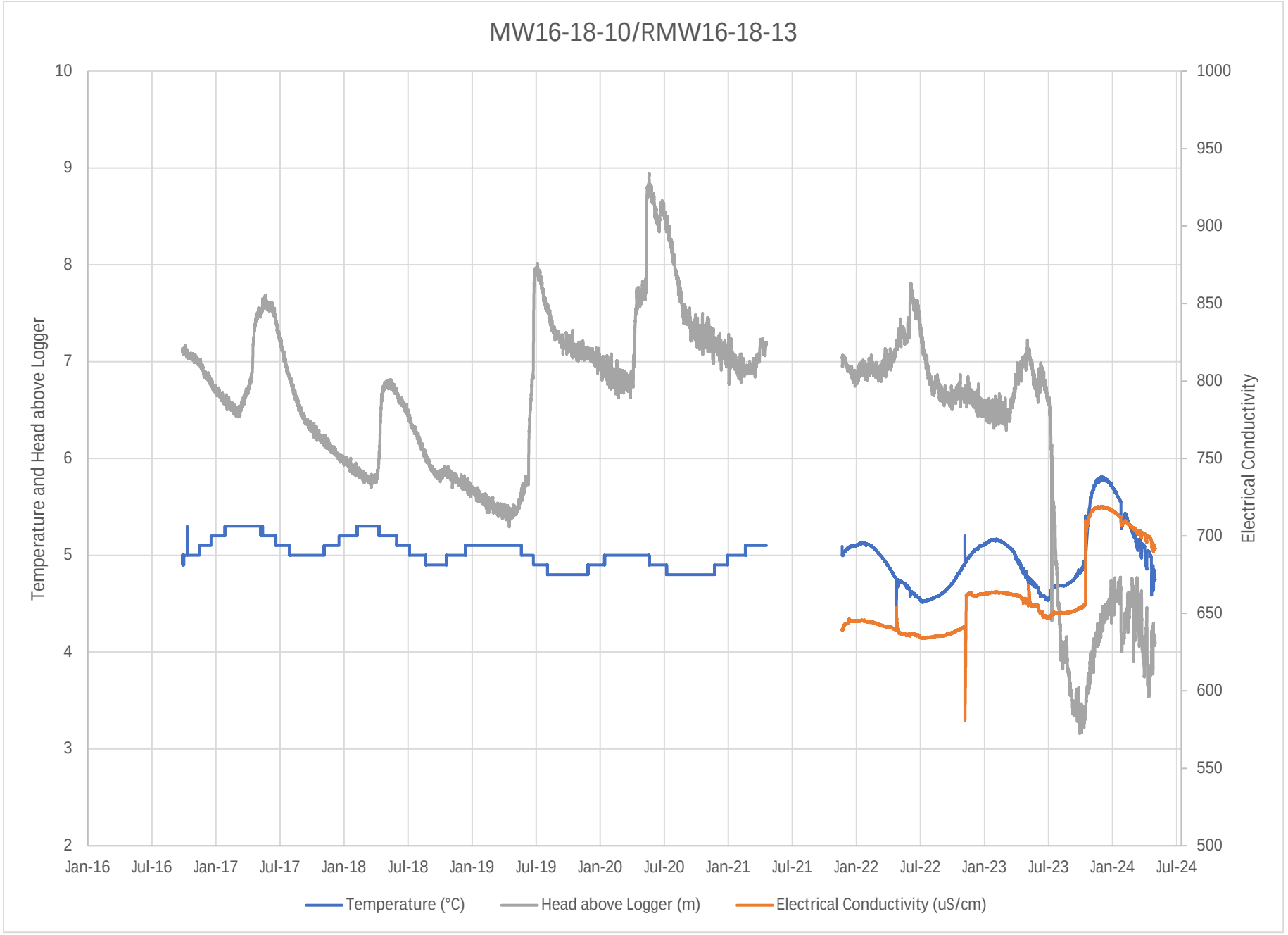

RMW16-5-12
Temperature and Head above Logger
Electrical Conductivity
7
6.5
6
5.5
5
4.5
4
3.5
3
700
650
600
550
500
450
400
350
300
250
200
3-Jul-21
1-Jan-22
3-Jul-22
2-Jan-23
4-Jul-23
2-Jan-24
3-Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

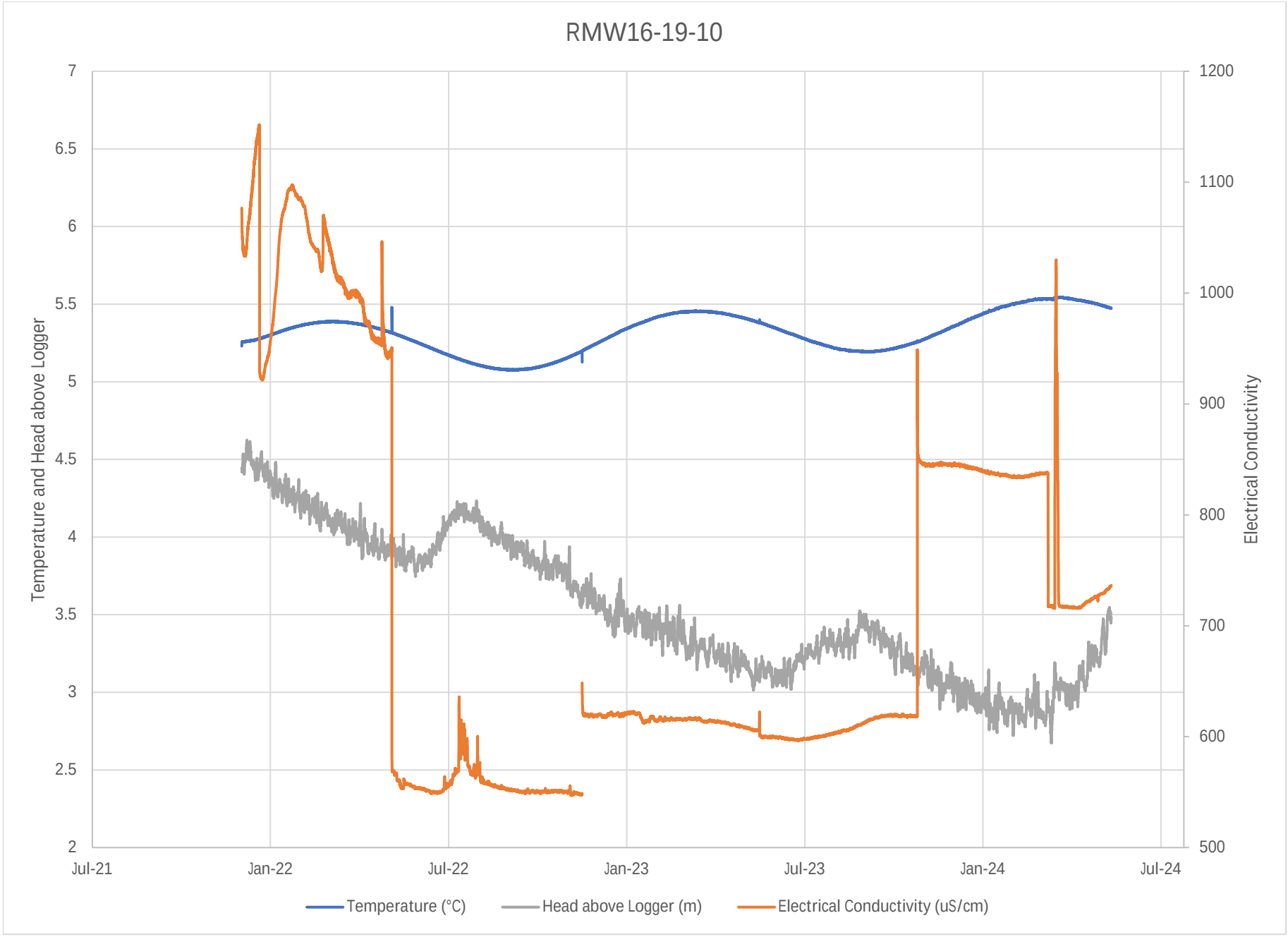

RMW16-13-37
Temperature and Head above Logger
Electrical Conductivity
10
9
8
7
6
5
4
3
2
1
0
1400
1200
1000
800
600
400
200
0
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

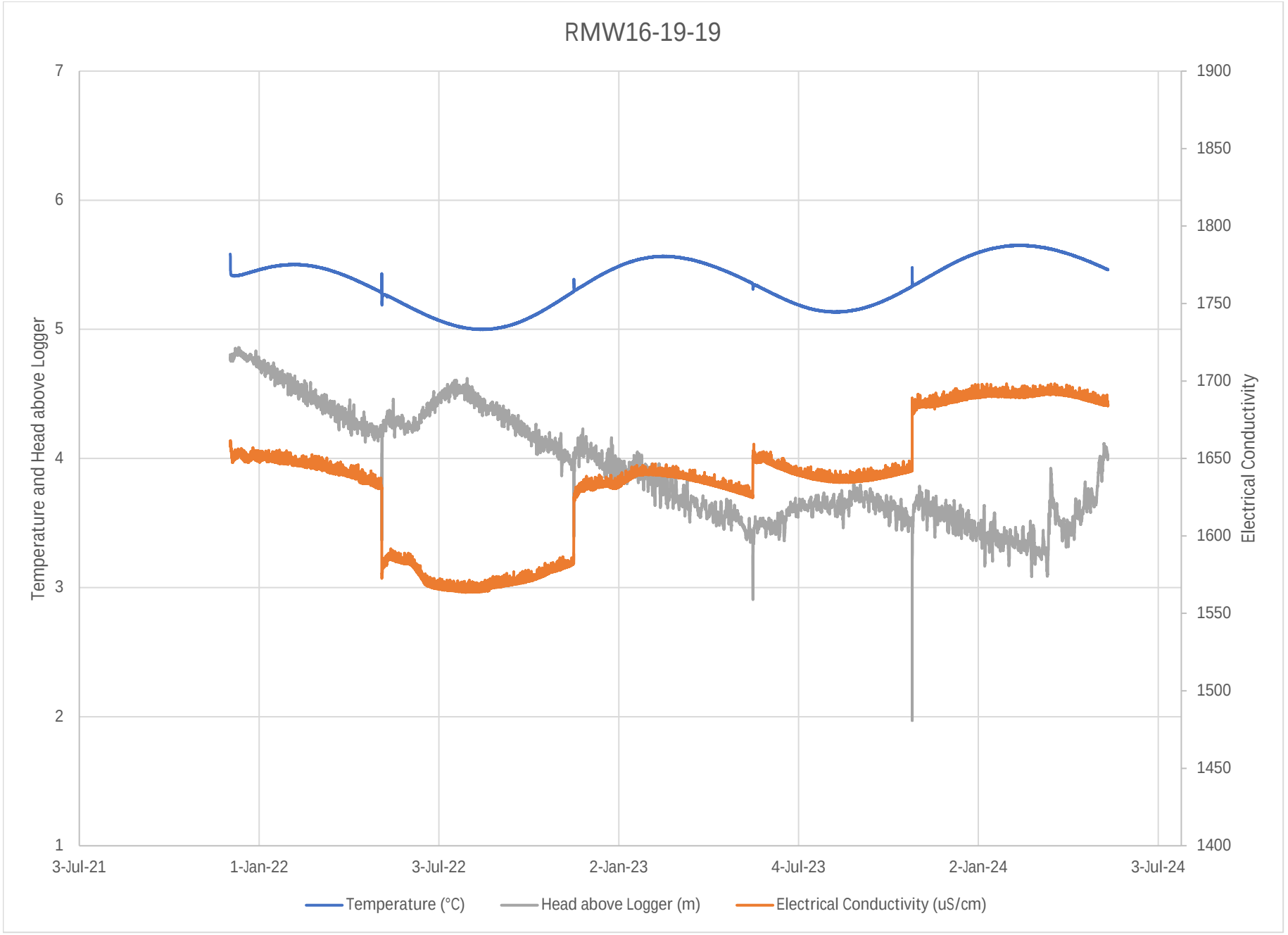

RMW16-16-17
Temperature and Head above Logger
Electrical Conductivity
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
3200
3100
3000
2900
2800
2700
2600
2500
2400
2300
2200
3-Jul-21
1-Jan-22
3-Jul-22
2-Jan-23
4-Jul-23
2-Jan-24
3-Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

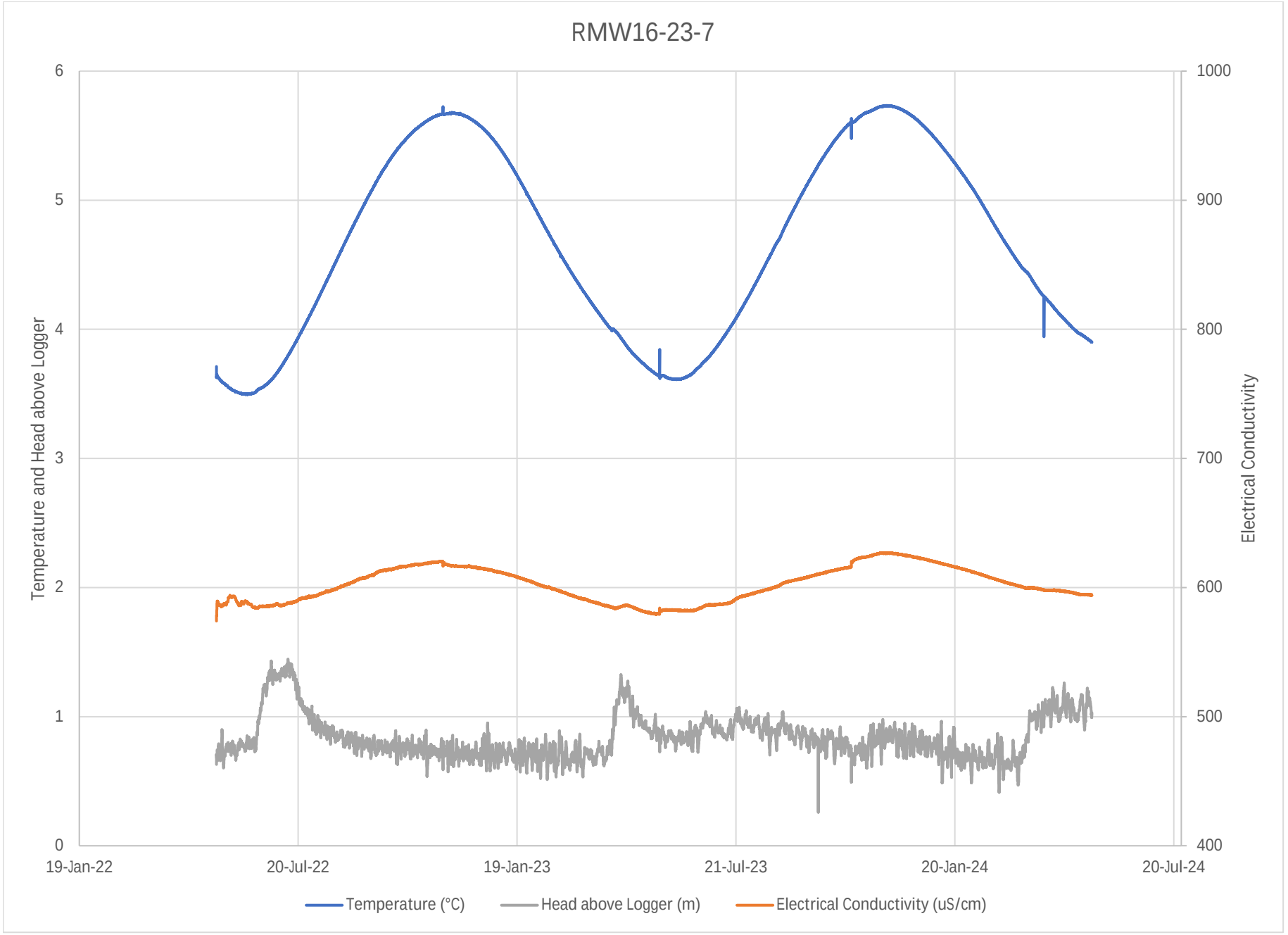

RMW16-17-10
Termperature and Head above Logger
Electrical Conductivity
6
5.5
5
4.5
4
3.5
3
2.5
2
1700
1650
1600
1550
1500
1450
1400
1350
1300
1250
1200
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

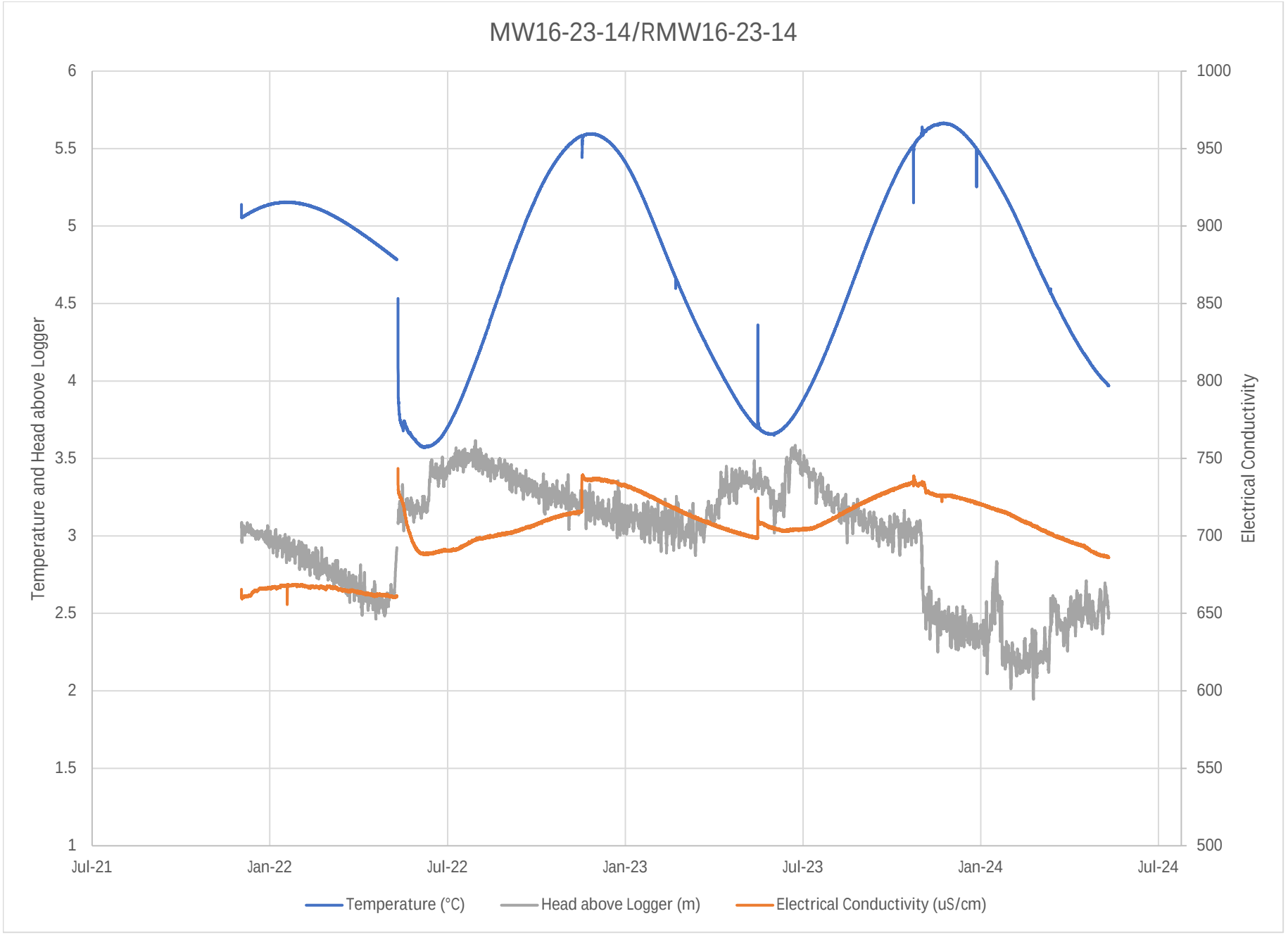

RMW16-18-5
Temperature and Head above Logger
Electrical Conductivity
7
6
5
4
3
2
1
0
1100
1050
1000
950
900
850
800
750
700
650
600
3-Jul-21
1-Jan-22
3-Jul-22
2-Jan-23
4-Jul-23
2-Jan-24
3-Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

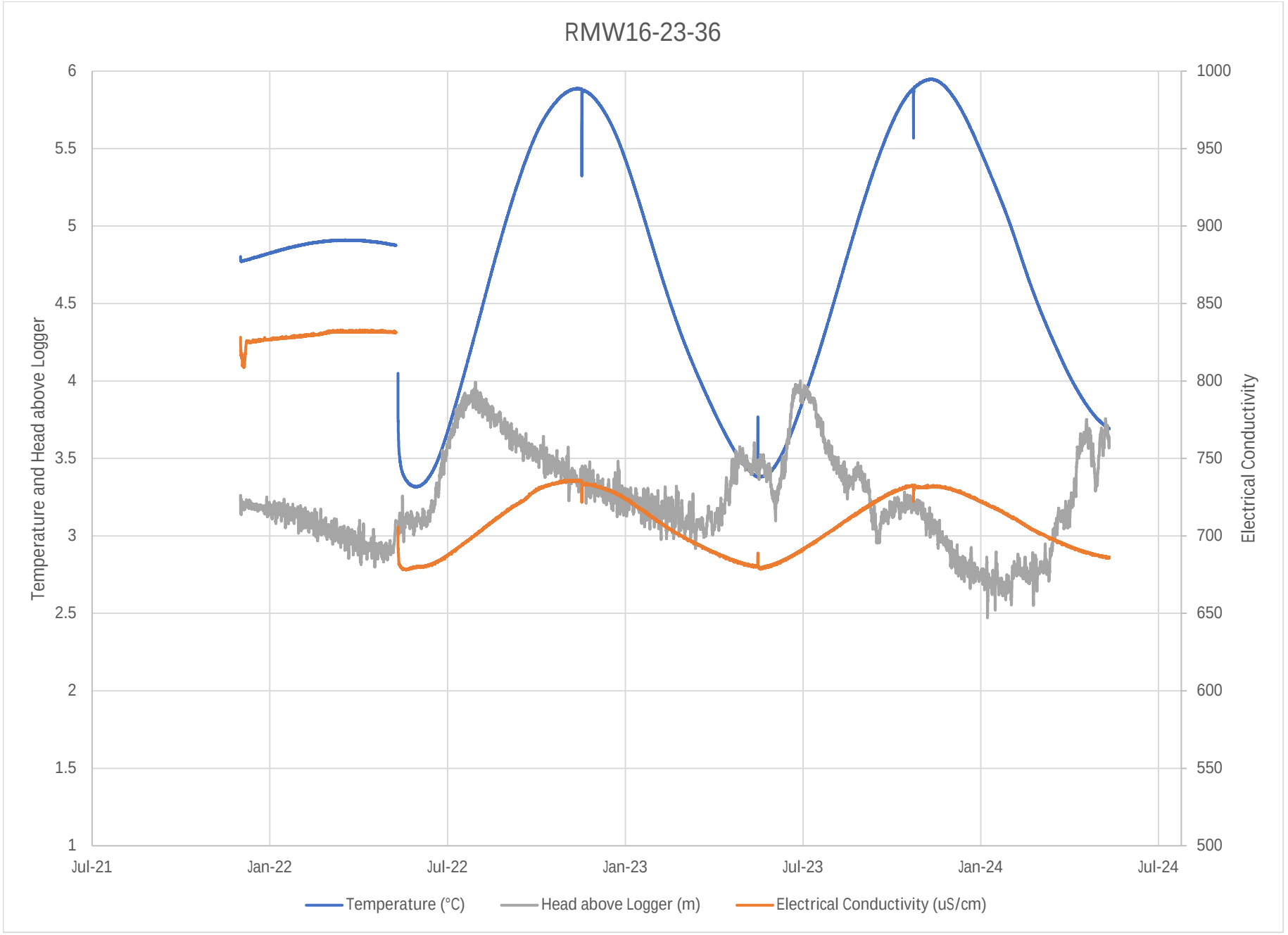

MW16-18-10/RMW16-18-13
Temperature and Head above Logger
Electrical Conductivity
10
9
8
7
6
5
4
3
2
1000
950
900
850
800
750
700
650
600
550
500
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

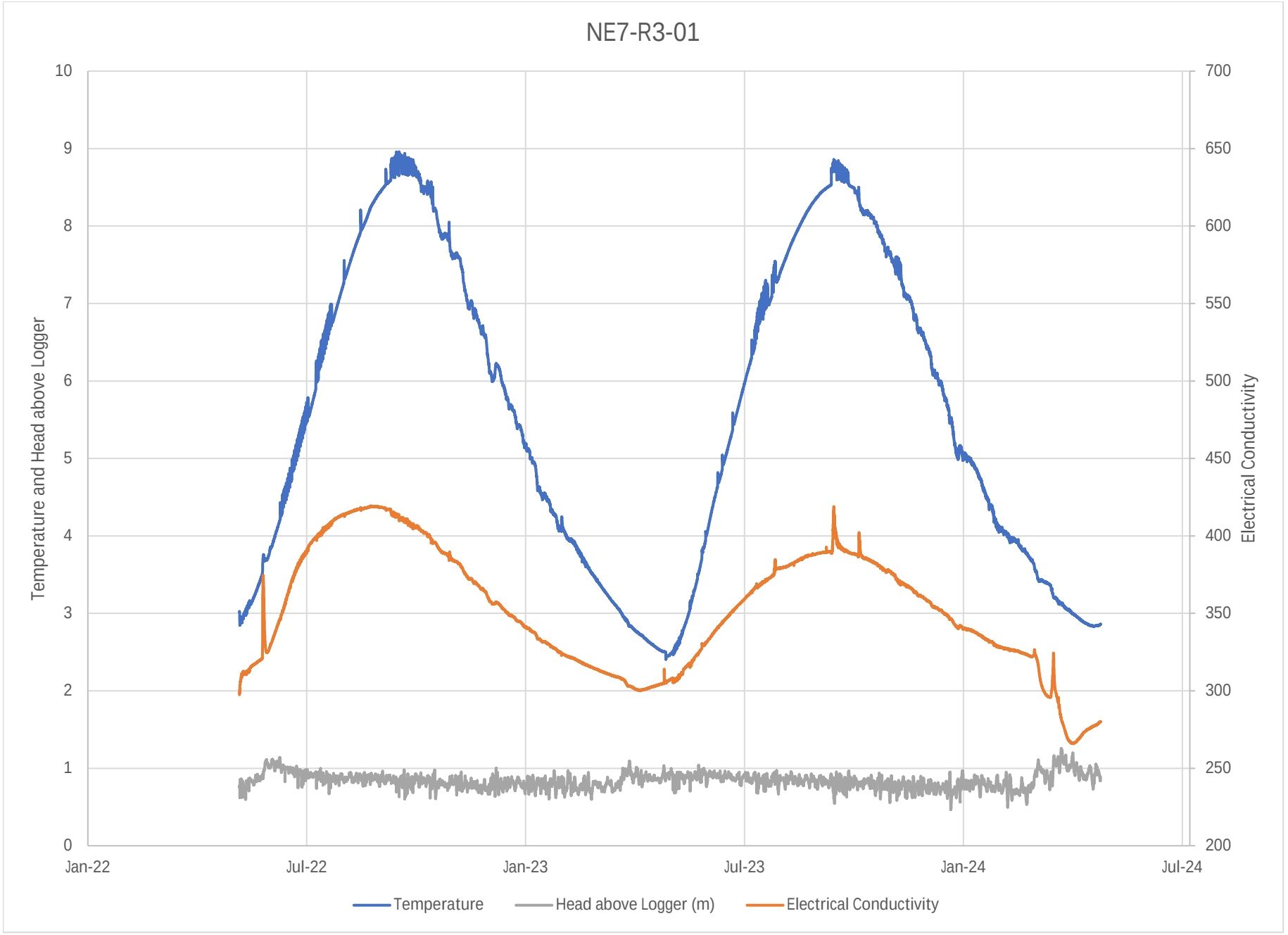

RMW16-19-10
Temperature and Head above Logger
Electrical Conductivity
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1200
1100
1000
900
800
700
600
500
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

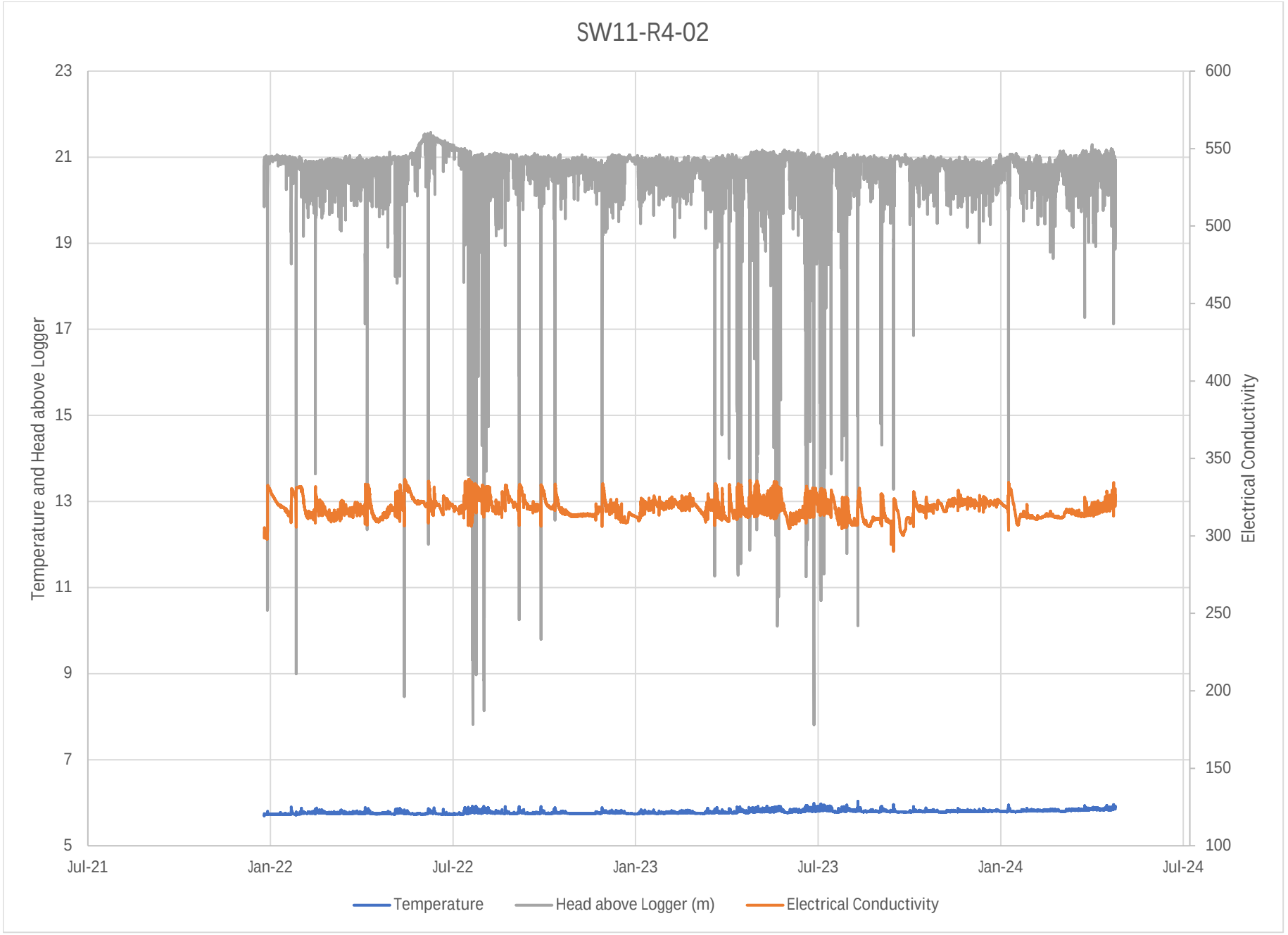

RMW16-19-19
Temperature and Head above Logger
Electrical Conductivity
7
6
5
4
3
2
1
1900
1850
1800
1750
1700
1650
1600
1550
1500
1450
1400
3-Jul-21
1-Jan-22
3-Jul-22
2-Jan-23
4-Jul-23
2-Jan-24
3-Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

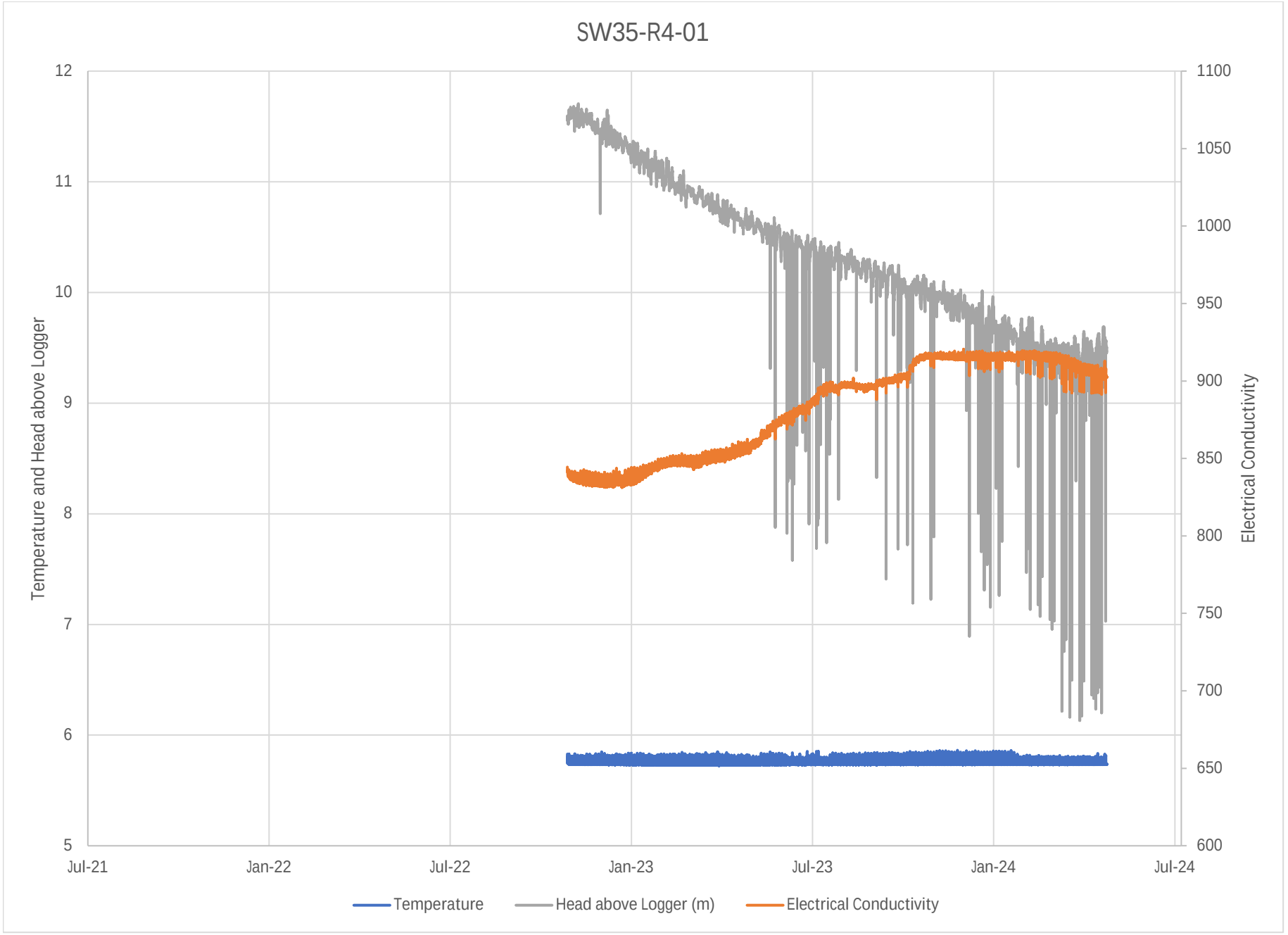

RMW16-23-7
Temperature and Head above Logger
Electrical Conductivity
6
5
4
3
2
1
0
1000
900
800
700
600
500
400
19-Jan-22
20-Jul-22
19-Jan-23
21-Jul-23
20-Jan-24
20-Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

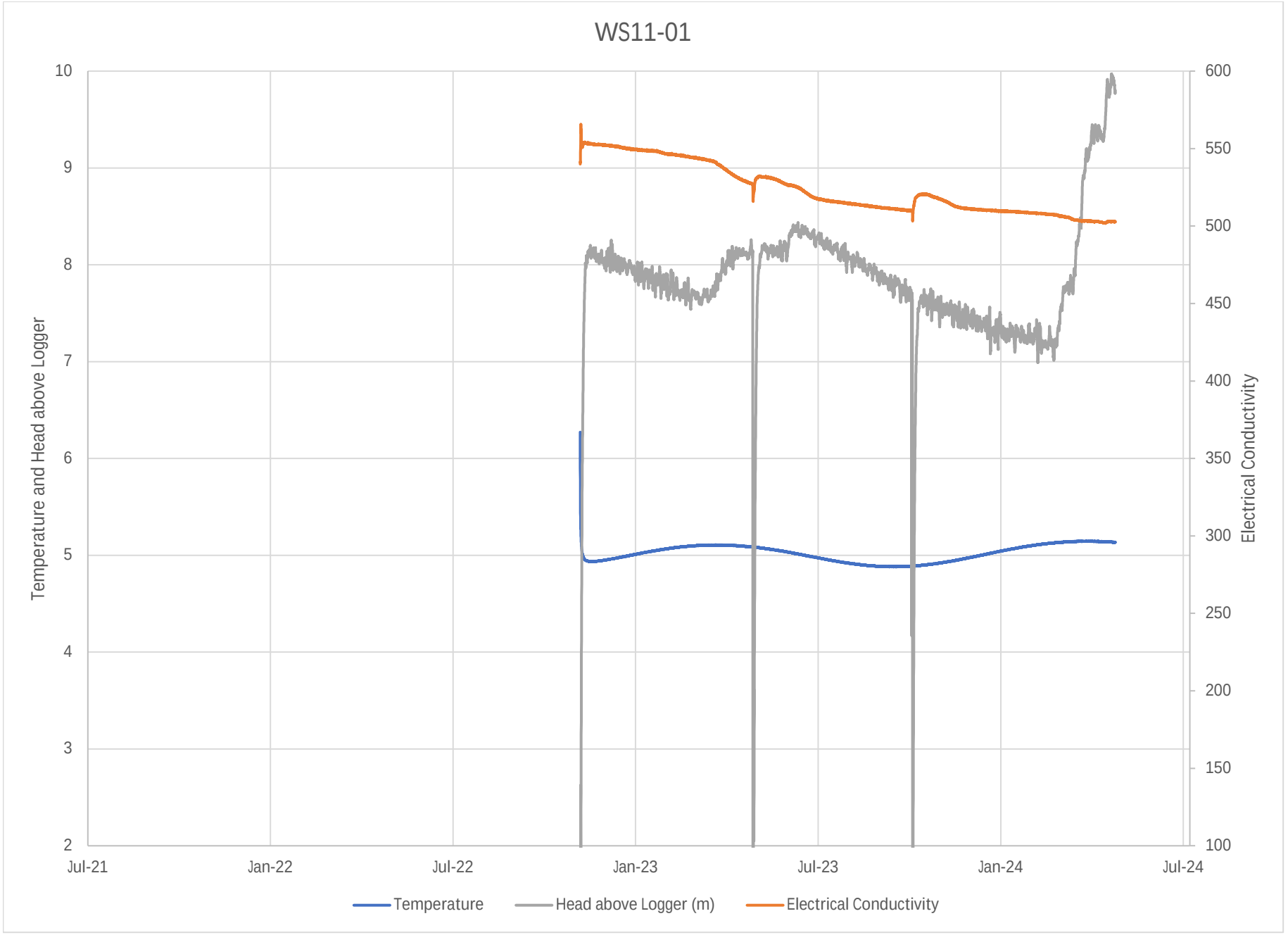

MW16-23-14/RMW16-23-14
Temperature and Head above Logger
Electrical Conductivity
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
1000
950
900
850
800
750
700
650
600
550
500
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

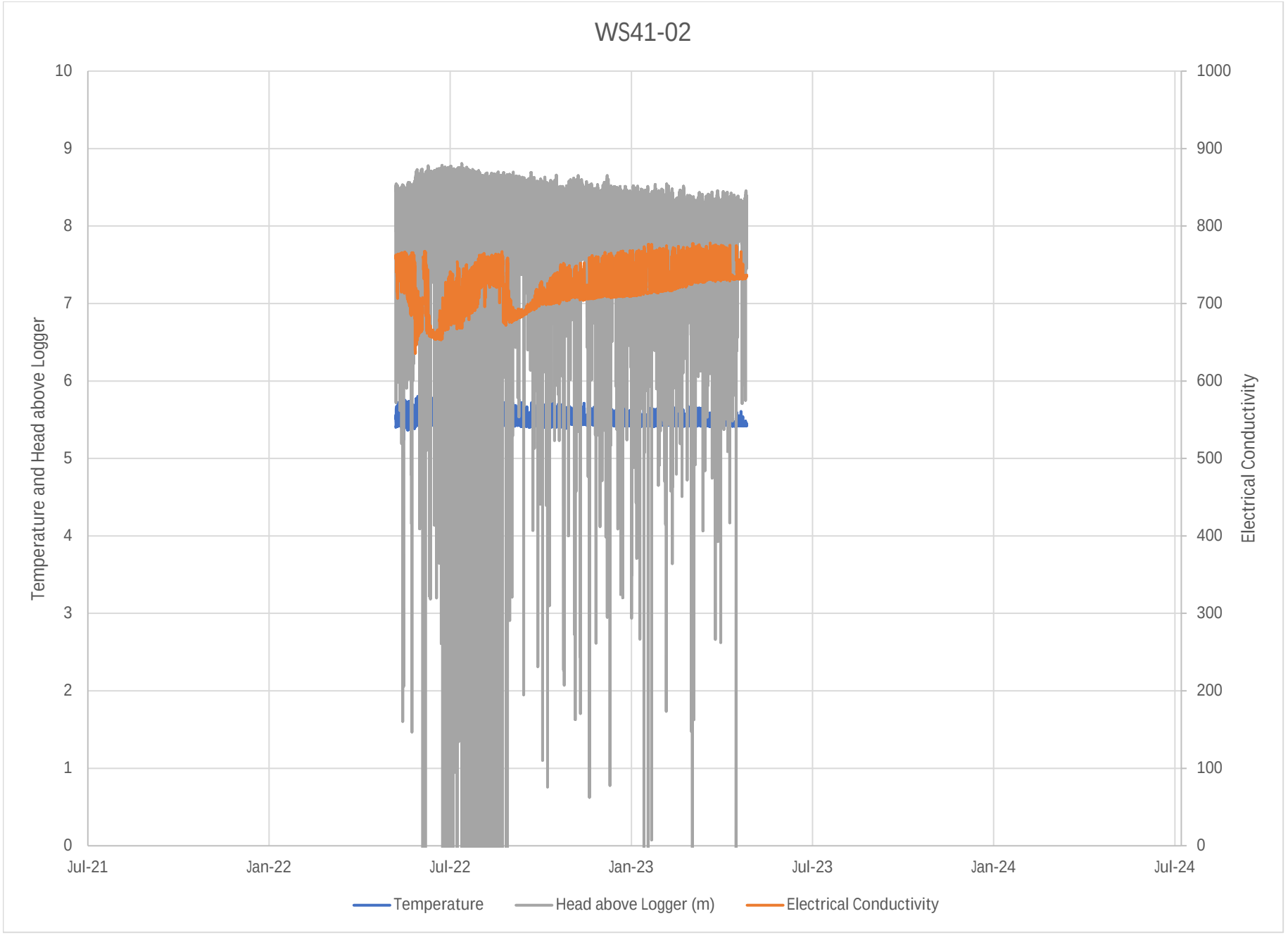

RMW16-23-36
Temperature and Head above Logger
Electrical Conductivity
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
1000
950
900
850
800
750
700
650
600
550
500
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature (°C)
Head above Logger (m)
Electrical Conductivity (uS/cm)

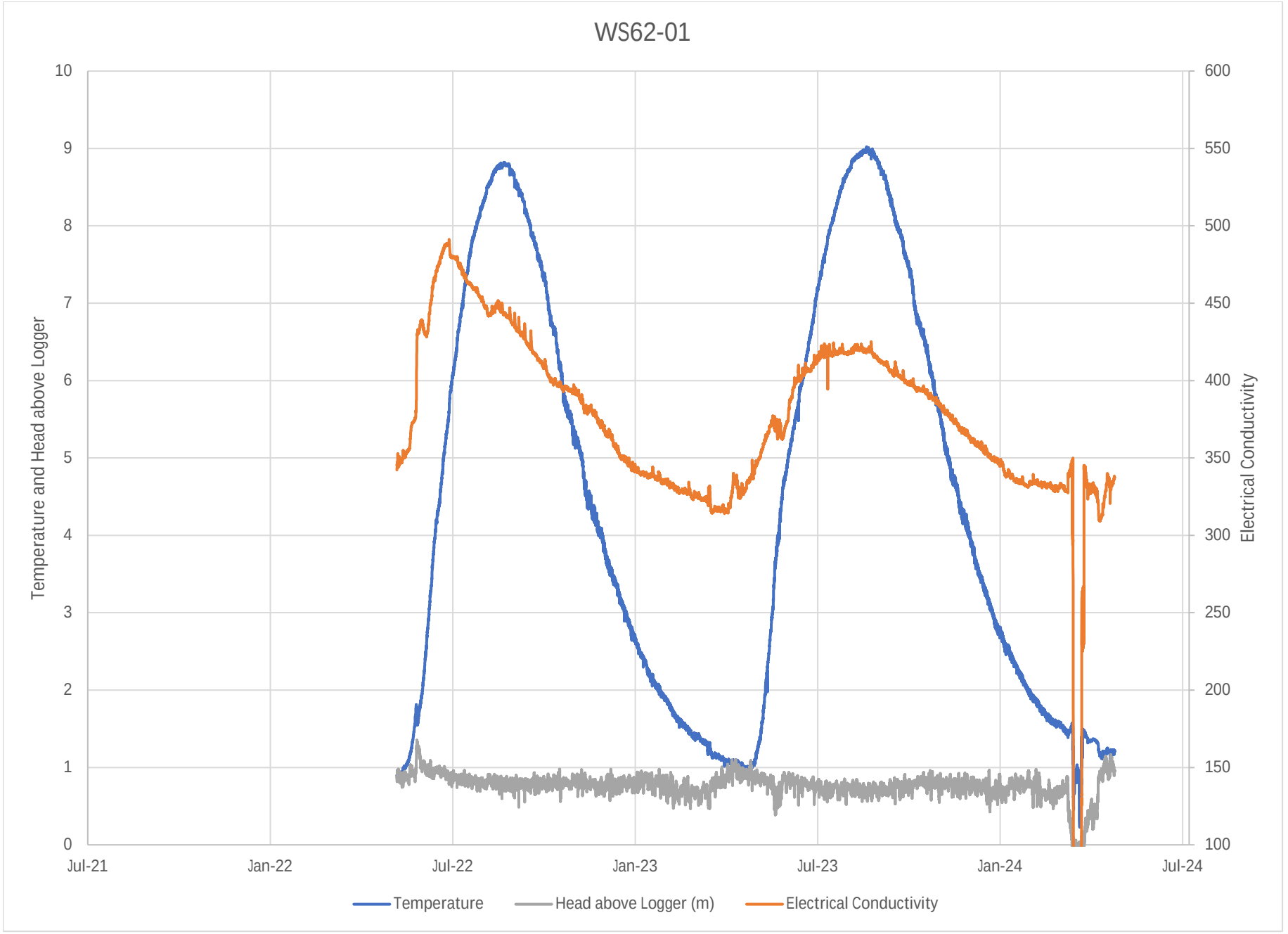

NE7-R3-01
Temperature and Head above Logger
Electrical Conductivity
10
9
8
7
6
5
4
3
2
1
0
700
650
600
550
500
450
400
350
300
250
200
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature
Head above Logger (m)
Electrical Conductivity

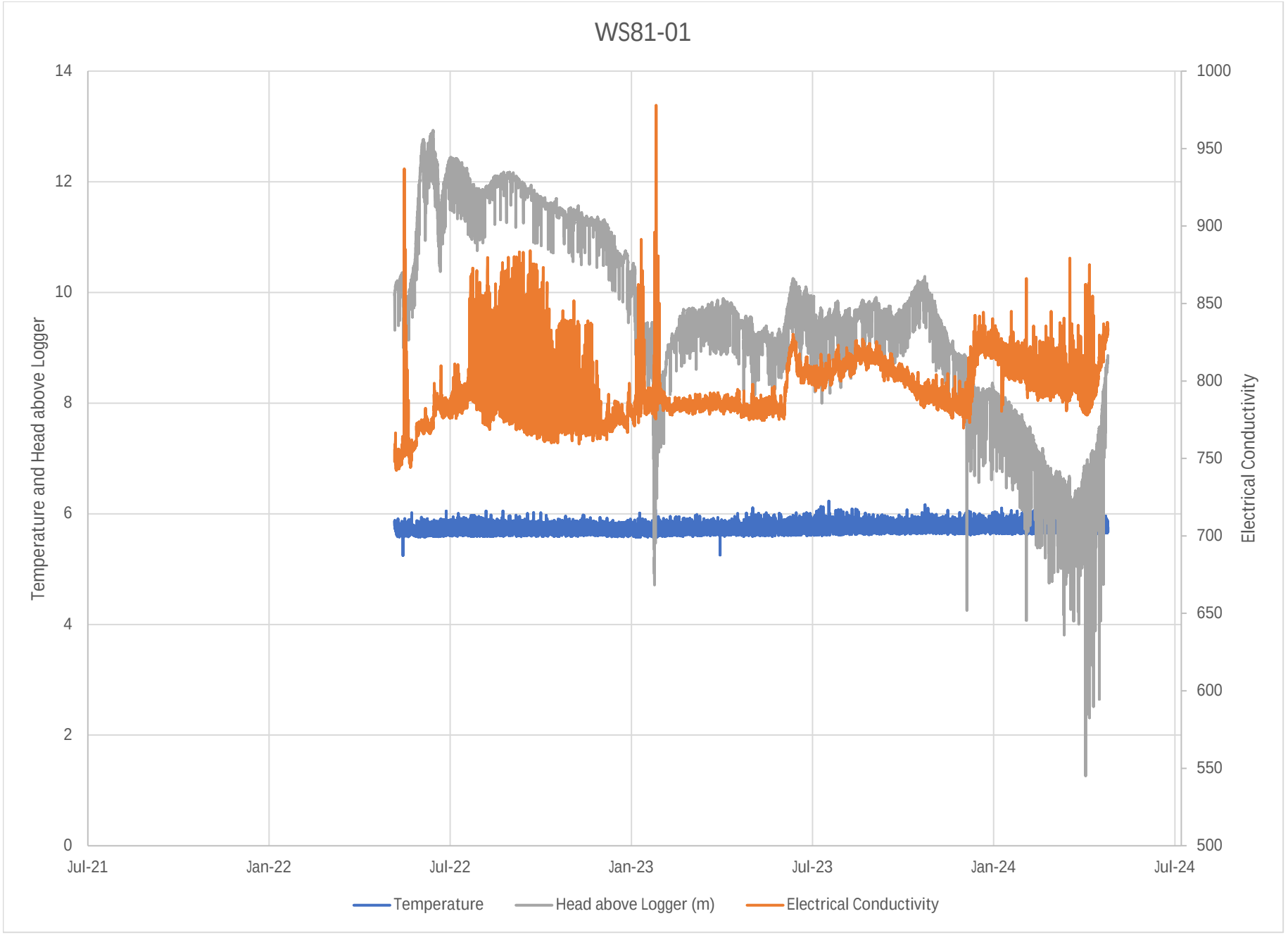

SW11-R4-02
Temperature and Head above Logger
Electrical Conductivity
23
21
19
17
15
13
11
9
7
5
600
550
500
450
400
350
300
250
200
150
100
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature
Head above Logger (m)
Electrical Conductivity

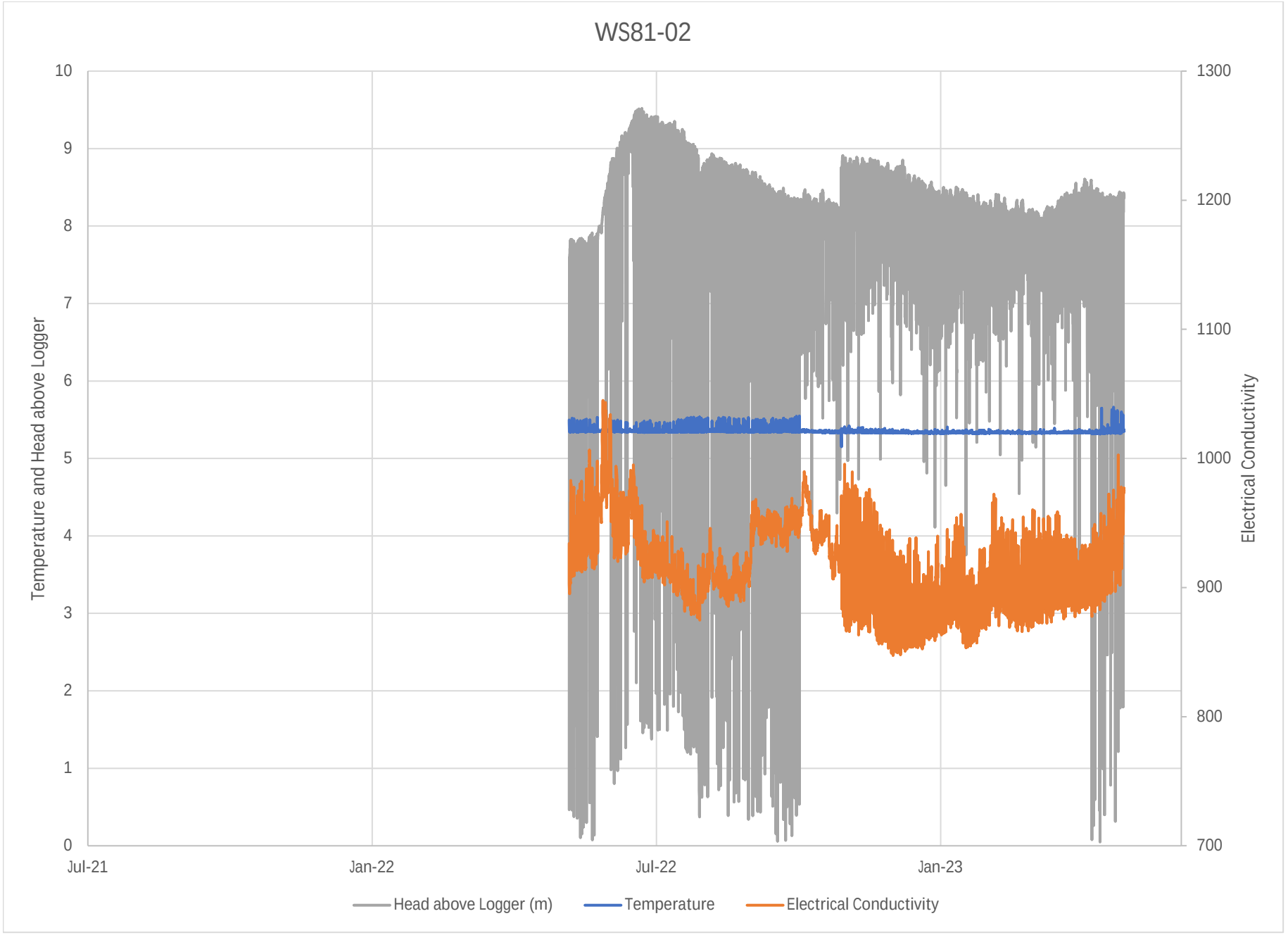

SW35-R4-01
Temperature and Head above Logger
Electrical Conductivity
12
11
10
9
8
7
6
5
1100
1050
1000
950
900
850
800
750
700
650
600
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature
Head above Logger (m)
Electrical Conductivity


WS11-01
Temperature and Head above Logger
Electrical Conductivity
10
9
8
7
6
5
4
3
2
600
550
500
450
400
350
300
250
200
150
100
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature
Head above Logger (m)
Electrical Conductivity


WS41-02
Temperature and Head above Logger
Electrical Conductivity
10
9
8
7
6
5
4
3
2
1
0
1000
900
800
700
600
500
400
300
200
100
0
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature
Head above Logger (m)
Electrical Conductivity


WS62-01
Temperature and Head above Logger
Electrical Conductivity
10
9
8
7
6
5
4
3
2
1
0
600
550
500
450
400
350
300
250
200
150
100
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature
Head above Logger (m)
Electrical Conductivity


WS81-01
Temperature and Head above Logger
Electrical Conductivity
14
12
10
8
6
4
2
0
1000
950
900
850
800
750
700
650
600
550
500
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24
Temperature
Head above Logger (m)
Electrical Conductivity


WS81-02
Temperature and Head above Logger
Electrical Conductivity
10
9
8
7
6
5
4
3
2
1
0
1300
1200
1100
1000
900
800
700
Jul-21
Jan-22
Jul-22
Jan-23
Head above Logger (m)
Temperature
Electrical Conductivity

Appendix D Laboratory Analytical Data and Historical Data Tables

Springbank Off-stream Reservoir Project 2024 Groundwater Monitoring Report
October 2024

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-1-15								MW16-2-6							
Sample Date				3-Oct-16	12-May-21	13-Jan-22	5-May-22	21-Nov-22	23-May-23	27-Oct-23	14-May-24	30-Sep-16	12-May-21	24-Nov-21	4-May-22	15-Nov-22	15-May-23	23-Oct-23	15-May-24
Sample ID				MW16-1-15	MW16-1-15	MW16-01-15	MW16-1-15	MW16-1-15	MW16-1-15	MW16-1-15	MW16-1-15	MW16-2-6	MW16-2-6	MW16-2-6	MW16-2-6	MW16-2-6	MW16-2-6	MW16-2-6	MW 16-2-6
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	BV	BV	BV	BV	BV	BV	MAXX	BV	AGAT	BV	BV	BV	BV	BV
Laboratory Work Order				B686741	C131657	C202060	C230164	C291884	C336439	C387774	C434263	B686123	C131657	21C834850	C229742	C290290	C334367	C386148	C435079
Laboratory Sample ID				PR2485	ZU0431	AMZ442	ASP036	BHL363	BQW247	CDB055	CNN527	PQ7069	ZU0435	3249831	ASN088	BHB173	BQM166	CCP849	CNR021
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ																
Field Parameters																			
Dissolved Oxygen, Field	mg/L	n/v	n/v	-	1.43	2.83	3.18	10.6	7.8	3.6	1.9	-	3.79	3.92	2.33	3.7	3.6	6.1	6.1
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,978[A]**	**2,187[A]**	**2,134[A]**	**2,192[A]**	**1,008[A]**	**1,976[A]**	**2,100[A]**	1.994	**5,210[A]**	**6,179[A]**	**6,105[A]**	**6,392[A]**	**5,807[A]**	**5,689[A]**	**6,534[A]**	6.534
Oxidation Reduction Potential, field	mV	n/v	n/v	-	60.2	44.7	68.2	-19.8	212.7	85.3	-41.5	-	92.4	95.3	-21.3	-33.2	156.9	27.4	27.4
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.2	7.23	7.64	7.16	**6.88[B]**	7.46	7.33	7.58	7.1	**6.86[B]**	**6.93[B]**	**6.38[AB]**	7.20	**6.94[B]**	**6.66[B]**	**6.66[B]**
Temperature, Field	deg C	n/v	≤15[B]	7.7	8.8	5.6	7.7	6.3	8.9	5.9	8.5	8.6	7.4	5.09	9	4.4	14.4	2.8	2.8
Calculated Parameters																			
Anion Sum	meq/L	n/v	n/v	25	27	29	29	28	-	28	28	83	97	-	94	99	95	89	89
Cation Sum	meq/L	n/v	n/v	28	26	27	29	26	-	30	28	83	96	-	96	100	94	100	97
Hardness (as CaCO3)	mg/L	n/v	n/v	1,000	990	1,000	1,100	940	1,100	1,100	1,100	2,600	3,100	3,390	3,100	3,000	3,000	3,200	3,100
Ion Balance	%	n/v	n/v	1.1	2.4	2.2	0.84	4.5	4.8	3.7	-	1.0	0.61	114	1.3	2.6	0.38	5.4	-
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	-	-	-	1.3	-	-	-	-	-	-	-	4.1
Nitrate	mg/L	13_{f}[A]	45[C]	<0.044	<0.22	<0.22	<0.22	0.065	<0.044	<0.044	<0.44	<0.22	<0.22	<0.5	<0.44	<2.2	<1.1	<0.22	<0.22
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.020	<0.050 MI	<0.050 AT	<0.050 AT	0.015	<0.010	<0.010	<0.10 MI	0.024	<0.050 MI	<0.02	<0.10 DB	<0.50 MI	<0.25 Z8	<0.050 Z8	<0.050 MI
Nitrite	mg/L	$1.97_{fn4.e,\ q}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	0.078	<0.033	<0.10	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**1,600[AB]**	**1,700[AB]**	**1,800[AB]**	**1,800[AB]**	**1,700[AB]**	**1,800[AB]**	**1,800[AB]**	**1,700[AB]**	**5,300[AB]**	**6,100[AB]**	**6,140[AB]**	**6,000[AB]**	**6,400[AB]**	**6,000[AB]**	**5,900[AB]**	**5,800[AB]**
BTEX and Petroleum Hydrocarbons																			
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00044	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00080	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00080	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.47	**5.9[A]**	<0.1	0.28	<0.10	0.11	<0.10	0.80
Miscellaneous Inorganics																			
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	2.6	2.4	2.1	2.4	2.7	2.2	2.4	2.5	6.2	4.2	4.774	4.1	4.4	3.3	3.2	4.0
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**2,100[A]**	**2,200[A]**	**2,200[A]**	**2,200[A]**	**2,100[A]**	**2,200[A]**	**2,100[A]**	**2,200[A]**	**5,900[A]**	**6,400[A]**	**6,550[A]**	**6,500[A]**	**6,400[A]**	**6,600[A]**	**6,100[A]**	**6,500[A]**
Sediment	none	n/v	n/v	-	-	-	-	-	-	-	-	-	-	NotPresent	-	-	-	-	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.88	7.63	7.56	7.74	7.75	7.98	7.89	7.84	7.95	7.31	7.82	7.41	7.48	7.66	8.12	7.90
Anions																			
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	300	320	320	300	320	320	330	330	520	650	615	650	650	610	460	660
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	360	390	400	370	400	390	400	400	630	790	751	800	800	740	560	800
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5.e}$[A]	≤500[B]	**910 CD[AB]**	**990 CD[AB]**	**1,000[AB]**	**1,100[AB]**	**1,000[AB]**	**1,000[AB]**	**1,000[AB]**	**990[AB]**	**3,500 CD[AB]**	**4,000 CD[AB]**	**3,880[AB]**	**3,900[AB]**	**4,100[AB]**	**4,000[AB]**	**3,800[AB]**	**3,700[AB]**
Chloride	mg/L	100[A]	≤250[B]	3.8	9.3	11	11	10	10	11	11	6.0	2.9	1.2	1.8	1.5	1.4	1.5	1.5
Nutrients																			
Nitrite (as N)	mg/L	$0.6_{n4.e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.024	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	<0.0030	0.0041	<0.0030	<0.0030	<0.0030	<0.0030	0.0033	0.0041	0.0059	<0.15	<0.0030	0.0051	0.0049	0.0043	0.0043
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	<0.050	0.045	0.036	0.036	0.056	0.058	0.037	0.057	0.27	0.2	0.15	0.16	0.13	0.17	0.17	0.20
Nitrate (as N)	mg/L	3.0[A]	10[C]	<0.010	<0.050	<0.050	<0.050	0.015	<0.010	<0.010	<0.10	<0.050 MI	<0.050	<0.02	<0.10	<0.50	<0.25	<0.050	<0.050
Phosphorus, Dissolved	mg/L	n/v	n/v	-	-	-	-	<0.0030	<0.0030	<0.0030	<0.0030 P2	-	-	-	-	<0.0030	<0.0030 P2	<0.0030 P2	<0.0030 P2
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	<0.0030	<0.0030	0.52 DB	<0.0030	-	-	-	-	0.0094	0.0060	-	0.0032	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	1.5 DB	0.26	0.258	0.86	<1.0	0.55	0.36	1.22	5.1 DB	7.2	2.3	<2.0	<0.50	1.36	0.461	4.6
Nitrogen	mg/L	n/v	n/v	-	0.26 DB	0.26	0.86 DB	<1.0 DB	0.55 DB	0.36 DB	1.2 DB	-	7.2 DB	-	<2.0 DB	0.50 DB	1.4 DB	0.461	4.6

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-1-15								MW16-2-6							
Sample Date				3-Oct-16	12-May-21	13-Jan-22	5-May-22	21-Nov-22	23-May-23	27-Oct-23	14-May-24	30-Sep-16	12-May-21	24-Nov-21	4-May-22	15-Nov-22	15-May-23	23-Oct-23	15-May-24
Sample ID				MW16-1-15	MW16-1-15	MW16-01-15	MW16-1-15	MW16-1-15	MW16-1-15	MW16-1-15	MW16-1-15	MW16-2-6	MW16-2-6	MW16-2-6	MW16-2-6	MW16-2-6	MW16-2-6	MW16-2-6	MW 16-2-6
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	BV	BV	BV	BV	BV	BV	MAXX	BV	AGAT	BV	BV	BV	BV	BV
Laboratory Work Order				B686741	C131657	C202060	C230164	C291884	C336439	C387774	C434263	B686123	C131657	21C834850	C229742	C290290	C334367	C386148	C435079
Laboratory Sample ID				PR2485	ZU0431	AMZ442	ASP036	BHL363	BQW247	CDB055	CNN527	PQ7069	ZU0435	3249831	ASN088	BHB173	BQM166	CCP849	CNR021
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Sample Type	**Units**	**2022 AEPA Tier 1**	**GCDWQ**																
Metals, Dissolved																			
Aluminum	mg/L	$0.05_{rn1,e}$[A]	0.1_{a}[B]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	-	<0.0030	<0.0030	0.016	0.0069	0.021	0.0036	<0.0030	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	-	<0.00060	<0.00060	0.00073	<0.00060	<0.001	<0.00060	0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	<0.00020	<0.00020	0.00036	0.00051	0.00038	-	0.00033	0.00037	0.0044	0.00035	<0.001	0.0010	0.00038	0.00048	0.00047	0.00056
Barium	mg/L	2.0[A]	2.0[C]	0.018	<0.010	0.012	0.012	0.011	-	0.012	0.013	0.018	<0.010	<0.05	<0.010	0.015	<0.010	<0.010	<0.010
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.078	0.078	0.077	0.080	0.061	-	0.098	0.073	0.11	0.10	0.11	0.11	0.11	0.11	0.12	0.10
Cadmium	mg/L	$0.00037_{r3,e}$[A]	0.007[C]	<0.000020	<0.000020	0.00032	0.000066	0.00018	-	0.000093	0.000053	0.000092	0.000039	0.000124	0.00027	0.00015	0.000075	0.00013	0.00012
Calcium	mg/L	n/v	n/v	230	220	230	250	220	260	260	240	390	400	451	410	410	410	430	420
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.0012	0.00087	0.00098	0.00099	0.0010	-	0.0010	0.00084	0.0060	0.0021	0.0027	0.0029	0.0025	0.0025	0.0023	0.0020
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.00020	0.00020	0.00097	<0.0010	<0.0010	-	<0.0010	<0.0010	0.00084	0.00090	0.0034	0.0015	**0.010**[A]	<0.0010	<0.0010	0.0012
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	0.069	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.1	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	$0.007_{r3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.022	<0.020	<0.020	<0.020	<0.020	-	<0.020	0.021	0.11	0.099	-	0.11	0.12	0.11	0.12	0.12
Magnesium	mg/L	n/v	n/v	110	100	100	110	95	120	120	110	400	520 CD	549	490	480	480	510	500
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.88**[AB]	**0.82**[AB]	**0.83**[AB]	**0.82**[AB]	**0.77**[AB]	**0.95**[AB]	**0.93**[AB]	**0.86**[AB]	**1.5**[AB]	**1.3**[AB]	**1.31**[AB]	**1.3**[AB]	**1.3**[AB]	**1.3**[AB]	**1.4**[AB]	**1.3**[AB]
Mercury	mg/L	0.0000050[A]	0.001[C]	0.0000029	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000020	<0.0000019	<0.0000025	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0028	0.0017	0.0019	0.0019	0.0020	-	0.0022	0.0028	0.0071	0.00091	<0.001	0.00092	0.00083	0.0010	0.00080	0.00062
Nickel	mg/L	$0.17_{r3,e}$[A]	n/v	0.0010	0.00083	0.0013	0.00099	0.0012	-	0.0011	0.0014	0.016	0.0059	0.007	0.0071	0.0059	0.0061	0.0063	0.0048
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	-	<0.10	<0.10	<0.10	<0.10	<0.08	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	4.8	3.6	3.8	4.2	3.6	4.1	4.2	4.0	9.4	7.5	8.8	8.3	8.4	8.0	9.0	8.3
Selenium	mg/L	0.0020[A]	0.05[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020	<0.00020	0.0013	<0.00020	<0.0005	0.00024	0.00079	<0.00020	0.00027	<0.00080 MI
Silicon	mg/L	n/v	n/v	4.7	4.3	4.4	4.5	3.9	-	5.3	4.5	5.9	4.8	-	5.2	5.3	5.2	5.3	5.0
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00005	<0.00010	**0.0034**[A]	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	160	140	160	170	160	170	170	160	**690 CD**[AB]	**750 CD**[AB]	**882**[AB]	**800**[AB]	**1,000**[AB]	**780**[AB]	**830**[AB]	**790**[AB]
Strontium	mg/L	n/v	7.0[C]	1.6	1.4	1.6	1.6	1.6	-	1.7	1.6	4.6	5.8 CD	-	6.0	6.2	6.3	6.4	6.3
Sulfur	mg/L	n/v	n/v	340	330	310	310	280	-	390	330	1,200 CD	1,400 CD	-	1,300	2,000	1,300	1,400	1,400
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	0.0026	<0.0010	0.0016	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	0.002	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0054	0.0043	0.0042	0.0048	0.0045	-	0.0050	0.0042	**0.040**[AC]	**0.029**[AC]	**0.031**[AC]	**0.029**[AC]	**0.029**[AC]	**0.031**[AC]	**0.028**[AC]	**0.025**[AC]
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	0.0012	<0.0010	-	<0.0010	<0.0010	0.0016	<0.0010	-	0.0013	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	-	<0.0030	<0.0030	0.016	0.0031	<0.005	<0.0030	<0.0030	<0.0030	<0.0030	0.0047
Metals, Total																			
Mercury	mg/L	0.0000050[A]	0.001[C]	***<0.0020 DB***	**0.0000473**[A]	**0.000038**[A]	**0.000055**[A]	**0.000393**[A]	**0.000141**[A]	**0.0000241**[A]	**0.000132 DB**[A]	***<0.0060 DB***	**0.000277 DB**[A]	**0.000032**[A]	**0.00071**[A]	**0.000028**[A]	**0.000051**[A]	**0.0000088**[A]	**0.00027 DB**[A]
Phosphorus	mg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	2.61	-	-	-	-	-
Microbiological Parameters																			
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<10 DB***	***<10 MI***	***<10 VV***	***<10***	***<1.0***	***<2.0 Z8***	***<1.0***	***<100 MI***	***<100 DB***	***<100 MI***	***<1***	***<2.0 AT***	***<5.0 MI***	***<5.0 Z8***	***<1.0***	***<100 SVH***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<10 DB***	***<10 MI***	***<10***	***<10***	***<1.0***	***<5.0 Z8***	***<1.0***	***<100 MI***	***<100 DB***	***<100 MI***	**2**[D]	***<10 AT***	***<5.0 MI***	***<5.0 Z8***	***<1.0***	***<100 MI SVH***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	4,900 DB	5,500	10,000 VV	2,700	380	660	300	-	49,000 DB	6,100 MI	8,700	6,200 DVM	>6000	1,600 Z8	1,500	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	-	-	-	>12000 MI	-	-	-	-	-	-	-	2,400 SVH
Total Coliforms	mpn/100mL	n/v	0[D]	**230 DB**[D]	***<10 MI***	**680 VV**[D]	**260**[D]	***<1.0***	***<2.0 Z8***	**1.0**[D]	***<100 MI***	***<100 DB***	***<100 MI***	**7**[D]	***<2.0 AT***	***<5.0 MI***	**5.0 Z8**[D]	**12**[D]	***<100 SVH***

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-5-11		RMW16-5-12						MW16-7-5							
Sample Date				4-Oct-16	14-May-21	1-Dec-21	4-May-22	21-Nov-22	19-May-23	23-Oct-23	15-May-24	27-Sep-16	13-May-21	1-Dec-21	5-May-22	16-Nov-22	17-May-23	23-Oct-23	14-May-24
Sample ID				MW16-5-11	MW16-5-4	RMW16-5-11	RMW16-5-11	RMW16-5-12	RMW16-5-12	RMW16-5-12	RMW 16-5-12	MW16-7-5	MW16-7-5	MW16-7-5	MW16-7-5	MW16-7-5	MW16-7-5	MW16-7-5	MW16-7-5
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	AGAT	BV	BV	BV	BV	BV	MAXX	BV	AGAT	BV	BV	BV	BV	BV
Laboratory Work Order				B687243	C132332	21C838865	C229742	C291884	C335907	C386148	C435079	B684487	C132075	21C838865	C230164	C290717	C335152	C386148	C434263
Laboratory Sample ID				PR5502	ZU4969	3284939	ASN090	BHL366	BQT302	CCP851	CNR022	PP7333	ZU2983	3284938	ASP038	BHD546	BQP594	CCP852	CNN526
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ																
Field Parameters																			
Dissolved Oxygen, Field	mg/L	n/v	n/v	-	12.81	8.3	5.12	4.4	3.8	5.1	3.5	-	13.59	8.14	2.9	5.3	11.2	6.2	4.5
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	710	707.5	776	818	769	798	858	0.732	**3,660[A]**	**3,246[A]**	**3,318[A]**	**3,271[A]**	**3,116[A]**	**2,715[A]**	**2,876[A]**	2.577
Oxidation Reduction Potential, field	mV	n/v	n/v	-	73.6	-17.3	-45.2	-30.9	119.8	16.5	-7.7	-	63.0	95.7	5.8	-43.5	121.4	-26.5	44.8
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.1	7.40	7.73	**6.96[B]**	7.28	7.45	7.16	7.74	7.5	7.26	7.28	7.09	7.07	7.53	7.05	7.10
Temperature, Field	deg C	n/v	≤15[B]	6.7	7.4	5.1	8.9	4.8	**19.5[B]**	0.9	5.8	7.6	6.5	5.94	7.4	11.3	6.2	4.4	10.7
Calculated Parameters																			
Anion Sum	meq/L	n/v	n/v	8.8	8.3	-	9.2	9.0	9.6	7.1	8.1	55	36	-	38	44	39	38	35
Cation Sum	meq/L	n/v	n/v	8.7	8.1	-	9.6	8.6	19	7.8	9.5	49	44	-	43	40	39	39	35
Hardness (as CaCO3)	mg/L	n/v	n/v	340	320	329	310	280	720	230	320	1,600	1,400	1,440	1,300	1,200	1,200	1,100	990
Ion Balance	%	n/v	n/v	0.99	1.2	120	2.2	2.5	33	5.0	-	0.90	9.8	120	6.8	5.1	0.49	1.2	-
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	-	-	-	8.0	-	-	-	-	-	-	-	0.014
Nitrate	mg/L	13_{f}[A]	45[C]	3.3	2.7	0.8	<0.044	0.26	0.14	0.22	<0.044	<0.044	0.062	2.2	0.088	<0.22	0.094	<0.044	<0.044
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.76	0.62	0.18	<0.010	0.059	0.032	0.049	<0.010	<0.020	0.014	0.50	0.020	<0.050 MI	0.021	<0.010	<0.010
Nitrite	mg/L	$1.97_{m4,e,q}$[A]	3[C]	<0.033	<0.033	<0.05	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.10	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	440	410	426	480	450	**660[AB]**	380	440	**3,400[AB]**	**2,400[AB]**	**2,560[AB]**	**2,500[AB]**	**2,700[AB]**	**2,400[AB]**	**2,400[AB]**	**2,200[AB]**
BTEX and Petroleum Hydrocarbons																			
Benzene	mg/L	0.0050[A]	0.005[C]	0.00055	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050 EC	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	0.0013	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00080	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00080	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics																			
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	2.8	3.6	3	2.5	1.7	3.0	1.2	1.3	9.2	3.6	4	3.8	4.8	5.2	2.2	2.6
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	780	720	729	780	770	770	670	720	**3,900[A]**	**3,400[A]**	**3,470[A]**	**3,200[A]**	**3,300[A]**	**3,000[A]**	**2,800[A]**	**2,800[A]**
Sediment	none	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.96	7.96	8.26	8.04	7.94	7.90	8.32	8.09	7.57	7.91	8.19	7.82	7.53	7.58	8.16	7.90
Anions																			
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	380	370	334	410	400	430	310	360	380	440	415	400	450	470	470	480
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	470	450	408	500	490	530	370	440	470	540	507	490	540	570	570	590
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	≤500[B]	43	36	46.1	48	43	43	43	40	**2,200 CD[AB]**	**1,300 CD[AB]**	**1,450[AB]**	**1,400[AB]**	**1,700[AB]**	**1,400[AB]**	**1,400[AB]**	**1,200[AB]**
Chloride	mg/L	100[A]	≤250[B]	4.8	3.3	3.3	2.7	1.8	<1.0	2.3	1.5	14	8.8	6.9	5.8	8.8	5.9	4.6	3.5
Nutrients																			
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	<0.0030	<0.15	<0.0030	0.0043	<0.0030	0.0034	0.0038	0.012 OG	0.011	<0.15	0.011	0.0075	0.0072	0.0097	<0.0030
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.062	0.14	0.28	0.29	0.17	0.31	0.28	0.18	0.16	0.11	0.06	0.029	0.019	0.055	0.037	0.035
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.76	0.62	0.18	<0.010	0.059	0.032	0.049	<0.010	<0.010	0.014	0.50	0.020	<0.050	0.021	<0.010	<0.010
Phosphorus, Dissolved	mg/L	n/v	n/v	-	-	-	-	<0.0030	<0.0030	0.010	<0.0030 P2	-	-	-	-	0.0073	0.0031 P2	0.015	0.0047
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	0.0034	0.0059	-	0.058	-	-	-	-	0.0065	0.012	-	0.010	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	7.5 DB	2.4	8.00	4.7	<2.0	0.75	3.4	0.72	0.62	<1.0	0.89	1.80	1.02	2.70	0.649	1.01
Nitrogen	mg/L	n/v	n/v	-	3.0 DB	-	4.7 DB	<2.0 DB	0.78 DB	3.4 IF	0.72 DB	-	<1.0 DB	-	1.8 DB	1.0 DB	2.7	0.649	1.0 DB

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-5-11		RMW16-5-12						MW16-7-5							
Sample Date				4-Oct-16	14-May-21	1-Dec-21	4-May-22	21-Nov-22	19-May-23	23-Oct-23	15-May-24	27-Sep-16	13-May-21	1-Dec-21	5-May-22	16-Nov-22	17-May-23	23-Oct-23	14-May-24
Sample ID				MW16-5-11	MW16-5-4	RMW16-5-11	RMW16-5-11	RMW16-5-12	RMW16-5-12	RMW16-5-12	RMW 16-5-12	MW16-7-5	MW16-7-5	MW16-7-5	MW16-7-5	MW16-7-5	MW16-7-5	MW16-7-5	MW16-7-5
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	AGAT	BV	BV	BV	BV	BV	MAXX	BV	AGAT	BV	BV	BV	BV	BV
Laboratory Work Order				B687243	C132332	21C838865	C229742	C291884	C335907	C386148	C435079	B684487	C132075	21C838865	C230164	C290717	C335152	C386148	C434263
Laboratory Sample ID				PR5502	ZU4969	3284939	ASN090	BHL366	BQT302	CCP851	CNR022	PP7333	ZU2983	3284938	ASP038	BHD546	BQP594	CCP852	CNN526
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ																
Metals, Dissolved																			
Aluminum	mg/L	$0.05_{rn1,e}$[A]	0.1_{a}[B]	0.011	0.018	**0.061**[A]	0.0058	<0.0030	**2.8**[AB]	<0.0030	<0.0030	0.0048	<0.0030	0.039	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.001	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.001	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	0.0010	0.00047	<0.001	0.00056	0.00028	0.0020	0.00043	0.00039	0.0010	0.00046	<0.001	0.00063	0.00041	0.00031	0.00054	0.00023
Barium	mg/L	2.0[A]	2.0[C]	0.068	0.071	0.07	0.069	0.070	0.33	0.062	0.067	0.032	0.013	<0.05	0.019	0.020	0.018	0.019	0.015
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.036	0.043	0.09	0.12	0.079	0.097	<0.10	0.10	0.12	0.10	0.11	0.10	0.099	0.094	0.13	0.093
Cadmium	mg/L	$0.00037_{r3,e}$[A]	0.007[C]	<0.000020	0.000022	0.000030	<0.00002	<0.000020	0.00075	<0.000020	<0.000020	0.00013	0.000021	0.000028	<0.00002	0.000083	0.000077	<0.000020	0.000057
Calcium	mg/L	n/v	n/v	76	69	74.9	68	62	180	49	69	250	210	234	200	190	190	180	160
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	0.0047	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.0010	0.00040	<0.0009	0.00042	0.00038	0.0048	0.00038	0.00035	0.0051	0.00077	0.0018	0.00085	<0.00030	<0.00030	0.00093	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.00020	0.0013	<0.0008	<0.0010	<0.0010	0.0046	<0.0010	<0.0010	0.00097	0.00023	<0.0008	<0.0010	0.0011	0.0056	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	0.061	<0.060	<0.1	<0.060	<0.060	**36**[AB] **0.0070**[C]	***<0.30***	<0.060	<0.060	<0.060	<0.1	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	$0.007_{r3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	0.0004	<0.00020	<0.00020		<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	<0.020	0.022	-	<0.020	<0.020	0.032	<0.10	<0.020	0.077	0.070	-	0.060	0.070	0.073	0.068	0.060
Magnesium	mg/L	n/v	n/v	38	37	34.5	34	30	64	27	35	230	210	209	190	170	170	160	140
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.15**[AB]	**0.11**[AB]	**0.122**[AB]	**0.14**[AB]	**0.15**[AB]	**1.2**[AB]	**0.045**[AB]	**0.15**[AB]	**0.81**[AB]	**0.30**[AB]	**0.389**[AB]	**0.22**[AB]	<0.0040	**0.12**[AB]	**0.21 MSY**[AB]	**0.15**[AB]
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000020	<0.0000019	-	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	0.0000020	<0.0000019	-	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.012	0.0056	0.006	0.0039	0.0015	0.00081	0.0018	0.0011	0.0026	0.0011	0.002	0.0014	0.0013	0.0014	0.0013	0.0010
Nickel	mg/L	$0.17_{r3,e}$[A]	n/v	0.0020	0.0010	0.003	0.0015	0.0011	0.0081	0.00095	0.00087	0.011	0.0035	0.006	0.0027	0.0035	0.0027	0.0031	0.0021
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.08	<0.10	<0.10	1.7	<0.50	<0.10	<0.10	<0.10	<0.08	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	3.7	3.7	8.1	8.2	6.6	7.2	9.5	6.8	5.9	4.5	5.0	5.5	5.1	4.9	5.7 MSY	4.7
Selenium	mg/L	0.0020[A]	0.05[C]	**0.0031**[A]	**0.0025**[A]	<0.0005	0.00029	0.0010	0.0016	0.0010	0.00025	0.00046	0.00021	<0.0005	0.00094	0.00055	0.00025	0.00039	<0.00020
Silicon	mg/L	n/v	n/v	4.2	4.5	-	4.1	2.8	17	<2.5	3.0	5.6	5.0	-	4.6	4.2	4.6	5.0	4.4
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	39	35	58.0	73	65	68	67	70	**400**[AB]	**370**[AB]	**405**[AB]	**400**[AB]	**370**[AB]	**350**[AB]	**390**[AB]	**350**[AB]
Strontium	mg/L	n/v	7.0[C]	0.82	0.93	-	1.2	1.3	1.5	0.95	1.4	2.4	2.3	-	2.1	2.1	1.9	1.9	1.6
Sulfur	mg/L	n/v	n/v	13	11	-	18	11	13	15	14	700 CD	610 CD	-	530	480	460	370	400
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	-	0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	0.002	0.0016	<0.0010	0.0073	<0.0010	<0.0010	<0.0010	<0.0010	0.002	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0053	0.0067	0.002	0.0022	0.0014	0.0021	0.0016	0.0014	**0.020**[A]	**0.014**[A]	**0.018**[A]	**0.016**[A]	**0.016**[A]	**0.015**[A]	**0.014**[A]	**0.011**[A]
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	-	0.0011	<0.0010	0.0083	<0.0010	<0.0010	<0.0010	<0.0010	-	0.0013	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	<0.005	<0.0030	<0.0030	0.029	<0.0030	<0.0030	<0.0030	<0.0030	<0.005	<0.0030	0.0036	<0.0030	<0.0030	<0.0030
Metals, Total																			
Mercury	mg/L	0.0000050[A]	0.001[C]	***<0.020 DB***	**0.000383 DB**[A]	**0.000055**[A]	**0.000096**[A]	**0.000477**[A]	**0.000091**[A]	**0.000037**[A]	**0.000122 DB**[A]	***<0.0020 DB***	**0.0000292**[A]	**0.000013**[A]	**0.000114**[A]	**0.00021**[A]	**0.000196**[A]	**0.0000062**[A]	**0.000050 DB**[A]
Phosphorus	mg/L	n/v	n/v	-	-	11.6	-	-	-	-	-	-	-	1.11	-	-	-	-	-
Microbiological Parameters																			
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<100 DB***	***<100 MI***	**411**[D]	**10 AT**[D]	***<1.0***	***<10 Z8***	***<100 Z8***	***<100 MI***	***<10***	***<10 SVH MI***	**14**[D]	***<100***	***<100***	***<10 Z8***	***<100 Z8***	***<10 MI***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<100 DB***	***<100 MI***	**579**[D]	**10 AT**[D]	***<1.0***	***<10 Z8***	***<100 Z8***	***<100 MI***	***<10 DB***	**20 SVH MI**[D]	**35**[D]	***<100***	***<100 MI***	**10 Z8**[D]	***<100 Z8***	***<10 MI***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	44,000 DB	18,000 MI	4,600	>6000 DVM	480	33,000 Z8	4,700 Z8	-	920	210	1,760	2,400	130 SC1	1,900 Z8	710	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	-	-	-	4,800 SVH	-	-	-	-	-	-	-	>4800 MI
Total Coliforms	mpn/100mL	n/v	0[D]	***<100 DB***	***<100 MI***	**2,424**[D]	**10 AT**[D]	***<1.0***	***<10 Z8***	***<100 Z8***	***<100 MI***	**1,700**[D]	***<10 SVH MI***	**365**[D]	***<100***	**1,300 MI**[D]	**140 Z8**[D]	**310 Z8**[D]	**62 MI**[D]

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Springbank Off-stream Reservoir Project 2024 Groundwater Monitoring Report
October 2024

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-8-8								MW16-8-19							
Sample Date				4-Oct-16	13-May-21	13-Jan-22	6-May-22	23-Nov-22	19-May-23	27-Oct-23	17-May-24	4-Oct-16	13-May-21	13-Jan-22	6-May-22	23-Nov-22	19-May-23	27-Oct-23	17-May-24
Sample ID				MW16-8-8	MW16-8-8	MW16-8-8	MW16-8-8	MW16-8-8	MW16-8-8	MW16-8-8	MW16-8-8	MW16-8-19	MW16-8-19	MW16-8-19	MW16-8-9	MW16-8-19	MW16-8-19	MW16-8-19	MW16-8-19
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	BV	BV	BV	BV	BV	BV	MAXX	BV	BV	BV	BV	BV	BV	BV
Laboratory Work Order				B687243	C132075	C202060	C230432	C292418	C335907	C387774	C435488	B687243	C132075	C202060	C230432	C292418	C335907	C387774	C435488
Laboratory Sample ID				PR5504	ZU2984	AMZ443	ASQ366	BHO195	BQT299	CDB048	CNT049	PR5505	ZU2985	AMZ444	ASQ367	BHO194	BQT300	CDB047	CNT050
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ																
Field Parameters																			
Dissolved Oxygen, Field	mg/L	n/v	n/v	-	14.49	3.65	4.15	5.9	8.0	3.5	8.1	-	2.75	4.81	3.3	6.9	7.6	1.7	3.4
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,003[A]**	**1,081[A]**	**1,410[A]**	**1,157[A]**	**1,099[A]**	**1,250[A]**	**1,124[A]**	0.934	**1,130[A]**	**1,246[A]**	**1,282[A]**	**1,292[A]**	**1,284[A]**	**1,227[A]**	**1,267[A]**	1.195
Oxidation Reduction Potential, field	mV	n/v	n/v	-	88.7	73.6	68.1	-41.2	196.9	195.1	-15.5	-	88.4	84.1	84.5	-53.6	200.2	204.0	9.1
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.1	7.38	7.59	7.43	7.31	7.53	7.29	7.27	7.4	7.09	7.4	**6.97[B]**	7.67	7.29	7.04	**6.91[B]**
Temperature, Field	deg C	n/v	≤15[B]	7.7	7.1	6	9.5	4.6	14.0	6.1	6.6	6.8	6.9	4.8	7.5	4.1	11.9	5.3	5.0
Calculated Parameters																			
Anion Sum	meq/L	n/v	n/v	12	12	13	14	14	13	14	14	15	14	14	13	14	15	13	15
Cation Sum	meq/L	n/v	n/v	12	13	14	16	14	14	15	15	14	15	16	16	14	16	17	16
Hardness (as CaCO3)	mg/L	n/v	n/v	550	590	620	710	640	660	670	680	580	640	670	680	600	690	710	680
Ion Balance	%	n/v	n/v	1.0	3.3	1.7	5.8	1.6	3.6	6.7	-	0.93	3.1	5.7	9.3	2.7	5.8	14	-
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	-	-	-	4.2	-	-	-	-	-	-	-	5.1
Nitrate	mg/L	13_{f}[A]	45[C]	6.9	3.6	3.6	3.3	2.8	2.0	1.4	2.6	3.1	3.8	4.1	3.9	3.2	3.2	2.6	2.1
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	1.6	0.81 MI	0.81	0.74	0.63	0.46	0.31	0.59	0.70	0.87 MI	0.92	0.88	0.72	0.72	0.60	0.47
Nitrite	mg/L	$1.97_{pt4.e,\ q}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**640[AB]**	**660[AB]**	**720[AB]**	**770[AB]**	**740[AB]**	**740[AB]**	**780[AB]**	**750[AB]**	**750[AB]**	**750[AB]**	**760[AB]**	**740[AB]**	**720[AB]**	**780[AB]**	**750[AB]**	**790[AB]**
BTEX and Petroleum Hydrocarbons																			
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00080	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00080	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics																			
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	2.8	1.6	1.8	2.8	2.2	5.1	2.5	2.0 PRH	1.3	0.63	0.95	1.8	1.4	3.5	1.4	1.4 PRH
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,100[A]**	**1,100[A]**	**1,100[A]**	**1,100[A]**	**1,100[A]**	**1,100[A]**	**1,100[A]**	**1,200[A]**	**1,300[A]**	**1,300[A]**	**1,300[A]**	**1,200[A]**	**1,300[A]**	**1,300[A]**	**1,200[A]**	**1,300[A]**
Sediment	none	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.90	7.81	7.50	7.78	7.80	7.72	7.73	7.73	7.74	7.69	7.43	7.65	7.69	7.79	7.82	7.85
Anions																			
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	370	370	400	430	420	410	340	420	460	440	450	420	430	470	390	470
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	450	460	490	520	510	500	420	510	560	530	540	510	530	570	470	580
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{rt5.e}$[A]	≤500[B]	140	180 CD	210	210	220	210	230	220	110	82	85	84	93	84	92	92
Chloride	mg/L	100[A]	≤250[B]	60	27	28	28	28	27	66	25	**110[A]**	**130[A]**	**120[A]**	**120 AT[A]**	**110[A]**	**120[A]**	**110[A]**	**120[A]**
Nutrients																			
Nitrite (as N)	mg/L	$0.6_{pt4.e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	0.0049	0.0043	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0040	<0.0030
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.055	<0.015	<0.015	<0.015	0.10	<0.015	<0.015	<0.015	<0.050	0.018	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Nitrate (as N)	mg/L	3.0[A]	10[C]	1.6	0.81	0.81	0.74	0.63	0.46	0.31	0.59	0.70	0.87	0.92	0.88	0.72	0.72	0.60	0.47
Phosphorus, Dissolved	mg/L	n/v	n/v	-	-	-	-	0.0050	<0.0030	<0.0030	<0.0030 PRH	-	-	-	-	<0.0030	<0.0030	<0.0030 P2	<0.0030 PRH
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	0.0045	0.0053	1.4 DB	<0.0030	-	-	-	-	<0.0030	<0.0030	0.11 DB	<0.0030	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.95	0.182	0.131	14.2	<0.40	3.36	2.8	0.83	1.3	0.177	0.105	0.075	<0.20	<0.020	0.118	<0.020
Nitrogen	mg/L	n/v	n/v	-	0.99	0.94	15 DB	0.65 DB	3.8	3.1 DB	1.4 DB	-	1.0	1.0	0.95	0.60 DB	0.57 NN	0.71	0.49

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-8-8								MW16-8-19							
Sample Date				4-Oct-16	13-May-21	13-Jan-22	6-May-22	23-Nov-22	19-May-23	27-Oct-23	17-May-24	4-Oct-16	13-May-21	13-Jan-22	6-May-22	23-Nov-22	19-May-23	27-Oct-23	17-May-24
Sample ID				MW16-8-8	MW16-8-8	MW16-8-8	MW16-8-8	MW16-8-8	MW16-8-8	MW16-8-8	MW16-8-8	MW16-8-19	MW16-8-19	MW16-8-19	MW16-8-9	MW16-8-19	MW16-8-19	MW16-8-19	MW16-8-19
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	BV	BV	BV	BV	BV	BV	MAXX	BV	BV	BV	BV	BV	BV	BV
Laboratory Work Order				B687243	C132075	C202060	C230432	C292418	C335907	C387774	C435488	B687243	C132075	C202060	C230432	C292418	C335907	C387774	C435488
Laboratory Sample ID				PR5504	ZU2984	AMZ443	ASQ366	BHO195	BQT299	CDB048	CNT049	PR5505	ZU2985	AMZ444	ASQ367	BHO194	BQT300	CDB047	CNT050
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	**Units**	**2022 AEPA Tier 1**	**GCDWQ**																
Metals, Dissolved																			
Aluminum	mg/L	0.05$_{rt1,e}$[A]	0.1$_{a}$[B]	<0.0030	0.0096	0.0049	0.0033	<0.0030	0.0045	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0037	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.0011	0.00068	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010$_{ALARA}$[C]	<0.00020	0.00025	<0.00020	0.00030	0.00036	0.00029	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Barium	mg/L	2.0[A]	2.0[C]	0.039	0.044	0.045	0.046	0.048	0.062	0.050	0.045	0.054	0.062	0.063	0.067	0.063	0.067	0.071	0.062
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.043	0.052	0.042	0.047	0.060	0.042	0.030	0.040	0.043	0.053	0.047	0.052	0.051	0.047	0.045	0.047
Cadmium	mg/L	0.00037$_{r3,e}$[A]	0.007[C]	0.000040	<0.000020	<0.00002	<0.00002	<0.000020	0.000023	0.000022	<0.000020	0.000029	0.000020	0.000023	0.000028	0.000034	0.000031	0.000028	0.000025
Calcium	mg/L	n/v	n/v	120	130	130	150	140	140	150	150	130	150	150	150	140	160	170	160
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.00057	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	0.00032	0.0020	0.00053	<0.0010	0.0014	0.0011	<0.0010	<0.0010	<0.00020	0.00022	0.00051	<0.0010	0.0015	0.0020	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	0.007$_{r3,e}$[A]	0.005$_{ALARA}$[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	<0.020	0.020	<0.020	<0.020	<0.020	0.039	<0.020	<0.020	<0.020	0.021	0.028	<0.020	<0.020	0.028	<0.020	0.023
Magnesium	mg/L	n/v	n/v	60	67	70	82	71	75	71	77	60	67	70	72	60	72	71	71
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.12[AB]**	0.013	**0.025[AB]**	0.019	**0.030[AB]**	**0.044[AB]**	0.010	0.0040	0.0062	0.0058	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000020	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	0.0000025	<0.0000019	<0.000002	<0.0000019	0.0000022	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0011	0.00073	0.00078	0.0010	0.00086	0.0010	0.0010	0.0016	0.00085	0.0011	0.00068	0.00060	0.00058	0.00067	0.00070	0.0012
Nickel	mg/L	0.17$_{r3,e}$[A]	n/v	0.0025	0.0011	0.0011	0.00082	0.0011	0.0013	0.0010	0.00073	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	5.8	5.7	6.1	6.8	6.0	6.3	6.8	5.9	5.7	6.1	6.5	6.8	5.9	6.7	7.4	6.5
Selenium	mg/L	0.0020[A]	0.05[C]	**0.011[A]**	**0.0044[A]**	**0.0038[A]**	**0.0035[A]**	**0.0040[A]**	0.0020	**0.0022[A]**	**0.0024[A]**	**0.0080[A]**	**0.0061[A]**	**0.0086[A]**	**0.0077[A]**	**0.0086[A]**	**0.0075[A]**	**0.0071[A]**	**0.0066[A]**
Silicon	mg/L	n/v	n/v	4.2	4.9	4.4	4.6	4.3	4.6	4.2	4.1	3.7	4.6	4.1	4.1	3.7	4.2	4.2	4.2
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	**0.00042[A]**	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	25	24	25	28	26	26	42	26	47	51	56	56	52	56	62	58
Strontium	mg/L	n/v	7.0[C]	0.90	1.1	1.2	1.3	1.2	1.2	1.3	1.2	1.3	1.4	1.5	1.5	1.5	1.5	1.7	1.5
Sulfur	mg/L	n/v	n/v	45	73	62	68	66	66	120	66	29	31	27	27	27	28	28	31
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	0.0021	0.0018	0.012	0.0037	0.0039	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	0.0012	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	**0.011[A]**	**0.011[A]**	**0.012[A]**	**0.013[A]**	**0.013[A]**	**0.013[A]**	**0.014[A]**	**0.013[A]**	0.0053	0.0044	0.0049	0.0050	0.0053	0.0056	0.0057	0.0053
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	0.0036	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Metals, Total																			
Mercury	mg/L	0.0000050[A]	0.001[C]	***<0.02 DB***	**0.0000091[A]**	**0.000146[A]**	**0.00278[AC]**	**0.000105[A]**	**0.000857[A]**	**0.000123[A]**	**0.000289 DB[A]**	***<0.000100 DB***	**0.0000262[A]**	**0.0000104[A]**	**0.0000058[A]**	0.0000036	0.0000036	<0.0000019	<0.0000019
Phosphorus	mg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Microbiological Parameters																			
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<100 DB***	***<1.0***	***<10 VV***	***<100 DVM***	***<1.0***	***<10 Z8***	***<100 Z8***	***<100 MI***	***<1.0***	***<10 MI***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<100 DB***	***<1.0***	***<10 VV***	***<100 DVM***	***<1.0***	***<10 Z8***	***<100 Z8***	***<100 MI***	***<1.0***	***<10 MI***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	34,000 DB	1,100	16,000 VV	470 AT	45	13,000 Z8	900 Z8 SVH	-	620	210	140	73	35	230	13 SVH	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	-	-	-	>12000 MI	-	-	-	-	-	-	-	1,200
Total Coliforms	mpn/100mL	n/v	0[D]	***<100 DB***	**>2400[U]**	**200 VV[U]**	**530 DVM[U]**	***<1.0***	**3,700 Z8[U]**	**6,300 Z8[U]**	**1,900 MI[U]**	**27[U]**	***<10 MI***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-10-15								MW16-11-15							
Sample Date				4-Oct-16	13-May-21	24-Nov-21	9-May-22	17-Nov-22	17-May-23	23-Oct-23	14-May-24	30-Sep-16	13-May-21	22-Nov-21	6-May-22	17-Nov-22	18-May-23	25-Oct-23	14-May-24
Sample ID				MW16-10-15	MW16-10-15	MW16-10-15	MW16-10-15	RMW16-10-15	MW16-10-15	MW16-10-15	MW16-10-15	MW16-11-15	MW16-11-15	RMW16-11-15	MW16-11-15	RMW16-11-15	MW16-11-15	MW16-11-15	MW16-11-15
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	AGAT	BV	BV	BV	BV	BV	MAXX	BV	AGAT	BV	BV	BV	BV	BV
Laboratory Work Order				B687243	C132075	21C834850	C230795	C291130	C335152	C386148	C434263	B686123	C132075	21C833752	C230432	C291130	C335681	C386944	C434263
Laboratory Sample ID				PR5503	ZU2987	3249833	ASS483	BHF765	BQP597	CCP853	CNN528	PQ7068	ZU2986	3240639	ASQ363	BHF766	BQS281	CCW515	CNN529
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ																
Field Parameters																			
Dissolved Oxygen, Field	mg/L	n/v	n/v	-	20.18	3.1	5.02	7.1	5.6	3.5	5.9	-	1.52	4.7	2.77	9.6	7.9	3.9	6.3
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**2,890[A]**	**3,992[A]**	**3,930[A]**	**4,422[A]**	**4,183[A]**	**4,101[A]**	**4,569[A]**	4.251	**2,750[A]**	**3,012[A]**	**2,842[A]**	**2,921[A]**	**3,087[A]**	**2,677[A]**	**4,525[A]**	2.883
Oxidation Reduction Potential, field	mV	n/v	n/v	-	-54.3	60.5	-0.25	-143.0	136.4	-5.6	24.6	-	48.7	47.5	-8.3	-18.5	86.2	-235.0	-39.2
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.2	**6.80[B]**	**6.49[AB]**	**6.86[B]**	**6.78[B]**	7.26	**6.87[B]**	**6.98[B]**	7.1	7.01	7.08	**6.94[B]**	7.44	7.43	7.32	7.27
Temperature, Field	deg C	n/v	≤15[B]	9	9.5	5.03	9	1.8	8.5	0.8	8.7	9.4	8.0	4.35	8.5	1.7	9.1	2.6	9.8
Calculated Parameters																			
Anion Sum	meq/L	n/v	n/v	45	61	-	64	66	63	64	59	39	41	-	36	42	39	40	39
Cation Sum	meq/L	n/v	n/v	42	62	-	63	64	65	70	65	38	42	-	38	42	41	40	41
Hardness (as CaCO3)	mg/L	n/v	n/v	1,400	2,300	2,510	2,500	2,400	2,500	2,600	2,400	1,200	1,400	1,240	1,200	1,300	1,300	1,300	1,300
Ion Balance	%	n/v	n/v	0.94	0.93	113	0.85	1.3	1.6	4.9	-	0.98	0.17	108	1.8	0.26	3.2	0.31	-
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	-	-	-	4.4	-	-	-	-	-	-	-	2.3
Nitrate	mg/L	13_{f}[A]	45[C]	0.12	<0.22	<0.5	<0.22	2.2	<1.1	0.24	0.22	<0.044	<0.22	<0.5	<0.044	<0.044	<0.22	<0.22	<0.44
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.027	<0.050 MI	<0.02	<0.050 AT	0.50	<0.25 Z8	0.054 Z8	0.050 MI	<0.020	<0.050 MI	<0.02	<0.010	<0.010	<0.050 Z8	<0.050 Z8	<0.10 MI
Nitrite	mg/L	$1.97_{pt4.e,\ q}$[A]	3[C]	<0.033	<0.033	<0.10	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.05	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**2,800[AB]**	**3,900[AB]**	**3,960[AB]**	**4,000[AB]**	**4,100[AB]**	**4,000[AB]**	**4,100[AB]**	**3,800[AB]**	**2,400[AB]**	**2,600[AB]**	**2,390[AB]**	**2,300[AB]**	**2,700[AB]**	**2,500[AB]**	**2,500[AB]**	**2,500[AB]**
BTEX and Petroleum Hydrocarbons																			
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00080	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00080	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics																			
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	4.2	2.3	4.391	2.6	2.5	2.3	1.6	2.7	3.1	2.4	6	3.0	2.8	9.6	2.8	2.6
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**3,000[A]**	**4,300[A]**	**4,390[A]**	**4,300[A]**	**4,300[A]**	**4,400[A]**	**4,300[A]**	**4,600[A]**	**3,100[A]**	**3,100[A]**	**3,000[A]**	**2,900[A]**	**3,100[A]**	**3,100[A]**	**3,000[A]**	**3,100[A]**
Sediment	none	n/v	n/v	-	-	NotPresent	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.65	7.52	7.87	7.29	7.57	7.25	7.97	7.65	7.99	7.69	8.07	7.86	7.75	7.63	8.02	7.79
Anions																			
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<5.0	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	380	480	472	490	470	510	490	510	410	410	400	370	410	400	360	410
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	470	580	575	600	580	620	590	620	500	500	497	450	500	490	430	500
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<5.0	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<5.0	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{rt5.e}$[A]	≤500[B]	**1,800 CD[AB]**	**2,500 CD[AB]**	**2,450[AB]**	**2,600[AB]**	**2,700[AB]**	**2,500[AB]**	**2,600[AB]**	**2,400[AB]**	**1,500 CD[AB]**	**1,600 CD[AB]**	**1,380[AB]**	**1,400[AB]**	**1,600[AB]**	**1,500[AB]**	**1,600[AB]**	**1,500[AB]**
Chloride	mg/L	100[A]	≤250[B]	7.1	3.7	2.3	2.6	3.0	2.3	2.6	2.9	1.7	1.5	<1.0	<1.0	<1.0	<1.0	1.3	<1.0
Nutrients																			
Nitrite (as N)	mg/L	$0.6_{pt4.e}$[A]	1[C]	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	<0.0030	<0.15	<0.0030	0.0031	0.0048	0.0043	<0.0030	<0.0030	<0.0030	<0.15	<0.0030	0.0033	<0.0030	<0.0030	<0.0030
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.59	0.43	0.46	0.46	0.44	0.45	0.42	0.44	0.49	0.39	0.53	0.46	-	0.69	0.39	0.46
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.027	<0.050	<0.02	<0.050	0.50	<0.25	0.054	0.050	<0.010	<0.050	<0.02	<0.010	<0.010	<0.050	<0.050	<0.10
Phosphorus, Dissolved	mg/L	n/v	n/v	-	-	-	-	0.0036	0.010	0.0057	0.0065	-	-	-	-	<0.015 DB	<0.0030	<0.0030	0.0030
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	0.0035	0.017	-	0.021	-	-	-	-	0.0033	<0.0030	-	<0.0030	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	5.4 CD	1.88	11.1	1.5	1.5	1.08	0.845	2.35	3.7 DB	1.67	39.8	4.0	<1.0	0.48	0.51	1.13
Nitrogen	mg/L	n/v	n/v	-	1.9 DB	-	1.5 DB	2.0 DB	1.1 DB	0.899	2.4	-	1.7 DB	-	4.0 DB	<1.0 DB	0.48 DB NNA	0.51 DB	1.1 DB

See notes on last page

Springbank Off-stream Reservoir Project 2024 Groundwater Monitoring Report
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Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-10-15								MW16-11-15							
Sample Date				4-Oct-16	13-May-21	24-Nov-21	9-May-22	17-Nov-22	17-May-23	23-Oct-23	14-May-24	30-Sep-16	13-May-21	22-Nov-21	6-May-22	17-Nov-22	18-May-23	25-Oct-23	14-May-24
Sample ID				MW16-10-15	MW16-10-15	MW16-10-15	MW16-10-15	RMW16-10-15	MW16-10-15	MW16-10-15	MW16-10-15	MW16-11-15	MW16-11-15	RMW16-11-15	MW16-11-15	RMW16-11-15	MW16-11-15	MW16-11-15	MW16-11-15
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	AGAT	BV	BV	BV	BV	BV	MAXX	BV	AGAT	BV	BV	BV	BV	BV
Laboratory Work Order				B687243	C132075	21C834850	C230795	C291130	C335152	C386148	C434263	B686123	C132075	21C833752	C230432	C291130	C335681	C386944	C434263
Laboratory Sample ID				PR5503	ZU2987	3249833	ASS483	BHF765	BQP597	CCP853	CNN528	PQ7068	ZU2986	3240639	ASQ363	BHF766	BQS281	CCW515	CNN529
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ																
Metals, Dissolved																			
Aluminum	mg/L	0.05$_{rn1,e}$[A]	0.1$_{a}$[B]	0.0042	<0.0030	**0.069**[A]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0057	<0.004	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	0.00079	<0.00060	<0.001	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.001	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010$_{ALARA}$[C]	0.0012	0.00053	<0.001	0.00034	0.00037	0.00030	0.00026	0.00023	0.0012	0.0011	0.002	0.00060	0.00042	0.00063	0.00025	0.00046
Barium	mg/L	2.0[A]	2.0[C]	0.022	0.015	<0.05	0.012	0.015	0.013	<0.050 MSY	0.011	0.016	0.012	<0.05	0.012	0.014	0.013	0.011	0.013
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.12	0.22	0.21	0.21	0.23	0.22	0.38	0.20	0.10	0.12	0.09	0.12	0.12	0.11	0.10	0.10
Cadmium	mg/L	0.00037$_{r3,e}$[A]	0.007[C]	0.00010[A]	<0.000020	0.000262[A]	0.000067[A]	0.0009	0.00021[A]	0.000080[A]	0.00014[A]	0.000043[A]	0.000052[A]	0.000288[A]	0.000078[A]	0.00017[A]	0.000098[A]	0.000088[A]	0.000023
Calcium	mg/L	n/v	n/v	320	470	514	460	480	490	510	460	290	330	297	280	320	310	290	310
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	0.0008	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.0043	0.0041	0.0050	0.0044	0.0044	0.0041	0.0039	0.0038	0.0016	0.0014	0.0018	0.0013	0.0014	0.0015	0.0014	0.0013
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.00020	<0.00020	**0.0127**[A]	<0.0010	<0.0010	0.0027	<0.0010	<0.0010	0.00029	0.00072	<0.0008	<0.0010	0.0011	0.0020	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	**0.35**[AB]	<0.1	<0.060	<0.060	<0.060	***<0.30***	<0.060	**0.37**[AB]	**0.52**[AB]	<0.1	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	0.007$_{r3,e}$[A]	0.005$_{ALARA}$[C]	<0.00020	<0.00020	0.0005	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.055	0.050	-	0.025	0.040	0.058	<0.10	0.064	0.050	0.055	-	0.044	0.047	0.049	0.057	0.053
Magnesium	mg/L	n/v	n/v	140	280	299	310	290	310	320	300	110	140	122	120	130	130	140	130
Manganese	mg/L	0.020[A]	≤0.02[B]	**1.0**[AB]	**3.0**[AB]	**2.80**[AB]	**2.8**[AB]	**2.9**[AB]	**2.8**[AB]	**2.9**[AB]	**2.7**[AB]	**0.77**[AB]	**1.2**[AB]	**0.721**[AB]	**0.84**[AB]	**1.1**[AB]	**1.0**[AB]	**1.2**[AB]	**1.1**[AB]
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000020	<0.0000019	<0.0000025	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	0.0000036	<0.0000019	<0.0000025	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0034	0.00047	<0.001	0.00066	0.00084	0.00055	0.00065	0.0014	0.0015	0.00057	0.001	0.0011	0.00062	0.00050	0.00050	0.00095
Nickel	mg/L	0.17$_{r3,e}$[A]	n/v	0.013	0.0070	0.013	0.0080	0.0084	0.0076	0.0077	0.0072	0.0027	0.0025	<0.003	0.0022	0.0023	0.0023	0.0024	0.0021
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.08	<0.10	<0.10	<0.10	<0.50	<0.10	<0.10	<0.10	<0.08	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	11	10	11.2	10	10	10	11	10	6.0	5.9	6.9	6.3	5.9	6.5	5.9	5.7
Selenium	mg/L	0.0020[A]	0.05[C]	0.00038	0.00052	<0.0005	<0.00020	0.00095	<0.00020	<0.00020	0.00021	<0.00020	<0.00020	0.0010	0.0010	0.00025	0.00044	<0.00020	<0.00020
Silicon	mg/L	n/v	n/v	4.5	6.0	-	5.4	5.1	5.2	5.5	5.1	4.8	5.3	-	4.2	4.3	4.7	4.8	4.5
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	**330**[AB]	**350**[AB]	**401**[AB]	**320**[AB]	**370**[AB]	**340**[AB]	**410**[AB]	**390**[AB]	**320**[AB]	**320**[AB]	**343**[AB]	**320**[AB]	**350**[AB]	**340**[AB]	**310**[AB]	**320**[AB]
Strontium	mg/L	n/v	7.0[C]	3.4	6.6 CD	-	**7.1**[C]	**7.2**[C]	**7.2**[C]	**7.4**[C]	6.8	2.6	3.0	-	2.9	3.2	3.0	3.0	3.0
Sulfur	mg/L	n/v	n/v	650 CD	920 CD	-	890	790	900	840	920	480	590 CD	-	470	470	610	580	530
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	-	0.0011	0.0013	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	0.0011
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	0.003	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.003	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	**0.012**[A]	0.0080	**0.011**[A]	0.010	0.010	**0.011**[A]	**0.011**[A]	**0.012**[A]	0.0071	0.0054	0.006	0.0061	0.0056	0.0051	0.0060	0.0053
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	**0.035**[A]	<0.0030	0.0076	<0.0030	0.0032	<0.0030	0.0053	<0.0030	<0.005	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Metals, Total																			
Mercury	mg/L	0.0000050[A]	0.001[C]	***<0.02 DB***	**0.000195 DB**[A]	**0.000092**[A]	**0.000169**[A]	**0.00048**[A]	**0.000196**[A]	**0.000049**[A]	**0.00021 DB**[A]	***<0.0060 DB***	**0.000215 DB**[A]	**0.000052**[A]	**0.0009**[A]	**0.000163**[A]	**0.00062**[A]	<0.0000019	**0.000054 DB**[A]
Phosphorus	mg/L	n/v	n/v	-	-	9.25	-	-	-	-	-	-	-	24.4	-	-	-	-	-
Microbiological Parameters																			
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<100 DB***	***<10 MI***	**6**[D]	***<10 AT***	***<100 MI***	***<10 Z8***	***<100 Z8***	***<100 MI***	***<100 DB***	***<10 MI***	**11**[D]	***<100 DVM***	***<100 MI***	***<10 Z8***	***<5.0 Z8***	**10 MI**[D]
Fecal Coliforms	mpn/100mL	n/v	0[D]	**100 DB**[D]	***<10 MI***	**23**[D]	***<50 AT***	***<100 MI***	***<10 Z8***	***<100 Z8***	***<100 MI***	***<100 DB***	***<10 MI***	**11**[D]	***<100 DVM***	***<1.0***	***<10 Z8***	***<5.0 Z8***	***<10 MI***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	>6000 DB	5,400 MI	91,500	1,200 AT	1,500	820	2,600	-	23,000 DB	370	5,800	1,900 AT	390 SC1	36,000 Z8	3,900	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	-	-	-	>12000 MI	-	-	-	-	-	-	-	>4800 MI
Total Coliforms	mpn/100mL	n/v	0[D]	**9,100 DB**[D]	**310 MI**[D]	**154**[D]	***<10 AT***	***<100 MI***	***<10 Z8***	***<100 Z8***	***<100 MI***	**100 DB**[D]	***<10 MI***	**205**[D]	***<100 DVM***	***<100 MI***	***<10 Z8***	***<5.0 Z8***	**52 MI**[D]

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-12-3	RMW16-13-37						MW16-14-33	MW16-15-34	RMW16-15-39		MW16-16-11	
Sample Date				6-Oct-16	24-Nov-21	9-May-22	18-Nov-22	16-May-23	24-Oct-23	13-May-24	27-Sep-16	26-Sep-16	24-Oct-23	13-May-24	3-Oct-16	13-May-21
Sample ID				MW16-12-3	MW16-13-37	RMW16-13-37	RMW16-13-37	RMW16-13-37	RMW16-13-37	RRMW16-13-37	MW16-14-33	MW16-15-34	RMW16-15-39	RRMW16-15-39	MW16-16-11	MW16-16-11
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	AGAT	BV	BV	BV	BV	BV	MAXX	MAXX	BV	BV	MAXX	BV
Laboratory Work Order				B688395	21C834850	C230795	C291479	C334712	C386477	C433947	B684487	B684017	C386477	C433947	B686741	C132075
Laboratory Sample ID				PS2813	3249834	ASS484	BHH857	BQN668	CCT431	CNL872	PP7330	PP4727	CCT432	CNL871	PR2486	ZU2982
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Unconsolidated	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ													
Field Parameters																
Dissolved Oxygen, Field	mg/L	n/v	n/v	-	6.07	5.11	5.0	2.0	3.8	3.0	-	-	1.5	4.6	-	14.91
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**2,370[A]**	**3,344[A]**	**3,027[A]**	**1,772[A]**	**1,214[A]**	366	1.519	**1,906[A]**	984	918	0.908	**4,840[A]**	**5,210[A]**
Oxidation Reduction Potential, field	mV	n/v	n/v	-	-44.4	-101.7	-21.4	-100.9	-151.4	-101.2	-	-	-209.8	-133.3	-	84.2
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7	8.01	7.67	**8.53[A]**	8.08	7.25	8.16	7.5	7.4	**8.63[A]**	**8.89[A]**	7.2	**6.76[B]**
Temperature, Field	deg C	n/v	≤15[B]	6.7	3.96	6.2	3.8	9.6	3.4	7.6	8	8	2.1	8.6	12.1	12.2
Calculated Parameters																
Anion Sum	meq/L	n/v	n/v	33	-	35	21	33	4.6	17	45	11	11	11	78	81
Cation Sum	meq/L	n/v	n/v	31	-	34	21	15	4.6	18	160	10	12	11	75	80
Hardness (as CaCO3)	mg/L	n/v	n/v	1,300	155	110	42	20	69	98	6,700	52	30	28	2,400	2,700
Ion Balance	%	n/v	n/v	0.94	110	0.63	0.83	37	0.053	-	3.4	0.95	2.5	-	0.95	0.41
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	-	-	2.0	-	-	-	1.4	-	-
Nitrate	mg/L	13_f[A]	45[C]	1.5	0.7	<0.044	0.17	<0.044	1.4	0.11	0.072	<0.044	0.052	0.096	0.14	<0.22
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.34	0.16	<0.010	0.038	<0.010	0.32	0.044	<0.020	<0.020	0.012	0.022	0.031	<0.050 MI
Nitrite	mg/L	$1.97_{n4.e,\ q}$[A]	3[C]	<0.033	<0.10	<0.033	<0.033	<0.033	<0.033	0.061	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**1,900[AB]**	**2,470[AB]**	**2,200[AB]**	**1,200[AB]**	**1,400[AB]**	250	**990[AB]**	**4,700[AB]**	**610[AB]**	**660[AB]**	**650[AB]**	**4,900[AB]**	**5,100[AB]**
BTEX and Petroleum Hydrocarbons																
Benzene	mg/L	0.0050[A]	0.005[C]	-	<0.0005	0.00051	<0.00040	<0.00060 EC	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	**0.0056[AC]**	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	-	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.024	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	-	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	**0.0034[AB]**	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	-	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.013	<0.00080
Xylene, o-	mg/L	n/v	n/v	-	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.0056	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	-	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00080	<0.00080	<0.00089	<0.00089	0.019	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	-	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	-	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	-	<0.1	<0.10	<0.10	<0.37	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics																
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	-	58.28	41	16	10	3.9	3.4	3.9	1.7	7.3	7.1	4.6	3.4
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**2,600[A]**	**3,650[A]**	**3,100[A]**	**1,800[A]**	**1,800[A]**	420	**1,700[A]**	**2,000[A]**	1,000	**1,100[A]**	1,000	**5,400[A]**	**5,500[A]**
Sediment	none	n/v	n/v	-	Sediment	-	-	-	-	-	-	-	-	-	-	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.97	8.33	8.02	7.96	8.41	7.75	8.18	7.80	8.31	8.47	**8.61[A]**	7.57	7.48
Anions																
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<0.50	<5	<1.0	<1.0	<100	<1.0	<1.0	81	<0.50	7.9	9.5	<0.50	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	410	450	640	740	1,600	180	510	1,500	350	350 NF	400	630	720
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	510	540	780	900	1,900	220	620	1,600	430	410	470	770	870
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<0.50	<5	<1.0	<1.0	<100	<1.0	<1.0	97	<0.50	9.5	11	<0.50	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<0.50	<5	<1.0	<1.0	<100	<1.0	<1.0	<5.0	<0.50	<1.0	<1.0	<0.50	<1.0
Sulfate	mg/L	$429_{n5.e}$[A]	≤500[B]	**900 CD[AB]**	**1,130[AB]**	**950[AB]**	260	90	14	49	**730 CD[AB]**	170	140	130	**3,100 CD[AB]**	**3,200 CD[AB]**
Chloride	mg/L	100[A]	≤250[B]	**230 CD[A]**	**156[A]**	84	30	9.0	26	**220[A]**	25	3.4	42	22	7.9	5.9
Nutrients																
Nitrite (as N)	mg/L	$0.6_{n4.e}$[A]	1[C]	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	0.019	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	-	<0.15	0.0078	0.0047	0.013	0.0087	0.0077	0.0039	0.0038	<0.0030	0.017	0.0045	0.0037
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	-	1.77	1.5	1.0	2.0	0.038	0.88	1.5	0.99 *[A]	0.58	1.3	0.60	0.33
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.34	0.16	<0.010	0.038	<0.010	0.32	0.026	0.016	<0.010	0.012	0.022	0.031	<0.050
Phosphorus, Dissolved	mg/L	n/v	n/v	-	-	-	0.0070	<0.030 DB P2	0.0085 P2	0.013	-	-	<0.0030	0.015 P2	-	-
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	-	-	0.0048	-	-	-	-	0.0073	0.0057	-	-	0.011	<0.0030
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	-	17.0	3.2	<2.0	22.0	0.801	1.28	38 CD	0.90 A*	0.941	3.2	14 DB	1.25
Nitrogen	mg/L	n/v	n/v	-	-	3.2 DB	<2.0 DB	22	1.12	1.3	-	-	0.953	3.3	-	1.2 DB

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-12-3	RMW16-13-37						MW16-14-33	MW16-15-34	RMW16-15-39		MW16-16-11	
Sample Date				6-Oct-16	24-Nov-21	9-May-22	18-Nov-22	16-May-23	24-Oct-23	13-May-24	27-Sep-16	26-Sep-16	24-Oct-23	13-May-24	3-Oct-16	13-May-21
Sample ID				MW16-12-3	MW16-13-37	RMW16-13-37	RMW16-13-37	RMW16-13-37	RMW16-13-37	RRMW16-13-37	MW16-14-33	MW16-15-34	RMW16-15-39	RRMW16-15-39	MW16-16-11	MW16-16-11
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	AGAT	BV	BV	BV	BV	BV	MAXX	MAXX	BV	BV	MAXX	BV
Laboratory Work Order				B688395	21C834850	C230795	C291479	C334712	C386477	C433947	B684487	B684017	C386477	C433947	B686741	C132075
Laboratory Sample ID				PS2813	3249834	ASS484	BHH857	BQN668	CCT431	CNL872	PP7330	PP4727	CCT432	CNL871	PR2486	ZU2982
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Unconsolidated	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated	Unconsolidated
Sample Type	**Units**	**2022 AEPA Tier 1**	**GCDWQ**													
Metals, Dissolved																
Aluminum	mg/L	0.05$_{rn1,e}$[A]	0.1$_{a}$[B]	0.0070	**0.279**[AB]	0.013	0.012	**0.064**[A]	0.0059	<0.0030	0.016 NF M[A]	0.0040	**0.077**[A]	**0.45**[AB]	0.0056	0.0050
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.001	0.00075	0.0043	0.0059	0.0017	0.0012	0.0021	0.0013	0.0041	0.0017	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010$_{ALARA}$[C]	0.00092	0.003	0.0049	0.0013	0.0024	0.00028	0.00077	0.0017	0.0010	0.00075	0.0015	0.00085	0.00056
Barium	mg/L	2.0[A]	2.0[C]	0.12	0.09	0.049	0.30	0.16	0.054	0.21	**3.8**[AC]	0.013	0.021	0.035	0.026	0.013
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.051	0.16	0.18	0.14	0.15	0.023	0.092	***<2.0***	0.040	0.071	0.053	0.20	0.29
Cadmium	mg/L	0.00037$_{r3,e}$[A]	0.007[C]	0.000036	0.000098[A]	<0.00002	0.000061[A]	0.000025	<0.000020	<0.000020	0.000024	<0.000020	<0.000020	<0.000020	0.00014 NF	0.000098
Calcium	mg/L	n/v	n/v	270	47.6	32	12	6.1	23	29	2,300	14	7.5	6.9	440	460
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	0.0006	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	<0.00030	<0.0009	0.00031	0.00045	<0.00030	<0.00030	<0.00030	0.00065	<0.00030	<0.00030	<0.00030	0.0037	0.0036
Copper	mg/L	0.0070[A]	≤1.0[B]	0.0018	**0.0233**[A]	<0.0010	0.0021	**0.013**[A]	0.0050	<0.0010	<0.00020	<0.00020	0.0064	<0.0010	**0.0097**[A]	0.00022
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	0.1	0.22	<0.060	0.29	<0.060	<0.060	**68**[AB]	<0.060	<0.060	0.26	<0.060	**0.51**[AB]
Lead	mg/L	0.007$_{r3,e}$[A]	0.005$_{ALARA}$[C]	<0.00020	0.0006	<0.00020	0.00026	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.030	-	0.085	0.050	0.044	<0.020	0.052	<2.0	0.074	0.047	0.044	0.15	0.15
Magnesium	mg/L	n/v	n/v	160	8.8	6.7	2.8	1.2	2.9	5.9	190	4.2	2.7	2.6	320	370
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.025**[AB]	**0.187**[AB]	**0.16**[AB]	0.016	0.015	0.019	**0.021**[AB]	**14**[AB]	**0.028**[AB]	**0.022**[AB]	0.0071	**2.3**[AB]	**3.4**[AB]
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000020	<0.0000025	<0.0000019	<0.0000019	**0.00046**[A]	<0.0000019	<0.0000019	<0.0000020	<0.0000020	<0.0000019	<0.0000019	<0.0000020	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0021	0.046	0.064	0.089	0.12	0.0071	0.027	0.028	0.018	0.032	0.026	0.0011	0.00041
Nickel	mg/L	0.17$_{r3,e}$[A]	n/v	0.0041	0.003	0.0022	0.0088	0.0015	0.0011	0.00077	0.0036	<0.00050	0.00095	0.00056	0.0066	0.0070
Phosphorus	mg/L	n/v	n/v	<0.10	0.08	<0.10	<0.10	<0.10	<0.10	<0.10	49	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	6.4	5.6	5.1	3.6	3.9	2.4	3.5	53	2.4	6.3	4.3	15	13
Selenium	mg/L	0.0020[A]	0.05[C]	0.0016	**0.0042**[A]	0.00096	0.0010	0.00058	0.00048	0.00042	0.0011	0.00065	**0.0033**[A]	0.0012	0.00038	0.00030
Silicon	mg/L	n/v	n/v	6.1	-	5.0	3.0	3.8	1.6	2.6	25	2.6	2.5	4.2	6.3	7.1
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	110	**860**[AB]	**740**[AB]	**450**[AB]	**340**[AB]	74	**370**[AB]	**410**[AB]	**210**[AB]	**250**[AB]	**240**[AB]	**600 CD**[AB]	**590 CD**[AB]
Strontium	mg/L	n/v	7.0[C]	1.1	-	0.59	0.28	0.12	0.16	0.44	**9.7**[C]	0.25	0.11	0.11	4.9	6.0 CD
Sulfur	mg/L	n/v	n/v	270	-	320	68	31	4.6	14	220	51	47	37	1,000 CD	1,200 CD
Thallium	mg/L	n/v	n/v	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	-	<0.0010	0.0080	0.0023	0.010	0.0046	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	0.007	0.0019	0.0013	0.0015	<0.0010	<0.0010	0.0020	<0.0010	<0.0010	0.0084	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.010	**0.029**[AC]	**0.030**[AC]	**0.022**[AC]	**0.018**[A]	0.0014	0.0047	**0.012**[A]	0.00024	0.00098	0.0020	**0.033**[AC]	**0.019**[A]
Vanadium	mg/L	n/v	n/v	0.0011	-	0.0011	0.0030	0.0075	<0.0010	0.0023	<0.0010	<0.0010	0.0030	0.0075	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	0.018	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0036	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Metals, Total																
Mercury	mg/L	0.0000050[A]	0.001[C]	**0.00030 DB**[A]	***<0.0000125***	**0.000522**[A]	**0.000233**[A]	**0.00322**[AC]	**0.0000150**[A]	**0.000232 DB**[A]	***<0.02 DB***	***<0.00010 DB***	**0.000052**[A]	**0.00056 DB**[A]	***<0.0060 DB***	**0.0000788**[A]
Phosphorus	mg/L	n/v	n/v	-	8.47	-	-	-	-	-	-	-	-	-	-	-
Microbiological Parameters																
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	-	**3**[D]	***<10 AT***	***<100 MI***	***<20 Z8***	**1.0**[D]	***<50 MI***	***<20***	***<1.0***	***<10 Z8***	***<100 MI***	***<100 DB***	***<10 SVH MI***
Fecal Coliforms	mpn/100mL	n/v	0[D]	-	**5**[D]	**10 AT**[D]	***<100 MI***	**63 Z8**[D]	**31**[D]	***<50 MI***	***<20 DB***	***<1.0***	***<10 Z8***	***<100 MI***	***<100 DB***	***<10 SVH MI***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	-	111,000	150,000 AT	1,000	26,000 Z8	>6000	-	>6000	39	>6000	-	50,000 DB	350
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	-	-	>120000 MI	-	-	-	>240000 MI	-	-
Total Coliforms	mpn/100mL	n/v	0[D]	-	**178**[D]	**85 AT**[D]	**310 MI**[D]	**80 Z8**[D]	**>2400**[D]	**6,200 MI**[D]	**2,300**[D]	***<1.0***	**52 Z8**[D]	***<100 MI***	**200 DB**[D]	***<10 SVH MI***

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Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				RMW16-16-17						MW16-17-5	RMW16-17-10		RRMW16-17-8		MW16-18-6	
Sample Date				2-Dec-21	5-May-22	18-Nov-22	16-May-23	23-Oct-23	13-May-24	6-Oct-16	22-Nov-21	10-May-22	23-Oct-23	13-May-24	4-Oct-16	13-May-21
Sample ID				RMW16-16-17	RMW16-16-17	RMW16-16-17	RMW16-16-17	RMW16-16-17	RMW16-16-17	MW16-17-5	RMW16-17-11	RMW16-17-11	RRMW16-17-8	RRMW16-17-8	MW16-18-6	MW16-18-6
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				AGAT	BV	BV	BV	BV	BV	MAXX	AGAT	BV	BV	BV	MAXX	BV
Laboratory Work Order				21C839274	C230164	C291479	C334712	C386148	C433947	B688395	21C833752	C231132	C386148	C433947	B687243	C132075
Laboratory Sample ID				3287968	ASP026	BHH855	BQN670	CCP847	CNL870	PS2812	3240499	ASU359	CCP846	CNL869	PR5499	ZU2989
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ													
Field Parameters																
Dissolved Oxygen, Field	mg/L	n/v	n/v	6.62	3.98	13.4	5.1	2.7	2.7	-	7.13	3.61	11.9	5.9	-	23.79
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**5,160[A]**	**5,086[A]**	**2,651[A]**	**4,612[A]**	**5,246[A]**	5.246	**6,290[A]**	**2,077[A]**	**2,143[A]**	**6,521[A]**	10.95	**1,029[A]**	**1,060[A]**
Oxidation Reduction Potential, field	mV	n/v	n/v	5	-23.4	-16.8	21.2	-114.2	-114.2	-	19.3	51.2	-98.6	61.5	-	62.5
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.13	**6.9[B]**	7.32	7.27	7.01	7.01	7	7.2	7.11	**6.99[B]**	**6.77[B]**	7.1	7.43
Temperature, Field	deg C	n/v	≤15[B]	4.07	7.5	2.2	12.3	3.0	3.0	6.7	6.55	7.4	1.7	9.5	6.3	6.4
Calculated Parameters																
Anion Sum	meq/L	n/v	n/v	-	59	67	66	63	77	110	-	26	190	210	13	12
Cation Sum	meq/L	n/v	n/v	-	66	66	67	70	66	100	-	27	210	190	12	13
Hardness (as CaCO3)	mg/L	n/v	n/v	1,520	1,400	1,300	1,300	1,400	1,300	3,500	826	850	5,700	5,200	480	490
Ion Balance	%	n/v	n/v	109	5.6	0.78	0.85	5.8	-	0.93	108	0.36	4.3	-	0.98	2.0
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	-	7.8	-	-	-	-	4.6	-	-
Nitrate	mg/L	13_{f}[A]	45[C]	<0.5	<0.22	<0.22	<0.22	<0.044	<0.22	5.0	<0.5	<0.22	0.41	<0.22	5.3	4.1
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.02	<0.050 AT	<0.050 MI	<0.050 Z8	<0.010	<0.050 MI	1.3	<0.02	<0.050 AT	0.093 Z8	<0.050 MI	1.2	0.93 MI
Nitrite	mg/L	$1.97_{n4,e,q}$[A]	3[C]	<0.10	<0.033	<0.033	<0.033	<0.033	<0.033	0.55	<0.05	<0.033	<0.033	<0.033	0.10	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**4,460[AB]**	**3,900[AB]**	**4,300[AB]**	**4,200[AB]**	**4,200[AB]**	**4,800[AB]**	**6,900[AB]**	**1,530[AB]**	**1,600[AB]**	**13,000[AB]**	**13,000[AB]**	**650[AB]**	**620[AB]**
BTEX and Petroleum Hydrocarbons																
Benzene	mg/L	0.0050[A]	0.005[C]	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.0005	<0.00040	<0.00040	<0.00040	0.00062	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	-	-	<0.00080	<0.00080	<0.00080	0.0020	<0.00080
Xylene, o-	mg/L	n/v	n/v	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	-	<0.00040	<0.00040	<0.00040	0.0010	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	-	<0.0005	<0.00089	<0.00089	<0.00089	0.0030	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	-	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	-	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	-	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics																
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	4	2.6	3.2	5.5	1.9	2.6	-	6	3.3	22 DSM	23	4.9	3.8
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**5,510[A]**	**5,200[A]**	**5,100[A]**	**5,000[A]**	**4,900[A]**	**5,300[A]**	**6,900[A]**	**2,080[A]**	**2,100[A]**	**12,000[A]**	**12,000[A]**	**1,100[A]**	**1,100[A]**
Sediment	none	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.14	7.89	7.61	7.90	8.09	7.94	7.81	8.02	7.80	8.06	7.26	8.01	7.93
Anions																
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<5	<1.0	<1.0	<1.0	<0.50	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	683	640	730	740	680	720	520	453	450	830	940	420	450
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	833	780	890	900	830	880	640	566	550	1,000	1,200	510	550
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<5	<1.0	<1.0	<1.0	<0.50	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<5	<1.0	<1.0	<1.0	<0.50	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	≤500[B]	**2,560[AB]**	**2,200[AB]**	**2,500[AB]**	**2,400[AB]**	**2,300[AB]**	**3,000[AB]**	**4,800 CD[AB]**	**744[AB]**	**830[AB]**	**8,500[AB]**	**9,100[AB]**	100	82
Chloride	mg/L	100[A]	≤250[B]	4.1	5.3	5.2	5.2	5.5	5.1	8.7	<1.0	<1.0	4.5	6.9	72	45
Nutrients																
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	0.17	<0.01	<0.010	<0.010	<0.010	0.031	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.15	0.0037	0.0039	<0.0030	<0.0030	<0.0030	-	<0.15	0.0043	0.0052	0.0049	<0.0030	0.0032
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	1.91	1.7	1.6	1.7	1.5	1.6	-	0.05	0.066	0.51	0.56	<0.050	<0.015
Nitrate (as N)	mg/L	3.0[A]	10[C]	<0.02	<0.050	<0.050	<0.050	<0.010	<0.050	1.1	<0.02	<0.050	0.093	<0.050	1.2	0.93
Phosphorus, Dissolved	mg/L	n/v	n/v	-	-	0.0032	0.13	<0.0030	<0.0030	-	-	-	<0.0030 P2	0.0057	-	-
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	-	<0.0030	-	-	-	-	-	-	0.0034	-	-	0.0038	0.0031
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	19.06	4.8	2.09	2.71	1.83	2.11	-	4.5	<2.0	2.10	2.74	1.3	0.72
Nitrogen	mg/L	n/v	n/v	-	4.8 DB	2.1 DB	2.7	1.83	2.1	-	-	<2.0 DB	2.19	2.7	-	1.7 DB

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Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				RMW16-16-17						MW16-17-5	RMW16-17-10		RRMW16-17-8		MW16-18-6	
Sample Date				2-Dec-21	5-May-22	18-Nov-22	16-May-23	23-Oct-23	13-May-24	6-Oct-16	22-Nov-21	10-May-22	23-Oct-23	13-May-24	4-Oct-16	13-May-21
Sample ID				RMW16-16-17	RMW16-16-17	RMW16-16-17	RMW16-16-17	RRMW16-16-17	RRMW16-16-17	MW16-17-5	RMW16-17-11	RMW16-17-11	RRMW16-17-8	RRMW16-17-8	MW16-18-6	MW16-18-6
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				AGAT	BV	BV	BV	BV	BV	MAXX	AGAT	BV	BV	BV	MAXX	BV
Laboratory Work Order				21C839274	C230164	C291479	C334712	C386148	C433947	B688395	21C833752	C231132	C386148	C433947	B687243	C132075
Laboratory Sample ID				3287968	ASP026	BHH855	BQN670	CCP847	CNL870	PS2812	3240499	ASU359	CCP846	CNL869	PR5499	ZU2989
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ													
Metals, Dissolved																
Aluminum	mg/L	0.05$_{n1,e}$[A]	0.1$_{a}$[B]	0.005	<0.0030	0.015	0.0055	<0.0030	<0.0030	0.0039	0.011	<0.0030	0.0059	<0.0030	<0.0030	0.0053
Antimony	mg/L	0.0060[A]	0.006[C]	0.002	0.00096	<0.00060	<0.00060	<0.00060	<0.00060	0.00062	<0.001	0.0014	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010$_{ALARA}$[C]	**0.014[AC]**	**0.012[AC]**	0.0048	0.0030	0.0048	0.0022	0.00053	0.001	0.00042	0.00087	0.00072	0.00022	0.00026
Barium	mg/L	2.0[A]	2.0[C]	<0.05	0.012	<0.010	<0.050	<0.010	<0.010	0.041	<0.05	0.022	0.015	0.015	0.075	0.080
Beryllium	mg/L	n/v	n/v	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.23	0.22	0.19	0.22	0.23	0.22	0.12	0.12	0.13	0.18	0.16	0.088	0.092
Cadmium	mg/L	0.00037$_{r3,e}$[A]	0.007[C]	0.000064	0.000087	0.00004	<0.000020	<0.000020	<0.000020	0.00028	0.000086	<0.00002	0.00014	0.00013	<0.000020	<0.000020
Calcium	mg/L	n/v	n/v	346	300	280	280	310	280	410	189	190	420	390	86	85
Chromium	mg/L	0.050[A]	0.05[C]	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.0096	0.0054	0.0034	0.0017	0.0021	0.0019	0.00083	0.0022	0.0014	0.0070	0.0064	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.0008	<0.0010	<0.0010	0.0043	<0.0010	<0.0010	0.0017	<0.0008	<0.0010	0.0028	0.0019	0.00067	0.00080
Iron	mg/L	0.30[A]	≤0.3[B]	<0.1	<0.060	<0.060	**5.6[AB]**	<0.060	<0.060	<0.060	<0.1	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	0.007$_{r3,e}$[A]	0.005$_{ALARA}$[C]	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	-	0.24	0.22	0.25	0.26	0.26	0.15	-	0.022	0.12	0.11	0.026	0.027
Magnesium	mg/L	n/v	n/v	159	150	140	150	160	150	600 CD	86.0	92	1,100	1,000	63	67
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.902[AB]**	**0.69[AB]**	**0.41[AB]**	**0.56[AB]**	**0.61[AB]**	**0.40[AB]**	**0.39[AB]**	**0.648[AB]**	**0.72[AB]**	**2.7[AB]**	**2.5[AB]**	**0.058[AB]**	0.0047
Mercury	mg/L	0.0000050[A]	0.001[C]	-	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000020	**0.0000052[A]**	<0.0000019	<0.0000019	<0.0000019	<0.0000020	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.025	0.0085	0.0015	0.00087	0.0013	0.00062	0.0015	0.001	0.0010	0.0018	0.0016	0.0019	0.0015
Nickel	mg/L	0.17$_{r3,e}$[A]	n/v	0.060	0.029	0.014	0.0048	0.0095	0.0049	0.0054	0.006	0.0018	0.0099	0.0093	0.00099	0.00060
Phosphorus	mg/L	n/v	n/v	<0.08	<0.10	<0.10	<0.50	<0.10	<0.10	0.11	<0.08	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	14.0	12	8.3	9.6	9.4	7.9	11	5.4	5.6	15	13	2.4	2.2
Selenium	mg/L	0.0020[A]	0.05[C]	<0.0005	0.0011	0.00048	0.00099	<0.00020	<0.00080 MI	**0.034[A]**	<0.0005	<0.00020	0.0011	0.00057	0.0012	**0.0023[A]**
Silicon	mg/L	n/v	n/v	-	5.0	4.2	16	5.0	4.6	5.2	-	4.5	5.7	5.2	4.1	4.3
Silver	mg/L	0.00010[A]	n/v	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	**972[AB]**	**880[AB]**	**930[AB]**	**910[AB]**	**950[AB]**	**900[AB]**	**750 CD[AB]**	**232[AB]**	**220[AB]**	**2,200[AB]**	**2,000[AB]**	66	62
Strontium	mg/L	n/v	7.0[C]	-	7.0	**7.2[C]**	**7.2[C]**	**7.7[C]**	**7.2[C]**	4.7	-	2.7	**10[C]**	**9.4[C]**	0.75	0.80
Sulfur	mg/L	n/v	n/v	-	830	770	750	870	780	1,500 CD	-	250	2,900	2,700	29	31
Thallium	mg/L	n/v	n/v	0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	0.002	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.002	<0.0010	0.0021	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.005	0.0014	0.00036	0.00031	0.00049	0.00030	**0.031[AC]**	0.007	0.0067	**0.049[AC]**	**0.043[AC]**	**0.011[A]**	0.0076
Vanadium	mg/L	n/v	n/v	-	0.0010	<0.0010	0.0020	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.005	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0062	<0.005	<0.0030	<0.0030	0.0048	<0.0030	<0.0030
Metals, Total																
Mercury	mg/L	0.0000050[A]	0.001[C]	**0.000035[A]**	**0.000491[A]**	**0.000234[A]**	**0.000232[A]**	***<0.000019***	***<0.00019 DB***	***<0.00020 DB***	***<0.0000125***	**0.000239[A]**	**0.000066[A]**	**0.00026 DB[A]**	***<0.0060 DB***	**0.0000383[A]**
Phosphorus	mg/L	n/v	n/v	10.4	-	-	-	-	-	-	2.62	-	-	-	-	-
Microbiological Parameters																
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	**1[D]**	***<10***	***<100 MI***	***<10 Z8***	***<100 Z8***	***<5.0 MI***	-	**3[D]**	***<10 AT***	***<100 Z8***	***<50 MI***	***<10 DB***	***<10 MI***
Fecal Coliforms	mpn/100mL	n/v	0[D]	**2[D]**	***<100***	***<100 MI***	***<10 Z8***	***<100 Z8***	***<5.0 MI***	-	**8[D]**	**10 AT[D]**	***<100 Z8***	***<50 MI***	***<10 DB***	***<10 MI***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	18,300	740	520	220 Z8	500	-	-	95,000	900 AT	26,000 Z8	-	4,400 DB	140
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	-	1,600 MI	-	-	-	-	99,000 MI	-	-
Total Coliforms	mpn/100mL	n/v	0[D]	**550[D]**	**210[D]**	***<100 MI***	***<10 Z8***	***<100 Z8***	**38 MI[D]**	-	**1,990[D]**	**160 AT[D]**	**610 Z8[D]**	**23,000 MI[D]**	**140 DB[D]**	***<10 MI***

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				RMW16-18-5						MW16-18-10		RMW16-18-13						MW16-19-8
Sample Date				22-Nov-21	5-May-22	17-Nov-22	18-May-23	27-Oct-23	16-May-24	4-Oct-16	13-May-21	22-Nov-21	5-May-22	17-Nov-22	18-May-23	27-Oct-23	16-May-24	27-Sep-16
Sample ID				RMW16-18-6	RMW16-18-6	RMW16-18-05	RMW16-18-5	RMW16-18-5	RMW16-18-5	MW16-18-10	MW16-18-10	RMW16-18-10	RMW16-18-10	RMW16-18-13	RMW16-18-13	RMW16-18-13	RMW16-18-13	MW16-19-8
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				AGAT	BV	BV	BV	BV	BV	MAXX	STANTEC	AGAT	BV	BV	BV	BV	BV	MAXX
Laboratory Work Order				21C833752	C230164	C291130	C335681	C387774	C435132	B687243	C132075	21C833752	C230164	C291130	C335681	C387774	C435132	B684487
Laboratory Sample ID				3240637	ASP032	BHF768	BQS288	CDB053	CNR327	PR5500	ZU2988	3240638	ASP034	BHF767	BQS289	CDB054	CNR328	PP7334
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ															
Field Parameters																		
Dissolved Oxygen, Field	mg/L	n/v	n/v	41.26	3.71	3.4	4.3	7.8	7.7	-	5.11	3.19	2.56	2.3	4.7	2.8	3.1	-
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,073[A]**	**1,143[A]**	**1,131[A]**	**1,013[A]**	**1,087[A]**	1.029	**1,049[A]**	**1,211[A]**	**1,011[A]**	**1,098[A]**	**1,136[A]**	**1,014[A]**	**1,189[A]**	1.052	**2,400[A]**
Oxidation Reduction Potential, field	mV	n/v	n/v	62.1	67	-10.4	191.6	100.7	1.7	-	69.4	52.3	66.9	2.3	167.1	103.5	-23.9	-
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.94	7.42	7.22	7.50	7.69	7.30	7	7.53	7.64	7.45	7.39	7.58	7.99	7.45	7.6
Temperature, Field	deg C	n/v	≤15[B]	6.32	8.2	1.9	9.6	5.4	6.1	6.3	6.5	5.04	7.5	1.4	14.5	6.0	11.8	8
Calculated Parameters																		
Anion Sum	meq/L	n/v	n/v	-	12	12	12	12	12	13	13	-	12	11	12	11	12	32
Cation Sum	meq/L	n/v	n/v	-	13	13	14	14	13	12	13	-	13	12	14	13	14	31
Hardness (as CaCO3)	mg/L	n/v	n/v	265	260	260	300	280	270	160	200	132	180	140	200	130	200	980
Ion Balance	%	n/v	n/v	109	3.3	1.6	8.1	8.4	-	0.93	0.068	103	5.3	2.9	8.8	7.6	-	0.96
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	-	6.8	-	-	-	-	-	-	-	7.0	-
Nitrate	mg/L	13_{f}[A]	45[C]	4.3	4.1	3.9	4.2	0.92	3.3	0.51	1.6	1.5	2.8	<0.44	3.0	1.3	2.3	1.8
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.97	0.95	0.89 MI	0.95 Z8	0.21	0.75	0.13	0.35	0.34	0.63	<0.10 MI	0.68	0.28	0.52	0.42
Nitrite	mg/L	$1.97_{pt4.e,\ q}$[A]	3[C]	<0.05	0.040	0.040	<0.033	<0.033	<0.033	0.054	<0.033	<0.05	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**665[AB]**	**650[AB]**	**670[AB]**	**690[AB]**	**680[AB]**	**660[AB]**	**680[AB]**	**740[AB]**	**640[AB]**	**660[AB]**	**640[AB]**	**680[AB]**	**680[AB]**	**690[AB]**	**2,000[AB]**
BTEX and Petroleum Hydrocarbons																		
Benzene	mg/L	0.0050[A]	0.005[C]	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.0013	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00068	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.0029	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.0012	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	0.0041	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00080
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics																		
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	6	2.2 DSM	2.5	2.2	1.5	2.0 PRH	2.6	1.6	4	1.8	2.0	1.7	1.5	1.6 PRH	6.3
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,130[A]**	**1,100[A]**	**1,100[A]**	**1,100[A]**	**1,100[A]**	**1,100[A]**	**1,200[A]**	**1,200[A]**	**1,080[A]**	**1,100[A]**	**1,100[A]**	**1,100[A]**	**1,100[A]**	**1,100[A]**	**2,500[A]**
Sediment	none	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.25	7.95	8.06	7.95	8.15	8.32	8.10	7.96	8.40	8.20	8.19	8.07	8.40	8.42	7.56
Anions																		
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<5	<1.0	<1.0	<1.0	<1.0	4.5	<0.50	<1.0	6	<1.0	<1.0	<1.0	3.3	8.6	<0.50
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	408	380	410	410	390	370	410	420	386	390	370	380	360	400	420
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	511	470	500	500	480	440	500	510	468	470	450	470	430	460	520
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<5	<1.0	<1.0	<1.0	<1.0	5.4	<0.50	<1.0	7	<1.0	<1.0	<1.0	4.0	10	<0.50
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
Sulfate	mg/L	$429_{rt5.e}$[A]	≤500[B]	62.2	70	68	59	72	72	110	94	82.4	80	82	68	73	69	**1,100 CD[AB]**
Chloride	mg/L	100[A]	≤250[B]	80.2	92	93	96	91	92	78	**110[A]**	64.3	76	79	87	96	89	1.9
Nutrients																		
Nitrite (as N)	mg/L	$0.6_{pt4.e}$[A]	1[C]	<0.01	0.012	0.012	<0.010	<0.010	<0.010	0.017	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.15	0.0049	0.0046	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.15	<0.0030	0.0048	<0.0030	<0.0030	<0.0030	<0.0030
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.05	0.017	0.030	0.020	0.018	0.032	<0.050	0.034	0.04	<0.015	<0.015	<0.015	<0.015	<0.015	0.070
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.97	0.93	0.88	0.95	0.21	0.75	0.12	0.35	0.34	0.63	<0.10	0.68	0.28	0.52	0.42
Phosphorus, Dissolved	mg/L	n/v	n/v	-	-	0.011	<0.0030	<0.0030	<0.0030 PRH	-	-	-	-	<0.0030	<0.0030	<0.0030	<0.0030 PRH	-
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	-	0.0069	-	-	-	-	<0.0030	<0.0030	-	<0.0030	-	-	-	-	0.0037
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	1.7	0.63	<1.0	0.24	5.1	0.94	18 CD	0.89	1.1	0.30	0.62	<0.020	0.142	0.281	0.70 DB
Nitrogen	mg/L	n/v	n/v	-	1.6 DB	<1.0 DB	1.2 DB	5.3 DB	1.7	-	1.2 DB	-	0.93 DB	0.62	0.70	0.43	0.80	-

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				RMW16-18-5						MW16-18-10		RMW16-18-13						MW16-19-8
Sample Date				22-Nov-21	5-May-22	17-Nov-22	18-May-23	27-Oct-23	16-May-24	4-Oct-16	13-May-21	22-Nov-21	5-May-22	17-Nov-22	18-May-23	27-Oct-23	16-May-24	27-Sep-16
Sample ID				RMW16-18-6	RMW16-18-6	RMW16-18-05	RMW16-18-5	RMW16-18-5	RMW16-18-5	MW16-18-10	MW16-18-10	RMW16-18-10	RMW16-18-10	RMW16-18-13	RMW16-18-13	RMW16-18-13	RMW16-18-13	MW16-19-8
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				AGAT	BV	BV	BV	BV	BV	MAXX	BV	AGAT	BV	BV	BV	BV	BV	MAXX
Laboratory Work Order				21C833752	C230164	C291130	C335681	C387774	C435132	B687243	C132075	21C833752	C230164	C291130	C335681	C387774	C435132	B684487
Laboratory Sample ID				3240637	ASP032	BHF768	BQS288	CDB053	CNR327	PR5500	ZU2988	3240638	ASP034	BHF767	BQS289	CDB054	CNR328	PP7334
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ															
Metals, Dissolved																		
Aluminum	mg/L	0.05$_{rn1,e}$[A]	0.1$_{a}$[B]	0.017	0.015	<0.0030	0.0048	0.0033	0.0038	<0.0030	0.0032	0.017	<0.0030	<0.0030	0.0040	0.0037	0.0042	0.0039
Antimony	mg/L	0.0060[A]	0.006[C]	<0.001	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.001	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010$_{ALARA}$[C]	0.001	0.00029	<0.00020	<0.00020	0.00026	0.00025	0.00039	<0.00020	<0.001	0.00035	<0.00020	<0.00020	<0.00020	0.00028	0.00030
Barium	mg/L	2.0[A]	2.0[C]	<0.05	0.065	0.075	0.077	0.066	0.057	0.030	0.028	<0.05	0.041	0.034	0.045	0.033	0.046	0.013
Beryllium	mg/L	n/v	n/v	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.11	0.11	0.12	0.11	0.12	0.10	0.14	0.16	0.13	0.14	0.14	0.14	0.14	0.12	0.092
Cadmium	mg/L	0.00037$_{r3,e}$[A]	0.007[C]	0.000047	<0.00002	0.000028	0.000022	<0.000020	<0.000020	<0.000020	<0.000020	0.000082	<0.00002	<0.000020	<0.000020	<0.000020	<0.000020	0.000057
Calcium	mg/L	n/v	n/v	54.7	52	54	59	56	54	38	47	29.5	38	30	42	30	41	230
Chromium	mg/L	0.050[A]	0.05[C]	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	<0.0009	0.00031	0.00033	0.00035	0.00044	<0.00030	0.00034	<0.00030	<0.0009	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	0.0011	<0.0010	<0.0010	0.0029	0.0010	0.0011	<0.00020	0.00041	0.0016	<0.0010	<0.0010	0.0023	0.0011	**0.015[A]**	0.00059
Iron	mg/L	0.30[A]	≤0.3[B]	<0.1	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.1	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	0.007$_{r3,e}$[A]	0.005$_{ALARA}$[C]	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0002	<0.00020	<0.00020	<0.00020	<0.00020	0.00075	<0.00020
Lithium	mg/L	n/v	n/v	-	<0.020	<0.020	<0.020	<0.020	<0.020	0.031	0.039	-	<0.020	0.020	<0.020	0.020	<0.020	0.029
Magnesium	mg/L	n/v	n/v	31.1	32	30	38	33	33	16	21	14.1	21	15	23	13	23	99
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.099[AB]**	**0.099[AB]**	**0.12[AB]**	**0.13[AB]**	**0.13[AB]**	<0.0040	**0.20[AB]**	**0.21[AB]**	**0.078[AB]**	**0.12[AB]**	**0.098[AB]**	**0.13[AB]**	**0.10[AB]**	**0.12[AB]**	**0.071[AB]**
Mercury	mg/L	0.0000050[A]	0.001[C]	0.0000039	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000020	<0.0000019	<0.0000025	<0.0000019	<0.0000019	<0.0000019	0.0000020	<0.0000019	<0.0000020
Molybdenum	mg/L	n/v	n/v	0.004	0.0032	0.0034	0.0027	0.0045	0.0022	0.0037	0.0018	0.005	0.0036	0.0037	0.0037	0.0038	0.0043	0.00060
Nickel	mg/L	0.17$_{r3,e}$[A]	n/v	<0.003	0.0013	0.0009	0.00087	0.0012	<0.00050	<0.00050	0.0025	<0.003	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.08	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.08	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	2.6	2.2	2.0	2.3	3.0	2.4	1.3	1.3	1.3	1.4	0.95	1.3	1.2	1.4	5.9
Selenium	mg/L	0.0020[A]	0.05[C]	<0.0005	0.00060	0.00065	0.00053	0.00053	**0.0026[A]**	0.00066	0.0013	<0.0005	0.00053	0.00053	0.00044	0.0010	0.0010	**0.056[AC]**
Silicon	mg/L	n/v	n/v	-	3.8	3.3	3.6	5.0	3.6	3.4	4.0	-	3.0	2.7	3.4	3.1	3.1	3.6
Silver	mg/L	0.00010[A]	n/v	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	179	170	170	190	190	180	**200[B]**	**210[AB]**	**210[AB]**	**210[AB]**	**210[AB]**	**220[AB]**	**250[AB]**	**220[AB]**	**260[AB]**
Strontium	mg/L	n/v	7.0[C]	-	0.41	0.43	0.47	0.48	0.40	0.27	0.36	-	0.28	0.22	0.29	0.21	0.28	1.4
Sulfur	mg/L	n/v	n/v	-	22	19	21	23	24	33	36	-	24	24	27	26	22	370
Thallium	mg/L	n/v	n/v	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	-	<0.0010	<0.0010	<0.0010	0.0016	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.008	0.0080	0.0075	0.0078	0.0090	0.0066	0.0064	0.0049	0.005	0.0056	0.0044	0.0054	0.0048	0.0057	**0.013[A]**
Vanadium	mg/L	n/v	n/v	-	0.0016	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	0.0018	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.005	<0.0030	<0.0030	<0.0030	0.0045	<0.0030	<0.0030	<0.0030	<0.005	<0.0030	<0.0030	<0.0030	<0.0030	0.0091	<0.0030
Metals, Total																		
Mercury	mg/L	0.0000050[A]	0.001[C]	**0.000069[A]**	**0.000225[A]**	**0.000255[A]**	**0.00021[A]**	**0.000129[A]**	**0.000558 DB[A]**	***<0.0060 DB***	***<0.00019 DB***	**0.000049[A]**	**0.0000083[A]**	0.0000041	***<0.000019***	**0.0000071[A]**	**0.0000288[A]**	***<0.0020 DB***
Phosphorus	mg/L	n/v	n/v	2.87	-	-	-	-	-	-	-	0.53	-	-	-	-	-	-
Microbiological Parameters																		
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1***	***<100***	***<100 MI***	***<10 Z8***	***<100 Z8***	***<100 MI***	***<100 DB***	***<10 MI***	**1[D]**	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	**63[D]**
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1***	***<100***	***<1.0***	***<10 Z8***	***<100 Z8***	***<100 MI***	***<100 DB***	***<10 MI***	**1[D]**	***<10***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<10 DB***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	89,500	79,000	>6000	>60000 Z8	2,800 Z8	-	17,000 DB	450	6,200	2,500	2,300	1,400	49	-	>6000
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	-	4,400 MI	-	-	-	-	-	-	-	>2400	-
Total Coliforms	mpn/100mL	n/v	0[D]	**85[D]**	***<100***	***<100 MI***	***<10 Z8***	***<100 Z8***	***<100 MI***	**310 DB[D]**	***<10 MI***	**770[D]**	**12[D]**	**1.0[D]**	***<1.0***	***<1.0***	**5.2[D]**	**280[D]**

See notes on last page

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Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				RMW16-19-10						MW16-19-19	RMW16-19-19						MW16-21-11
Sample Date				1-Dec-21	6-May-22	17-Nov-22	18-May-23	27-Oct-23	16-May-24	27-Sep-16	1-Dec-21	6-May-22	17-Nov-22	18-May-23	27-Oct-23	16-May-24	29-Sep-16
Sample ID				RMW16-19-8	RMW16-19-8	RMW16-19-10	RMW16-19-10	RMW16-19-10	RMW16-19-10	MW16-19-19	RMW16-19-19	RMW16-19-19	RMW16-19-19	RMW16-19-19	RMW16-19-19	RMW16-19-19	MW16-21-11
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				AGAT	BV	BV	BV	BV	BV	MAXX	AGAT	BV	BV	BV	BV	BV	MAXX
Laboratory Work Order				21C838865	C230432	C291130	C335681	C387774	C435132	B684487	21C838865	C230432	C291130	C335681	C387774	C435132	B685593
Laboratory Sample ID				3284935	ASQ364	BHF769	BQS287	CDB051	CNR329	PP7335	3284875	ASQ365	BHF764	BQS286	CDB052	CNR330	PQ3527
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ														
Field Parameters																	
Dissolved Oxygen, Field	mg/L	n/v	n/v	5.19	5.09	4.0	6.4	3.8	3.2	-	2.75	2.04	3.8	7.2	0.7	2.5	-
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**3,024[A]**	**3,057[A]**	**3,014[A]**	**2,468[A]**	**2,360[A]**	2.673	**2,850[A]**	**2,642[A]**	**2,642[A]**	**2,607[A]**	**2,646[A]**	**2,731[A]**	2.647	848
Oxidation Reduction Potential, field	mV	n/v	n/v	123.8	52.2	-28.0	98.3	111.5	35.4	-	-4.7	-103	-29.1	-31.7	-47.3	-78.8	-
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.07	7.09	**6.95[B]**	7.41	7.17	**6.93[B]**	7.2	7.23	7.05	7.15	7.40	7.20	7.13	7.2
Temperature, Field	deg C	n/v	≤15[B]	4.28	10.6	4.9	9.7	7.3	10.1	8.2	3.89	6.8	3.0	13.7	5.2	10.2	8.5
Calculated Parameters																	
Anion Sum	meq/L	n/v	n/v	-	38	40	36	26	38	36	-	32	32	33	33	35	9.2
Cation Sum	meq/L	n/v	n/v	-	42	40	39	32	39	34	-	33	31	34	35	36	9.9
Hardness (as CaCO3)	mg/L	n/v	n/v	1,180	1,200	1,100	1,100	810	1,100	600	485	480	470	540	520	550	440
Ion Balance	%	n/v	n/v	117	4.4	0.18	4.0	9.3	-	0.95	108	1.3	1.3	1.4	3.6	-	1.1
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	-	0.49	-	-	-	-	-	-	0.47	-
Nitrate	mg/L	13_{f}[A]	45[C]	<0.5	<0.22	<0.044	<0.044	<0.044	0.068	<0.044	<0.5	<0.044	<0.044	<0.044	<0.044	<0.044	**21[A]**
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.02	<0.050 AT	<0.010	<0.010	<0.010	0.015	<0.020	<0.02	<0.010	<0.010	<0.010	<0.010	<0.010	4.8
Nitrite	mg/L	$1.97_{m4,e,q}$[A]	3[C]	<0.10	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.05	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**2,330[AB]**	**2,500[AB]**	**2,600[AB]**	**2,300[AB]**	**1,800[AB]**	**2,400[AB]**	**2,200[AB]**	**1,850[AB]**	**2,000[AB]**	**2,000[AB]**	**2,100[AB]**	**2,100[AB]**	**2,200[AB]**	480
BTEX and Petroleum Hydrocarbons																	
Benzene	mg/L	0.0050[A]	0.005[C]	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00059
Xylene, m & p-	mg/L	n/v	n/v	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00090
Xylene, o-	mg/L	n/v	n/v	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.0010
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00080	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	0.0019
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics																	
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	6	5.7	5.7	3.9	3.2	4.3 PRH	3.9	4	3.6	3.9	3.7	3.3	3.3 PRH	4.8
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**3,110[A]**	**3,100[A]**	**3,100[A]**	**2,800[A]**	**2,400[A]**	**3,000[A]**	**3,000[A]**	**2,760[A]**	**2,600[A]**	**2,700[A]**	**2,700[A]**	**2,700[A]**	**2,900[A]**	800
Sediment	none	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.12	7.57	7.76	7.64	8.00	7.85	7.54	8.24	8.01	8.01	7.79	8.00	7.90	7.96
Anions																	
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	402	480	460	510	390	500	520	519	620	590	590	530	580	390
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	490	590	560	620	480	610	640	634	750	720	720	640	710	470
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50
Sulfate	mg/L	$429_{rt5,e}$[A]	≤500[B]	**1,280[AB]**	**1,400[AB]**	**1,500[AB]**	**1,200[AB]**	**890[AB]**	**1,400[AB]**	**1,200 CD[AB]**	**883[AB]**	**940[AB]**	**980[AB]**	**1,000[AB]**	**1,100[AB]**	**1,100[AB]**	50
Chloride	mg/L	100[A]	≤250[B]	2.5	2.1	2.9	1.7	<1.0	1.8	1.7	<1.0	1.2	1.2	<1.0	<1.0	<1.0	4.6
Nutrients																	
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.15	0.0035	0.0042	<0.0030	<0.0030	<0.0030	<0.0030	<0.15	<0.0030	0.0032	<0.0030	0.0036	<0.0030	0.0041 OG
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.08	0.043	0.074	0.38	0.14	0.089	1.1	1.14	1.00	1.0	1.0	1.1	1.0	<0.050
Nitrate (as N)	mg/L	3.0[A]	10[C]	<0.02	<0.050	<0.010	<0.010	<0.010	0.015	<0.010	<0.02	<0.010	<0.010	<0.010	<0.010	<0.010	**4.8[A]**
Phosphorus, Dissolved	mg/L	n/v	n/v	-	-	<0.0030	<0.0030	<0.0030	<0.0030 PRH	-	-	-	<0.0030	0.0042	<0.0030 P2	<0.0030 PRH	-
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	-	<0.0030	-	-	-	-	<0.0030	-	<0.0030	-	-	-	-	0.013
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	10.58	1.45	<1.0	0.91	1.65	0.422	1.5 DB	5.66	1.27	1.39	1.13	1.52	1.28	3.3 DB
Nitrogen	mg/L	n/v	n/v	-	1.5 DB	<1.0 DB	0.91 DB	1.6 DB	0.44	-	-	1.3	1.4 DB	1.1	1.5	1.3	-

See notes on last page

Springbank Off-stream Reservoir Project 2024 Groundwater Monitoring Report
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Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				RMW16-19-10						MW16-19-19	RMW16-19-19						MW16-21-11
Sample Date				1-Dec-21	6-May-22	17-Nov-22	18-May-23	27-Oct-23	16-May-24	27-Sep-16	1-Dec-21	6-May-22	17-Nov-22	18-May-23	27-Oct-23	16-May-24	29-Sep-16
Sample ID				RMW16-19-8	RMW16-19-8	RMW16-19-10	RMW16-19-10	RMW16-19-10	RMW16-19-10	MW16-19-19	RMW16-19-19	RMW16-19-19	RMW16-19-19	RMW16-19-19	RMW16-19-19	RMW16-19-19	MW16-21-11
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				AGAT	BV	BV	BV	BV	BV	MAXX	AGAT	BV	BV	BV	BV	BV	MAXX
Laboratory Work Order				21C838865	C230432	C291130	C335681	C387774	C435132	B684487	21C838865	C230432	C291130	C335681	C387774	C435132	B685593
Laboratory Sample ID				3284935	ASQ364	BHF769	BQS287	CDB051	CNR329	PP7335	3284875	ASQ365	BHF764	BQS286	CDB052	CNR330	PQ3527
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ														
Metals, Dissolved																	
Aluminum	mg/L	0.05$_{rn1,e}$[A]	0.1$_{a}$[B]	**0.072**[A]	<0.0030	0.0033	<0.0030	<0.0030	<0.0030	0.0033	**0.102**[AB]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0033
Antimony	mg/L	0.0060[A]	0.006[C]	<0.001	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.001	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010$_{ALARA}$[C]	0.002	0.00035	0.00028	0.00025	<0.00020	<0.00020	0.00033	<0.001	<0.00020	0.00026	<0.00020	0.00020	<0.00020	0.00045
Barium	mg/L	2.0[A]	2.0[C]	<0.05	0.015	0.013	0.013	<0.010	<0.010	<0.010	<0.05	<0.010	<0.010	<0.010	<0.010	<0.010	0.087
Beryllium	mg/L	n/v	n/v	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.12	0.13	0.12	0.13	0.12	0.12	0.13	0.15	0.15	0.15	0.15	0.12	0.13	0.061
Cadmium	mg/L	0.00037$_{r3,e}$[A]	0.007[C]	0.000096	0.000051	0.000026	0.00012	0.000098	0.00012	<0.000020	0.000035	<0.00002	<0.000020	<0.000020	<0.000020	<0.000020	0.000073
Calcium	mg/L	n/v	n/v	309	290	280	260	200	260	140	119	110	110	130	120	130	86
Chromium	mg/L	0.050[A]	0.05[C]	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.0012	0.00068	0.00061	0.00067	0.00064	0.00046	<0.00030	<0.0009	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00062
Copper	mg/L	0.0070[A]	≤1.0[B]	0.0011	<0.0010	0.0013	0.0021	<0.0010	<0.0010	<0.00020	<0.0008	<0.0010	<0.0010	0.0025	<0.0010	<0.0010	0.0013
Iron	mg/L	0.30[A]	≤0.3[B]	<0.1	<0.060	<0.060	<0.060	<0.060	<0.060	**2.6**[AB]	<0.1	<0.060	<0.060	<0.060	<0.060	<0.060	0.078
Lead	mg/L	0.007$_{r3,e}$[A]	0.005$_{ALARA}$[C]	0.0006	<0.00020	<0.00020	<0.00020	0.00082	<0.00020	<0.00020	0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	-	0.024	0.021	0.021	0.022	0.026	0.056	-	0.053	0.054	0.053	0.056	0.062	0.028
Magnesium	mg/L	n/v	n/v	100	110	100	96	75	96	62	45.6	49	46	55	52	55	54
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.537**[AB]	**0.61**[AB]	**0.59**[AB]	**0.79**[AB]	**0.75**[AB]	**0.62**[AB]	**0.37**[AB]	**0.248**[AB]	**0.28**[AB]	**0.29**[AB]	**0.32**[AB]	**0.33**[AB]	**0.31**[AB]	**0.17**[AB]
Mercury	mg/L	0.0000050[A]	0.001[C]	-	<0.0000019	<0.0000019	<0.0000019	0.0000020	<0.0000019	<0.0000020	-	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000020
Molybdenum	mg/L	n/v	n/v	<0.001	0.00081	0.00077	0.00065	0.00093	0.00087	0.0012	0.002	0.0015	0.0014	0.0011	0.0012	0.0011	0.0010
Nickel	mg/L	0.17$_{r3,e}$[A]	n/v	0.004	0.0026	0.0023	0.0020	0.0014	0.0016	<0.00050	<0.003	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0016
Phosphorus	mg/L	n/v	n/v	<0.08	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.08	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	6.5	6.8	6.1	7.0	6.7	6.5	5.9	5.3	5.7	5.2	5.9	5.4	5.4	7.6
Selenium	mg/L	0.0020[A]	0.05[C]	<0.0005	**0.0030**[A]	**0.0024**[A]	0.0010	0.00043	0.0012	<0.00020	<0.0005	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0019
Silicon	mg/L	n/v	n/v	-	3.9	3.7	4.2	4.1	3.8	3.4	-	3.6	3.3	3.7	3.5	3.2	4.7
Silver	mg/L	0.00010[A]	n/v	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	**388**[AB]	**410**[AB]	**410**[AB]	**410**[AB]	**360**[AB]	**400**[AB]	**490**[AB]	**486**[AB]	**530**[AB]	**500**[AB]	**530**[AB]	**560**[AB]	**560**[AB]	21
Strontium	mg/L	n/v	7.0[C]	-	1.9	1.9	1.9	1.6	1.8	2.1	-	1.8	1.8	2.0	1.9	1.8	1.1
Sulfur	mg/L	n/v	n/v	-	450	440	400	280	400	370	-	320	290	310	310	310	19
Thallium	mg/L	n/v	n/v	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	0.002	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.002	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	**0.013**[A]	**0.012**[A]	**0.012**[A]	0.0099	0.010	**0.011**[A]	0.00092	0.002	0.00088	0.00087	0.00086	0.00090	0.00080	0.0067
Vanadium	mg/L	n/v	n/v	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.005	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.005	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Metals, Total																	
Mercury	mg/L	0.0000050[A]	0.001[C]	**0.000081**[A]	**0.00072**[A]	**0.000708**[A]	**0.001**[A]	**0.000132**[A]	**0.000398 DB**[A]	***<0.00020 DB***	**0.000041**[A]	**0.0000099**[A]	**0.0000093**[A]	**0.0000077**[A]	0.0000028	<0.0000019	***<0.02 DB***
Phosphorus	mg/L	n/v	n/v	14.2	-	-	-	-	-	-	8.71	-	-	-	-	-	-
Microbiological Parameters																	
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	**13**[D]	***<100 DVM***	***<100 MI***	***<10 Z8***	***<100 Z8***	***<100 MI***	***<10***	**1**[D]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<10 DB***
Fecal Coliforms	mpn/100mL	n/v	0[D]	**26**[D]	***<100 DVM***	***<1.0***	***<10 Z8***	***<100 Z8***	***<100 MI***	***<10 DB***	**2**[D]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<10 DB***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	8,900	1,100 AT	290	19,000 Z8	3,000 Z8	-	1,700	1,350	140	550	1,300	16	-	3,200 DB
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	-	>24000 MI	-	-	-	-	-	-	21	-
Total Coliforms	mpn/100mL	n/v	0[D]	**194**[D]	**410 DVM**[D]	***<100 MI***	***<10 Z8***	***<100 Z8***	***<100 MI***	**10**[D]	**86**[D]	**5.2**[D]	***<1.0***	***<1.0***	***<1.0***	**1.0**[D]	**20 DB**[D]

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-22-26								RMW16-23-7					MW16-23-14		
Sample Date				28-Sep-16	14-May-21	23-Nov-21	10-May-22	22-Nov-22	18-May-23	25-Oct-23	16-May-24	13-May-22	18-Nov-22	18-May-23	25-Oct-23	15-May-24	29-Sep-16	14-May-21	23-Nov-21
Sample ID				MW16-22-26	MW16-22-26	MW16-22-26	MW16-22-26	MW16-22-26	MW16-22-26	MW16-22-26	MW16-22-26	RMW16-23-14(7)	RMW16-23-7	RMW16-23-7	RMW16-23-7	RMW 16-23-7	MW16-23-14	MW16-23-14	MW16-23-14
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	AGAT	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	MAXX	BV	AGAT
Laboratory Work Order				B685112	C132332	21C834079	C231132	C292215	C335681	C386944	C435132	C232198	C291479	C335681	C386944	C435079	B685593	C132332	21C834079
Laboratory Sample ID				PQ0285	ZU4970	3244031	ASU356	BHN145	BQS280	CCW514	CNR331	ASZ832	BHH856	BQS283	CCW511	CNR024	PQ3529	ZU4971	3244037
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ																
Field Parameters																			
Dissolved Oxygen, Field	mg/L	n/v	n/v	-	4.71	4.89	5.34	3.9	9.2	2.2	5.2	5.87	4.2	4.2	2.9	2.9	-	9.22	4.31
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**2,080[A]**	**1,897[A]**	**1,922[A]**	**2,120[A]**	**1,934[A]**	**1,833[A]**	**2,293[A]**	1,882	947	**1,015[A]**	700	**1,041[A]**	0.935	**1,064[A]**	993	**1,016[A]**
Oxidation Reduction Potential, field	mV	n/v	n/v	-	65.8	89.4	130.3	-50.3	107.8	-272.4	-110.1	-6.5	-22.6	114.0	-258.1	-17.7	-	0.1	31.9
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.2	7.37	7.68	7.25	7.76	7.59	7.88	8.03	7.46	7.18	7.49	7.68	7.17	7.2	**6.96[B]**	**6.92[B]**
Temperature, Field	deg C	n/v	≤15[B]	7.9	14.0	3.56	4.8	3.1	7.4	1.6	7.3	6.4	6.8	12.7	2.0	7.6	9.4	10.4	2.17
Calculated Parameters																			
Anion Sum	meq/L	n/v	n/v	26	24	-	24	24	25	24	25	10	11	11	11	11	13	13	-
Cation Sum	meq/L	n/v	n/v	26	24	-	23	24	27	23	25	9.7	11	13	11	12	14	12	-
Hardness (as CaCO3)	mg/L	n/v	n/v	640	680	704	680	670	770	670	720	390	440	540	460	480	540	510	565
Ion Balance	%	n/v	n/v	1.0	0.53	116	4.1	0.92	3.2	2.2	-	2.0	1.7	8.0	1.0	-	1.0	1.7	111
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	-	-	-	1.0	-	-	-	-	2.6	-	-	-
Nitrate	mg/L	13_{f}[A]	45[C]	0.054	3.3	1.5	<0.044	0.55	0.35	0.089	0.18	0.37	<0.044	<0.044	<0.044	<0.044	<0.044	<0.044	<0.5
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.020	0.73	0.34	0.022	0.14	0.11	0.020	0.076	0.098 AT	<0.010	<0.010	<0.010	<0.010	<0.020	<0.010	<0.02
Nitrite	mg/L	$1.97_{pt4.e,q}$[A]	3[C]	<0.033	<0.033	<0.05	0.069	0.062	0.11	<0.033	0.12	0.046	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.05
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**1,700[AB]**	**1,600[AB]**	**1,480[AB]**	**1,500[AB]**	**1,600[AB]**	**1,700[AB]**	**1,500[AB]**	**1,600[AB]**	**560[AB]**	**590[AB]**	**630[AB]**	**580[AB]**	**600[AB]**	**680[AB]**	**620[AB]**	**639[AB]**
BTEX and Petroleum Hydrocarbons																			
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0003
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	-
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00080	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00080	<0.00089	<0.0005
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Miscellaneous Inorganics																			
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	3.3	2.4	3	1.5	2.6	1.6	1.4	1.2 PRH	2.8	1.5	2.1	0.97	1.4	4.1	2.1	6
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**2,200[A]**	**2,000[A]**	**2,000[A]**	**2,000[A]**	**2,000[A]**	**2,000[A]**	**1,900[A]**	**2,000[A]**	900	980	980	990	980	**1,100[A]**	**1,100[A]**	**1,040[A]**
Sediment	none	n/v	n/v	-	-	NotPresent	-	-	-	-	-	-	-	-	-	-	-	-	NotPresent
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.04	7.80	8.13	7.94	7.86	7.52	8.04	8.28	7.98	7.74	7.77	8.06	7.98	7.94	7.52	7.90
Anions																			
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	180	180	184	180	180	190	170	180	250	340	340	330	330	600	580	561
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	220	220	232	220	220	230	210	220	300	420	410	400	400	730	710	702
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5
Sulfate	mg/L	$429_{n5.e}$[A]	≤500[B]	**1,100 CD[AB]**	**970 CD[AB]**	**845[AB]**	**1,000[AB]**	**990[AB]**	**1,000[AB]**	**970[AB]**	**1,000[AB]**	170	140	140	140	140	70	45	35.7
Chloride	mg/L	100[A]	≤250[B]	4.9	3.5	12.8	3.1	2.9	2.6	1.9	1.9	54	47	50	49	51	3.5	<1.0	5.5
Nutrients																			
Nitrite (as N)	mg/L	$0.6_{pt4.e}$[A]	1[C]	<0.010	<0.010	<0.01	0.021	0.019	0.034	<0.010	0.035	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01
Orthophosphate (as P)	mg/L	n/v	n/v	0.0076 OG	0.0068	<0.15	0.0092 DXE	0.051	0.011	0.0073	0.0050	<0.0030	0.0048	<0.0030	<0.0030	<0.0030	<0.0030	0.0033	0.17
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.68	0.021	0.14	0.39	1.0	0.62	0.58	0.57	0.13	0.055	0.20	0.046	0.042	0.14	0.089	0.10
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.012	0.73	0.34	<0.010	0.12	0.080	0.020	0.040	0.084	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.02
Phosphorus, Dissolved	mg/L	n/v	n/v	-	-	-	-	0.061	0.056	0.0051 P2	<0.0030 P2 PRH	-	<0.0030	0.014	<0.0030	<0.0030	-	-	-
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	<0.0030	0.0081	-	<0.0030	-	-	-	-	0.0066	-	-	-	-	<0.0030	0.0045	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.97	<0.020	0.3	0.788	1.51	0.665	0.86	0.973	1.52	<0.20	1.62	0.117	0.133	2.8 CD	0.149	1.0
Nitrogen	mg/L	n/v	n/v	-	0.62	-	0.81	1.7	0.78	0.88 DB	1.0	1.6 DB	<0.20 DB	1.6 DB	0.12	0.13	-	0.15	-

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-22-26								RMW16-23-7					MW16-23-14		
Sample Date				**28-Sep-16**	**14-May-21**	**23-Nov-21**	**10-May-22**	**22-Nov-22**	**18-May-23**	**25-Oct-23**	**16-May-24**	**13-May-22**	**18-Nov-22**	**18-May-23**	**25-Oct-23**	**15-May-24**	**29-Sep-16**	**14-May-21**	**23-Nov-21**
Sample ID				**MW16-22-26**	**MW16-22-26**	**MW16-22-26**	**MW16-22-26**	**MW16-22-26**	**MW16-22-26**	**MW16-22-26**	**MW16-22-26**	**RMW16-23-14(7)**	**RMW16-23-7**	**RMW16-23-7**	**RMW16-23-7**	**RMW 16-23-7**	**MW16-23-14**	**MW16-23-14**	**MW16-23-14**
Sampling Company				**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**
Laboratory				**MAXX**	**BV**	**AGAT**	**BV**	**BV**	**BV**	**BV**	**BV**	**BV**	**BV**	**BV**	**BV**	**BV**	**MAXX**	**BV**	**AGAT**
Laboratory Work Order				**B685112**	**C132332**	**21C834079**	**C231132**	**C292215**	**C335681**	**C386944**	**C435132**	**C232198**	**C291479**	**C335681**	**C386944**	**C435079**	**B685593**	**C132332**	**21C834079**
Laboratory Sample ID				**PQ0285**	**ZU4970**	**3244031**	**ASU356**	**BHN145**	**BQS280**	**CCW514**	**CNR331**	**ASZ832**	**BHH856**	**BQS283**	**CCW511**	**CNR024**	**PQ3529**	**ZU4971**	**3244037**
Location Description				**Tier 2**	**Tier 2**	**Tier 2**	**Tier 2**	**Tier 2**	**Tier 2**	**Tier 2**	**Tier 2**	**Tier 2**	**Tier 2**	**Tier 2**	**Tier 2**	**Tier 2**	**Tier 2**	**Tier 2**	**Tier 2**
Lithology				**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**
Sample Type	**Units**	**2022 AEPA Tier 1**	**GCDWQ**																
Metals, Dissolved																			
Aluminum	mg/L	$0.05_{rn1,e}$ [A]	0.1_{a} [B]	0.0036	0.0057	0.015	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0060	<0.0030	0.0040	<0.0030	<0.0030	<0.0030	<0.0030	<0.004
Antimony	mg/L	0.0060 [A]	0.006 [C]	<0.00060	<0.00060	<0.001	0.0020	0.0014	0.0011	<0.00060	0.00096	0.0028	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.001
Arsenic	mg/L	0.0050 [A]	0.010_{ALARA} [C]	0.00073	<0.00020	0.002	0.00048	0.00040	0.00049	0.00055	0.00048	0.00039	0.00032	0.00022	<0.00020	<0.00020	**0.0056 [A]**	0.0013	0.002
Barium	mg/L	2.0 [A]	2.0 [C]	0.034	0.020	<0.05	0.016	0.016	0.018	0.015	0.020	0.11	0.10	0.099	0.063	0.045	0.12	0.090	<0.05
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005
Boron	mg/L	1.0 [A]	5 [C]	0.098	0.14	0.14	0.12	0.13	0.14	0.13	0.12	0.027	<0.020	0.028	0.024	0.021	0.13	0.13	0.12
Cadmium	mg/L	$0.00037_{r3,e}$ [A]	0.007 [C]	<0.000020	0.000042	0.000052	<0.00002	<0.000020	<0.000020	0.000081	0.000057	<0.00002	0.000043	0.000045	0.000021	<0.000020	0.000033	<0.000020	0.000029
Calcium	mg/L	n/v	n/v	170	170	184	160	170	190	160	180	99	110	130	100	120	130	130	146
Chromium	mg/L	0.050 [A]	0.05 [C]	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005
Cobalt	mg/L	n/v	n/v	0.00087	<0.00030	<0.0009	0.00050	0.00034	0.00032	0.00044	0.00053	0.00036	0.00069	0.00066	0.00072	0.00042	0.0020	0.00079	<0.0009
Copper	mg/L	0.0070 [A]	≤1.0 [B]	<0.00020	0.00026	<0.0008	<0.0010	<0.0010	0.0019	0.0011	<0.0010	<0.0010	<0.0010	0.0020	<0.0010	<0.0010	<0.00020	0.0056	<0.0008
Iron	mg/L	0.30 [A]	≤0.3 [B]	0.11	<0.060	<0.1	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	**0.50 [AB]**	**0.91 [AB]**	<0.1
Lead	mg/L	$0.007_{r3,e}$ [A]	0.005_{ALARA} [C]	<0.00020	<0.00020	0.0003	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002
Lithium	mg/L	n/v	n/v	0.064	0.064	-	0.032	0.055	0.050	0.061	0.052	<0.020	<0.020	<0.020	0.023	<0.020	0.032	0.033	-
Magnesium	mg/L	n/v	n/v	54	58	59.3	66	60	70	66	64	34	41	54	48	46	53	45	48.6
Manganese	mg/L	0.020 [A]	≤0.02 [B]	**0.51 [AB]**	**0.27 [AB]**	**0.400 [AB]**	**0.46 [AB]**	**0.43 [AB]**	**0.47 [AB]**	**0.46 [AB]**	**0.39 [AB]**	**0.074 [AB]**	**0.26 [AB]**	**0.35 [AB]**	**0.41 [AB]**	**0.39 [AB]**	**0.75 [AB]**	**0.37 [AB]**	**0.368 [AB]**
Mercury	mg/L	0.0000050 [A]	0.001 [C]	<0.0000020	<0.0000019	**0.0000056 [A]**	<0.0000019	<0.0000019	<0.0000019	0.0000028	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000020	<0.0000019	**0.0000081 [A]**
Molybdenum	mg/L	n/v	n/v	0.0039	0.0032	0.003	0.0028	0.0023	0.0023	0.0027	0.0045	0.0076	0.0015	0.0010	0.0012	0.0010	0.0053	0.00052	<0.001
Nickel	mg/L	$0.17_{r3,e}$ [A]	n/v	0.0018	0.0014	<0.003	0.00080	0.0010	0.00088	0.0012	0.0010	0.0016	0.0025	0.0017	0.0014	0.00075	0.0053	0.00088	<0.003
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.08
Potassium	mg/L	n/v	n/v	7.1	6.7	6.8	6.6	6.8	7.8	6.7	7.2	7.6	5.2	5.6	4.8	4.7	6.5	4.5	5.0
Selenium	mg/L	0.0020 [A]	0.05 [C]	0.00023	0.00048	0.0010	<0.00020	0.00036	<0.00020	0.00035	0.00034	**0.0023 [A]**	<0.00020	0.00026	0.00020	<0.00020	<0.00020	<0.00020	0.0011
Silicon	mg/L	n/v	n/v	4.8	4.4	-	4.0	3.8	4.4	3.9	3.5	3.4	3.4	4.2	3.8	3.6	6.5	5.9	-
Silver	mg/L	0.00010 [A]	n/v	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00005
Sodium	mg/L	200 [A]	≤200 [B]	**310 [AB]**	**230 [AB]**	**252 [AB]**	**200 [B]**	**230 [AB]**	**250 [AB]**	**210 [AB]**	**230 [AB]**	40	44	50	42	45	59	40	53.2
Strontium	mg/L	n/v	7.0 [C]	2.4	3.1	-	2.9	3.0	3.2	3.0	3.0	0.44	0.72	0.75	0.70	0.70	1.1	1.3	-
Sulfur	mg/L	n/v	n/v	350	330	-	340	310	330	320	280	48	38	48	46	45	25	15	-
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0001
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	-	0.011	0.0064	0.0046	<0.0010	0.0048	0.0014	<0.0010	0.0011	0.0010	0.0016	<0.0010	<0.0010	-
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.002
Uranium	mg/L	0.010 [A]	0.02 [C]	0.0044	0.0026	0.003	0.0022	0.0019	0.0019	0.0022	0.0017	**0.011 [A]**	0.0031	0.0023	0.0022	0.0018	0.0052	0.0026	0.003
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-
Zinc	mg/L	0.030 [A]	≤5.0 [B]	<0.0030	0.016	<0.005	0.015	<0.0030	0.0032	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0030	<0.0030	<0.0030	<0.005
Metals, Total																			
Mercury	mg/L	0.0000050 [A]	0.001 [C]	***<0.0060 DB***	<0.0000019	**0.0000056 [A]**	<0.0000019	<0.0000019	<0.0000019	**0.000037 [A]**	**0.000054 DB [A]**	**0.000377 [A]**	**0.000206 [A]**	**0.000186 [A]**	0.0000022	**0.0000149 [A]**	***<0.02 DB***	**0.0000234 [A]**	**0.000013 [A]**
Phosphorus	mg/L	n/v	n/v	-	-	0.16	-	-	-	-	-	-	-	-	-	-	-	-	0.55
Microbiological Parameters																			
Escherichia coli (E.Coli)	mpn/100mL	n/v	0 [D]	***<10 DB***	***<1.0***	***<1***	***<1.0***	***<1.0***	***<1.0***	***<5.0 Z8***	***<2.0 MI***	***<1.0***	***<100 MI***	***<10 Z8***	***<2.0 Z8***	***<2.0 MI***	***<10 DB***	***<10 MI***	**1 [D]**
Fecal Coliforms	mpn/100mL	n/v	0 [D]	***<10 DB***	***<1.0***	**1 [D]**	**3.1 [D]**	***<1.0***	***<1.0***	***<5.0 Z8***	***<2.0 MI***	***<1.0***	***<100 MI***	***<10 Z8***	***<2.0 Z8***	***<2.0 MI***	***<10 DB***	***<10 MI***	**1 [D]**
Heterotrophic Plate Count	cfu/mL	n/v	n/v	>6000	510	3,800	1,200	780	5,500	1,000	-	2,000	640	32,000 Z8	790	-	20,000 DB	6,100 MI	2,660
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	-	-	-	>4800 MI	-	-	-	-	>2400	-	-	-
Total Coliforms	mpn/100mL	n/v	0 [D]	**2,000 DB [D]**	**1,200 [D]**	**488 [D]**	**460 [D]**	**180 [D]**	**140 [D]**	**10 Z8 [D]**	**4.0 MI [D]**	**3.1 [D]**	***<100 MI***	***<10 Z8***	**4.0 Z8 [D]**	***<2.0 MI***	**>2400 DB [D]**	***<10 MI***	**17 [D]**

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				RMW16-23-13					MW16-23-36			RMW16-23-32				
Sample Date				13-May-22	18-Nov-22	18-May-23	25-Oct-23	15-May-24	29-Sep-16	14-May-21	23-Nov-21	13-May-22	18-Nov-22	18-May-23	25-Oct-23	15-May-24
Sample ID				RMW16-23-13	RMW16-23-14	RMW16-23-14	RMW16-23-14	RMW 16-23-14	MW16-23-36	MW16-23-36	MW16-23-36	RMW 16-23-36(32)	RMW16-23-32	RMW16-23-32	RMW16-23-32	RMW 16-23-32
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	MAXX	BV	AGAT	BV	BV	BV	BV	BV
Laboratory Work Order				C232198	C291479	C335681	C386944	C435079	B685593	C132332	21C834079	C232198	C291479	C335681	C386944	C435079
Laboratory Sample ID				ASZ834	BHH853	BQS284	CCW512	CNR025	PQ3528	ZU4972	3244036	ASZ833	BHH854	BQS285	CCW513	CNR026
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ													
Field Parameters																
Dissolved Oxygen, Field	mg/L	n/v	n/v	4.73	4.2	3.6	1.2	1.2	-	13.11	2.8	3.6	6.1	4.9	1.8	1.8
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,257[A]**	**1,015[A]**	**1,064[A]**	**1,355[A]**	1.355	**1,256[A]**	**1,298[A]**	**1,281[A]**	**1,169[A]**	**1,166[A]**	**1,071[A]**	**1,224[A]**	1.083
Oxidation Reduction Potential, field	mV	n/v	n/v	81.2	-22.6	93.2	-254.2	-254.2	-	-72.6	-38.1	27.1	-23.8	78.2	-268.0	-57.7
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.49	7.18	7.55	7.35	7.35	7.3	7.64	7.71	7.71	7.79	7.68	7.90	7.82
Temperature, Field	deg C	n/v	≤15[B]	6.9	6.8	13.7	2.4	2.4	8.3	7.8	3.88	5.5	5.8	9.0	2.4	7.6
Calculated Parameters																
Anion Sum	meq/L	n/v	n/v	13	13	13	12	13	14	15	-	12	13	13	12	13
Cation Sum	meq/L	n/v	n/v	13	13	17	14	13	14	14	-	12	14	16	13	14
Hardness (as CaCO3)	mg/L	n/v	n/v	340	310	380	320	380	180	190	198	63	67	81	65	71
Ion Balance	%	n/v	n/v	1.1	0.83	13	7.0	-	0.99	1.8	112	1.3	2.7	10	1.0	-
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	1.7	-	-	-	-	-	-	-	2.7
Nitrate	mg/L	13_f[A]	45[C]	0.24	<0.044	<0.044	<0.044	<0.044	<0.044	<0.044	<0.5	0.051	0.056	<0.044	0.056	<0.044
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.054 AT	<0.010	<0.010	<0.010	<0.010	<0.020	<0.010	<0.02	0.012	0.013	<0.010	0.013	<0.010
Nitrite	mg/L	$1.97_{n4,e,q}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.05	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**750[AB]**	**740[AB]**	**810[AB]**	**750[AB]**	**730[AB]**	**850[AB]**	**900[AB]**	**858[AB]**	**660[AB]**	**750[AB]**	**780[AB]**	**700[AB]**	**730[AB]**
BTEX and Petroleum Hydrocarbons																
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00080	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics																
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	2.5	1.9	1.4	1.4	1.3	2.9	2.3	4	1.7	1.1	1.3	1.1	1.5
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,200[A]**	**1,200[A]**	**1,200[A]**	**1,100[A]**	**1,100[A]**	**1,300[A]**	**1,400[A]**	**1,380[A]**	**1,200[A]**	**1,200[A]**	**1,200[A]**	**1,200[A]**	**1,200[A]**
Sediment	none	n/v	n/v	-	-	-	-	-	-	-	NotPresent	-	-	-	-	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.97	7.85	8.00	8.03	8.14	8.22	8.16	8.33	8.37	8.27	8.26	8.28	8.40
Anions																
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5	4.5	<1.0	<1.0	<1.0	3.9
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	390	370	370	350	380	290	300	314	480	530	530	510	540
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	480	460	450	430	460	350	370	386	570	640	650	620	650
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5	5.4	<1.0	<1.0	<1.0	4.7
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	≤500[B]	240	240	240	230	220	380 CD	410 CD	339	110	120	100	110	100
Chloride	mg/L	100[A]	≤250[B]	16	15	13	17	24	3.2	2.2	3.1	<1.0	<1.0	<1.0	<1.0	<1.0
Nutrients																
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	0.0048	<0.0030	<0.0030	<0.0030	0.0040 OG	0.0043	<0.15	0.0076	0.0094	0.0070	0.0074	0.0074
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.24	0.45	0.56	0.66	0.48	0.83	1.1	1.11	0.80	0.75	0.72	0.76	0.81
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.054	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.02	0.012	0.013	<0.010	0.013	<0.010
Phosphorus, Dissolved	mg/L	n/v	n/v	-	<0.0030	<0.0030	<0.0030	<0.0030	-	-	-	-	0.0051	0.0044 P2	0.0033 P2	0.0061 P2
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	<0.0030	-	-	-	-	0.013	0.016	-	0.0078	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.37	0.751	0.571	0.611	0.769	1.3	1.86	4.3	0.989	0.927	0.759	0.809	0.880
Nitrogen	mg/L	n/v	n/v	0.42 DB	0.75	0.57	0.61 NNA	0.77	-	1.9 DB	-	1.0	0.94	0.76	0.82	0.88

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				RMW16-23-13					MW16-23-36			RMW16-23-32				
Sample Date				13-May-22	18-Nov-22	18-May-23	25-Oct-23	15-May-24	29-Sep-16	14-May-21	23-Nov-21	13-May-22	18-Nov-22	18-May-23	25-Oct-23	15-May-24
Sample ID				RMW16-23-13	RMW16-23-14	RMW16-23-14	RMW16-23-14	RMW 16-23-14	MW16-23-36	MW16-23-36	MW16-23-36	RMW 16-23-36(32)	RMW16-23-32	RMW16-23-32	RMW16-23-32	RMW 16-23-32
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	MAXX	BV	AGAT	BV	BV	BV	BV	BV
Laboratory Work Order				C232198	C291479	C335681	C386944	C435079	B685593	C132332	21C834079	C232198	C291479	C335681	C386944	C435079
Laboratory Sample ID				ASZ834	BHH853	BQS284	CCW512	CNR025	PQ3528	ZU4972	3244036	ASZ833	BHH854	BQS285	CCW513	CNR026
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ													
Metals, Dissolved																
Aluminum	mg/L	$0.05_{rn1,e}$[A]	0.1_{a}[B]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0074	<0.0030	0.004	0.0033	<0.0030	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	0.00061	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.001	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	0.00021	<0.00020	<0.00020	<0.00020	<0.00020	0.00035	0.00029	0.002	0.00056	0.00046	0.00054	0.00052	0.00046
Barium	mg/L	2.0[A]	2.0[C]	0.030	0.021	0.020	0.017	0.016	0.030	0.053	<0.05	0.019	0.020	0.022	0.017	0.020
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.070	0.054	0.080	0.064	0.060	0.086	0.095	0.09	0.087	0.080	0.090	0.074	0.083
Cadmium	mg/L	$0.00037_{r3,e}$[A]	0.007[C]	0.000030	0.000042	0.00003	0.000020	<0.000020	<0.000020	<0.000020	0.000017	<0.00002	<0.000020	<0.000020	<0.000020	<0.000020
Calcium	mg/L	n/v	n/v	79	76	90	82	93	50	51	54.4	17	18	21	16	19
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.00047	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0009	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.0010	<0.0010	0.0019	<0.0010	<0.0010	<0.00020	0.00025	<0.0008	<0.0010	<0.0010	0.0019	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	**0.77**[AB]	<0.1	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	$0.007_{r3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.030	0.033	0.042	0.041	0.034	0.066	0.075	-	0.037	0.051	0.050	0.055	0.063
Magnesium	mg/L	n/v	n/v	35	30	37	29	37	14	15	15.2	5.1	5.6	6.8	5.9	5.8
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.42**[AB]	**0.21**[AB]	**0.20**[AB]	**0.17**[AB]	**0.12**[AB]	**0.083**[AB]	**0.10**[AB]	**0.073**[AB]	**0.027**[AB]	**0.028**[AB]	**0.031**[AB]	**0.022**[AB]	**0.021**[AB]
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000020	<0.0000019	<0.0000025	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0066	0.0014	0.0012	0.0014	0.0011	0.0023	0.0023	0.005	0.0022	0.0021	0.0020	0.0022	0.0017
Nickel	mg/L	$0.17_{r3,e}$[A]	n/v	0.00085	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.003	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.08	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	4.9	4.3	5.5	4.8	4.5	4.2	4.0	4.3	2.5	2.6	3.2	2.3	2.8
Selenium	mg/L	0.0020[A]	0.05[C]	0.00039	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0020	0.00029	<0.00020	<0.00020	<0.00020	<0.00020
Silicon	mg/L	n/v	n/v	4.2	3.6	4.8	4.3	4.2	3.8	3.8	-	3.5	3.2	3.9	3.4	3.4
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	140	150	**200**[B]	170	120	**230**[AB]	**230**[AB]	**252**[AB]	**240**[AB]	**280**[AB]	**320**[AB]	**260**[AB]	**280**[AB]
Strontium	mg/L	n/v	7.0[C]	0.55	0.83	0.93	1.0	0.96	0.77	0.83	-	0.29	0.33	0.36	0.32	0.33
Sulfur	mg/L	n/v	n/v	79	62	76	77	72	120	140	-	38	36	38	38	37
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0023	0.00050	0.00033	0.00028	0.00044	0.00010	<0.00010	<0.001	0.00024	0.00020	0.00018	0.00017	0.00014
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.005	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Metals, Total																
Mercury	mg/L	0.0000050[A]	0.001[C]	**0.0000211**[A]	<0.0000019	<0.0000019	<0.0000019	<0.0000019	***<0.00020 DB***	**0.0000699**[A]	**0.000025**[A]	0.0000024	<0.0000019	<0.0000019	0.0000023	<0.0000019
Phosphorus	mg/L	n/v	n/v	-	-	-	-	-	-	-	2.01	-	-	-	-	-
Microbiological Parameters																
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	**11**[D]	***<20 MI***	***<1***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	**5.1**[D]	***<20 MI***	***<1***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	35	1,200	780	110	-	400	1,100 MI	2,450	110	760	87	2.0	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	330	-	-	-	-	-	-	-	11
Total Coliforms	mpn/100mL	n/v	0[D]	**8.6**[D]	**9.7**[D]	**1.0**[D]	***<1.0***	***<1.0***	**520**[D]	***<20 MI***	**81**[D]	**20**[D]	***<1.0***	***<1.0***	***<1.0***	***<1.0***

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW21-3-15					MW21-6-7						MW21-6-12			
Sample Date				4-May-22	16-Nov-22	16-May-23	26-Oct-23	16-May-24	22-Nov-21	5-May-22	15-Nov-22	17-May-23	26-Oct-23	16-May-24	22-Nov-21	5-May-22	15-Nov-22	17-May-23
Sample ID				MW21-3b	MW21-3-15	MW21-3-15	MW21-3-15	MW21-3-15	MW21-6a	MW21-6a	MW21-6-7	MW21-6-7	MW21-6-7	MW21-6-7	MW21-6b	MW21-6b	MW21-6-12	MW21-6-12
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	AGAT	BV	BV	BV	BV	BV	AGAT	BV	BV	BV
Laboratory Work Order				C229742	C290717	C334712	C387360	C435132	21C833752	C230164	C290290	C335152	C387360	C435132	21C833752	C230164	C290290	C335152
Laboratory Sample ID				ASN084	BHD545	BQN669	CCY431	CNR326	3240635	ASP028	BHB169	BQP598	CCY430	CNR324	3240636	ASP030	BHB170	BQP599
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ															
Field Parameters																		
Dissolved Oxygen, Field	mg/L	n/v	n/v	4.76	8.0	12.0	3.4	5.3	17.92	3.55	4.0	7.7	4.6	5.6	7.91	2.24	5.9	6.9
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,145[A]**	**1,272[A]**	**1,115[A]**	**1,211[A]**	1,135	**1,306[A]**	**1,427[A]**	**1,367[A]**	**1,301[A]**	**1,440[A]**	1,446	**1,425[A]**	**1,592[A]**	**1,479[A]**	**1,409[A]**
Oxidation Reduction Potential, field	mV	n/v	n/v	88.2	-35.8	190.4	205.3	-14.7	41.5	7.8	-49.6	150.9	64.7	13.1	69	-53.6	-50.6	81.3
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.56	**8.60[A]**	7.90	8.47	8.13	7.4	7	7.19	7.40	7.16	7.07	7.83	7.01	7.36	7.23
Temperature, Field	deg C	n/v	≤15[B]	8.4	0.7	9.3	6.1	6.2	7.36	9	5.8	7.6	6.6	5.5	5.99	12.1	5.9	10.2
Calculated Parameters																		
Anion Sum	meq/L	n/v	n/v	21	15	14	14	14	-	15	16	16	15	16	-	16	17	17
Cation Sum	meq/L	n/v	n/v	13	13	15	16	15	-	19	17	16	22	20	-	20	18	17
Hardness (as CaCO3)	mg/L	n/v	n/v	22	23	16	16	43	351	390	320	320	460	410	336	380	350	340
Ion Balance	%	n/v	n/v	22	6.8	4.7	7.3	-	110	12	1.8	1.6	17	-	106	10	2.5	0.84
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	3.5	-	-	-	-	-	9.5	-	-	-	-
Nitrate	mg/L	13_f[A]	45[C]	0.062	0.050	0.045	<0.044	0.31	<0.5	<0.044	0.17	<0.044	0.056	0.42	<1.0	<0.044	<0.044	<0.044
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.014	0.011	0.010	<0.010	0.13	<0.02	<0.010	0.039	<0.010	0.013	0.094	<0.02	<0.010	<0.010	<0.010
Nitrite	mg/L	$1.97_{pt4.e,q}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	0.22	<0.05	<0.033	<0.033	<0.033	<0.033	<0.033	<0.05	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**990[AB]**	**820[AB]**	**820[AB]**	**840[AB]**	**830[AB]**	**957[AB]**	**950[AB]**	**940[AB]**	**910[AB]**	**1,000[AB]**	**1,000[AB]**	**968[AB]**	**980[AB]**	**1,000[AB]**	**960[AB]**
BTEX and Petroleum Hydrocarbons																		
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
Miscellaneous Inorganics																		
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	5.6	2.7	2.0	1.9	2.5 PRH	14	3.5	3.8	4.1	3.4	2.9 PRH	8	2.5	2.5	3.3
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,100[A]**	**1,200[A]**	**1,200[A]**	**1,300[A]**	**1,300[A]**	**1,480[A]**	**1,400[A]**	**1,400[A]**	**1,400[A]**	**1,400[A]**	**1,600[A]**	**1,510[A]**	**1,500[A]**	**1,600[A]**	**1,500[A]**
Sediment	none	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	**8.59[A]**	8.43	8.45	**8.66[A]**	**8.51[A]**	8.13	7.83	7.67	7.48	8.16	8.15	8.07	7.91	7.68	7.54
Anions																		
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	13	5.5	9.5	23	18	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	910	610	540	500	530	549	500	550	550	460	470	537	480	530	540
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	1,100	740	630	560	610	684	610	670	670	570	570	669	590	640	660
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	16	6.6	11	28	21	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5.e}$[A]	≤500[B]	130	150	150	170	160	223	230	230	220	250	260	221	240	230	220
Chloride	mg/L	100[A]	≤250[B]	3.7	<1.0	1.9	1.4	<1.0	19.0	18	27	25	32	48	44.7	48	74	66
Nutrients																		
Nitrite (as N)	mg/L	$0.6_{pt4.e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	0.065	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	0.12	0.029	0.016	0.026	0.041	<0.15	<0.0030	0.0042	<0.0030	0.0034	<0.0030	<0.15	<0.0030	<0.0030	<0.0030
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.90	0.51	0.33	0.33	0.48	0.12	0.036	0.024	0.045	0.061	0.039	0.23	0.19	0.18	0.16
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.014	0.011	0.010	<0.010	0.069	<0.02	<0.010	0.039	<0.010	0.013	0.094	<0.02	<0.010	<0.010	<0.010
Phosphorus, Dissolved	mg/L	n/v	n/v	-	0.044	0.018	0.027	0.021 PRH	-	-	0.032	3.0 DB	<0.0030	<0.0030 PRH	-	-	0.12 DB	<0.0030
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	0.13	-	-	-	-	-	0.010	-	-	-	-	-	<0.0030	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	14.4	<1.0	0.66	<0.40	0.95	166	4.7	1.15	2.02	8.2	1.16	1.4	0.47	0.690	0.315
Nitrogen	mg/L	n/v	n/v	14 DB	<1.0 DB	0.67 DB	<0.40 DB NNA	1.1	-	4.7 DB	1.2 DB	2.0	8.2	1.3	-	0.47 DB	0.69	0.31

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Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW21-3-15					MW21-6-7						MW21-6-12			
Sample Date				4-May-22	16-Nov-22	16-May-23	26-Oct-23	16-May-24	22-Nov-21	5-May-22	15-Nov-22	17-May-23	26-Oct-23	16-May-24	22-Nov-21	5-May-22	15-Nov-22	17-May-23
Sample ID				MW21-3b	MW21-3-15	MW21-3-15	MW21-3-15	MW21-3-15	MW21-6a	MW21-6a	MW21-6-7	MW21-6-7	MW21-6-7	MW21-6-7	MW21-6b	MW21-6b	MW21-6-12	MW21-6-12
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	AGAT	BV	BV	BV	BV	BV	AGAT	BV	BV	BV
Laboratory Work Order				C229742	C290717	C334712	C387360	C435132	21C833752	C230164	C290290	C335152	C387360	C435132	21C833752	C230164	C290290	C335152
Laboratory Sample ID				ASN084	BHD545	BQN669	CCY431	CNR326	3240635	ASP028	BHB169	BQP598	CCY430	CNR324	3240636	ASP030	BHB170	BQP599
Location Description				Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ															
Metals, Dissolved																		
Aluminum	mg/L	0.05$_{rn1,e}$[A]	0.1$_{a}$[B]	**3.9**[AB]	0.022	0.0076	**0.22**[AB]	**1.1**[AB]	0.009	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.005	<0.0030	<0.0030	0.0063
Antimony	mg/L	0.0060[A]	0.006[C]	0.0016	0.00081	<0.00060	<0.00060	***<0.012***	<0.001	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.001	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010$_{ALARA}$[C]	**0.0065**[A]	0.0014	0.0013	0.0019	<0.0040	0.001	0.00023	0.00023	0.00028	0.00021	<0.00020	0.001	0.00072	0.00083	0.00090
Barium	mg/L	2.0[A]	2.0[C]	0.041	0.060	0.020	0.021	0.19	<0.05	0.025	0.021	0.021	0.027	0.025	<0.05	0.015	0.014	0.013
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.020	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.19	0.19	0.22	0.22	0.20	0.19	0.20	0.19	0.19	0.21	0.19	0.21	0.23	0.20	0.21
Cadmium	mg/L	0.00037$_{r3,e}$[A]	0.007[C]	0.000029	<0.000020	<0.000020	<0.000020	<0.00040	0.000037	0.000023	<0.000020	0.000033	0.000032	0.000021	0.000077	<0.00002	<0.000020	0.000029
Calcium	mg/L	n/v	n/v	6.6	6.8	5.4	5.8	17	91.2	100	86	84	120	110	88.7	98	91	87
Chromium	mg/L	0.050[A]	0.05[C]	0.0036	<0.0010	<0.0010	<0.0010	<0.020	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.0010	<0.00030	<0.00030	<0.00030	<0.0060	<0.0009	0.00037	0.00058	0.00055	0.00053	<0.00030	<0.0009	0.00058	0.00054	0.00063
Copper	mg/L	0.0070[A]	≤1.0[B]	**0.0080**[A]	0.0025	**0.0074**[A]	0.0013	***<0.020***	<0.0008	<0.0010	<0.0010	0.0014	<0.0010	<0.0010	0.0012	<0.0010	0.0010	0.0017
Iron	mg/L	0.30[A]	≤0.3[B]	**0.95**[AB]	**3.5**[AB]	<0.060	0.13	**0.70**[AB]	<0.1	<0.060	<0.060	<0.060	<0.060	<0.060	<0.1	<0.060	<0.060	<0.060
Lead	mg/L	0.007$_{r3,e}$[A]	0.005$_{ALARA}$[C]	0.0016	<0.00020	<0.00020	<0.00020	0.0044	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	<0.020	0.027	0.029	0.038	<0.20	-	0.032	0.034	0.032	0.046	0.037	-	0.045	0.048	0.050
Magnesium	mg/L	n/v	n/v	1.4	1.5	0.53	0.48	<2.0	30.0	34	26	27	38	32	27.7	33	29	29
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.034**[AB]	0.015	<0.0040	0.0041	**0.12**[AB]	0.009	**0.17**[AB]	**0.18**[AB]	**0.20**[AB]	**0.22**[AB]	0.0079	**0.149**[AB]	**0.18**[AB]	**0.099**[AB]	**0.097**[AB]
Mercury	mg/L	0.0000050[A]	0.001[C]	0.000002	<0.0000019	<0.0000019	0.0000024	<0.0000019	**0.0000054**[A]	<0.0000019	<0.0000019	<0.0000019	0.0000021	<0.0000019	***<0.0000125***	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.023	0.0044	0.0016	0.0026	<0.0040	0.002	0.0016	0.0011	0.0017 NH	0.0012	0.0019	0.002	0.0012	0.0011	0.0017
Nickel	mg/L	0.17$_{r3,e}$[A]	n/v	0.0067	<0.00050	0.00059	0.00080	<0.010	<0.003	0.0019	0.0018	0.0023	0.0024	0.0011	0.005	0.0016	0.0021	0.0029
Phosphorus	mg/L	n/v	n/v	0.11	<0.10	<0.10	<0.10	<1.0	<0.14	<0.10	<0.10	<0.10	<0.10	<0.10	<0.08	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	1.2	1.5	0.63	0.73	<3.0	6.2	5.2	4.3	4.1	5.5	4.7	4.3	5.1	4.7	4.3
Selenium	mg/L	0.0020[A]	0.05[C]	**0.0022**[A]	0.00068	0.00056	0.00041	***<0.0040***	<0.0005	0.00023	<0.00020	<0.00020	<0.00020	0.00037	<0.0005	<0.00020	<0.00020	<0.00020
Silicon	mg/L	n/v	n/v	4.5	9.6	4.2	4.2	<5.0	-	4.9	4.3	4.6	5.3	4.4	-	4.5	3.9	4.3
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	***<0.0020***	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	**300**[AB]	**290**[AB]	**340**[AB]	**360**[AB]	**330**[AB]	**251**[AB]	**260**[AB]	**240**[AB]	**220**[AB]	**280**[AB]	**260**[AB]	**253**[AB]	**270**[AB]	**260**[AB]	**230**[AB]
Strontium	mg/L	n/v	7.0[C]	0.053	0.076	0.059	0.066	<0.20	-	1.0	0.89	0.90	1.2	1.2	-	1.8	1.6	1.5
Sulfur	mg/L	n/v	n/v	46	44	54	60	49	-	72	66	75	88	81	-	73	65	75
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.0040	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.020	-	<0.0010	<0.0010	<0.0010	0.0017	<0.0010	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	0.15	0.0045	<0.0010	0.0078	<0.020	0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.001	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0072	0.0012	0.00049	0.00078	<0.0020	0.008	0.0070	0.0073	0.0077	0.0081	0.0073	0.004	0.0043	0.0053	0.0062
Vanadium	mg/L	n/v	n/v	0.011	0.0013	0.0025	0.0018	<0.020	-	0.0014	<0.0010	<0.0010	<0.0010	<0.0010	-	0.0014	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	0.0065	<0.0030	<0.0030	<0.0030	**1.1**[A]	<0.005	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.005	<0.0030	0.0039	<0.0030
Metals, Total																		
Mercury	mg/L	0.0000050[A]	0.001[C]	**0.00446**[AC]	**0.00176**[AC]	**0.0000333**[A]	**0.0000334**[A]	**0.000216 DB**[A]	**0.000060**[A]	**0.00169**[AC]	**0.000731**[A]	**0.00093**[A]	**0.000375**[A]	**0.00075 DB**[A]	**0.000010**[A]	**0.0000122**[A]	**0.00002**[A]	**0.0000217**[A]
Phosphorus	mg/L	n/v	n/v	-	-	-	-	-	10.3	-	-	-	-	-	0.50	-	-	-
Microbiological Parameters																		
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<100 AT***	***<100***	***<10 Z8***	***<10 Z8***	***<100 MI***	**4**[D]	***<10***	***<100 MI***	***<10 Z8***	***<100 Z8***	***<100 MI***	***<1***	**10**[D]	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<100 AT***	***<100 MI***	***<10 Z8***	***<10 Z8***	***<100 MI***	**9**[D]	***<100***	***<100 MI***	***<10 Z8***	***<100 Z8***	***<100 MI***	***<1***	***<10***	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	100,000 DVM	>6000	540 Z8	>6000	-	73,000	1,200	1,600	170	1,100	-	5,650	210	970	130
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	>24000 MI	-	-	-	-	-	>24000 SVH	-	-	-	-
Total Coliforms	mpn/100mL	n/v	0[D]	***<100 AT***	**980**[D]	***<10 Z8***	***<10 Z8***	***<100 MI***	**830**[D]	**30**[D]	***<100 MI***	***<10 Z8***	***<100 Z8***	***<100 MI***	**548**[D]	**10**[D]	***<1.0***	***<1.0***

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Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW21-6-12 (Continued)		MW16-3-7							MW16-4-16	MW16-4-22					
Sample Date				26-Oct-23	16-May-24	28-Sep-16	12-May-21	24-Nov-21	4-May-22	15-May-23	23-Oct-23	14-May-24	4-Oct-16	4-Oct-16	12-May-21	24-Nov-21	4-May-22	21-Nov-22	19-May-23
Sample ID				MW21-6-12	MW21-6-12	MW16-3-7	MW16-3-7	MW16-3-7	MW16-3-7	MW16-3-7	MW16-3-7	MW16-3-7	MW16-4-16	MW16-4-20	MW16-4-22	MW16-4-22	MW16-4-22	MW16-4-22	MW16-4-22
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	MAXX	BV	AGAT	BV	BV	BV	BV	MAXX	MAXX	BV	AGAT	BV	BV	BV
Laboratory Work Order				C387360	C435132	B685112	C131657	21C834850	C229742	C334367	C386148	C434263	B687243	B687243	C131657	21C834850	C229742	C291884	C335907
Laboratory Sample ID				CCY429	CNR325	PQ0282	ZU0434	3249830	ASN087	BQM165	CCP848	CNN525	PR5506	PR5501	ZU0433	3249832	ASN089	BHL365	BQT301
Location Description				Tier 2	Tier 2	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well
Lithology				Bedrock	Bedrock	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated		Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ																
Field Parameters																			
Dissolved Oxygen, Field	mg/L	n/v	n/v	3.9	7.2	-	8.41	6.99	4.05	10.5	3.0	23.4	-	-	6.51	3.59	2.73	10.4	2.0
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,413[A]**	1.486	**2,410[A]**	**1,307[A]**	**1,845[A]**	**2,566[A]**	**2,481[A]**	**2,549[A]**	1.487	-	**3,550[A]**	**2,857[A]**	**4,143[A]**	**4,362[A]**	**4,085[A]**	**3,934[A]**
Oxidation Reduction Potential, field	mV	n/v	n/v	73.8	-29.8	-	51.9	104.4	85.6	215.8	37.5	28.9	-	-	11.9	37.2	-28.7	-22.8	-75.0
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.07	7.47	7.3	7.30	7.1	**6.64[B]**	7.34	7.27	7.74	-	7.2	**6.75[B]**	**6.88[B]**	**6.33[AB]**	**6.99[B]**	7.04
Temperature, Field	deg C	n/v	≤15[B]	6.5	6.2	9.4	8.4	7.46	10.4	13.9	3.38	5.8	-	6.2	8.5	5.38	14.7	4.2	**17.9[B]**
Calculated Parameters																			
Anion Sum	meq/L	n/v	n/v	15	18	32	29	-	33	33	29	16	55	54	61	-	60	61	56
Cation Sum	meq/L	n/v	n/v	21	20	33	28	-	35	32	30	18	51	50	57	-	59	55	62
Hardness (as CaCO3)	mg/L	n/v	n/v	410	410	950	770	823	1,000	910	820	490	1,700	1,700	1,900	1,660	2,000	1,800	2,100
Ion Balance	%	n/v	n/v	15	-	1.0	2.6	120	2.4	1.0	1.6	-	0.94	0.94	3.4	94	1.1	4.8	5.3
Ion Balance % Difference	%	n/v	n/v	-	6.3	-	-	-	-	-	-	5.9	-	-	-	-	-	-	-
Nitrate	mg/L	13_{f}[A]	45[C]	<0.044	0.074	1.3	1.1	0.8	<0.22	1.0	<0.22	6.2	0.045	<0.044	<0.22	<0.5	<0.22	<0.044	<0.22
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.010	0.017	0.30	0.26	0.18	<0.050 DB	0.23	<0.050 Z8	1.4	<0.020	<0.020	<0.050 MI	<0.02	<0.050 DB	<0.010	<0.050 Z8
Nitrite	mg/L	$1.97_{pt4.e,\ q}$[A]	3[C]	<0.033	<0.033	0.051	<0.033	<0.05	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.10	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**990[AB]**	**1,100[AB]**	**2,000[AB]**	**1,800[AB]**	**1,550[AB]**	**2,000[AB]**	**2,000[AB]**	**1,800[AB]**	**940[AB]**	**3,400[AB]**	**3,400[AB]**	**3,800[AB]**	**3,600[AB]**	**3,800[AB]**	**3,800[AB]**	**3,700[AB]**
BTEX and Petroleum Hydrocarbons																			
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00080	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00080	<0.00080	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
Miscellaneous Inorganics																			
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	2.6	2.5 PRH	8.0	5.1	6.396	3.7	2.8	2.1	3.0	5.2	5.1	6.5	5.386	5.6	6.1	8.6
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,400[A]**	**1,600[A]**	**2,600[A]**	**2,400[A]**	**2,140[A]**	**2,500[A]**	**2,700[A]**	**2,400[A]**	**1,700[A]**	**4,000[A]**	**4,000[A]**	**4,200[A]**	**4,310[A]**	**4,300[A]**	**4,100[A]**	**4,300[A]**
Sediment	none	n/v	n/v	-	-	-	-	NotPresent	-	-	-	-	-	-	-	NotPresent	-	-	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.25	7.96	8.16	7.48	8.07	7.81	7.86	8.06	7.98	7.45	7.52	7.37	7.79	7.64	7.48	7.71
Anions																			
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<1.0	<5	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	440	530	450	420	387	470	440	370	190	460	460	470	448	490	470	470
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	540	650	550	510	472	570	540	460	240	560	570	580	547	590	580	580
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<1.0	<5	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<1.0	<5	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{rt5.e}$[A]	≤500[B]	240	270	**1,100 CD[AB]**	**910 CD[AB]**	**710[AB]**	**1,100[AB]**	**1,000[AB]**	**1,000[AB]**	180	**2,200 CD[AB]**	**2,100 CD[AB]**	**2,500 CD[AB]**	**2,320[AB]**	**2,400[AB]**	**2,500[AB]**	**2,200[AB]**
Chloride	mg/L	100[A]	≤250[B]	52	61	12	62	63.7	41	79	37	**290[AB]**	3.0	3.0	2.1	<1.0	1.1	<1.0	<1.0
Nutrients																			
Nitrite (as N)	mg/L	$0.6_{pt4.e}$[A]	1[C]	<0.010	<0.010	0.016	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	0.0043	0.0099 OG	0.013	<0.15	0.0046	0.0077	0.0092	0.0086	<0.0030	<0.0030	<0.0030	<0.15	<0.0030	<0.0030	<0.0030
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.13	0.13	0.20	0.073	0.05	0.051	0.030	0.025	0.019	1.0	0.96	0.97	0.93	1.0	1.0	1.0
Nitrate (as N)	mg/L	3.0[A]	10[C]	<0.010	0.017	0.29	0.26	0.18	<0.050	0.23	<0.050	1.4	0.010	<0.010	<0.050	<0.02	<0.050	<0.010	<0.050
Phosphorus, Dissolved	mg/L	n/v	n/v	<0.0030	<0.0030 PRH P2	-	-	-	-	0.0060 P2	0.0061 P2	0.0081 P2	-	-	-	-	-	<0.0030	<0.0030
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	-	-	0.0067	0.021	-	0.0089	-	-	-	<0.0030	<0.0030 MA	0.017	-	0.0041	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.243	0.291	1.7 DB	1.11	2.0	0.72	1.05	0.450	0.97	1.1	1.1	1.46	2.8	1.57	<2.0	1.43
Nitrogen	mg/L	n/v	n/v	0.24	0.31	-	1.4 DB	-	0.72 DB	1.3 DB	0.450	2.4	-	-	1.5 DB	-	1.6 DB	<2.0 DB	1.4

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW21-6-12 (Continued)		MW16-3-7							MW16-4-16	MW16-4-22					
Sample Date				26-Oct-23	16-May-24	28-Sep-16	12-May-21	24-Nov-21	4-May-22	15-May-23	23-Oct-23	14-May-24	4-Oct-16	4-Oct-16	12-May-21	24-Nov-21	4-May-22	21-Nov-22	19-May-23
Sample ID				MW21-6-12	MW21-6-12	MW16-3-7	MW16-3-7	MW16-3-7	MW16-3-7	MW16-3-7	MW16-3-7	MW16-3-7	MW16-4-16	MW16-4-20	MW16-4-22	MW16-4-22	MW16-4-22	MW16-4-22	MW16-4-22
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	MAXX	BV	AGAT	BV	BV	BV	BV	MAXX	MAXX	BV	AGAT	BV	BV	BV
Laboratory Work Order				C387360	C435132	B685112	C131657	21C834850	C229742	C334367	C386148	C434263	B687243	B687243	C131657	21C834850	C229742	C291884	C335907
Laboratory Sample ID				CCY429	CNR325	PQ0282	ZU0434	3249830	ASN087	BQM165	CCP848	CNN525	PR5506	PR5501	ZU0433	3249832	ASN089	BHL365	BQT301
Location Description				Tier 2	Tier 2	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well
Lithology				Bedrock	Bedrock	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated		Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	**Units**	**2022 AEPA Tier 1**	**GCDWQ**																
Metals, Dissolved																			
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_{a}[B]	<0.0030	<0.0030	0.0064	<0.0030	0.045	0.0089	<0.0030	0.0059	<0.0030	<0.0030	<0.0030	**0.14**[AB]	0.005	<0.0030	<0.0030	0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	<0.001	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.001	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	0.00059	0.00065	0.00078	<0.00020	<0.001	0.00045	0.00038	0.00039	0.00030	0.0019	0.0017	0.0020	0.001	0.00075	0.00099	0.0016
Barium	mg/L	2.0[A]	2.0[C]	0.016	0.014	0.035	0.025	<0.05	0.025	0.022	0.016	0.056	<0.010	<0.010	<0.010	<0.05	<0.010	<0.010	<0.010
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.23	0.21	0.10	0.088	0.08	0.10	0.096	0.10	0.031	0.11	0.11	0.12	0.12	0.13	0.097	0.12
Cadmium	mg/L	$0.00037_{r3,e}$[A]	0.007[C]	0.000034	<0.000020	0.000036	0.000020	0.000058	0.000054	0.000074	0.000081	0.000044	<0.000020	<0.000020	<0.000020	<0.000016	0.000026	0.000054	<0.000020
Calcium	mg/L	n/v	n/v	110	110	170	140	130	160	160	130	97	380	380	440	340	450	420	480
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	0.0018	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.00044	0.00030	0.0023	0.00087	<0.0009	0.00063	0.00064	0.00078	<0.00030	0.00031	0.00034	0.00055	0.0013	0.00033	0.00044	0.00035
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.0010	<0.0010	0.00085	0.00029	0.0042	<0.0010	0.0010	<0.0010	0.0012	<0.00020	<0.00020	0.00026	<0.0008	<0.0010	<0.0010	0.0016
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	0.17	<0.060	<0.1	<0.060	<0.060	<0.060	<0.060	**2.2**[AB]	**2.2**[AB]	**3.1**[AB]	**1.7**[AB]	<0.060	0.18	**1.4**[AB]
Lead	mg/L	$0.007_{r3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	<0.00020	<0.00020	0.0012	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.056	0.051	0.057	0.041	-	0.055	0.055	0.053	0.026	0.074	0.070	0.082	-	0.078	0.073	0.098
Magnesium	mg/L	n/v	n/v	35	34	130	110	121	150	130	120	59	180	180	200	197	210	190	230
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.084**[AB]	**0.076**[AB]	**0.39**[AB]	**0.26**[AB]	**0.201**[AB]	**0.23**[AB]	**0.24**[AB]	0.012	**0.020**[B]	**0.60**[AB]	**0.60**[AB]	**0.90**[AB]	**0.803**[AB]	**0.78**[AB]	**0.74**[AB]	**0.84**[AB]
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000020	<0.0000019	<0.0000025	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000020	<0.0000020	<0.0000019	<0.0000025	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0010	0.0019	0.0020	0.0011	0.002	0.0011	0.00089	0.0011	0.0018	0.0015	0.0016	0.00090	0.004	0.00095	0.0012	0.00075
Nickel	mg/L	$0.17_{r3,e}$[A]	n/v	0.0019	0.0014	0.0065	0.0028	0.005	0.0030	0.0025	0.0026	0.0016	<0.00050	<0.00050	0.0013	0.004	0.00083	0.0013	0.00091
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.08	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.08	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	5.1	4.9	6.1	4.1	4.7	4.8	4.4	4.7	3.9	8.5	8.2	8.5	8.9	9.4	8.7	9.7
Selenium	mg/L	0.0020[A]	0.05[C]	<0.00020	<0.00020	0.00026	<0.00020	<0.0005	<0.00020	<0.00020	0.00024	0.00043	<0.00020	<0.00020	<0.00020	0.0011	<0.00020	<0.00020	<0.00020
Silicon	mg/L	n/v	n/v	4.9	4.4	5.1	4.2	-	4.9	4.4	4.1	2.9	4.4	4.3	5.4	-	4.8	4.2	5.0
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00005	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	**280**[AB]	**280**[AB]	**320**[AB]	**280**[AB]	**289**[AB]	**330**[AB]	**320**[AB]	**320**[AB]	190	**390**[AB]	**370**[AB]	**400**[AB]	**466**[AB]	**430**[AB]	**420**[AB]	**450**[AB]
Strontium	mg/L	n/v	7.0[C]	1.7	1.7	1.6	1.5	-	1.7	1.8	1.5	0.86	5.9 CD	6.0 CD	6.1 CD	-	6.7	6.6	6.7
Sulfur	mg/L	n/v	n/v	89	89	370	300	-	380	340	300	67	720 CD	730 CD	690 CD	-	850	750	790
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0001	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	0.002	0.0027	<0.0010	0.0018	<0.0010	<0.0010	<0.0010	0.0029	0.002	0.0011	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0064	0.0070	**0.014**[A]	**0.012**[A]	**0.012**[A]	**0.014**[A]	**0.014**[A]	**0.012**[A]	0.0043	0.0022	0.0023	0.0023	0.002	0.0022	0.0022	0.0023
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	-	0.0013	0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	<0.0030	<0.0030	0.007	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.005	<0.0030	0.0049	<0.0030
Metals, Total																			
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	0.0000020	***<0.0060 DB***	**0.00117 DB**[AC]	**0.000016**[A]	**0.000047**[A]	**0.000059**[A]	0.0000022	**0.000047 DB**[A]	***<0.0060 DB***	***<0.0020 DB***	**0.000114 DB**[A]	<0.0000025	***<0.000019***	**0.000111**[A]	**0.0000118**[A]
Phosphorus	mg/L	n/v	n/v	-	-	-	-	1.19	-	-	-	-	-	-	-	1.01	-	-	-
Microbiological Parameters																			
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<100 Z8***	***<1.0***	***<10 DB***	***<100 MI***	**24**[D]	***<2.0 AT***	***<5.0 Z8***	***<5.0 Z8***	***<10 MI***	***<2.0 DB***	***<2.0 DB***	***<100 MI***	***<1***	***<2.0 AT***	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<10 DB***	***<100 MI***	**40**[D]	***<10 AT***	***<5.0 Z8***	**5.0 Z8**[D]	**10 MI**[D]	***<2.0 DB***	***<2.0 DB***	***<100 MI***	**3**[D]	***<10 AT***	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	47 SVH	-	>6000	5,700 MI	10,900	2,600	1,200 Z8	1,300	-	630 DB	550 DB	4,100 MI	500	3,300	65	1,500
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	73 SVH	-	-	-	-	-	-	>4800 MI	-	-	-	-	-	-	-
Total Coliforms	mpn/100mL	n/v	0[D]	***<100 Z8***	***<1.0***	**450 DB**[D]	***<100 MI***	**238**[D]	***<2.0 AT***	***<5.0 Z8***	**170 Z8**[D]	***<10 MI***	***<2.0 DB***	***<2.0 DB***	***<100 MI***	**7**[D]	***<2.0 AT***	***<1.0***	***<1.0***

See notes on last page

Springbank Off-stream Reservoir Project 2024 Groundwater Monitoring Report
October 2024

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-4-22 (Continued)		MW16-6-11							
Sample Date				23-Oct-23	15-May-24	27-Sep-16	12-May-21	1-Dec-21	5-May-22	22-Nov-22	17-May-23	27-Oct-23	17-May-24
Sample ID				MW16-4-22	MW 16-4-22	MW16-6-11	MW16-6-11	MW16-6-11	MW16-6-11	MW16-6-11	MW16-6-11	MW16-6-11	MW16-6-11
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	MAXX	BV	AGAT	BV	BV	BV	BV	BV
Laboratory Work Order				C386148	C435079	B684487	C131657	21C838865	C230164	C292215	C335152	C387774	C435488
Laboratory Sample ID				CCP850	CNR023	PP7331	ZU0436	3284937	ASP040	BHN144	BQP595	CDB049	CNT051
Location Description				EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well
Lithology				Bedrock	Bedrock	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ										
Field Parameters													
Dissolved Oxygen, Field	mg/L	n/v	n/v	4.2	2.6	-	3.72	14.78	2.59	10.9	6.7	4.5	7.2
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**4,497[A]**	4.078	**3,070[A]**	**3,269[A]**	**3,104[A]**	**3,157[A]**	**2,088[A]**	**2,961[A]**	**3,147[A]**	3.078
Oxidation Reduction Potential, field	mV	n/v	n/v	-29.7	-68.3	-	53.9	87.5	14.2	-45.6	118.1	108.7	12.6
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	**6.75[B]**	7.45	7.3	**6.95[B]**	7.13	**6.97[B]**	7.40	7.41	7.16	**6.90[B]**
Temperature, Field	deg C	n/v	≤15[B]	2.0	7.5	7.7	13.4	5.78	8	4.4	6.2	7.4	7.7
Calculated Parameters													
Anion Sum	meq/L	n/v	n/v	59	57	43	46	-	43	44	42	40	42
Cation Sum	meq/L	n/v	n/v	64	61	41	43	-	45	45	42	44	43
Hardness (as CaCO3)	mg/L	n/v	n/v	2,200	2,100	1,300	1,400	1,530	1,400	1,400	1,400	1,400	1,400
Ion Balance	%	n/v	n/v	4.0	-	0.95	3.9	119	2.4	1.4	0.34	4.9	-
Ion Balance % Difference	%	n/v	n/v	-	3.9	-	-	-	-	-	-	-	1.4
Nitrate	mg/L	13_{f}[A]	45[C]	<0.22	<0.22	<0.044	<0.22	<0.5	<0.22	0.13	<0.44	0.21	0.079
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.050 Z8	<0.050	<0.020	<0.050 MI	<0.02	<0.050 MSE AT	0.029	<0.10 Z8	0.048	0.018
Nitrite	mg/L	$1.97_{h4,e,q}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.10	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**3,900[AB]**	**3,700[AB]**	**2,700[AB]**	**2,900[AB]**	**2,730[AB]**	**2,800[AB]**	**2,900[AB]**	**2,700[AB]**	**2,600[AB]**	**2,700[AB]**
BTEX and Petroleum Hydrocarbons													
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00080	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics													
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	4.5	5.5	4.3	3.3	3	2.8	2.8	3.4	2.2	2.9 PRH
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**4,400[A]**	**4,300[A]**	**3,300[A]**	**3,400[A]**	**3,320[A]**	**3,200[A]**	**3,200[A]**	**3,300[A]**	**3,300[A]**	**3,300[A]**
Sediment	none	n/v	n/v	-	-	-	-	-	-	-	-	-	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.61	7.85	7.53	7.46	8.07	7.71	7.76	7.42	7.94	7.80
Anions													
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	480	480	330	370	276	400	360	370	350	370
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	590	580	410	460	336	480	440	460	430	460
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{r5,e}$[A]	≤500[B]	**2,400[AB]**	**2,300[AB]**	**1,800 CD[AB]**	**1,900 CD[AB]**	**1,660[AB]**	**1,700[AB]**	**1,800[AB]**	**1,700[AB]**	**1,600[AB]**	**1,600[AB]**
Chloride	mg/L	100[A]	≤250[B]	1.3	1.1	4.3	2.1	1.0	1.6	1.3	1.7	1.1	12
Nutrients													
Nitrite (as N)	mg/L	$0.6_{h4,e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	<0.0030	<0.0030	0.0040	<0.15	0.0034	0.0039	0.0048	0.0040	<0.0030
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.92	1.1	0.37	0.32	0.38	0.39	0.32	0.33	0.35	0.29
Nitrate (as N)	mg/L	3.0[A]	10[C]	<0.050	<0.050	<0.010	<0.050	<0.02	<0.050	0.029	<0.10	0.048	0.018
Phosphorus, Dissolved	mg/L	n/v	n/v	0.014	<0.0030	-	-	-	-	0.0051	<0.0030 P2	<0.0030 P2	<0.0030 PRH
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	-	-	<0.0030	0.0032	-	0.0052	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	1.20	1.22	6.5 DB	0.92	17.92	12.5	0.73	1.52	19	1.42
Nitrogen	mg/L	n/v	n/v	1.20	1.2	-	0.92 DB	-	12 DB	0.76 DB	1.5 DB	19 DB	1.4 DB

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-4-22 (Continued)		MW16-6-11							
Sample Date				23-Oct-23	15-May-24	27-Sep-16	12-May-21	1-Dec-21	5-May-22	22-Nov-22	17-May-23	27-Oct-23	17-May-24
Sample ID				MW16-4-22	MW 16-4-22	MW16-6-11	MW16-6-11	MW16-6-11	MW16-6-11	MW16-6-11	MW16-6-11	MW16-6-11	MW16-6-11
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	MAXX	BV	AGAT	BV	BV	BV	BV	BV
Laboratory Work Order				C386148	C435079	B684487	C131657	21C838865	C230164	C292215	C335152	C387774	C435488
Laboratory Sample ID				CCP850	CNR023	PP7331	ZU0436	3284937	ASP040	BHN144	BQP595	CDB049	CNT051
Location Description				EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well
Lithology				Bedrock	Bedrock	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ										
Metals, Dissolved													
Aluminum	mg/L	0.05$_{rn1,e}$[A]	0.1$_{a}$[B]	<0.0030	<0.0030	0.0041	<0.0030	**0.117**[AB]	<0.0030	<0.0030	**2.5**[AB]	<0.0030	0.0064
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	<0.001	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010$_{ALARA}$[C]	0.0011	0.00096	0.00050	0.00039	0.002	0.00054	0.00037	0.0011	0.00043	0.00042
Barium	mg/L	2.0[A]	2.0[C]	<0.010	0.014	0.021	0.011	<0.05	0.017	0.012	0.012	0.012	0.016
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.12	0.12	0.13	0.13	0.13	0.14	0.14	0.14	0.12	0.13
Cadmium	mg/L	0.00037$_{r3,e}$[A]	0.007[C]	0.000026	<0.000020	0.000058	0.000030	0.000096	0.000037	0.00015	0.00022	0.000075	0.0001
Calcium	mg/L	n/v	n/v	480	470	310	320	361	320	330	310	330	320
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	0.0023	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.00055	<0.00030	0.0041	0.0023	0.0018	0.0013	0.0019	0.0028	0.0015	0.0014
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.0010	<0.0010	<0.00020	0.00038	0.0009	<0.0010	<0.0010	0.0035	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	**0.42**[AB]	0.18	0.11	0.16	<0.1	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	0.007$_{r3,e}$[A]	0.005$_{ALARA}$[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	<0.00020	<0.00020	0.0010	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.088	0.11	0.049	0.044	-	0.047	0.052	0.056	0.050	0.049
Magnesium	mg/L	n/v	n/v	240	220	140	140	152	150	140	140	130	140
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.97**[AB]	**0.80**[AB]	**0.85**[AB]	**1.2**[AB]	**1.10**[AB]	**0.68**[AB]	**0.95**[AB]	**0.96**[AB]	**0.96**[AB]	**0.83**[AB]
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000020	<0.0000019	-	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.00087	0.00082	0.0014	0.00065	0.001	0.0018	0.00087	0.00088	0.0010	0.013
Nickel	mg/L	0.17$_{r3,e}$[A]	n/v	0.0014	0.00054	0.0064	0.0046	0.004	0.0032	0.0043	0.0062	0.0036	0.0037
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.08	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	10	9.4	8.5	6.4	7.5	8.1	7.0	6.6	7.9	7.7
Selenium	mg/L	0.0020[A]	0.05[C]	<0.00020	<0.00080 MI	0.00044	<0.00020	<0.0005	0.00069	0.00062	0.00023	0.00046	0.00022
Silicon	mg/L	n/v	n/v	4.9	4.8	5.0	4.8	-	4.1	4.2	4.5	4.3	4.3
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	**470**[AB]	**440**[AB]	**330**[AB]	**350**[AB]	**388**[AB]	**380**[AB]	**380**[AB]	**330**[AB]	**380**[AB]	**360**[AB]
Strontium	mg/L	n/v	7.0[C]	**7.1**[C]	6.9	2.4	2.9	-	3.0	3.1	2.7	3.1	2.8
Sulfur	mg/L	n/v	n/v	870	850	580 CD	530 CD	-	570	550	580	610	490
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	0.002	<0.0010	<0.0010	0.068	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0021	0.0021	0.0085	0.0067	0.008	0.0067	0.0069	0.0069	0.0059	0.0056
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	0.0022	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	0.0033	0.0038	<0.0030	<0.0030	<0.005	<0.0030	<0.0030	0.0083	<0.0030	**0.067**[A]
Metals, Total													
Mercury	mg/L	0.0000050[A]	0.001[C]	0.0000019	0.0000039	***<0.02 DB***	**0.000361 DB**[A]	**0.000080**[A]	**0.00376**[AC]	**0.000087**[A]	**0.00046**[A]	**0.000111**[A]	**0.00030 DB**[A]
Phosphorus	mg/L	n/v	n/v	-	-	-	-	14.0	-	-	-	-	-
Microbiological Parameters													
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<2.0 Z8***	***<1.0***	***<100***	***<100 MI***	**1**[D]	***<100***	***<1.0***	***<10 Z8***	***<100 Z8***	***<100 MI***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<2.0 Z8***	***<1.0***	***<100 DB***	***<100 MI***	**9**[D]	***<100***	***<1.0***	***<10 Z8***	***<100 Z8***	***<100 MI***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	>6000	-	56,000 DB	7,100 MI	12,100	22,000	71	3,100 Z8	2,900 Z8	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	21 SVH	-	-	-	-	-	-	-	>12000 MI
Total Coliforms	mpn/100mL	n/v	0[D]	***<2.0 Z8***	**5.2**[D]	**9,300**[D]	***<100 MI***	**113**[D]	***<100***	***<1.0***	***<10 Z8***	**2,000 Z8**[D]	**1,500 MI**[D]

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-6-20							MW16-6-20 (Continued)	MW16-9-6	MW16-15-16	MW16-20-21	MW16-24-30			
Sample Date				27-Sep-16	12-May-21	1-Dec-21	5-May-22	21-Nov-22	17-May-23	27-Oct-23	17-May-24	30-Sep-16	28-Sep-16	27-Sep-16	28-Sep-16	14-May-21	23-Nov-21	10-May-22
Sample ID				MW16-6-20	MW16-6-20	MW16-6-20	MW16-6-20	MW16-6-20	MW16-6-20	MW16-6-20	MW16-6-20	MW16-9-6	MW16-15-16	MW16-20-21	MW16-24-30	MW16-24-30	MW16-24-30	MW16-24-30
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	AGAT	BV	BV	BV	BV	BV	MAXX	MAXX	MAXX	MAXX	BV	AGAT	BV
Laboratory Work Order				B684487	C131657	21C838865	C230164	C291884	C335152	C387774	C435488	B686123	B685112	B684487	B685112	C132332	21C834079	C231132
Laboratory Sample ID				PP7332	ZU0437	3284936	ASP042	BHL364	BQP596	CDB050	CNT052	PQ7066	PQ0284	PP7336	PQ0283	ZU4973	3244038	ASU357
Location Description				EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated		Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	**Units**	**2022 AEPA Tier 1**	**GCDWQ**															
Field Parameters																		
Dissolved Oxygen, Field	mg/L	n/v	n/v	-	3.26	10.78	5.24	4.6	6.5	0.8	3.5	-	-	-	-	11.89	3.65	3.46
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,715[A]**	**2,104[A]**	**2,079[A]**	**2,255[A]**	**2,195[A]**	**2,042[A]**	**2,172[A]**	2.045	**1,515[A]**	-	**1,996[A]**	**1,114[A]**	**1,107[A]**	**1,074[A]**	**1,178[A]**
Oxidation Reduction Potential, field	mV	n/v	n/v	-	-52.6	48.8	12.1	-23.8	73.7	-58.8	-87.6	-	-	-	-	-10.9	25.8	36.5
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.5	7.75	8.01	7.67	8.31	7.62	7.88	7.96	7.2	-	7.2	7	7.83	7.47	7.46
Temperature, Field	deg C	n/v	≤15[B]	9.6	7.3	4.23	8.1	4.3	8.5	3.8	5.7	11	-	6.2	8.2	7.0	3.4	6.5
Calculated Parameters																		
Anion Sum	meq/L	n/v	n/v	21	28	-	49	24	24	22	25	21	12	25	13	13	-	13
Cation Sum	meq/L	n/v	n/v	21	22	-	26	23	23	26	24	22	14	24	14	12	-	13
Hardness (as CaCO3)	mg/L	n/v	n/v	340	250	234	210	190	200	230	200	930	160	740	160	160	170	170
Ion Balance	%	n/v	n/v	0.98	12	112	32	2.4	2.8	8.2	-	1.1	1.1	0.97	1.1	2.8	113	1.8
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	-	-	-	2.3	-	-	-	-	-	-	-
Nitrate	mg/L	13_{f}[A]	45[C]	0.086	<0.044	<0.5	<0.044	0.063	0.060	<0.044	<0.22	0.065	<0.044	0.085	<0.044	<0.044	<0.5	<0.044
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.020	<0.010	<0.02	<0.010	0.014	0.013	<0.010	<0.050 MI	<0.020	<0.020	<0.020	<0.020	<0.010	<0.02	<0.010
Nitrite	mg/L	$1.97_{pt4.e,q}$[A]	3[C]	<0.033	<0.033	<0.05	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.05	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**1,400[AB]**	**1,700[AB]**	**1,500[AB]**	**2,400[AB]**	**1,600[AB]**	**1,600[AB]**	**1,500[AB]**	**1,600[AB]**	**1,200[AB]**	**720[AB]**	**1,500[AB]**	**730[AB]**	**690[AB]**	**691[AB]**	**720[AB]**
BTEX and Petroleum Hydrocarbons																		
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.0010	<0.00040	<0.00040	<0.0005	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00050	<0.00040	<0.00040	<0.0003	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	-	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00080	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00080	<0.00080	<0.00080	<0.00080	<0.00089	<0.0005	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10
Miscellaneous Inorganics																		
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	4.1	3.0	4	3.0	2.6	1.8	2.1	2.2 PRH	4.7	1.4	3.8	1.2	2.8	4	1.1
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**2,000[A]**	**2,300[A]**	**2,290[A]**	**2,200[A]**	**2,200[A]**	**2,200[A]**	**2,200[A]**	**2,200[A]**	**1,700[A]**	**1,100[A]**	**2,100[A]**	**1,100[A]**	**1,100[A]**	**1,150[A]**	**1,100[A]**
Sediment	none	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	NotPresent	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.99	8.10	8.49	8.18	8.11	7.97	8.30	8.29	7.88	8.18	7.59	8.19	8.05	8.34	8.18
Anions																		
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	6	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<5	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	260	460	243	1,500	290	290	270	290	510	460	450	460	470	456	480
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	320	560	281	1,900	360	360	330	350	630	560	540	560	570	567	590
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	7	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<5	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<5	<1.0
Sulfate	mg/L	$429_{rt5.e}$[A]	≤500[B]	**770 CD[AB]**	**920 CD[AB]**	**814[AB]**	**890[AB]**	**880[AB]**	**870[AB]**	**790[AB]**	**940[AB]**	**490 CD[A]**	150	**760 CD[AB]**	160	150	120	150
Chloride	mg/L	100[A]	≤250[B]	4.0	3.2	1.0	1.7	<1.0	2.3	<1.0	<1.0	1.6	2.4	3.3	<1.0	2.5	2.0	1.0
Nutrients																		
Nitrite (as N)	mg/L	$0.6_{pt4.e}$[A]	1[C]	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	0.0031	<0.15	<0.0030	0.0037	0.0036	0.0032	<0.0030	0.0036	<0.0030	<0.0030	<0.0030	0.0034	<0.15	<0.0030
Ammonia (as N)	mg/L	4.815_{rt2}[A]	n/v	0.49	1.1	2.04	1.3	1.2	1.1	1.1	1.1	0.16	0.84 +[A]	0.57	0.86	0.81	0.77	0.83
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.020	<0.010	<0.02	<0.010	0.014	0.013	<0.010	<0.050	0.015	<0.010	0.019	<0.010	<0.010	<0.02	<0.010
Phosphorus, Dissolved	mg/L	n/v	n/v	-	-	-	-	<0.0030	<0.0030 P2	<0.0030 P2	<0.0030 PRH	-	-	-	-	-	-	-
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	<0.0030	0.0087	-	0.019	-	-	-	-	0.0059	0.0069	<0.0030	<0.0030	<0.0030	-	<0.0030
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	1.3	1.25	16.64	4.3	<2.0	2.34	1.31	1.22	0.20	0.81	11 DB	0.88	1.10	0.9	1.03
Nitrogen	mg/L	n/v	n/v	-	1.2	-	4.3 DB	<2.0 DB	2.4	1.3	1.2	-	-	-	-	1.1	-	1.0

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-6-20							MW16-6-20 (Continued)	MW16-9-6	MW16-15-16	MW16-20-21	MW16-24-30			
Sample Date				27-Sep-16	12-May-21	1-Dec-21	5-May-22	21-Nov-22	17-May-23	27-Oct-23	17-May-24	30-Sep-16	28-Sep-16	27-Sep-16	28-Sep-16	14-May-21	23-Nov-21	10-May-22
Sample ID				MW16-6-20	MW16-6-20	MW16-6-20	MW16-6-20	MW16-6-20	MW16-6-20	MW16-6-20	MW16-6-20	MW16-9-6	MW16-15-16	MW16-20-21	MW16-24-30	MW16-24-30	MW16-24-30	MW16-24-30
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	AGAT	BV	BV	BV	BV	BV	MAXX	MAXX	MAXX	MAXX	BV	AGAT	BV
Laboratory Work Order				B684487	C131657	21C838865	C230164	C291884	C335152	C387774	C435488	B686123	B685112	B684487	B685112	C132332	21C834079	C231132
Laboratory Sample ID				PP7332	ZU0437	3284936	ASP042	BHL364	BQP596	CDB050	CNT052	PQ7066	PQ0284	PP7336	PQ0283	ZU4973	3244038	ASU357
Location Description				EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated		Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ															
Metals, Dissolved																		
Aluminum	mg/L	0.05$_{rn1,e}$[A]	0.1$_{a}$[B]	0.0067	<0.0030	**0.397[AB]**	<0.0030	<0.0030	0.0031	<0.0030	<0.0030	<0.0030	<0.0030	0.0040	<0.0030	0.0032	0.013	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.001	0.00065	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.001	<0.00060
Arsenic	mg/L	0.0050[A]	0.010$_{ALARA}$[C]	0.00043	0.00041	<0.001	0.00081	<0.00020	0.00039	<0.00020	<0.00020	0.00093	0.0022	0.00043	0.0023	0.0025	0.005	0.0025
Barium	mg/L	2.0[A]	2.0[C]	0.031	0.014	<0.05	0.023	0.018	0.020	<0.050	<0.010	0.039	0.018	0.018	0.019	0.037	<0.05	0.018
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.093	0.11	0.11	0.12	0.092	0.12	0.15	0.12	0.14	0.089	0.076	0.089	0.093	0.09	0.088
Cadmium	mg/L	0.00037$_{r3,e}$[A]	0.007[C]	<0.000020	<0.000020	<0.000016	0.000069	<0.000020	<0.000020	<0.000020	<0.000020	0.000073	<0.000020	<0.000020	<0.000020	<0.000020	0.000021	<0.00002
Calcium	mg/L	n/v	n/v	76	63	63.2	55	50	54	60	53	220	38	160	38	38	41.2	41
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	0.0008	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0043	<0.0010	<0.0010	<0.0010	<0.0010	0.0007	<0.0010
Cobalt	mg/L	n/v	n/v	0.00056	0.00049	<0.0009	0.00069	0.00033	0.00040	<0.00030	<0.00030	0.0037	<0.00030	0.00085	<0.00030	<0.00030	<0.0009	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	0.00056	**0.013[A]**	0.0011	<0.0010	<0.0010	0.0011	0.0026	<0.0010	0.00064	<0.00020	<0.00020	<0.00020	<0.00020	0.0016	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	0.25	0.2	<0.060	<0.060	<0.060	***<0.30***	<0.060	0.13	0.15	**0.69[AB]**	0.14	0.10	<0.1	<0.060
Lead	mg/L	0.007$_{r3,e}$[A]	0.005$_{ALARA}$[C]	<0.00020	0.00045	0.0006	0.00027	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0010	<0.00020
Lithium	mg/L	n/v	n/v	0.044	0.048	-	0.070	0.060	0.080	<0.10	0.069	0.030	0.053	0.053	0.054	0.056	-	0.075
Magnesium	mg/L	n/v	n/v	36	22	18.5	17	15	17	19	17	94	15	82	16	15	16.2	17
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.16[AB]**	**0.22[AB]**	**0.119[AB]**	**0.17[AB]**	**0.11[AB]**	**0.14[AB]**	**0.11[AB]**	**0.074[AB]**	**0.93[AB]**	**0.066[AB]**	**0.34[AB]**	**0.067[AB]**	**0.076[AB]**	**0.065[AB]**	**0.067[AB]**
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000020	<0.0000019	-	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000019	<0.0000025	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0060	0.0026	0.004	0.0043	0.0022	0.0026	0.0022	0.0024	0.00082	0.0015	0.0052	0.0014	0.0035	0.001	0.0013
Nickel	mg/L	0.17$_{r3,e}$[A]	n/v	<0.00050	0.0013	<0.003	0.0013	0.00062	0.00061	<0.00050	<0.00050	0.0071	<0.00050	<0.00050	<0.00050	<0.00050	<0.003	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.08	<0.10	<0.10	<0.10	<0.50	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.08	<0.10
Potassium	mg/L	n/v	n/v	4.9	4.2	4.8	5.5	4.0	4.2	4.2	4.0	5.6	3.9	8.9	4.0	3.6	3.9	4.0
Selenium	mg/L	0.0020[A]	0.05[C]	<0.00020	<0.00020	<0.0005	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00090	<0.00020	<0.00020	0.0008	<0.00020
Silicon	mg/L	n/v	n/v	3.4	3.5	-	2.7	2.8	3.3	3.9	3.2	5.5	3.6	4.0	3.6	3.6	-	3.3
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00005	<0.00010
Sodium	mg/L	200[A]	≤200[B]	**320[AB]**	**390[AB]**	**452[AB]**	**490[AB]**	**440[AB]**	**420[AB]**	**490[AB]**	**460[AB]**	71	**230[AB]**	**210[AB]**	**240[AB]**	**200[B]**	**229[AB]**	**220[AB]**
Strontium	mg/L	n/v	7.0[C]	0.78	1.1	-	1.0	1.1	1.0	1.1	1.0	1.4	0.65	2.0	0.66	0.63	-	0.66
Sulfur	mg/L	n/v	n/v	250	300	-	280	230	280	330	260	180	50	240	51	51	-	44
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.0001	0.00025	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0001	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	0.003	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.001	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0021	0.00071	<0.001	0.00092	<0.00010	0.00011	<0.00010	<0.00010	0.0086	0.00020	0.0032	0.00022	0.00029	<0.001	0.00021
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	-	0.0024	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	0.0036	0.007	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.019	<0.0030
Metals, Total																		
Mercury	mg/L	0.0000050[A]	0.001[C]	***<0.00020 DB***	**0.0000064[A]**	**0.000022[A]**	**0.000208[A]**	**0.000141[A]**	**0.000049[A]**	0.0000030	<0.0000019	***<0.000020 DB***	<0.0000020	***<0.0060 DB***	<0.0000020	0.0000042	**0.0000052[A]**	<0.0000019
Phosphorus	mg/L	n/v	n/v	-	-	<0.08	-	-	-	-	-	-	-	-	-	-	<0.08	-
Microbiological Parameters																		
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	**2[D]**	***<100***	***<1.0***	***<10 Z8***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<100***	***<1.0***	***<1.0***	***<1***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<100 MI***	**5[D]**	***<100***	***<1.0***	***<10 Z8***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<100 DB***	***<1.0***	***<1.0***	***<1***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	>6000	4,000	13,800	26,000	8.0	10 Z9	97 SC1	-	1,100	120	17,000 DB	48	750	925	100
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	-	-	-	1,600	-	-	-	-	-	-	-
Total Coliforms	mpn/100mL	n/v	0[D]	**>2400[D]**	**4.1[D]**	**204[D]**	***<100***	***<1.0***	***<10 Z8***	**1,600[D]**	***<1.0***	**390[D]**	**1.0[D]**	**750[D]**	**2.0[D]**	***<1.0***	**43[D]**	**19[D]**

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Springbank Off-stream Reservoir Project 2024 Groundwater Monitoring Report
October 2024

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-25-9						MW16-26-18					
Sample Date				30-Sep-16	14-May-21	23-Nov-21	10-May-22	22-Nov-22	18-May-23	28-Sep-16	12-May-21	24-Nov-21	4-May-22	15-Nov-22	15-May-23
Sample ID				MW16-25-9	MW16-25-9	MW16-25-9	MW16-25-9	MW16-25-9	MW16-25-9	MW16-26-18	MW16-26-18	MW16-26-18	MW16-26-18	MW16-26-18	MW16-26-18
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	AGAT	BV	BV	BV	MAXX	BV	AGAT	BV	BV	BV
Laboratory Work Order				B686123	C132332	21C834079	C231132	C292215	C335681	B685112	C131657	21C834850	C229742	C290290	C334367
Laboratory Sample ID				PQ7067	ZU4974	3244039	ASU358	BHN146	BQS282	PQ0281	ZU0432	3249829	ASN086	BHB171	BQM164
Location Description				EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well
Lithology				Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ												
Field Parameters															
Dissolved Oxygen, Field	mg/L	n/v	n/v	-	11.01	4.01	2.93	6.2	2.8	-	7.76	3.68	3.08	9.6	4.8
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,039[A]**	**1,647[A]**	**1,279[A]**	**1,293[A]**	625	**1,072[A]**	**1,207[A]**	**3,581[A]**	**1,238[A]**	**1,372[A]**	**1,211[A]**	**1,249[A]**
Oxidation Reduction Potential, field	mV	n/v	n/v	-	62.3	36.6	98.7	-4.8	189.2	-	-32.5	80.1	-3.8	-34.3	37.9
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.1	7.11	7.17	7.11	7.66	7.35	7.4	7.70	7.23	7.29	7.51	7.89
Temperature, Field	deg C	n/v	≤15[B]	7.3	8.0	3.32	8.2	3.7	13.1	7.1	5.6	6.78	10.1	4.6	12.5
Calculated Parameters															
Anion Sum	meq/L	n/v	n/v	13	21	-	16	14	14	14	16	-	14	13	15
Cation Sum	meq/L	n/v	n/v	14	21	-	16	15	17	14	16	-	16	14	15
Hardness (as CaCO3)	mg/L	n/v	n/v	590	810	745	650	610	730	140	170	71	150	120	140
Ion Balance	%	n/v	n/v	1.1	0.40	115	0.77	1.0	11	1.0	0.57	100	6.0	3.4	0.98
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	mg/L	13_{f}[A]	45[C]	0.064	<0.044	<0.5	<0.044	0.081	0.12	<0.044	<0.044	<0.5	<0.044	0.070	<0.044
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.020	<0.010	<0.02	<0.010	0.018	0.027	<0.020	<0.010	<0.02	<0.010	0.016	<0.010
Nitrite	mg/L	$1.97_{n4,e,q}$[A]	3[C]	<0.033	<0.033	<0.05	<0.033	<0.033	<0.033	<0.033	<0.033	<0.05	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**680[AB]**	**1,200[AB]**	**903[AB]**	**830[AB]**	**750[AB]**	**780[AB]**	**870[AB]**	**990[AB]**	**780[AB]**	**910[AB]**	**850[AB]**	**920[AB]**
BTEX and Petroleum Hydrocarbons															
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00080	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089	<0.00080	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
Miscellaneous Inorganics															
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	5.6	4.8	7	4.1	4.0	4.7	2.1	2.3	3.274	1.8	1.3	2.2
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,100[A]**	**1,700[A]**	**1,350[A]**	**1,200[A]**	**1,200[A]**	**1,200[A]**	**1,300[A]**	**1,500[A]**	**1,310[A]**	**1,300[A]**	**1,300[A]**	**1,500[A]**
Sediment	none	n/v	n/v	-	-	NotPresent	-	-	-	-	-	NotPresent	-	-	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.11	7.74	8.07	7.73	7.81	7.49	8.29	8.21	8.32	8.26	8.14	8.28
Anions															
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	470	530	532	560	550	550	260	280	265	290	270	290
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	580	650	660	690	680	670	310	340	319	350	320	350
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<5	<1.0	<1.0	<1.0	<0.50	<1.0	<5	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	≤500[B]	150	**500 CD[AB]**	253	210	160	150	400 CD	380 CD	344	370	370	360
Chloride	mg/L	100[A]	≤250[B]	8.2	3.8	1.6	<1.0	<1.0	1.1	2.0	84	1.2	19	9.3	64
Nutrients															
Nitrite (as N)	mg/L	$0.6_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	0.0086	0.0079	<0.15	0.012	0.0064	0.010	<0.0030	0.0065	<0.15	<0.0030	0.0066	0.011
Ammonia (as N)	mg/L	4.815_{n2}[A]	n/v	0.12	0.029	<0.02	<0.015	<0.015	0.14	0.64	0.76	0.62	0.79	0.72	0.63
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.015	<0.010	<0.02	<0.010	0.018	0.027	<0.010	<0.010	<0.02	<0.010	0.016	<0.010
Phosphorus, Dissolved	mg/L	n/v	n/v	-	-	-	-	0.0059	0.0092 P2	-	-	-	-	<0.0030	0.0057 P2
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	0.016	0.018	-	0.0064	-	-	0.0062	0.013	-	0.0031	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.54 DB	0.69	1.4	2.26	<0.40	0.44	4.5 DB	1.42	1.7	<2.0	0.73	1.09
Nitrogen	mg/L	n/v	n/v	-	0.69 DB	-	2.3 DB	<0.40 DB	0.46 DB	-	1.4 DB	-	<2.0 DB	0.74 DB	1.1 DB

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-25-9						MW16-26-18					
Sample Date				30-Sep-16	14-May-21	23-Nov-21	10-May-22	22-Nov-22	18-May-23	28-Sep-16	12-May-21	24-Nov-21	4-May-22	15-Nov-22	15-May-23
Sample ID				MW16-25-9	MW16-25-9	MW16-25-9	MW16-25-9	MW16-25-9	MW16-25-9	MW16-26-18	MW16-26-18	MW16-26-18	MW16-26-18	MW16-26-18	MW16-26-18
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	AGAT	BV	BV	BV	MAXX	BV	AGAT	BV	BV	BV
Laboratory Work Order				B686123	C132332	21C834079	C231132	C292215	C335681	B685112	C131657	21C834850	C229742	C290290	C334367
Laboratory Sample ID				PQ7067	ZU4974	3244039	ASU358	BHN146	BQS282	PQ0281	ZU0432	3249829	ASN086	BHB171	BQM164
Location Description				EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well
Lithology				Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ												
Metals, Dissolved															
Aluminum	mg/L	0.05$_{n1,e}$[A]	0.1$_{a}$[B]	0.028	<0.0030	0.033	<0.0030	<0.0030	<0.0030	0.0037	<0.0030	**0.109**[AB]	0.0049	<0.0030	0.0053
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.001	0.0014	<0.00060	<0.00060	<0.00060	<0.00060	<0.001	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010$_{ALARA}$[C]	0.00078	0.00041	0.001	0.00060	0.00057	0.00045	<0.00020	<0.00020	<0.001	0.0010	0.00022	0.00035
Barium	mg/L	2.0[A]	2.0[C]	0.053	0.063	<0.05	0.050	0.049	0.058	<0.010	0.053	<0.05	0.018	0.014	0.032
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.099	0.070	0.06	0.071	0.058	0.068	0.13	0.12	0.13	0.14	0.12	0.13
Cadmium	mg/L	0.00037$_{r3,e}$[A]	0.007[C]	0.000065	0.000077	0.000023	0.000046	0.000044	0.000044	<0.000020	<0.000020	<0.000016	<0.00002	<0.000020	<0.000020
Calcium	mg/L	n/v	n/v	140	160	148	120	120	140	40	47	16.0	41	34	38
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.0020	0.00067	<0.0009	0.00069	0.00083	0.00054	<0.00030	<0.00030	<0.0009	<0.00030	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	0.0011	0.0016	0.0026	<0.0010	<0.0010	0.0024	0.00021	0.00021	0.0015	<0.0010	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	0.16	<0.060	<0.1	<0.060	<0.060	<0.060	0.15	0.14	<0.1	<0.060	<0.060	<0.060
Lead	mg/L	0.007$_{r3,e}$[A]	0.005$_{ALARA}$[C]	<0.00020	<0.00020	0.0007	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0011	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.034	0.071	-	0.043	0.051	0.046	0.035	0.028	-	0.038	0.038	0.023
Magnesium	mg/L	n/v	n/v	59	100	91.2	82	75	92	11	13	7.5	12	9.0	11
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.23**[AB]	**0.22**[AB]	**0.170**[AB]	**0.14**[AB]	**0.17**[AB]	**0.17**[AB]	**0.083**[AB]	**0.10**[AB]	**0.066**[AB]	**0.071**[AB]	**0.065**[AB]	**0.065**[AB]
Mercury	mg/L	0.0000050[A]	0.001[C]	0.0000035	<0.0000019	<0.0000025	<0.0000019	<0.0000019	<0.0000019	<0.0000020	<0.0000019	<0.0000025	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0036	0.0017	0.001	0.0014	0.0014	0.0010	0.0048	0.0045	0.005	0.0051	0.0047	0.0052
Nickel	mg/L	0.17$_{r3,e}$[A]	n/v	0.0067	0.0036	0.004	0.0028	0.0031	0.0029	<0.00050	<0.00050	<0.003	0.00060	<0.00050	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	0.09	<0.10	<0.10	<0.10	<0.10	<0.10	<0.08	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	6.6	5.9	5.7	5.8	5.2	6.3	2.8	2.8	1.9	2.7	2.1	3.0
Selenium	mg/L	0.0020[A]	0.05[C]	0.0014	<0.00020	0.0007	0.00045	0.00027	0.00035	<0.00020	<0.00020	0.0012	<0.00020	<0.00020	<0.00020
Silicon	mg/L	n/v	n/v	7.0	6.0	-	5.3	5.1	6.2	4.5	4.1	-	4.4	3.9	4.6
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	34	110	79.3	63	58	62	**250**[AB]	**290**[AB]	**253**[AB]	**290**[AB]	**270**[AB]	**270**[AB]
Strontium	mg/L	n/v	7.0[C]	0.74	1.7	-	1.3	1.2	1.3	0.61	0.65	-	0.67	0.54	0.62
Sulfur	mg/L	n/v	n/v	49	180	-	66	51	46	130	110	-	140	110	130
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0001	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	-	<0.0010	0.0012	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	0.002	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.004	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	**0.014**[A]	**0.035**[AC]	**0.028**[AC]	**0.025**[AC]	**0.024**[AC]	**0.021**[AC]	0.00013	0.00029	<0.001	0.00016	<0.00010	<0.00010
Vanadium	mg/L	n/v	n/v	0.0011	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	0.011	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.005	<0.0030	<0.0030	<0.0030
Metals, Total															
Mercury	mg/L	0.0000050[A]	0.001[C]	***<0.0020 DB***	**0.0000683**[A]	**0.000097**[A]	**0.000077**[A]	**0.0000113**[A]	**0.000042**[A]	***<0.0060 DB***	**0.0000096**[A]	**0.000016**[A]	**0.000131**[A]	**0.000037**[A]	**0.0000231**[A]
Phosphorus	mg/L	n/v	n/v	-	-	0.81	-	-	-	-	-	0.56	-	-	-
Microbiological Parameters															
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<10 DB***	***<10 MI***	**9**[D]	***<10 AT***	***<1.0***	***<10 Z8***	***<10 DB***	***<10 MI***	***<1***	***<5.0 AT***	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<10 DB***	***<10 MI***	**26**[D]	***<10 AT***	***<1.0***	***<10 Z8***	***<10 DB***	***<10 MI***	***<1***	***<10 AT***	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	7,900 DB	5,300 MI	21,100	2,700 AT	190 SC1	19,000 Z8	>6000	4,500	850	510	1,200	1,300
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Total Coliforms	mpn/100mL	n/v	0[D]	**>2400 DB**[U]	***<10 MI***	**70**[U]	**30 AT**[U]	***<1.0***	***<10 Z8***	**580 DB**[U]	**640 MI**[U]	**649**[U]	**26 AT**[U]	**150**[U]	**1,400**[U]

See notes on last page

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Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Sample Location				MW16-27-9					
Sample Date				28-Sep-16	12-May-21	24-Nov-21	4-May-22	15-Nov-22	15-May-23
Sample ID				MW16-27-9	MW16-27-9	MW16-27-4	MW16-27-9	MW16-27-9	MW16-27-9
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	AGAT	BV	BV	BV
Laboratory Work Order				B685112	C131657	21C834850	C229742	C290290	C334367
Laboratory Sample ID				PQ0280	ZU0430	3249794	ASN085	BHB172	BQM163
Location Description				EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well	EIA Project Well
Lithology				Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Sample Type	Units	2022 AEPA Tier 1	GCDWQ						
Field Parameters									
Dissolved Oxygen, Field	mg/L	n/v	n/v	-	1.77	38.5	5.31	14.7	6.9
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,902[A]**	**1,826[A]**	**1,479[A]**	**1,580[A]**	**1,437[A]**	**1,490[A]**
Oxidation Reduction Potential, field	mV	n/v	n/v	-	83.7	86.9	11.6	4.7	83.2
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.3	7.03	**6.85[B]**	**6.52[B]**	7.63	7.19
Temperature, Field	deg C	n/v	≤15[B]	8.2	6.8	2.65	9.3	4.3	9.6
Calculated Parameters									
Anion Sum	meq/L	n/v	n/v	25	29	-	18	18	19
Cation Sum	meq/L	n/v	n/v	22	24	-	21	20	19
Hardness (as CaCO3)	mg/L	n/v	n/v	800	800	739	760	700	670
Ion Balance	%	n/v	n/v	0.90	9.9	113	7.6	3.7	0.48
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	-	-
Nitrate	mg/L	13_{f}[A]	45[C]	<0.044	0.079	<0.5	<0.044	<0.044	<0.044
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	<0.020	0.018	<0.02	<0.010	<0.010	<0.010
Nitrite	mg/L	$1.97_{fd4,e,q}$[A]	3[C]	<0.033	<0.033	<0.05	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**1,400[AB]**	**1,600[AB]**	**1,100[AB]**	**1,100[AB]**	**1,100[AB]**	**1,100[AB]**
BTEX and Petroleum Hydrocarbons									
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.0003	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.0005	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00080	<0.00089	<0.0005	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
Miscellaneous Inorganics									
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	1.8	4.0	3.069	2.1	2.2	1.7
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**2,000[A]**	**2,600[A]**	**1,600[A]**	**1,500[A]**	**1,600[A]**	**1,600[A]**
Sediment	none	n/v	n/v	-	-	NotPresent	-	-	-
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.77	7.71	7.92	7.63	7.54	7.51
Anions									
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<5	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	530	420	482	510	490	520
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	650	510	588	620	600	640
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<5	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<5	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{rt5,e}$[A]	≤500[B]	**690 CD[AB]**	**490 CD[A]**	420	380	420	390
Chloride	mg/L	100[A]	≤250[B]	2.1	**370 CD[AB]**	<1.0	<1.0	<1.0	1.2
Nutrients									
Nitrite (as N)	mg/L	$0.6_{fd4,e}$[A]	1[C]	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	0.034	<0.15	<0.0030	0.0031	0.0034
Ammonia (as N)	mg/L	4.815_{fd2}[A]	n/v	0.38	0.35	0.35	0.33	0.36	0.29
Nitrate (as N)	mg/L	3.0[A]	10[C]	<0.010	0.018	<0.02	<0.010	<0.010	<0.010
Phosphorus, Dissolved	mg/L	n/v	n/v	-	-	-	-	<0.0030	<0.0030 P2
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	<0.0030	0.20	-	<0.0030	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	1.1	2.29	4.6	<2.0	0.59	0.86
Nitrogen	mg/L	n/v	n/v	-	2.3 DB	-	<2.0 DB	0.59 DB	0.86 DB

See notes on last page

Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

				MW16-27-9					
Sample Location									
Sample Date				**28-Sep-16**	**12-May-21**	**24-Nov-21**	**4-May-22**	**15-Nov-22**	**15-May-23**
Sample ID				**MW16-27-9**	**MW16-27-9**	**MW16-27-4**	**MW16-27-9**	**MW16-27-9**	**MW16-27-9**
Sampling Company				**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**
Laboratory				**MAXX**	**BV**	**AGAT**	**BV**	**BV**	**BV**
Laboratory Work Order				**B685112**	**C131657**	**21C834850**	**C229742**	**C290290**	**C334367**
Laboratory Sample ID				**PQ0280**	**ZU0430**	**3249794**	**ASN085**	**BHB172**	**BQM163**
Location Description				**EIA Project Well**	**EIA Project Well**	**EIA Project Well**	**EIA Project Well**	**EIA Project Well**	**EIA Project Well**
Lithology				**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**	**Unconsolidated**
Sample Type	**Units**	**2022 AEPA Tier 1**	**GCDWQ**						
Metals, Dissolved									
Aluminum	mg/L	$0.05_{rn1,e}$[A]	0.1_{a}[B]	<0.0030	**0.94**[AB]	<0.004	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.001	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	0.00036	0.0011	<0.001	0.00033	0.00032	0.00026
Barium	mg/L	2.0[A]	2.0[C]	<0.010	0.023	<0.05	0.013	0.010	0.017
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0005	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.13	0.12	0.13	0.14	0.11	0.14
Cadmium	mg/L	$0.00037_{r3,e}$[A]	0.007[C]	0.000026	0.000035	0.000017	0.000047	0.00017	0.00005
Calcium	mg/L	n/v	n/v	200	180	186	180	170	160
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	0.0013	<0.0005	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	0.0014	0.0020	<0.0009	0.0010	0.0012	0.0011
Copper	mg/L	0.0070[A]	≤1.0[B]	<0.00020	0.0017	<0.0008	<0.0010	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	**0.42**[AB]	<0.060	<0.1	<0.060	<0.060	<0.060
Lead	mg/L	$0.007_{r3,e}$[A]	0.005_{ALARA}[C]	<0.00020	0.00047	<0.0002	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.041	0.050	-	0.033	0.036	0.031
Magnesium	mg/L	n/v	n/v	75	85	66.7	73	66	64
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.41**[AB]	**0.65**[AB]	**0.362**[AB]	**0.32**[AB]	**0.29**[AB]	**0.30**[AB]
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000020	<0.0000019	<0.0000025	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.00058	0.0035	0.004	0.00053	0.00052	0.00051
Nickel	mg/L	$0.17_{r3,e}$[A]	n/v	0.00062	0.0047	<0.003	0.00093	0.00099	0.00077
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	4.9	6.3	4.7	5.1	4.7	4.6
Selenium	mg/L	0.0020[A]	0.05[C]	<0.00020	<0.00020	**0.0025**[A]	<0.00020	<0.00020	<0.00020
Silicon	mg/L	n/v	n/v	5.7	7.1	-	5.7	5.1	5.8
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00005	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	140	170	135	130	130	120
Strontium	mg/L	n/v	7.0[C]	1.6	1.4	-	1.4	1.3	1.4
Sulfur	mg/L	n/v	n/v	180	210	-	150	120	140
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	0.0001	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	0.097	0.002	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0049	**0.017**[A]	0.006	0.0050	0.0049	0.0053
Vanadium	mg/L	n/v	n/v	<0.0010	0.0026	-	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	0.0042	<0.005	<0.0030	<0.0030	<0.0030
Metals, Total									
Mercury	mg/L	0.0000050[A]	0.001[C]	***<0.02 DB***	**0.000306 DB**[A]	**0.000072**[A]	**0.000177**[A]	**0.000175**[A]	**0.000233**[A]
Phosphorus	mg/L	n/v	n/v	-	-	8.81	-	-	-
Microbiological Parameters									
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<10 DB***	***<100 MI***	**6**[D]	***<2.0 AT***	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<10 DB***	***<100 MI***	**27**[D]	***<10 AT***	***<5.0 MI***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	980	1,300 MI	2,400	430	130 SVH	38
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	-	-
Total Coliforms	mpn/100mL	n/v	0[D]	**850 DB**[D]	**410 MI**[D]	**173**[D]	**8.2 AT**[D]	***<1.0***	**20**[D]

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Table D1 Historical Groundwater Analytical Results - Tier 2 and EIA Project Wells

Notes:

2022 AEPA Tier 1	Alberta Environment and Protected Areas (AEPA). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch 189 pp.
A	Table 2. Alberta Tier 1 Groundwater Remediation Guidelines - Agricultural - Fine
GCDWQ	Health Canada (September 2022). Guidelines for Canadian Drinking Water Quality—Summary Table. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.
B	Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives/ Operational Guidelines
C	Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentration
D	Guidelines for Canadian Drinking Water Quality - Microbiological Parameters
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
a	This is an operational guidance value, designed to apply only to drinking water treatment plants using aluminum-based coagulants; it does not apply to naturally occurring aluminum found in groundwater. The operational guidance values of 0.1 mg/L applies to conventional treatment plants, and 0.2 mg/L applies to other types of treatment systems.
ALARA	as low as reasonably achievable
f	Guidelines only provided for Nitrate (as N). Nitrate guideline (as NO3) is calculated by multiplying the Nitrate (as N) guideline by 4.43.
j	High levels (above 500 mg/L) can cause physiological effects such as diarrhea or dehydration.
n1,e	See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.1 for further guidance on aquatic life pathway, standard varies with pH, long term guideline shown (see Table 1.1 for short term guideline). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
n2	See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.2 for further guidance on aquatic life pathway, standard varies with pH and temperature (see Table 1.2 for guideline and is for total ammonia (NH3 as N).
n3,e	See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.3 for further guidance on aquatic life pathway, standard varies with hardness, long term is shown (see Table 1.3 for short term). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
n4,e	Overall guideline value for ecological receptors only. See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.4 for further guidance on aquatic life pathway, standard varies with chloride, maximum nitrite-N is shown (see Table 1.4 for 30-day average). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
n4,e, g	Overall guideline value for ecological receptors only. See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.4 for further guidance on aquatic life pathway, standard varies with chloride, maximum nitrite-N is shown (see Table 1.4 for 30-day average). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines. Guidelines only provided for Nitrite (as N). Nitrite guideline (as NO2) is calculated by multiplying the Nitrite (as N) guideline by 3.29.
n5,e	Guideline for protection of aquatic life is below detection limit, groundwater monitoring is required. See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.7 for further guidance on aquatic life pathway, standard varies with hardness. Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
A*	Ammonia greater than TKN. Results are within acceptable limits of precision.
AT	Detection limit raised due to interference.
CD	Detection limits raised due to dilution to bring analyte within the calibrated range.
DB	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
DSM	Detection limits raised due to sample matrix
DVM	Detection limit raised based on sample volume used and sample matrix.
DXE	Dissolved greater than total. Unable to re-analyze due to insufficient sample.
EC	Detection limit raised due to interferent.
IF	RDL raised due to sample matrix interference.
MA	Matrix Spike outside acceptance limits due to matrix interference. Reanalysis yields similar results.
MI	Detection limits raised due to matrix interference.
MSE	Matrix spike exceeds acceptance limits due to probable matrix interference.
MSY	Matrix spike exceeds acceptance limits due to matrix interference.
NF	Duplicate exceeds acceptance criteria due to sample non homogeneity.
NH	Duplicate exceeds acceptance criteria due to sample non homogeneity. Reanalysis yields similar results.
NN	Nitrogen < Nitrate: Both values fall within the method uncertainty for duplicates and are likely equivalent.
NNA	Nitrogen < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.
OG	Orthophosphate greater than phosphate. Results within acceptable limits of precision.
P2	Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.
PRH	Sample filtered and preserved past method specified hold time
SC1	Spreader colony present. Quantitative colony reporting is not possible due to bacterial density.
SVH	Sample analyzed over hold time. Sample analysis is recommended within 24 hours of sampling.
VV	Detection limit raised based on sample volume used for analysis.
Z8	Detection limit raised due to matrix interference.
Z9	Detection limit raised due to matrix interference. One big Spreader colony obscured other colonies.
RPD	Relative Percent Difference.
61%	RPD exceeds data quality objective of 30%.
nc	RPD is not calculated if one or more values is non detect or if one or more values is less than five times the reportable detection limit.

Table D2 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Sample Location				WS81-01					WS81-02					NE7-R3-01				
Sample Date				11-Jan-22	25-May-22	17-May-23	25-Oct-23	15-May-24	11-Jan-22	25-May-22	17-May-23	25-Oct-23	15-May-24	25-May-22	16-Nov-22	16-May-23	24-Oct-23	15-May-24
Sample ID				WS81-01	WS81-01	WS81-1	WS81-1	WS81-01	WS81-02	WS81-02	WS81-2	WS81-2	WS81-02	NE7R3-1	NE7R3-1	NE7R3-1	NE7R3-1	NE7-R3-01
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV
Laboratory Work Order				C201468	C235072	C335152	C386944	C434936	C201468	C235072	C335152	C386944	C434936	C235072	C290717	C334712	C386477	C434999
Laboratory Sample ID				AMW362	ATQ223	BQP602	CCW510	CNQ415	AMW363	ATQ224	BQP601	CCW509	CNQ416	ATQ226	BHD548	BQN672	CCT429	CNQ629
Location Description				Tier 2a	Tier 2a	Tier 2a	Tier 2a	Tier 2a	Tier 2a	Tier 2a	Tier 2a	Tier 2a	Tier 2a	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated (alluvial)	Unconsolidated (alluvial)	Unconsolidated (alluvial)	Unconsolidated (alluvial)	Unconsolidated (alluvial)
Sample Type	Units	2022 AEPA Tier 1	GCDWQ															
Field Parameters																		
Dissolved Oxygen, Field	mg/L	n/v	n/v	2.18	7.93	6.3	3.5	5.6	1.96	1.73	4.7	1.6	1.9	11.48	10.2	16.9	7.7	10.6
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,201[A]**	**1,209[A]**	**1,128[A]**	**1,317[A]**	1.223	**1,350[A]**	**1,443[A]**	**1,357[A]**	**1,675[A]**	1.469	496	527	462	577	0.929
Oxidation Reduction Potential, field	mV	n/v	n/v	158.9	63.9	221.3	-209.3	14.2	-53.7	-46	16.4	-261.0	-109.2	107.6	-53.4	215.0	-122.1	6.6
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.45	7.66	7.43	7.19	7.21	7.48	7.35	7.46	7.48	7.63	7.67	**6.80[B]**	7.58	7.36	7.56
Temperature, Field	deg C	n/v	≤15[B]	5.8	8	7.9	8.5	6.9	5.2	6.9	6.2	5.2	6.6	3.8	7.5	4.0	6.4	4.6
Calculated Parameters																		
Anion Sum	meq/L	n/v	n/v	14	14	14	14	15	15	16	16	18	18	5.3	5.6	5.5	6.0	5.1
Cation Sum	meq/L	n/v	n/v	15	15	14	15	15	17	18	16	18	19	5.8	5.3	6.0	6.2	5.6
Hardness (as CaCO3)	mg/L	n/v	n/v	450	440	440	470	470	220	250	260	240	270	270	250	280	290	260
Ion Balance	%	n/v	n/v	5.7	3.5	0.043	3.9	-	5.9	5.4	0.23	0.10	-	4.7	2.8	4.9	1.7	-
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	0.92	-	-	-	-	2.7	-	-	-	-	4.4
Nitrate	mg/L	13_{i}[A]	45[C]	**15[A]**	**19[A]**	**25[A]**	**33[A]**	**52[AC]**	0.92	0.73	1.5	0.12	4.0	1.7	2.0	3.5	1.4	4.2
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	3.3	4.4	5.6	7.5	12	0.26	0.21	0.43	0.027	0.94	0.39	0.45	0.79	0.32	0.94
Nitrite	mg/L	$1.97_{n4,e,\alpha}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.033	0.16	0.14	0.27	<0.033	0.14	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**790[AB]**	**790[AB]**	**770[AB]**	**790[AB]**	**840[AB]**	**890[AB]**	**940[AB]**	**930[AB]**	**1,000[AB]**	**1,000[AB]**	290	290	300	320	280
BTEX and Petroleum Hydrocarbons																		
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics																		
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	2.0	1.9	2.2	2.2	2.4	2.8	3.3	3.7	3.0	2.6	<0.50	1.2	2.0	0.88	1.5
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,200[A]**	**1,200[A]**	**1,200[A]**	**1,300[A]**	**1,300[A]**	**1,300[A]**	**1,500[A]**	**1,500[A]**	**1,600[A]**	**1,600[A]**	500	530	500	530	460
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.47	7.80	7.57	8.08	8.05	7.82	7.59	7.58	8.37	8.18	7.60	7.56	7.67	8.38	7.65
Anions																		
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.2	<1.0	<1.0	<1.0	<1.0	5.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	440	420	440	420	420	550	550	550	580	570	180	200	190	220	190
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	530	520	540	510	510	670	670	670	700	700	220	240	230	260	230
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	8.6	<1.0	<1.0	<1.0	<1.0	5.9	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	≤500_{i}[B]	190	190	180	170	160	190	220	240	270	270	67	65	64	65	48
Chloride	mg/L	100[A]	≤250[B]	26	42	38	54	90	9.0	14	18	19	18	6.0	8.4	8.8	5.2	10
Fluoride	mg/L	1.0[A]	1.5[C]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nutrients																		
Nitrite (as N)	mg/L	$0.60_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.010	0.047	0.041	0.083	<0.010	0.044	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	0.0036	0.0031	<0.0030	<0.0030	0.0031	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0034	<0.0030
Ammonia (as N)	mg/L	3.287_{n2}[A]	n/v	<0.015	<0.015	<0.015	<0.015	<0.015	0.031	0.038	0.027	0.075	0.036	<0.015	<0.015	<0.015	<0.015	<0.015
Nitrate (as N)	mg/L	3.0[A]	10[C]	**3.3[A]**	**4.4[A]**	**5.6[A]**	**7.5[A]**	**12[AC]**	0.21	0.16	0.35	0.027	0.89	0.39	0.45	0.79	0.32	0.94
Phosphorus, Dissolved	mg/L	n/v	n/v	-	-	<0.0030	<0.0030	<0.0030 P2	-	-	0.093	<0.0030	<0.0030	-	<0.0030	<0.0030	<0.0030 P2	<0.0030
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	<0.0030	<0.0030	-	-	-	<0.0030	<0.0030	-	-	-	<0.0030	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	1.56	0.23	<0.20	<0.20	<0.25	0.123	0.239	0.062	0.254	<0.020	0.409	0.040	<0.020	0.068	0.112
Nitrogen	mg/L	n/v	n/v	4.9	4.6	5.1 NN	6.7 NN	8.9 NN	0.38	0.45	0.49	0.28	0.94	0.80	0.49	0.78 NN	0.391	1.1

See notes on last page

Springbank Off-stream Reservoir Project 2024 Groundwater Monitoring Report
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Table D2 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Sample Location				WS81-01					WS81-02					NE7-R3-01				
Sample Date				11-Jan-22	25-May-22	17-May-23	25-Oct-23	15-May-24	11-Jan-22	25-May-22	17-May-23	25-Oct-23	15-May-24	25-May-22	16-Nov-22	16-May-23	24-Oct-23	15-May-24
Sample ID				WS81-01	WS81-01	WS81-1	WS81-1	WS81-01	WS81-02	WS81-02	WS81-2	WS81-2	WS81-02	NE7R3-1	NE7R3-1	NE7R3-1	NE7R3-1	NE7R3-01
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV
Laboratory Work Order				C201468	C235072	C335152	C386944	C434936	C201468	C235072	C335152	C386944	C434936	C235072	C290717	C334712	C386477	C434999
Laboratory Sample ID				AMW362	ATQ223	BQP602	CCW510	CNQ415	AMW363	ATQ224	BQP601	CCW509	CNQ416	ATQ226	BHD548	BQN672	CCT429	CNQ629
Location Description				Tier 2a	Tier 2a	Tier 2a	Tier 2a	Tier 2a	Tier 2a	Tier 2a	Tier 2a	Tier 2a	Tier 2a	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Unconsolidated (alluvial)	Unconsolidated (alluvial)	Unconsolidated (alluvial)	Unconsolidated (alluvial)	Unconsolidated (alluvial)
Sample Type	Units	2022 AEPA Tier 1	GCDWQ															
Metals, Dissolved																		
Aluminum	mg/L	0.05$_{n1,e}$[A]	0.1$_{a}$[B]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	**0.73**[AB]	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010$_{ALARA}$[C]	<0.00020	<0.00020	0.00027	<0.00020	<0.00020	<0.00020	<0.00020	0.00026	<0.00020	<0.00020	<0.00020	0.00046	0.00040	<0.00020	<0.00020
Barium	mg/L	2.0[A]	2.0[C]	0.023	0.023	0.023	0.025	0.025	0.041	0.045	0.045	0.036	0.042	0.11	0.12	0.11	0.13	0.099
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.16	0.16	0.14	0.13	0.14	0.15	0.16	0.15	0.18	0.17	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium	mg/L	0.00037$_{n3,e}$[A]	0.007[C]	<0.00002	<0.00002	<0.000020	<0.000020	<0.000020	<0.00002	<0.00002	<0.000020	<0.000020	<0.000020	<0.00002	0.000048	<0.000020	<0.000020	<0.000020
Calcium	mg/L	n/v	n/v	95	91	88	91	99	47	53	54	51	60	74	69	77	81	71
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00038	<0.00030	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	0.0028 NH	0.0044	**0.014**[A]	**0.010**[A]	0.0049	0.00032	<0.0010	0.0021	<0.0010	<0.0010	**0.017**[A]	0.0022	0.0026	<0.0010	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	0.0070$_{n3,e}$[A]	0.005$_{ALARA}$[C]	<0.00020	<0.00020	0.00054	0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0012	0.00097	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.039	0.031	0.034	0.041	0.045	0.042	0.037	0.035	0.049	0.045	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium	mg/L	n/v	n/v	52	51	53	59	55	25	27	29	28	29	20	18	21	21	19
Manganese	mg/L	0.020[A]	≤0.02[B]	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.013	**0.022**[AB]	0.016	**0.075**[AB]	0.016	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	0.0000032	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0048	0.0052	0.0059	0.0045	0.0042	0.0017	0.0015	0.0016	0.0015	0.0018	0.00061	0.00069	0.00074	0.00080	0.00067
Nickel	mg/L	0.125$_{n3,e}$[A]	n/v	<0.00050	0.00052	0.0014	0.00056	0.00061	<0.00050	<0.00050	0.00055	<0.00050	0.00064	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	2.4	2.2	2.0	2.3	2.2	1.6	1.6	1.6	1.5	1.8	3.8	3.9	3.7	4.5	3.4
Selenium	mg/L	0.0020[A]	0.05[C]	**0.0032**[A]	**0.0038**[A]	**0.0026**[A]	**0.0025**[A]	**0.0022**[A]	0.0013	0.0013	0.00098	0.00059	0.0011	0.00061	0.00074	0.00063	0.00068	0.00046
Silicon	mg/L	n/v	n/v	3.3	3.4	3.3	3.4	3.5	3.1	3.3	3.2	3.2	3.1	2.8	2.6	2.7	3.0	2.5
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	140	140	120	130	130	**290**[AB]	**300**[AB]	**260**[AB]	**300**[AB]	**300**[AB]	6.8	7.0	7.9	7.1	8.3
Strontium	mg/L	n/v	7.0[C]	1.1	1.1	1.1	1.3	1.2	0.76	0.88	0.91	0.94	1.0	0.35	0.34	0.36	0.40	0.32
Sulfur	mg/L	n/v	n/v	57	65	61	53	50	61	78	81	95	94	25	17	23	21	14
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.015	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0041	0.0038	0.0039	0.0036	0.0033	0.0052	0.0051	0.0061	0.0049	0.0058	0.00070	0.00085	0.00072	0.00073	0.00061
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0020	0.0020	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	0.0061	0.023	0.0087	0.011	0.0042	0.0033	0.0031	<0.0030	0.0052	0.018	0.012	0.011	**0.20**[A]	0.0089
Metals, Total																		
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	0.0000020	<0.0000019	<0.0000019	<0.0000019	<0.0000019	0.0000035	<0.0000019
Microbiological Parameters																		
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	**1.0**[D]	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	**1.0**[D]
Heterotrophic Plate Count	cfu/mL	n/v	n/v	82	41	<1.0	2.0	-	3.0	22	<1.0	1.0	-	1.0	12	3.0	66	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	57	-	-	-	-	75	-	-	-	-	170
Total Coliforms	mpn/100mL	n/v	0[D]	**2.0**[D]	**28**[D]	**30**[D]	**26**[D]	***<1.0***	***<1.0***	**1.0**[D]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	**9.8**[D]	***<1.0***	**31**[D]	***<1.0***

See notes on last page

Table D2 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Sample Location				NE20-R3-01					SW11-R4-02					SW35-R4-01			
Sample Date				11-Jan-22	14-Nov-22	17-May-23	26-Oct-23	13-May-24	12-Jan-22	27-May-22	19-May-23	24-Oct-23	14-May-24	15-Nov-22	16-May-23	26-Oct-23	16-May-24
Sample ID				NE20R3-01	NE20R3-2	NE20R3-2	NE20R3-2	NE20-R3-01	SW11R4-02	SW11R4-2	SW11R4-2	SW11R4-2	SW11-R4-02	SW35R4-1	SW35R4-1	SW35R4-1	SW35-R4-01
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV
Laboratory Work Order				C201468	C289871	C335152	C387360	C433976	C201825	C235756	C335907	C386477	C434265	C290290	C334712	C387360	C435151
Laboratory Sample ID				AMW361	BGY829	BQP600	CCY428	CNL997	AMY182	ATT544	BQT306	CCT428	CNN532	BHB174	BQN671	CCY427	CNR363
Location Description				Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ														
Field Parameters																	
Dissolved Oxygen, Field	mg/L	n/v	n/v	9.25	8.6	9.5	-	8.0	1.12	1.88	3.0	1.6	2.6	3.0	5.8	2.6	1.9
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,600[A]**	**1,424[A]**	**1,135[A]**	-	1.479	460	477	442	485	0.415	**1,302[A]**	**1,305[A]**	**1,361[A]**	1.274
Oxidation Reduction Potential, field	mV	n/v	n/v	147.47	-14.8	213.4	-	80.4	-1.33	3	179.7	-192.1	-72.7	-44.2	162.7	239.3	7.4
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.78	7.48	7.34	-	7.33	8.38	7.84	7.73	8.15	8.22	7.64	7.59	7.63	7.51
Temperature, Field	deg C	n/v	≤15[B]	11.5	12.7	**15.4[B]**	-	13.2	5.7	8.6	7.6	3.9	7.2	8.7	7.4	6.9	7.1
Calculated Parameters																	
Anion Sum	meq/L	n/v	n/v	18	17	17	15	18	4.9	5.2	5.1	5.4	5.2	15	16	15	16
Cation Sum	meq/L	n/v	n/v	20	16	17	21	18	5.3	5.1	5.5	5.0	5.4	17	17	18	16
Hardness (as CaCO3)	mg/L	n/v	n/v	690	490	580	680	600	46	55	62	56	71	82	73	96	82
Ion Balance	%	n/v	n/v	4.9	3.0	2.0	15	-	3.8	0.52	4.2	3.9	-	3.4	2.2	9.0	-
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	1.5	-	-	-	-	1.8	-	-	-	1.8
Nitrate	mg/L	13_{f}[A]	45[C]	3.2	3.4	2.3	0.65	5.0	<0.044	<0.044	<0.044	<0.044	<0.044	5.4	4.1	6.7	5.8
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.72	0.77 MI	0.51	0.15	1.1	<0.010	<0.010	<0.010	<0.010	<0.010	1.2	0.92 Z8	1.5	1.3
Nitrite	mg/L	$1.97_{n4,e,\alpha}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	0.068	<0.16
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**1,100[AB]**	**930[AB]**	**940[AB]**	**960[AB]**	**1,000[AB]**	280	290	300	290	290	**900[AB]**	**930[AB]**	**940[AB]**	**900[AB]**
BTEX and Petroleum Hydrocarbons																	
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	0.0031	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics																	
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	2.2	2.1	2.4	2.0	2.1 MSY	0.57	<0.50	2.2	<0.50	<0.50	0.89	1.8	1.2	1.4
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,600[A]**	**1,500[A]**	**1,500[A]**	**1,400[A]**	**1,600[A]**	460	490	480	490	480	**1,400[A]**	**1,400[A]**	**1,400[A]**	**1,400[A]**
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.77	7.83	7.62	8.12	7.99	8.08	8.35	8.15	7.99	8.21	8.09	8.17	**8.67[A]**	8.15
Anions																	
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	38	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	440	440	450	390	430	190	190	190	210	190	580	610	580	580
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	530	530	550	480	530	230	230	230	250	230	710	750	610	710
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.8	<1.0	<1.0	<1.0	<1.0	<1.0	46	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	≤500_{i}[B]	320	290	270	290	290	51	60	57	56	62	170	170	170	170
Chloride	mg/L	100[A]	≤250[B]	**110[A]**	76	69	49	100	5.2	4.6	4.9	4.3	4.8	4.3	4.8	4.6	5.7
Fluoride	mg/L	1.0[A]	1.5[C]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nutrients																	
Nitrite (as N)	mg/L	$0.60_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.021	<0.050 MI MSE
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	0.0065	<0.0030	<0.0030	<0.0030	0.0040	0.0043	0.0033	0.0032	0.0032	0.0087	0.0089	0.0086	0.0090
Ammonia (as N)	mg/L	3.287_{n2}[A]	n/v	0.14	0.23	0.41	0.65	0.12	0.16	0.19	0.17	0.18	0.19	0.064	0.23	0.19	0.18
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.72	0.77	0.51	0.15	1.1	<0.010	<0.010	<0.010	<0.010	<0.010	1.2	0.92	1.5	1.3
Phosphorus, Dissolved	mg/L	n/v	n/v	-	<0.0030	<0.0030	<0.0030	<0.0030	-	-	<0.0030 P2	<0.0030 P2	<0.0030 P2	0.0091	0.0070 P2	0.0060	0.0049 P2
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	<0.0030	-	-	-	-	0.0057	<0.0030	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.356	1.13	0.302	0.614	0.208	0.157	0.188	0.183	0.201	0.268	0.099	0.371	0.29	<0.20
Nitrogen	mg/L	n/v	n/v	1.1	1.9	0.81	0.76	1.3	0.16	0.19	0.18	0.201	0.27	1.3	1.3	1.8 DB	1.1 NN

See notes on last page

Table D2 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Sample Location				NE20-R3-01					SW11-R4-02					SW35-R4-01			
Sample Date				11-Jan-22	14-Nov-22	17-May-23	26-Oct-23	13-May-24	12-Jan-22	27-May-22	19-May-23	24-Oct-23	14-May-24	15-Nov-22	16-May-23	26-Oct-23	16-May-24
Sample ID				NE20R3-01	NE2OR3-2	NE20R3-2	NE20R3-2	NE20-R3-01	SW11R4-02	SW11R4-2	SW11R4-2	SW11R4-2	SW11-R4-02	SW35R4-1	SW35R4-1	SW35R4-1	SW35-R4-01
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV
Laboratory Work Order				C201468	C289871	C335152	C387360	C433976	C201825	C235756	C335907	C386477	C434265	C290290	C334712	C387360	C435151
Laboratory Sample ID				AMW361	BGY829	BQP600	CCY428	CNL997	AMY182	ATT544	BQT306	CCT428	CNN532	BHB174	BQN671	CCY427	CNR363
Location Description				Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ														
Metals, Dissolved																	
Aluminum	mg/L	$0.05_{n1,e}$[A]	0.1_{a}[B]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0050	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010_{ALARA}[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00055	0.00072	0.00049	0.00052
Barium	mg/L	2.0[A]	2.0[C]	0.022	0.018	0.018	0.018	0.021	0.069	0.088	0.081	0.074	0.078	0.026	0.024	0.026	0.024
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.059	0.063	0.059	0.059	0.049	0.031	0.045	0.055	0.032	0.029	0.073	0.086	0.085	0.077
Cadmium	mg/L	$0.00037_{n3,e}$[A]	0.007[C]	0.000039	0.000046	0.000086	0.000093	0.000022	<0.00002	<0.00002	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Calcium	mg/L	n/v	n/v	150	94	130	150	130	12	15	17	14	19	21	19	24	22
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	0.0041	0.0039	0.0057	0.0028	0.0041	0.00094	0.0013	0.0015	<0.0010	<0.0010	0.0017	0.0026	0.0034	0.0012
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	$0.0070_{n3,e}$[A]	0.005_{ALARA}[C]	<0.00020	<0.00020	0.00021	<0.00020	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.044	0.032	0.040	0.059	0.040	0.024	<0.020	0.036	0.021	<0.020	0.072	0.077	0.096	0.077
Magnesium	mg/L	n/v	n/v	78	63	65	77	69	4.0	4.5	5.0	5.0	6.0	7.0	6.0	8.6	6.9
Manganese	mg/L	0.020[A]	≤0.02[B]	0.0088	<0.0040	**0.051[AB]**	**0.066[AB]**	0.0069	**0.039[AB]**	**0.048[AB]**	**0.051[AB]**	**0.059[AB]**	**0.057[AB]**	0.0060	0.0097	0.011	0.013
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	0.0000023	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0011	0.00093	0.00087	0.00088	0.00077	0.0019	0.0016	0.0013	0.0018	0.0017	0.0058	0.0052	0.0047	0.0035
Nickel	mg/L	$0.125_{n3,e}$[A]	n/v	0.0021	0.0021	0.0029	0.0026	0.0015	<0.00050	0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	8.0	6.6	6.4	7.2	6.5	0.80	0.76	0.92	0.84	0.92	2.7	2.8	3.3	2.9
Selenium	mg/L	0.0020[A]	0.05[C]	0.00038	0.00028	<0.00020	<0.00020	0.00034	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0011	0.00091	0.0018	0.0014
Silicon	mg/L	n/v	n/v	3.8	3.5	3.9	4.7	4.0	3.5	3.9	4.0	3.8	3.7	2.8	3.2	3.5	3.0
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	140	140	120	160	140	100	92	98	89	90	**340[AB]**	**350[AB]**	**380[AB]**	**330[AB]**
Strontium	mg/L	n/v	7.0[C]	1.8	1.7	1.6	1.8	1.7	0.25	0.32	0.34	0.32	0.38	0.32	0.31	0.35	0.35
Sulfur	mg/L	n/v	n/v	97	86	98	110	98	16	20	19	18	19	51	59	65	54
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0055	0.0036	0.0035	0.0026	0.0034	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00058	0.00048	0.00057	0.00060
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0018	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	0.018	0.017	0.018	**0.066[A]**	0.019	0.0039	**0.052[A]**	0.028	**0.036[A]**	0.028	0.0056	0.017	0.020	0.015
Metals, Total																	
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	**0.0000056[A]**	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Microbiological Parameters																	
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	68	160	83	16	-	340	72	28	890	-	100	1.0	26	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	>2400	-	-	-	-	1,000	-	-	-	65
Total Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0 PH***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***

See notes on last page

Springbank Off-stream Reservoir Project 2024 Groundwater Monitoring Report
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Table D2 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Sample Location				WS11-01					WS41-02				WS51-01		
Sample Date				26-Apr-16	25-Nov-22	17-May-23	23-Oct-23	14-May-24	5-Apr-16	26-May-22	14-Nov-22	15-May-23	13-Jan-22	23-May-23	14-May-24
Sample ID				WS11-01	WS11-1	WS11-1	WS11-1	WS11-01	WS41-02	WS41-2	WS41-2	WS41-2	WS51-01	WS51-1	WS51-01
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	BV	BV	BV	MAXX	BV	BV	BV	BV	BV	BV
Laboratory Work Order				B631208	C293015	C335152	C386148	C434263	B624910	C235445	C289871	C334367	C202060	C336439	C434266
Laboratory Sample ID				ON0858	BHR664	BQP593	CCP845	CNN524	OJ8684	ATR988	BGY828	BQM167	AMZ441	BQW245	CNN533
Location Description				Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ												
Field Parameters															
Dissolved Oxygen, Field	mg/L	n/v	n/v	-	16.2	6.7	5.0	5.8	-	4.37	3.8	5.4	1.75	2.9	2.5
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	-	898	747	**1,001[A]**	0.699	-	**1,182[A]**	**1,082[A]**	**1,080[A]**	793	724	0.664
Oxidation Reduction Potential, field	mV	n/v	n/v	-	-31.5	149.7	-173.0	11.0	-	91.7	13.8	130.0	-129.9	-81.3	-104.9
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	-	8.42	7.55	7.13	7.54	-	7.21	7.28	7.46	7.86	7.61	7.95
Temperature, Field	deg C	n/v	≤15[B]	-	5	12.6	2.7	6.8	-	7.6	6.5	6.9	6.9	8.5	6.9
Calculated Parameters															
Anion Sum	meq/L	n/v	n/v	47	10	9.5	9.1	9.4	12	13	12	14	8.8	-	9.0
Cation Sum	meq/L	n/v	n/v	43	11	9.3	11	9.5	11	14	14	14	9.6	-	9.0
Hardness (as CaCO3)	mg/L	n/v	n/v	510	240	240	270	250	56	250	410	170	190	190	190
Ion Balance	%	n/v	n/v	0.92	1.7	1.1	8.1	-	0.93	3.3	5.1	2.2	4.2	2.8	-
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	0.87	-	-	-	-	-	-	0.0070
Nitrate	mg/L	13_{r}[A]	45[C]	0.31	0.059	0.068	0.57	<0.044	2.8	8.4	**20[A]**	4.4	<0.044	<0.044	<0.044
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.098	0.013	0.015	0.13	<0.010	0.64	1.9	4.5	0.99	<0.010	<0.010	<0.010
Nitrite	mg/L	$1.97_{n4,e,\alpha}$[A]	3[C]	0.089	<0.033	<0.033	<0.033	<0.033	<0.033	0.036	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**2,800[AB]**	**540[AB]**	480	490	470	**640[AB]**	**730[AB]**	**670[AB]**	**750[AB]**	**510[AB]**	**520[AB]**	**520[AB]**
BTEX and Petroleum Hydrocarbons															
Benzene	mg/L	0.0050[A]	0.005[C]	-	<0.00040	0.00041	0.0014	0.00065	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	-	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	-	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	-	<0.00080	<0.00080	<0.00080	<0.00080	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	-	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	-	<0.00089	<0.00089	<0.00089	<0.00089	-	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	-	<0.10	<0.10	<0.10	<0.10	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	-	<0.10	<0.10	<0.10	<0.10	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	-	<0.10	<0.10	<0.10	<0.10	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics															
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	-	2.9	1.8	2.5	1.8	-	2.2	1.9	1.7	0.64	0.66	1.1
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**3,800[A]**	920	830	790	810	**1,100[A]**	**1,200[A]**	**1,100[A]**	**1,200[A]**	810	800	790
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.09	8.19	7.88	8.12	8.04	7.99	7.75	7.62	8.04	7.84	8.21	7.91
Anions															
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	1,100	450	450	430	450	520	530	450	580	310	310	300
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	1,300	550	550	530	540	640	640	550	710	380	380	370
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<0.50	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	$≤500_{i}$[B]	**1,200 CD[AB]**	25	13	10	15	65	80	60	86	120	130	140
Chloride	mg/L	100[A]	≤250[B]	15	29	6.3	5.5	3.8	3.3	34	60	23	<1.0	<1.0	<1.0
Fluoride	mg/L	1.0[A]	1.5[C]	0.37	-	-	-	-	0.62	-	-	-	-	-	-
Nutrients															
Nitrite (as N)	mg/L	$0.60_{n4,e}$[A]	1[C]	0.027	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	-	<0.0030	<0.0030	<0.0030	<0.0030	-	<0.0030	0.0035	<0.0030	0.0032	<0.0030	<0.0030
Ammonia (as N)	mg/L	3.287_{n2}[A]	n/v	-	0.29	0.25	0.23	0.25	-	0.2	0.018	0.25	0.26	0.24	0.26
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.071	0.013	0.015	0.13	<0.010	0.64	1.9	**4.5[A]**	0.99	<0.010	<0.010	<0.010
Phosphorus, Dissolved	mg/L	n/v	n/v	-	0.0061	0.011	0.062	0.0082	-	-	<0.0030	<0.0030	-	<0.0030	<0.0030
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	-	-	-	-	-	-	<0.0030	-	-	<0.0030	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	-	0.57	0.332	0.631	0.448	-	0.20	2.23	0.409	0.269	0.270	0.388
Nitrogen	mg/L	n/v	n/v	-	0.59 DB	0.35	0.761	0.45	-	2.1	6.7	1.4	0.27	0.27	0.39

See notes on last page

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Table D2 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Sample Location				WS11-01					WS41-02					WS51-01		
Sample Date				26-Apr-16	25-Nov-22	17-May-23	23-Oct-23	14-May-24	5-Apr-16	26-May-22	14-Nov-22	15-May-23	13-Jan-22	23-May-23	14-May-24
Sample ID				WS11-01	WS11-1	WS11-1	WS11-1	WS11-01	WS41-02	WS41-2	WS41-2	WS41-2	WS51-01	WS51-1	WS51-01
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				MAXX	BV	BV	BV	BV	MAXX	BV	BV	BV	BV	BV	BV
Laboratory Work Order				B631208	C293015	C335152	C386148	C434263	B624910	C235445	C289871	C334367	C202060	C336439	C434266
Laboratory Sample ID				ON0858	BHR664	BQP593	CCP845	CNN524	OJ8684	ATR988	BGY828	BQM167	AMZ441	BQW245	CNN533
Location Description				Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
Lithology				Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Sample Type	Units	2022 AEPA Tier 1	GCDWQ												
Metals, Dissolved															
Aluminum	mg/L	0.05$_{n1,e}$[A]	0.1$_{a}$[B]	0.0056	0.0037	<0.0030	0.0041	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	-	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	0.0033	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	-	<0.00060
Arsenic	mg/L	0.0050[A]	0.010$_{ALARA}$[C]	0.00085	0.0021	0.00089	0.00060	0.00028	<0.00020	<0.00020	<0.00020	0.00045	0.00054	-	0.00070
Barium	mg/L	2.0[A]	2.0[C]	0.019	0.17	0.21	0.31	0.28	0.022	0.055	0.080	0.045	0.015	-	0.015
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.14	**1.2**[A]	0.54	0.43	0.31	0.047	0.059	0.053	0.055	0.10	-	0.095
Cadmium	mg/L	0.00037$_{n3,e}$[A]	0.007[C]	0.000028	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000023	0.00003	<0.000020	<0.00002	-	<0.000020
Calcium	mg/L	n/v	n/v	98	54	50	58	54	14	57	90	41	57	59	57
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010
Cobalt	mg/L	n/v	n/v	0.00046	0.00053	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	-	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	0.0016	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	0.0018	0.0067	0.0031	<0.00020	-	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	0.14	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	0.0070$_{n3,e}$[A]	0.005$_{ALARA}$[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020
Lithium	mg/L	n/v	n/v	0.14	0.026	<0.020	<0.020	<0.020	0.052	0.035	<0.020	0.036	0.023	-	0.024
Magnesium	mg/L	n/v	n/v	64	26	27	30	29	4.8	27	44	18	11	11	11
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.18**[AB]	**0.28**[AB]	**0.32**[AB]	**0.29**[AB]	**0.36**[AB]	0.017	0.013	<0.0040	0.0077	**0.13**[AB]	**0.16**[AB]	**0.14**[AB]
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000020	0.0000039	<0.0000019	<0.0000019	<0.0000019	<0.0000020	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.0032	0.0068	0.0030	0.0061	0.0088	0.0053	0.0076	0.0044	0.0089	0.0051	-	0.0052
Nickel	mg/L	0.125$_{n3,e}$[A]	n/v	0.0024	0.0013	0.00078	0.0018	0.00058	<0.00050	0.0012	0.00078	<0.00050	<0.00050	-	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	<0.10
Potassium	mg/L	n/v	n/v	3.3	6.4	5.1	6.1	4.8	2.2	5.1	6.2	4.0	1.1	1.1	1.1
Selenium	mg/L	0.0020[A]	0.05[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00026	**0.0037**[A]	**0.0063**[A]	0.0020	<0.00020	-	<0.00020
Silicon	mg/L	n/v	n/v	2.7	5.0	5.8	5.5	5.4	2.5	3.0	3.3	2.7	5.0	-	4.8
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010
Sodium	mg/L	200[A]	≤200[B]	**750 CD**[AB]	130	100	120	99	**230**[AB]	**210**[AB]	120	**230**[AB]	130	130	120
Strontium	mg/L	n/v	7.0[C]	1.5	2.8	2.6	2.9	2.7	0.27	0.79	1.3	0.63	0.56	-	0.52
Sulfur	mg/L	n/v	n/v	270	7.9	4.5	3.6	4.4	20	28	21	29	39	-	42
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0022	0.00045	0.00012	0.00013	0.00012	0.00032 MD	0.0031	0.0037	0.0031	0.00015	-	0.00015
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	0.010	0.0049	0.0035	<0.0030	<0.0030	0.023	0.0072	0.026	0.011	<0.0030	-	<0.0030
Metals, Total															
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000020	**0.00094**[A]	0.0000026	0.0000022	<0.0000019	<0.0000020	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Microbiological Parameters															
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<10 MI***	***<1.0***	***<100 Z8***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	-	***<10 MI***	***<1.0***	***<100 Z8***	***<1.0***	-	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	-	110	320	870 SVH	-	-	240	1,300	<1.0	1.0	1.0	-
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	>2400	-	-	-	-	-	-	85
Total Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	**10 MI**[U]	**>2400**[U]	**2,300 Z8**[U]	***<1.0***	**24**[U]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***

See notes on last page

Table D2 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Sample Location				WS62-01						SE35-R4-01	SE35-R4-02	SW2-R4-01	SW2-R4-02	SW11-R4-01	WS20-1	WS20-2	WS27-01	WS36-01	WS36-02	WS36-03
Sample Date				14-Jan-22	25-May-22	16-Nov-22	16-May-23	24-Oct-23	15-May-24	10-Jan-22	25-May-22	11-Jan-22	26-May-22	12-Jan-22	24-May-23	24-May-23	24-May-23	24-May-23	24-May-23	24-May-23
Sample ID				WS62-01	WS62-01	WS62-1	WS62-1	WS62-1	WS62-01	SE35R4-01	SE35R4-2	SW2R4-01	SW2R4-2	SW11R4-01	WS20-1	WS20-2	WS27-1	WS36-1	WS36-2	WS36-3
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV
Laboratory Work Order				C202261	C235072	C290717	C334712	C386477	C434999	C201202	C235072	C201468	C235441	C201825	C336854	C336854	C336854	C336854	C336854	C336854
Laboratory Sample ID				ANA368	ATQ222	BHD547	BQN673	CCT430	CNQ628	AMU845	ATQ221	AMW360	ATR966	AMY181	BQZ215	BQZ216	BQZ214	BQZ210	BQZ211	BQZ212
Location Description				Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	One Time	One Time	One Time	One Time	One Time	One Time	One Time	One Time	One Time	One Time	One Time
Lithology				Unconsolidated (alluvial)	Unconsolidated (alluvial)	Unconsolidated (alluvial)	Unconsolidated (alluvial)	Unconsolidated (alluvial)	Unconsolidated (alluvial)	Bedrock	Bedrock	Unknown	Unknown	Bedrock	Bedrock	Unknown	Unknown	Unknown	Unknown	Unknown
Sample Type	**Units**	**2022 AEPA Tier 1**	**GCDWQ**																	
Field Parameters																				
Dissolved Oxygen, Field	mg/L	n/v	n/v	6.76	5.81	5.3	12.6	-	5.3	5.05	2.32	3.65	6.77	1.97	5.7	8.5	3.4	7.5	2.5	4.8
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	582	625	605	572	-	0.582	**1,307[A]**	**1,265[A]**	**1,923[A]**	**2,999[A]**	408	385	325	979	904	**1,884[A]**	**1,431[A]**
Oxidation Reduction Potential, field	mV	n/v	n/v	108.2	88.4	-44.0	213.6	-	61.6	52.4	-43	125.1	142	-163.4	52.3	250.9	139.3	135.1	123.1	40.9
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.67	7.5	7.01	7.45	-	7.12	7.19	7.28	7.33	7.23	**8.71[A]**	7.58	7.70	7.57	7.55	7.41	7.45
Temperature, Field	deg C	n/v	≤15[B]	3.4	4.3	8.1	4.0	-	3.5	5.4	8.3	5.9	12.5	5.5	5.6	13.7	7.1	7.6	8.0	8.8
Calculated Parameters																				
Anion Sum	meq/L	n/v	n/v	6.5	6.9	7.0	7.1	6.4	7.1	15	14	27	39	4.6	4.7	3.9	11	12	21	18
Cation Sum	meq/L	n/v	n/v	7.0	7.3	6.2	7.3	6.6	7.6	16	15	26	38	4.9	4.3	3.8	13	13	23	19
Hardness (as CaCO3)	mg/L	n/v	n/v	330	340	290	350	310	360	590	610	810	860	58	120	190	270	530	760	520
Ion Balance	%	n/v	n/v	3.5	3.0	6.2	2.0	1.5	-	3.7	4.6	0.51	0.34	3.3	4.8	1.8	5.4	5.2	4.6	3.5
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	-	3.1	-	-	-	-	-	-	-	-	-	-	-
Nitrate	mg/L	13_{f}[A]	45[C]	0.13	0.28	0.14	0.46	0.16	0.48	3.5	<0.044	**26[A]**	1.4	0.13	<0.044	0.59	3.9	3.2	**16[A]**	**15[A]**
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.030	0.063	0.032	0.10	0.036	0.11	0.78	<0.010	5.8	0.32	0.030	<0.010	0.13	0.87	0.72	3.5	3.4
Nitrite	mg/L	$1.97_{n4,e,\alpha}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	0.038	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	350	370	360	380	340	390	**820[AB]**	**720[AB]**	**1,600[AB]**	**2,500[AB]**	250	250	210	**650[AB]**	**620[AB]**	**1,100[AB]**	**1,000[AB]**
BTEX and Petroleum Hydrocarbons																				
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics																				
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	1.1	0.93	1.5	1.9	0.76	1.6	1.6	1.5	3.4	3.1	0.52	<0.50	0.73	1.2	0.88	1.4	1.3
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	590	630	620	630	580	620	**1,300[A]**	**1,300[A]**	**2,200[A]**	**3,000[A]**	410	420	350	1,000	1,000	**2,000[A]**	**1,500[A]**
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.47	7.37	7.51	7.83	8.09	7.73	7.41	7.36	7.56	7.55	8.21	7.94	8.02	8.38	8.29	7.80	8.23
Anions																				
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6.5	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	240	240	250	240	230	240	490	430	480	460	210	160	140	420	440	510	540
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	290	290	300	290	280	290	590	520	590	570	260	190	160	490	530	630	650
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.8	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	≤500_{i}[B]	76	91	87	98	77	100	160	74	**720[AB]**	**1,400[AB]**	14	70	59	100	77	94	180
Chloride	mg/L	100[A]	≤250[B]	5.8	6.6	8.1	6.8	5.8	5.0	63	**120[A]**	54	3.3	2.0	2.7	<1.0	35	50	**290[AB]**	**110[A]**
Fluoride	mg/L	1.0[A]	1.5[C]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nutrients																				
Nitrite (as N)	mg/L	$0.60_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	0.0077	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0032	<0.0030	0.012	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Ammonia (as N)	mg/L	3.287_{n2}[A]	n/v	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.058	0.26	0.21	0.38	0.14	<0.015	<0.015	0.19	<0.015	<0.015	0.38
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.030	0.063	0.032	0.10	0.036	0.11	0.78	<0.010	**5.8[A]**	0.32	0.030	<0.010	0.13	0.87	0.72	**3.5[A]**	**3.4[A]**
Phosphorus, Dissolved	mg/L	n/v	n/v	-	-	<0.0030	<0.0030	<0.0030	<0.0030	-	-	-	-	-	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	<0.0030	<0.0030	-	-	-	-	<0.0030	<0.0030	0.0031	<0.0030	0.0087	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.053	0.123	0.061	<0.020	0.072	0.154	0.076	0.382	0.71	0.929	0.260	<2.0	0.027	0.231	<0.020	<0.10	0.28
Nitrogen	mg/L	n/v	n/v	0.083	0.19	0.093	0.11	0.108	0.26	0.86	0.38	6.5	1.3	0.29	<2.0 DB	0.16	1.1	0.58 NN	3.4 NN	3.7

See notes on last page

Table D2 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Sample Location				WS62-01						SE35-R4-01	SE35-R4-02	SW2-R4-01	SW2-R4-02	SW11-R4-01	WS20-1	WS20-2	WS27-01	WS36-01	WS36-02	WS36-03
Sample Date				14-Jan-22	25-May-22	16-Nov-22	16-May-23	24-Oct-23	15-May-24	10-Jan-22	25-May-22	11-Jan-22	26-May-22	12-Jan-22	24-May-23	24-May-23	24-May-23	24-May-23	24-May-23	24-May-23
Sample ID				WS62-01	WS62-01	WS62-1	WS62-1	WS62-1	WS62-01	SE35R4-01	SE35R4-2	SW2R4-01	SW2R4-2	SW11R4-01	WS20-1	WS20-2	WS27-1	WS36-1	WS36-2	WS36-3
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV
Laboratory Work Order				C202261	C235072	C290717	C334712	C386477	C434999	C201202	C235072	C201468	C235441	C201825	C336854	C336854	C336854	C336854	C336854	C336854
Laboratory Sample ID				ANA368	ATQ222	BHD547	BQN673	CCT430	CNQ628	AMU845	ATQ221	AMW360	ATR966	AMY181	BQZ215	BQZ216	BQZ214	BQZ210	BQZ211	BQZ212
Location Description				Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	One Time	One Time	One Time	One Time	One Time	One Time	One Time	One Time	One Time	One Time	One Time
Lithology				Unconsolidated (alluvial)	Unconsolidated (alluvial)	Unconsolidated (alluvial)	Unconsolidated (alluvial)	Unconsolidated (alluvial)	Unconsolidated (alluvial)	Bedrock	Bedrock	Unknown	Unknown	Bedrock	Bedrock	Unknown	Unknown	Unknown	Unknown	Unknown
Sample Type	Units	2022 AEPA Tier 1	GCDWQ																	
Metals, Dissolved																				
Aluminum	mg/L	0.05$_{n1,e}$[A]	0.1$_{a}$[B]	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0043	0.0045	0.0038	<0.0030	0.0032	0.0035	0.025
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00094	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010$_{ALARA}$[C]	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0023	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Barium	mg/L	2.0[A]	2.0[C]	0.063	0.066	0.062	0.066	0.069	0.067	0.025	0.030	0.034	<0.010	0.28	0.035	0.055	0.051	0.031	0.051	0.032
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.074	0.058	0.089	0.16	0.061	<0.020	<0.020	0.047	0.055	0.078	0.086
Cadmium	mg/L	0.00037$_{n3,e}$[A]	0.007[C]	<0.00002	<0.00002	<0.000020	<0.000020	<0.000020	<0.000020	0.000026	<0.00002	<0.00002	<0.00002	<0.00002	<0.000020	<0.000020	<0.000020	<0.000020	0.00003	<0.000020
Calcium	mg/L	n/v	n/v	92	96	81	96	83	99	130	140	180	210	14	29	50	58	110	170	120
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	**0.013[A]**	**0.017[A]**	**0.023[A]**	**0.018[A]**	**0.048[A]**	**0.020[A]**	0.0045	<0.0010	0.0034	**0.013[A]**	0.00045	0.0025	**0.019[A]**	0.0012	<0.0010	**0.017[A]**	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	**0.47[AB]**	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	mg/L	0.0070$_{n3,e}$[A]	0.005$_{ALARA}$[C]	<0.00020	<0.00020	<0.00020	<0.00020	0.00066	<0.00020	<0.00020	<0.00020	<0.00020	0.00024	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00024	<0.00020
Lithium	mg/L	n/v	n/v	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.026	<0.020	0.071	0.11	<0.020	<0.020	<0.020	0.053	0.020	0.027	0.053
Magnesium	mg/L	n/v	n/v	24	25	21	26	25	26	66	65	88	83	5.4	12	15	29	62	79	53
Manganese	mg/L	0.020[A]	≤0.02[B]	0.0063	0.0062	<0.0040	0.0070	0.0045	0.0044	0.0040	**0.071[AB]**	**0.062[AB]**	**0.15[AB]**	0.015	**0.11[AB]**	<0.0040	0.016	<0.0040	<0.0040	**0.023[AB]**
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	0.0000021	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.00041	0.00040	0.00048	0.00054	0.00054	0.00045	0.0012	0.00023	0.00066	0.00036	0.0012	0.0025	0.00062	0.0036	0.00046	0.0010	0.0031
Nickel	mg/L	0.125$_{n3,e}$[A]	n/v	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00054	<0.00050	0.00062	0.0078	<0.00050	0.00057	<0.00050	<0.00050	<0.00050	0.0014	0.0011
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	2.0	2.0	1.8	2.0	1.8	2.3	6.4	6.2	4.0	4.9	0.91	1.3	0.56	4.1	6.3	7.7	7.0
Selenium	mg/L	0.0020[A]	0.05[C]	0.00061	0.0011	0.00062	0.0012	0.00066	0.0015	**0.0039[A]**	**0.012[A]**	0.0014	<0.00020	<0.00020	0.00022	0.00073	**0.0024[A]**	**0.016[A]**	0.0015	**0.0044[A]**
Silicon	mg/L	n/v	n/v	2.7	2.9	2.5	2.9	3.1	2.8	3.8	4.0	4.4	5.3	4.0	1.1	2.4	2.7	4.1	3.2	3.4
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	8.8	8.6	8.1	8.6	7.6	8.2	97	59	**230[AB]**	**480[AB]**	85	42	1.9	170	52	170	190
Strontium	mg/L	n/v	7.0[C]	0.46	0.47	0.42	0.46	0.46	0.46	1.4	1.7	1.8	3.5	0.22	0.26	0.40	0.74	1.3	1.8	1.2
Sulfur	mg/L	n/v	n/v	25	33	23	33	26	31	53	29	200	490	6.0	18	22	26	28	27	50
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.00067	0.0010	0.00080	0.0011	0.00070	0.0012	0.0050	0.0033	0.010	0.00019	<0.00010	<0.00010	0.00042	0.0021	0.0042	0.0059	0.0059
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	0.0057	0.028	0.012	0.016	**0.057[A]**	**0.050[A]**	0.0096	<0.0030	0.024	**0.053[A]**	<0.0030	<0.0030	0.021	0.0033	<0.0030	0.012	0.0062
Metals, Total																				
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Microbiological Parameters																				
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<2.0 AT***	***<1.0***	***<1.0***	***<1.0***	***<2.0 Z8***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<2.0 Z8***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	16	7.0	<1.0	25	8.0	-	370	300	33	>6000	470	120	<1.0	400	<1.0	6.0	64
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	-	35	-	-	-	-	-	-	-	-	-	-	-
Total Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	**1.0[D]**	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***3,500 < AT***	**1.0[D]**	***<1.0***	***<1.0***	***<2.0 Z8***	**1.0[D]**	***<1.0***	***<1.0***	**2.0[D]**	***<1.0***

See notes on last page

Table D2 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Sample Location				WS36-04	WS42-01	WS42-02	WS48-01	WS50-01	WS56-01	WS56-02	WS65-01	WS65-02	WS67-01
Sample Date				**24-May-23**	**26-May-22**	**26-May-22**	**13-Jan-22**	**23-May-23**	**10-Jan-22**	**10-Jan-22**	**12-Jan-22**	**12-Jan-22**	**25-May-22**
Sample ID				**WS36-4**	**WS42-1**	**WS42-2**	**WS48-01**	**WS50-1**	**WS56-01**	**WS56-02**	**WS65-01**	**WS65-02**	**WS67-01**
Sampling Company				**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**
Laboratory				**BV**	**BV**	**BV**	**BV**	**BV**	**BV**	**BV**	**BV**	**BV**	**BV**
Laboratory Work Order				**C336854**	**C235450**	**C235450**	**C202060**	**C336439**	**C201202**	**C201202**	**C201825**	**C201825**	**C235072**
Laboratory Sample ID				**BQZ213**	**ATR997**	**ATR998**	**AMZ440**	**BQW246**	**AMU843**	**AMU844**	**AMY183**	**AMY184**	**ATQ225**
Location Description				**One Time**	**One Time**	**One Time**	**One Time**	**One Time**	**One Time**	**One Time**	**One Time**	**One Time**	**One Time**
Lithology				**Unknown**	**Bedrock**	**Bedrock**	**Bedrock**	**Unknown**	**Bedrock**	**Bedrock**	**Bedrock**	**Unknown**	**Unconsolidated (alluvial)**
Sample Type	**Units**	**2022 AEPA Tier 1**	**GCDWQ**										
Field Parameters													
Dissolved Oxygen, Field	mg/L	n/v	n/v	2.2	6.07	4.78	3.49	4.1	6.59	1.75	10.13	1.16	3.76
Electrical Conductivity, Field	µS/cm	1,000[A]	n/v	**1,304[A]**	**1,102[A]**	**1,070[A]**	**1,823[A]**	**2,138[A]**	**1,341[A]**	**2,009[A]**	448	549	520
Oxidation Reduction Potential, field	mV	n/v	n/v	100.1	101.3	112.3	-102.9	16.4	-35.8	122	63.2	-25.8	-94.4
pH, Field	S.U.	6.5-8.5[A]	7.0-10.5[B]	7.36	**6.99[B]**	7.04	7.7	7.74	7.01	7.19	7.73	8.29	7.47
Temperature, Field	deg C	n/v	≤15[B]	12.2	6.3	7.7	4.4	7.1	6.3	7.8	5.5	4.4	8
Calculated Parameters													
Anion Sum	meq/L	n/v	n/v	16	12	11	22	-	15	19	4.9	5.7	5.5
Cation Sum	meq/L	n/v	n/v	17	13	12	21	-	16	21	5.2	6.4	5.6
Hardness (as CaCO3)	mg/L	n/v	n/v	510	560	550	600	140	670	11	250	21	260
Ion Balance	%	n/v	n/v	4.1	4.2	4.2	3.0	0.66	3.6	3.2	3.0	5.5	1.2
Ion Balance % Difference	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Nitrate	mg/L	13[A]	45[C]	3.3	1.5	4.4	<0.044	<0.044	0.054	0.77	0.96	0.097	0.28
Nitrate + Nitrite (as N)	mg/L	100[A]	n/v	0.75	0.34	1.0	<0.010	<0.010	0.012	0.17	0.22	0.022	0.063
Nitrite	mg/L	$1.97_{n4,e,\alpha}$[A]	3[C]	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Total Dissolved Solids	mg/L	500[A]	≤500[B]	**870[AB]**	**610[AB]**	**600[AB]**	**1,400[AB]**	**1,600[AB]**	**760[AB]**	**1,100[AB]**	270	340	280
BTEX and Petroleum Hydrocarbons													
Benzene	mg/L	0.0050[A]	0.005[C]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024[A]	0.024[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016[A]	0.0016[B]	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene, m & p-	mg/L	n/v	n/v	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Xylene, o-	mg/L	n/v	n/v	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes, Total	mg/L	0.020[A]	0.02[B]	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	2.2[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PHC F2 (>C10-C16 range)	mg/L	1.1[A]	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Miscellaneous Inorganics													
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	1.3	2.1	1.8	1.2	1.7	1.2	11	0.86	1.3	3.3
Electrical Conductivity, Lab	µS/cm	1,000[A]	n/v	**1,400[A]**	**1,100[A]**	**1,100[A]**	**1,800[A]**	**2,400[A]**	**1,300[A]**	**2,000[A]**	450	550	500
pH, lab	S.U.	6.5-8.5[A]	7.0-10.5[B]	8.01	7.38	7.44	7.65	8.50	7.40	7.35	7.55	8.05	7.38
Anions													
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	17	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	500	380	380	210	630	430	380	160	220	230
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	610	460	460	260	730	530	460	200	260	280
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	21	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	$429_{n5,e}$[A]	≤500[B]	140	64	58	**870[AB]**	**650[AB]**	86	56	74	69	43
Chloride	mg/L	100[A]	≤250[B]	96	95	94	2.2	4.3	**140[A]**	**380[AB]**	2.8	<1.0	1.9
Fluoride	mg/L	1.0[A]	1.5[C]	-	-	-	-	-	-	-	-	-	-
Nutrients													
Nitrite (as N)	mg/L	$0.60_{n4,e}$[A]	1[C]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	<0.0030	<0.0030	<0.0030	0.0032	0.0036	<0.0030	<0.0030	0.0033	0.0038	<0.0030
Ammonia (as N)	mg/L	3.287_{n2}[A]	n/v	0.23	<0.015	<0.015	0.58	0.57	0.34[A]	<0.015	<0.015	0.58	1.0
Nitrate (as N)	mg/L	3.0[A]	10[C]	0.75	0.34	1.0	<0.010	<0.010	0.012	0.17	0.22	0.022	0.063
Phosphorus, Dissolved	mg/L	n/v	n/v	<0.0030	-	-	-	<0.0030 P2	-	-	-	-	-
Phosphorus, Total (Dissolved)	mg/L	n/v	n/v	-	<0.0030	<0.0030	0.026	-	0.056	<0.0030	<0.0030	0.41 DB	<0.0030
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.207	0.784	0.092	0.724	0.727	0.522	0.046	0.082	<2.0	2.78
Nitrogen	mg/L	n/v	n/v	0.96	1.1	1.1	0.72	0.73	0.53	0.22	0.30	<2.0 DB	2.8 DB

See notes on last page

Table D2 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Sample Location				WS36-04	WS42-01	WS42-02	WS48-01	WS50-01	WS56-01	WS56-02	WS65-01	WS65-02	WS67-01
Sample Date				24-May-23	26-May-22	26-May-22	13-Jan-22	23-May-23	10-Jan-22	10-Jan-22	12-Jan-22	12-Jan-22	25-May-22
Sample ID				WS36-4	WS42-1	WS42-2	WS48-01	WS50-1	WS56-01	WS56-02	WS65-01	WS65-02	WS67-01
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV	BV	BV	BV	BV
Laboratory Work Order				C336854	C235450	C235450	C202060	C336439	C201202	C201202	C201825	C201825	C235072
Laboratory Sample ID				BQZ213	ATR997	ATR998	AMZ440	BQW246	AMU843	AMU844	AMY183	AMY184	ATQ225
Location Description				One Time	One Time	One Time	One Time	One Time	One Time	One Time	One Time	One Time	One Time
Lithology				Unknown	Bedrock	Bedrock	Bedrock	Unknown	Bedrock	Bedrock	Bedrock	Unknown	Unconsolidated (alluvial)
Sample Type	**Units**	**2022 AEPA Tier 1**	**GCDWQ**										
Metals, Dissolved													
Aluminum	mg/L	0.05$_{n1,e}$[A]	0.1$_{a}$[B]	0.012	<0.0030	<0.0030	<0.0030	-	<0.0030	<0.0030	0.0081	0.0066	<0.0030
Antimony	mg/L	0.0060[A]	0.006[C]	<0.00060	<0.00060	<0.00060	<0.00060	-	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.0050[A]	0.010$_{ALARA}$[C]	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020	<0.00020	<0.00020	0.00048	0.00033
Barium	mg/L	2.0[A]	2.0[C]	0.036	0.049	0.050	<0.010	-	0.039	<0.010	0.082	0.025	0.17
Beryllium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.0[A]	5[C]	0.085	0.036	0.036	0.081	-	0.11	0.063	<0.020	0.075	<0.020
Cadmium	mg/L	0.00037$_{n3,e}$[A]	0.007[C]	<0.000020	0.000030	<0.00002	<0.00002	-	0.000022	<0.00002	<0.00002	<0.00002	<0.00002
Calcium	mg/L	n/v	n/v	110	130	120	170	33	150	1.7	70	6.4	76
Chromium	mg/L	0.050[A]	0.05[C]	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	n/v	n/v	<0.00030	<0.00030	<0.00030	<0.00030	-	0.00038	<0.00030	<0.00030	<0.00030	<0.00030
Copper	mg/L	0.0070[A]	≤1.0[B]	0.0010	<0.0010	0.0011	0.0025	-	<0.00020	**0.011**[A]	0.0035	0.00052	<0.0010
Iron	mg/L	0.30[A]	≤0.3[B]	<0.060	<0.060	<0.060	<0.060	<0.060	**0.41**[AB]	<0.060	<0.060	0.11	0.072
Lead	mg/L	0.0070$_{n3,e}$[A]	0.005$_{ALARA}$[C]	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	n/v	n/v	0.056	<0.020	<0.020	0.030	-	0.043	0.036	<0.020	0.032	<0.020
Magnesium	mg/L	n/v	n/v	59	60	60	43	13	74	1.5	18	1.3	18
Manganese	mg/L	0.020[A]	≤0.02[B]	**0.044**[AB]	<0.0040	<0.0040	**0.40**[AB]	**0.10**[AB]	**0.20**[AB]	<0.0040	<0.0040	0.0064	**0.42**[AB]
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Molybdenum	mg/L	n/v	n/v	0.00072	0.0011	0.00068	0.0022	-	0.00028	0.00067	0.00068	0.0074	0.00052
Nickel	mg/L	0.125$_{n3,e}$[A]	n/v	<0.00050	<0.00050	<0.00050	<0.00050	-	0.0007	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	-	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	n/v	7.0	5.4	5.5	5.5	2.0	7.4	1.3	0.88	1.7	3.3
Selenium	mg/L	0.0020[A]	0.05[C]	0.00082	**0.0073**[A]	**0.0071**[A]	<0.00020	-	0.0014	**0.0063**[A]	0.00078	<0.00020	<0.00020
Silicon	mg/L	n/v	n/v	3.6	4.3	4.3	4.8	-	3.2	3.9	2.1	2.6	3.7
Silver	mg/L	0.00010[A]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200[A]	≤200[B]	150	29	29	**210**[AB]	**550**[AB]	43	**470**[AB]	3.9	140	4.2
Strontium	mg/L	n/v	7.0[C]	1.6	1.1	1.1	1.6	-	2.3	<0.020	0.40	0.080	0.31
Sulfur	mg/L	n/v	n/v	41	22	20	250	-	28	18	23	22	15
Thallium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.010[A]	0.02[C]	0.0040	0.0046	0.0042	<0.00010	-	0.0022	0.0057	0.00048	0.00018	<0.00010
Vanadium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	0.0013	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.030[A]	≤5.0[B]	<0.0030	<0.0030	<0.0030	**0.036**[A]	-	**0.058**[A]	<0.0030	0.011	<0.0030	**1.2**[A]
Metals, Total													
Mercury	mg/L	0.0000050[A]	0.001[C]	<0.0000019	<0.0000019	<0.0000019	0.0000021	<0.0000019	<0.0000019	<0.0000019	<0.0000019	***<0.000019***	<0.0000019
Microbiological Parameters													
Escherichia coli (E.Coli)	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<10 VV***	***<2.0 AT***
Fecal Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<1.0***	***<10 VV HX***	***<2.0 AT***
Heterotrophic Plate Count	cfu/mL	n/v	n/v	2.0	15	2.0	600	4.0	2.0	<1.0	29	>6000 DSM	220
Heterotrophic Plate Count	mpn/100mL	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Total Coliforms	mpn/100mL	n/v	0[D]	***<1.0***	***<1.0***	**1.0**[U]	***<1.0***	***<1.0***	***<1.0***	***<1.0***	**6.3**[U]	**240 VV**[U]	***30 < AT***

See notes on last page

Table D2 Groundwater Analytical Results - Tier 2a, Tier 3 and One-Time Domestic Monitoring Wells

Notes:

2022 AEPA Tier 1	Alberta Environment and Protected Areas (AEPA). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch 189 pp.
A	Table 2. Alberta Tier 1 Groundwater Remediation Guidelines - Agricultural - Fine
GCDWQ	Health Canada (September 2022). Guidelines for Canadian Drinking Water Quality—Summary Table. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.
B	Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives/ Operational Guidelines
C	Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentration
D	Guidelines for Canadian Drinking Water Quality - Microbiological Parameters
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
a	This is an operational guidance value, designed to apply only to drinking water treatment plants using aluminum-based coagulants; it does not apply to naturally occurring aluminum found in groundwater. The operational guidance values of 0.1 mg/L applies to conventional treatment plants, and 0.2 mg/L applies to other types of treatment systems.
ALARA	as low as reasonably achievable
f	Guidelines only provided for Nitrate (as N). Nitrate guideline (as NO3) is calculated by multiplying the Nitrate (as N) guideline by 4.43.
j	High levels (above 500 mg/L) can cause physiological effects such as diarrhea or dehydration.
n1,e	See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.1 for further guidance on aquatic life pathway, standard varies with pH, long term guideline shown (see Table 1.1 for short term guideline). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
n2	See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.2 for further guidance on aquatic life pathway, standard varies with pH and temperature (see Table 1.2 for guideline and is for total ammonia (NH3 as N).
n3,e	See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.3 for further guidance on aquatic life pathway, standard varies with hardness, long term is shown (see Table 1.3 for short term). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
n4,e	Overall guideline value for ecological receptors only. See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.4 for further guidance on aquatic life pathway, standard varies with chloride, maximum nitrite-N is shown (see Table 1.4 for 30-day average). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
n4,e, g	Overall guideline value for ecological receptors only. See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.4 for further guidance on aquatic life pathway, standard varies with chloride, maximum nitrite-N is shown (see Table 1.4 for 30-day average). Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines. Guidelines only provided for Nitrite (as N). Nitrite guideline (as NO2) is calculated by multiplying the Nitrite (as N) guideline by 3.29.
n5,e	Guideline for protection of aquatic life is below detection limit, groundwater monitoring is required. See Environmental Quality Guideline for Alberta Surface Waters (AEP, 2018), Tables 1 and 1.7 for further guidance on aquatic life pathway, standard varies with hardness. Must refer to Tables in Appendix B of the Tier 1 guidelines and select lowest of aquatic life guideline and all other guidelines.
<	Less than.
AT	Detection limit raised due to interference.
CD	Detection limits raised due to dilution to bring analyte within the calibrated range.
DB	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
DSM	Detection limits raised due to sample matrix
HX	Holding time had been exceeded upon sample receipt.
MD	Dissolved greater than total. Results are within limits of uncertainty.
MI	Detection limits raised due to matrix interference.
MSE	Matrix spike exceeds acceptance limits due to probable matrix interference.
MSY	Matrix spike exceeds acceptance limits due to matrix interference.
NH	Duplicate exceeds acceptance criteria due to sample non homogeneity. Reanalysis yields similar results.
NN	Nitrogen < Nitrate: Both values fall within the method uncertainty for duplicates and are likely equivalent.
P2	Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.
PH	Sample received past hold time.
SVH	Sample analyzed over hold time. Sample analysis is recommended within 24 hours of sampling.
VV	Detection limit raised based on sample volume used for analysis.
Z8	Detection limit raised due to matrix interference.
RPD	Relative Percent Difference.
61%	RPD exceeds data quality objective of 30%.
nc	RPD is not calculated if one or more values is non detect or if one or more values is less than five times the reportable detection limit.

Your Project #: 110773396
Site Location: SR1
Your C.O.C. #: 1 of 1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/09
Report #: R3424232
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C386148
Received: 2023/10/23, 18:19

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	9	N/A	2023/11/03	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	9	N/A	2023/10/29	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	9	N/A	2023/10/30		Auto Calc
Cadmium - low level CCME - Dissolved	6	N/A	2023/10/26		Auto Calc
Cadmium - low level CCME - Dissolved	3	N/A	2023/10/27		Auto Calc
Chloride/Sulphate by Auto Colourimetry	8	N/A	2023/10/27	AB SOP-00020	SM24-4500-Cl/SO4-E m
Chloride/Sulphate by Auto Colourimetry	1	N/A	2023/11/06	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	9	2023/10/24	2023/10/25	AB SOP-00089	SM 23 9223 A,B m
Total Coliforms and E.Coli	9	2023/10/24	2023/10/25	AB SOP-00089	SM 23 9223 A,B m
Carbon (DOC) -Lab Filtered (2)	1	N/A	2023/10/28	AB SOP-00087	MMCW 119 1996 m
Carbon (DOC) -Lab Filtered (2)	8	N/A	2023/10/29	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	9	N/A	2023/11/03	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (3)	9	2023/10/26	2023/10/26	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	1	N/A	2023/10/28		Auto Calc
Hardness	8	N/A	2023/10/29		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	2	2023/10/26	2023/10/27	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Dissolved) by CV-Lab Filtered	7	2023/10/27	2023/10/28	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	9	2023/10/24	2023/10/31	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (4)	1	N/A	2023/10/26	AB SOP-00042	EPA 6010d R5 m
Elements by ICP-Dissolved-Lab Filtered (4)	1	N/A	2023/10/27	AB SOP-00042	EPA 6010d R5 m
Elements by ICP-Dissolved-Lab Filtered (4)	2	N/A	2023/10/28	AB SOP-00042	EPA 6010d R5 m
Elements by ICP-Dissolved-Lab Filtered (4)	4	N/A	2023/10/29	AB SOP-00042	EPA 6010d R5 m
Elements by ICP-Dissolved-Lab Filtered (4)	1	N/A	2023/11/08	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (5)	6	N/A	2023/10/25	AB SOP-00043	EPA 6020b R2 m
Elements by ICPMS-Dissolved-Lab Filtered (5)	3	N/A	2023/10/27	AB SOP-00043	EPA 6020b R2 m
Ion Balance	5	N/A	2023/11/03		Auto Calc
Ion Balance	4	N/A	2023/11/04		Auto Calc
Sum of cations, anions	1	N/A	2023/10/28		Auto Calc
Sum of cations, anions	8	N/A	2023/10/29		Auto Calc
Nitrogen (Total) (1)	8	N/A	2023/10/31	BBY6SOP-00016	SM 24 4500-N C m
Nitrogen (Total) (1)	1	N/A	2023/11/02	BBY6SOP-00016	SM 24 4500-N C m

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Site Location: SR1
Your C.O.C. #: 1 of 1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/09
Report #: R3424232
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C386148
Received: 2023/10/23, 18:19

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Ammonia-N (Total)	9	N/A	2023/10/25	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	9	N/A	2023/10/26		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	4	N/A	2023/10/25	AB SOP-00091	SM 24 4500 NO3m
NO2 (N); NO2 (N) + NO3 (N) in Water	5	N/A	2023/10/26	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	8	2023/10/31	2023/10/31		Auto Calc
Nitrate (as N)	1	2023/10/31	2023/11/01		Auto Calc
pH @25°C (6)	9	N/A	2023/11/03	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (7)	9	N/A	2023/10/25	AB SOP-00025	SM 24 4500-P A,F m
Heterotrophic Plate Count	9	2023/10/24	2023/10/26	CAL SOP-00012	SM 23 9215 A & B m
Total Dissolved Solids (Calculated)	5	N/A	2023/11/03		Auto Calc
Total Dissolved Solids (Calculated)	4	N/A	2023/11/04		Auto Calc
Total Kjeldahl Nitrogen (Total)	1	N/A	2023/11/02	BBY WI-00033	Auto Calc
Total Kjeldahl Nitrogen (Total)	4	N/A	2023/11/03	BBY WI-00033	Auto Calc
Total Kjeldahl Nitrogen (Total)	4	N/A	2023/11/04	BBY WI-00033	Auto Calc
Total Phosphorus-Dissolved-Lab Filtered (8)	9	2023/10/26	2023/10/28	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Your Project #: 110773396
Site Location: SR1
Your C.O.C. #: 1 of 1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/09
Report #: R3424232
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C386148

Received: 2023/10/23, 18:19

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bureau Veritas Vancouver, 4606 Canada Way , Burnaby, BC, V5G 1K5

(2) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.

(3) Silica gel clean up employed.

(4) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.

(5) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.

(6) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.

(7) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

(8) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Encryption Key



Bureau Veritas
09 Nov 2023 09:19:23

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (780)577-7173

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This report has been generated and distributed using a secure automated process.

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

Bureau Veritas Job #: C386148
Report Date: 2023/11/09

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CCP845		CCP845			CCP846			
Sampling Date		2023/10/23 09:26		2023/10/23 09:26			2023/10/23 10:20			
COC Number		1 of 1		1 of 1			1 of 1			
	UNITS	WS11-1	MU	WS11-1 Lab-Dup	MU	QC Batch	RRMW16-17-8	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	N/A	N/A	B168344	<0.10	N/A	0.10	B168344
Volatiles										
Benzene	mg/L	0.0014	+/- 0.00044	0.0015	+/- 0.00045	B169803	<0.00040	N/A	0.00040	B169803
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	B169803	<0.00040	N/A	0.00040	B169803
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	B169803	<0.00040	N/A	0.00040	B169803
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	B169803	<0.00080	N/A	0.00080	B169803
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	B169803	<0.00040	N/A	0.00040	B169803
Xylenes (Total)	mg/L	<0.00089	N/A	N/A	N/A	B166993	<0.00089	N/A	0.00089	B167525
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	N/A	N/A	B166993	<0.10	N/A	0.10	B167525
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	B169803	<0.10	N/A	0.10	B169803
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	101	N/A	102	N/A	B169803	101	N/A	N/A	B169803
4-Bromofluorobenzene (sur.)	%	104	N/A	103	N/A	B169803	103	N/A	N/A	B169803
D4-1,2-Dichloroethane (sur.)	%	109	N/A	110	N/A	B169803	108	N/A	N/A	B169803
O-TERPHENYL (sur.)	%	100	N/A	N/A	N/A	B168344	95	N/A	N/A	B168344

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C386148
Report Date: 2023/11/09

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CCP847		CCP848		CCP849		CCP850			
Sampling Date		2023/10/23 10:55		2023/10/23 12:35		2023/10/23 13:08		2023/10/23 13:50			
COC Number		1 of 1		1 of 1		1 of 1		1 of 1			
	UNITS	RRMW16-16-17	MU	MW16-3-7	MU	MW16-2-6	MU	MW16-4-22	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B168344
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B169803
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B167525
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B167525
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B169803
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	101	N/A	101	N/A	101	N/A	101	N/A	N/A	B169803
4-Bromofluorobenzene (sur.)	%	103	N/A	102	N/A	104	N/A	103	N/A	N/A	B169803
D4-1,2-Dichloroethane (sur.)	%	110	N/A	109	N/A	110	N/A	111	N/A	N/A	B169803
O-TERPHENYL (sur.)	%	101	N/A	99	N/A	98	N/A	97	N/A	N/A	B168344

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C386148
Report Date: 2023/11/09

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CCP851		CCP852		CCP853			
Sampling Date		2023/10/23 14:30		2023/10/23 15:08		2023/10/23 15:50			
COC Number		1 of 1		1 of 1		1 of 1			
	UNITS	RMW16-5-12	MU	MW16-7-5	MU	MW16-10-15	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B168344
Volatiles									
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B169803
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B167525
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B167525
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B169803
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	101	N/A	101	N/A	99	N/A	N/A	B169803
4-Bromofluorobenzene (sur.)	%	104	N/A	103	N/A	105	N/A	N/A	B169803
D4-1,2-Dichloroethane (sur.)	%	110	N/A	108	N/A	110	N/A	N/A	B169803
O-TERPHENYL (sur.)	%	98	N/A	96	N/A	94	N/A	N/A	B168344

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCP845				CCP846			
Sampling Date		2023/10/23 09:26				2023/10/23 10:20			
COC Number		1 of 1				1 of 1			
	UNITS	WS11-1	MU	RDL	QC Batch	RRMW16-17-8	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	9.1	N/A	N/A	B167125	190	N/A	N/A	B167125
Cation Sum	meq/L	11	N/A	N/A	B167125	210	N/A	N/A	B167125
Hardness (CaCO3)	mg/L	270	N/A	0.50	B167413	5700	N/A	0.50	B167413
Ion Balance (% Difference)	%	8.1	N/A	N/A	B167438	4.3	N/A	N/A	B167438
Nitrate (N)	mg/L	0.13	N/A	0.010	B178234	0.093	N/A	0.050	B178234
Nitrate (NO3)	mg/L	0.57	N/A	0.044	B167439	0.41	N/A	0.22	B167439
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B167439	<0.033	N/A	0.033	B167439
Calculated Total Dissolved Solids	mg/L	490	N/A	10	B167138	13000	N/A	100	B167138
Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	B167109	0.14	+/- 0.059	0.020	B167109
Misc. Inorganics									
Conductivity	uS/cm	790	+/- 21	2.0	B178340	12000	+/- 320	2.0	B178340
pH	pH	8.12	+/- 0.0805	N/A	B178341	8.06	+/- 0.0798	N/A	B178341
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B178337	<1.0	N/A	1.0	B178337
Alkalinity (Total as CaCO3)	mg/L	430	+/- 32	1.0	B178337	830	+/- 62	1.0	B178337
Bicarbonate (HCO3)	mg/L	530	+/- 8.1	1.0	B178337	1000	+/- 15	1.0	B178337
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B178337	<1.0	N/A	1.0	B178337
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B178337	<1.0	N/A	1.0	B178337
Chloride (Cl)	mg/L	5.5	+/- 1.2	1.0	B174202	4.5	+/- 1.2	1.0	B174202
Sulphate (SO4)	mg/L	10	+/- 1.2	1.0	B174202	8500	+/- 540	100	B174202
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B170327	<0.010	N/A	0.010	B170327
Nitrate plus Nitrite (N)	mg/L	0.13	+/- 0.018	0.010	B170327	0.093 (1)	+/- <RDL	0.050	B170327
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	0.0041	+/- <RDL	0.0030	B174245	0.0059	+/- <RDL	0.0030	B170340
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B174245	<0.00060	N/A	0.00060	B170340
Dissolved Arsenic (As)	mg/L	0.00060	+/- <RDL	0.00020	B174245	0.00087	+/- <RDL	0.00020	B170340
Dissolved Barium (Ba)	mg/L	0.31	+/- 0.026	0.010	B174196	0.015	+/- <RDL	0.010	B174196

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C386148
Report Date: 2023/11/09

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCP845				CCP846			
Sampling Date		2023/10/23 09:26				2023/10/23 10:20			
COC Number		1 of 1				1 of 1			
	UNITS	WS11-1	MU	RDL	QC Batch	RRMW16-17-8	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B174245	<0.0010	N/A	0.0010	B170340
Dissolved Boron (B)	mg/L	0.43	+/- 0.041	0.020	B174196	0.18	+/- <RDL	0.020	B174196
Dissolved Calcium (Ca)	mg/L	58	+/- 5.9	0.30	B174196	420	+/- 43	0.30	B174196
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B174245	<0.0010	N/A	0.0010	B170340
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	B174245	0.0070	+/- 0.00064	0.00030	B170340
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B174245	0.0028	+/- <RDL	0.0010	B170340
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B174196	<0.060	N/A	0.060	B174196
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B174245	<0.00020	N/A	0.00020	B170340
Dissolved Lithium (Li)	mg/L	<0.020	N/A	0.020	B174196	0.12	+/- <RDL	0.020	B174196
Dissolved Magnesium (Mg)	mg/L	30	+/- 1.9	0.20	B174196	1100	+/- 72	2.0	B174196
Dissolved Manganese (Mn)	mg/L	0.29	+/- 0.020	0.0040	B174196	2.7	+/- 0.18	0.0040	B174196
Dissolved Molybdenum (Mo)	mg/L	0.0061	+/- 0.0015	0.00020	B174245	0.0018	+/- 0.00051	0.00020	B170340
Dissolved Nickel (Ni)	mg/L	0.0018	+/- <RDL	0.00050	B174245	0.0099	+/- 0.00084	0.00050	B170340
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B174196	<0.10	N/A	0.10	B174196
Dissolved Potassium (K)	mg/L	6.1	+/- 0.32	0.30	B174196	15	+/- 0.74	0.30	B174196
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	B174245	0.0011	+/- <RDL	0.00020	B170340
Dissolved Silicon (Si)	mg/L	5.5	+/- 1.0	0.50	B174196	5.7	+/- 1.1	0.50	B174196
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B174245	<0.00010	N/A	0.00010	B170340
Dissolved Sodium (Na)	mg/L	120	+/- 12	0.50	B174196	2200	+/- 220	5.0	B174196
Dissolved Strontium (Sr)	mg/L	2.9	+/- 0.28	0.020	B174196	10	+/- 1.0	0.20	B174196
Dissolved Sulphur (S)	mg/L	3.6	+/- 0.26	0.20	B174196	2900	+/- 190	2.0	B174196
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B174245	<0.00020	N/A	0.00020	B170340
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B174245	<0.0010	N/A	0.0010	B170340
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B174245	0.0021	+/- <RDL	0.0010	B170340
Dissolved Uranium (U)	mg/L	0.00013	+/- <RDL	0.00010	B174245	0.049	+/- 0.0043	0.00010	B170340
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B174245	<0.0010	N/A	0.0010	B170340
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B174245	<0.0030	N/A	0.0030	B170340

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C386148
Report Date: 2023/11/09

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCP847				CCP848			
Sampling Date		2023/10/23 10:55				2023/10/23 12:35			
COC Number		1 of 1				1 of 1			
	UNITS	RRMW16-16-17	MU	RDL	QC Batch	MW16-3-7	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	63	N/A	N/A	B167125	29	N/A	N/A	B167125
Cation Sum	meq/L	70	N/A	N/A	B167125	30	N/A	N/A	B167125
Hardness (CaCO3)	mg/L	1400	N/A	0.50	B167413	820	N/A	0.50	B167413
Ion Balance (% Difference)	%	5.8	N/A	N/A	B167438	1.6	N/A	N/A	B167438
Nitrate (N)	mg/L	<0.010	N/A	0.010	B178234	<0.050	N/A	0.050	B178234
Nitrate (NO3)	mg/L	<0.044	N/A	0.044	B167439	<0.22	N/A	0.22	B167439
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B167439	<0.033	N/A	0.033	B167439
Calculated Total Dissolved Solids	mg/L	4200	N/A	25	B167138	1800	N/A	25	B167138
Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	B167109	0.081	+/- 0.036	0.020	B167109
Misc. Inorganics									
Conductivity	uS/cm	4900	+/- 130	2.0	B176895	2400	+/- 63	2.0	B178340
pH	pH	8.09	+/- 0.0801	N/A	B176896	8.06	+/- 0.0799	N/A	B178341
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B176892	<1.0	N/A	1.0	B178337
Alkalinity (Total as CaCO3)	mg/L	680	+/- 50	1.0	B176892	370	+/- 28	1.0	B178337
Bicarbonate (HCO3)	mg/L	830	+/- 13	1.0	B176892	460	+/- 7.1	1.0	B178337
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B176892	<1.0	N/A	1.0	B178337
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B176892	<1.0	N/A	1.0	B178337
Chloride (Cl)	mg/L	5.5	+/- 1.3	1.0	B174202	37	+/- 3.1	1.0	B173541
Sulphate (SO4)	mg/L	2300	+/- 150	25	B174202	1000	+/- 64	25	B173541
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B170327	<0.010	N/A	0.010	B170327
Nitrate plus Nitrite (N)	mg/L	<0.010	N/A	0.010	B170327	<0.050 (1)	N/A	0.050	B170327
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B170340	0.0059	+/- <RDL	0.0030	B170340
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B170340	<0.00060	N/A	0.00060	B170340
Dissolved Arsenic (As)	mg/L	0.0048	+/- 0.00043	0.00020	B170340	0.00039	+/- <RDL	0.00020	B170340
Dissolved Barium (Ba)	mg/L	<0.010	N/A	0.010	B174196	0.016	+/- <RDL	0.010	B174196

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCP847				CCP848			
Sampling Date		2023/10/23 10:55				2023/10/23 12:35			
COC Number		1 of 1				1 of 1			
	UNITS	RRMW16-16-17	MU	RDL	QC Batch	MW16-3-7	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B170340
Dissolved Boron (B)	mg/L	0.23	+/- 0.023	0.020	B174196	0.10	+/- <RDL	0.020	B174196
Dissolved Calcium (Ca)	mg/L	310	+/- 31	0.30	B174196	130	+/- 13	0.30	B174196
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B170340
Dissolved Cobalt (Co)	mg/L	0.0021	+/- <RDL	0.00030	B170340	0.00078	+/- <RDL	0.00030	B170340
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B170340
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B174196	<0.060	N/A	0.060	B174196
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B170340	<0.00020	N/A	0.00020	B170340
Dissolved Lithium (Li)	mg/L	0.26	+/- 0.022	0.020	B174196	0.053	+/- <RDL	0.020	B174196
Dissolved Magnesium (Mg)	mg/L	160	+/- 10	0.20	B174196	120	+/- 7.7	0.20	B174196
Dissolved Manganese (Mn)	mg/L	0.61	+/- 0.041	0.0040	B174196	0.012	+/- <RDL	0.0040	B174196
Dissolved Molybdenum (Mo)	mg/L	0.0013	+/- 0.00041	0.00020	B170340	0.0011	+/- 0.00037	0.00020	B170340
Dissolved Nickel (Ni)	mg/L	0.0095	+/- 0.00081	0.00050	B170340	0.0026	+/- <RDL	0.00050	B170340
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B174196	<0.10	N/A	0.10	B174196
Dissolved Potassium (K)	mg/L	9.4	+/- 0.48	0.30	B174196	4.7	+/- <RDL	0.30	B174196
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	B170340	0.00024	+/- <RDL	0.00020	B170340
Dissolved Silicon (Si)	mg/L	5.0	+/- 0.95	0.50	B174196	4.1	+/- 0.78	0.50	B174196
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B170340	<0.00010	N/A	0.00010	B170340
Dissolved Sodium (Na)	mg/L	950	+/- 93	2.5	B174196	320	+/- 31	0.50	B174196
Dissolved Strontium (Sr)	mg/L	7.7	+/- 0.75	0.10	B174196	1.5	+/- 0.15	0.020	B174196
Dissolved Sulphur (S)	mg/L	870	+/- 58	1.0	B174196	300	+/- 20	0.20	B174196
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B170340	<0.00020	N/A	0.00020	B170340
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B170340
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B170340	0.0018	+/- <RDL	0.0010	B170340
Dissolved Uranium (U)	mg/L	0.00049	+/- <RDL	0.00010	B170340	0.012	+/- 0.0011	0.00010	B170340
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B170340	0.0010	+/- <RDL	0.0010	B170340
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B170340	<0.0030	N/A	0.0030	B170340

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCP849				CCP850			
Sampling Date		2023/10/23 13:08				2023/10/23 13:50			
COC Number		1 of 1				1 of 1			
	UNITS	MW16-2-6	MU	RDL	QC Batch	MW16-4-22	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	89	N/A	N/A	B167125	59	N/A	N/A	B167125
Cation Sum	meq/L	100	N/A	N/A	B167125	64	N/A	N/A	B167125
Hardness (CaCO3)	mg/L	3200	N/A	0.50	B167413	2200	N/A	0.50	B167413
Ion Balance (% Difference)	%	5.4	N/A	N/A	B167438	4.0	N/A	N/A	B167438
Nitrate (N)	mg/L	<0.050	N/A	0.050	B178234	<0.050	N/A	0.050	B178234
Nitrate (NO3)	mg/L	<0.22	N/A	0.22	B167439	<0.22	N/A	0.22	B167439
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B167439	<0.033	N/A	0.033	B167439
Calculated Total Dissolved Solids	mg/L	5900	N/A	50	B167138	3900	N/A	25	B167138
Elements									
Dissolved Cadmium (Cd)	ug/L	0.13	+/- 0.056	0.020	B167109	0.026	+/- <RDL	0.020	B167109
Misc. Inorganics									
Conductivity	uS/cm	6100	+/- 160	2.0	B176895	4400	+/- 120	2.0	B178340
pH	pH	8.12	+/- 0.0804	N/A	B176896	7.61	+/- 0.0754	N/A	B178341
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B176892	<1.0	N/A	1.0	B178337
Alkalinity (Total as CaCO3)	mg/L	460	+/- 34	1.0	B176892	480	+/- 36	1.0	B178337
Bicarbonate (HCO3)	mg/L	560	+/- 8.6	1.0	B176892	590	+/- 9.0	1.0	B178337
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B176892	<1.0	N/A	1.0	B178337
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B176892	<1.0	N/A	1.0	B178337
Chloride (Cl)	mg/L	1.5	+/- 1.2	1.0	B173541	1.3	+/- 1.2	1.0	B174202
Sulphate (SO4)	mg/L	3800	+/- 240	50	B173541	2400	+/- 150	25	B174202
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B170327	<0.010	N/A	0.010	B170327
Nitrate plus Nitrite (N)	mg/L	<0.050 (1)	N/A	0.050	B170327	<0.050 (1)	N/A	0.050	B170327
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B174245	<0.0030	N/A	0.0030	B170340
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B174245	<0.00060	N/A	0.00060	B170340
Dissolved Arsenic (As)	mg/L	0.00047	+/- <RDL	0.00020	B174245	0.0011	+/- <RDL	0.00020	B170340
Dissolved Barium (Ba)	mg/L	<0.010	N/A	0.010	B174196	<0.010	N/A	0.010	B174196

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCP849				CCP850			
Sampling Date		2023/10/23 13:08				2023/10/23 13:50			
COC Number		1 of 1				1 of 1			
	UNITS	MW16-2-6	MU	RDL	QC Batch	MW16-4-22	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B174245	<0.0010	N/A	0.0010	B170340
Dissolved Boron (B)	mg/L	0.12	+/- <RDL	0.020	B174196	0.12	+/- <RDL	0.020	B174196
Dissolved Calcium (Ca)	mg/L	430	+/- 44	0.30	B174196	480	+/- 49	1.5	B174196
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B174245	<0.0010	N/A	0.0010	B170340
Dissolved Cobalt (Co)	mg/L	0.0023	+/- <RDL	0.00030	B174245	0.00055	+/- <RDL	0.00030	B170340
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B174245	<0.0010	N/A	0.0010	B170340
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B174196	0.42	+/- <RDL	0.060	B174196
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B174245	<0.00020	N/A	0.00020	B170340
Dissolved Lithium (Li)	mg/L	0.12	+/- <RDL	0.020	B174196	0.088	+/- <RDL	0.020	B174196
Dissolved Magnesium (Mg)	mg/L	510	+/- 32	1.0	B174196	240	+/- 15	0.20	B174196
Dissolved Manganese (Mn)	mg/L	1.4	+/- 0.094	0.0040	B174196	0.97	+/- 0.065	0.0040	B174196
Dissolved Molybdenum (Mo)	mg/L	0.00080	+/- 0.00031	0.00020	B174245	0.00087	+/- 0.00032	0.00020	B170340
Dissolved Nickel (Ni)	mg/L	0.0063	+/- 0.00055	0.00050	B174245	0.0014	+/- <RDL	0.00050	B170340
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B174196	<0.10	N/A	0.10	B174196
Dissolved Potassium (K)	mg/L	9.0	+/- 0.46	0.30	B174196	10	+/- 0.50	0.30	B174196
Dissolved Selenium (Se)	mg/L	0.00027	+/- <RDL	0.00020	B174245	<0.00020	N/A	0.00020	B170340
Dissolved Silicon (Si)	mg/L	5.3	+/- 1.0	0.50	B174196	4.9	+/- 0.94	0.50	B174196
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B174245	<0.00010	N/A	0.00010	B170340
Dissolved Sodium (Na)	mg/L	830	+/- 81	2.5	B174196	470	+/- 46	0.50	B174196
Dissolved Strontium (Sr)	mg/L	6.4	+/- 0.63	0.10	B174196	7.1	+/- 0.69	0.10	B174196
Dissolved Sulphur (S)	mg/L	1400	+/- 91	1.0	B174196	870	+/- 58	1.0	B174196
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B174245	<0.00020	N/A	0.00020	B170340
Dissolved Tin (Sn)	mg/L	0.0016	+/- <RDL	0.0010	B174245	<0.0010	N/A	0.0010	B170340
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B174245	<0.0010	N/A	0.0010	B170340
Dissolved Uranium (U)	mg/L	0.028	+/- 0.0025	0.00010	B174245	0.0021	+/- 0.00020	0.00010	B170340
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B174245	<0.0010	N/A	0.0010	B170340
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B174245	0.0033	+/- <RDL	0.0030	B170340

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCP851				CCP852			
Sampling Date		2023/10/23 14:30				2023/10/23 15:08			
COC Number		1 of 1				1 of 1			
	UNITS	RMW16-5-12	MU	RDL	QC Batch	MW16-7-5	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	7.1	N/A	N/A	B167125	38	N/A	N/A	B167125
Cation Sum	meq/L	7.8	N/A	N/A	B167125	39	N/A	N/A	B167125
Hardness (CaCO3)	mg/L	230	N/A	0.50	B167413	1100	N/A	0.50	B167413
Ion Balance (% Difference)	%	5.0	N/A	N/A	B167438	1.2	N/A	N/A	B167438
Nitrate (N)	mg/L	0.049	N/A	0.010	B178234	<0.010	N/A	0.010	B178234
Nitrate (NO3)	mg/L	0.22	N/A	0.044	B167439	<0.044	N/A	0.044	B167439
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B167439	<0.033	N/A	0.033	B167439
Calculated Total Dissolved Solids	mg/L	380	N/A	10	B167138	2400	N/A	25	B167138
Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	B167109	<0.020	N/A	0.020	B167109
Misc. Inorganics									
Conductivity	uS/cm	670	+/- 18	2.0	B176895	2800	+/- 73	2.0	B176895
pH	pH	8.32	+/- 0.0825	N/A	B176896	8.16	+/- 0.0809	N/A	B176896
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B176892	<1.0	N/A	1.0	B176892
Alkalinity (Total as CaCO3)	mg/L	310	+/- 23	1.0	B176892	470	+/- 35	1.0	B176892
Bicarbonate (HCO3)	mg/L	370	+/- 5.8	1.0	B176892	570	+/- 8.8	1.0	B176892
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B176892	<1.0	N/A	1.0	B176892
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B176892	<1.0	N/A	1.0	B176892
Chloride (Cl)	mg/L	2.3	+/- 1.2	1.0	B187014	4.6	+/- 1.2	1.0	B173541
Sulphate (SO4)	mg/L	43	+/- <RDL	5.0	B187014	1400	+/- 87	25	B173541
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B170332	<0.010	N/A	0.010	B170332
Nitrate plus Nitrite (N)	mg/L	0.049	+/- 0.013	0.010	B170332	<0.010	N/A	0.010	B170332
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B170340	<0.0030	N/A	0.0030	B170340
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B170340	<0.00060	N/A	0.00060	B170340
Dissolved Arsenic (As)	mg/L	0.00043	+/- <RDL	0.00020	B170340	0.00054	+/- <RDL	0.00020	B170340
Dissolved Barium (Ba)	mg/L	0.062	+/- <RDL	0.050	B190950	0.019	+/- <RDL	0.010	B172759
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B170340

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCP851				CCP852			
Sampling Date		2023/10/23 14:30				2023/10/23 15:08			
COC Number		1 of 1				1 of 1			
	UNITS	RMW16-5-12	MU	RDL	QC Batch	MW16-7-5	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	<0.10	N/A	0.10	B190950	0.13	+/- <RDL	0.020	B172759
Dissolved Calcium (Ca)	mg/L	49	+/- 4.9	1.5	B190950	180	+/- 18	0.30	B172759
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B170340
Dissolved Cobalt (Co)	mg/L	0.00038	+/- <RDL	0.00030	B170340	0.00093	+/- <RDL	0.00030	B170340
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B170340
Dissolved Iron (Fe)	mg/L	<0.30	N/A	0.30	B190950	<0.060	N/A	0.060	B172759
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B170340	<0.00020	N/A	0.00020	B170340
Dissolved Lithium (Li)	mg/L	<0.10	N/A	0.10	B190950	0.068	+/- <RDL	0.020	B172759
Dissolved Magnesium (Mg)	mg/L	27	+/- 1.7	1.0	B190950	160	+/- 10	0.20	B172759
Dissolved Manganese (Mn)	mg/L	0.045	+/- <RDL	0.020	B190950	0.21 (1)	+/- 0.014	0.0040	B172759
Dissolved Molybdenum (Mo)	mg/L	0.0018	+/- 0.00052	0.00020	B170340	0.0013	+/- 0.00041	0.00020	B170340
Dissolved Nickel (Ni)	mg/L	0.00095	+/- <RDL	0.00050	B170340	0.0031	+/- <RDL	0.00050	B170340
Dissolved Phosphorus (P)	mg/L	<0.50	N/A	0.50	B190950	<0.10	N/A	0.10	B172759
Dissolved Potassium (K)	mg/L	9.5	+/- <RDL	1.5	B190950	5.7 (1)	+/- 0.31	0.30	B172759
Dissolved Selenium (Se)	mg/L	0.0010	+/- <RDL	0.00020	B170340	0.00039	+/- <RDL	0.00020	B170340
Dissolved Silicon (Si)	mg/L	<2.5	N/A	2.5	B190950	5.0	+/- 0.96	0.50	B172759
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B170340	<0.00010	N/A	0.00010	B170340
Dissolved Sodium (Na)	mg/L	67	+/- 6.6	2.5	B190950	390	+/- 38	0.50	B172759
Dissolved Strontium (Sr)	mg/L	0.95	+/- <RDL	0.10	B190950	1.9	+/- 0.18	0.020	B172759
Dissolved Sulphur (S)	mg/L	15	+/- 1.0	1.0	B190950	370	+/- 25	0.20	B172759
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B170340	<0.00020	N/A	0.00020	B170340
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B170340
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B170340
Dissolved Uranium (U)	mg/L	0.0016	+/- 0.00016	0.00010	B170340	0.014	+/- 0.0013	0.00010	B170340
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B170340
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B170340	<0.0030	N/A	0.0030	B170340

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Matrix spike exceeds acceptance limits due to matrix interference.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCP852				CCP853			
Sampling Date		2023/10/23 15:08				2023/10/23 15:50			
COC Number		1 of 1				1 of 1			
	UNITS	MW16-7-5 Lab-Dup	MU	RDL	QC Batch	MW16-10-15	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	N/A	N/A	N/A	B167125	64	N/A	N/A	B167125
Cation Sum	meq/L	N/A	N/A	N/A	B167125	70	N/A	N/A	B167125
Hardness (CaCO3)	mg/L	N/A	N/A	0.50	B167413	2600	N/A	0.50	B167413
Ion Balance (% Difference)	%	N/A	N/A	N/A	B167438	4.9	N/A	N/A	B167438
Nitrate (N)	mg/L	N/A	N/A	0.010	B178234	0.054	N/A	0.050	B178234
Nitrate (NO3)	mg/L	N/A	N/A	0.044	B167439	0.24	N/A	0.22	B167439
Nitrite (NO2)	mg/L	N/A	N/A	0.033	B167439	<0.033	N/A	0.033	B167439
Calculated Total Dissolved Solids	mg/L	N/A	N/A	25	B167138	4100	N/A	25	B167138
Elements									
Dissolved Cadmium (Cd)	ug/L	N/A	N/A	0.020	B167109	0.080	+/- 0.036	0.020	B167527
Misc. Inorganics									
Conductivity	uS/cm	N/A	N/A	2.0	B176895	4300	+/- 110	2.0	B176895
pH	pH	N/A	N/A	N/A	B176896	7.97	+/- 0.0790	N/A	B176896
Anions									
Alkalinity (PP as CaCO3)	mg/L	N/A	N/A	1.0	B176892	<1.0	N/A	1.0	B176892
Alkalinity (Total as CaCO3)	mg/L	N/A	N/A	1.0	B176892	490	+/- 36	1.0	B176892
Bicarbonate (HCO3)	mg/L	N/A	N/A	1.0	B176892	590	+/- 9.1	1.0	B176892
Carbonate (CO3)	mg/L	N/A	N/A	1.0	B176892	<1.0	N/A	1.0	B176892
Hydroxide (OH)	mg/L	N/A	N/A	1.0	B176892	<1.0	N/A	1.0	B176892
Chloride (Cl)	mg/L	N/A	N/A	1.0	B173541	2.6	+/- 1.2	1.0	B174202
Sulphate (SO4)	mg/L	N/A	N/A	25	B173541	2600	+/- 160	25	B174202
Nutrients									
Nitrite (N)	mg/L	N/A	N/A	0.010	B170332	<0.010	N/A	0.010	B170327
Nitrate plus Nitrite (N)	mg/L	N/A	N/A	0.010	B170332	0.054 (1)	+/- <RDL	0.050	B170327
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	N/A	N/A	0.0030	B170340	<0.0030	N/A	0.0030	B174245
Dissolved Antimony (Sb)	mg/L	N/A	N/A	0.00060	B170340	<0.00060	N/A	0.00060	B174245
Dissolved Arsenic (As)	mg/L	N/A	N/A	0.00020	B170340	0.00026	+/- <RDL	0.00020	B174245

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCP852				CCP853			
Sampling Date		2023/10/23 15:08				2023/10/23 15:50			
COC Number		1 of 1				1 of 1			
	UNITS	MW16-7-5 Lab-Dup	MU	RDL	QC Batch	MW16-10-15	MU	RDL	QC Batch
Dissolved Barium (Ba)	mg/L	0.017	+/- <RDL	0.010	B172759	<0.050 (1)	N/A	0.050	B174196
Dissolved Beryllium (Be)	mg/L	N/A	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B174245
Dissolved Boron (B)	mg/L	0.11	+/- <RDL	0.020	B172759	0.38	+/- <RDL	0.10	B174196
Dissolved Calcium (Ca)	mg/L	180	+/- 18	0.30	B172759	510	+/- 51	1.5	B174196
Dissolved Chromium (Cr)	mg/L	N/A	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B174245
Dissolved Cobalt (Co)	mg/L	N/A	N/A	0.00030	B170340	0.0039	+/- 0.00036	0.00030	B174245
Dissolved Copper (Cu)	mg/L	N/A	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B174245
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B172759	<0.30	N/A	0.30	B174196
Dissolved Lead (Pb)	mg/L	N/A	N/A	0.00020	B170340	<0.00020	N/A	0.00020	B174245
Dissolved Lithium (Li)	mg/L	0.063	+/- <RDL	0.020	B172759	<0.10	N/A	0.10	B174196
Dissolved Magnesium (Mg)	mg/L	160	+/- 10	0.20	B172759	320	+/- 21	1.0	B174196
Dissolved Manganese (Mn)	mg/L	0.20	+/- 0.014	0.0040	B172759	2.9	+/- 0.20	0.020	B174196
Dissolved Molybdenum (Mo)	mg/L	N/A	N/A	0.00020	B170340	0.00065	+/- 0.00028	0.00020	B174245
Dissolved Nickel (Ni)	mg/L	N/A	N/A	0.00050	B170340	0.0077	+/- 0.00067	0.00050	B174245
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B172759	<0.50	N/A	0.50	B174196
Dissolved Potassium (K)	mg/L	5.5	+/- 0.30	0.30	B172759	11	+/- <RDL	1.5	B174196
Dissolved Selenium (Se)	mg/L	N/A	N/A	0.00020	B170340	<0.00020	N/A	0.00020	B174245
Dissolved Silicon (Si)	mg/L	5.0	+/- 0.96	0.50	B172759	5.5	+/- <RDL	2.5	B174196
Dissolved Silver (Ag)	mg/L	N/A	N/A	0.00010	B170340	<0.00010	N/A	0.00010	B174245
Dissolved Sodium (Na)	mg/L	380	+/- 38	0.50	B172759	410	+/- 40	2.5	B174196
Dissolved Strontium (Sr)	mg/L	1.9	+/- 0.18	0.020	B172759	7.4	+/- 0.73	0.10	B174196
Dissolved Sulphur (S)	mg/L	390	+/- 26	0.20	B172759	840	+/- 56	1.0	B174196
Dissolved Thallium (Tl)	mg/L	N/A	N/A	0.00020	B170340	<0.00020	N/A	0.00020	B174245
Dissolved Tin (Sn)	mg/L	N/A	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B174245
Dissolved Titanium (Ti)	mg/L	N/A	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B174245
Dissolved Uranium (U)	mg/L	N/A	N/A	0.00010	B170340	0.011	+/- 0.0010	0.00010	B174245
Dissolved Vanadium (V)	mg/L	N/A	N/A	0.0010	B170340	<0.0010	N/A	0.0010	B174245
Dissolved Zinc (Zn)	mg/L	N/A	N/A	0.0030	B170340	0.0032	+/- <RDL	0.0030	B174245

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Matrix spike exceeds acceptance limits due to matrix interference.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCP853			
Sampling Date		2023/10/23 15:50			
COC Number		1 of 1			
	UNITS	MW16-10-15 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Elements					
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B174245
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B174245
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	0.00020	B174245
Dissolved Barium (Ba)	mg/L	<0.050	N/A	0.050	B174196
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B174245
Dissolved Boron (B)	mg/L	0.27	+/- <RDL	0.10	B174196
Dissolved Calcium (Ca)	mg/L	500	+/- 51	1.5	B174196
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B174245
Dissolved Cobalt (Co)	mg/L	0.0039	+/- 0.00036	0.00030	B174245
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B174245
Dissolved Iron (Fe)	mg/L	<0.30	N/A	0.30	B174196
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B174245
Dissolved Lithium (Li)	mg/L	<0.10	N/A	0.10	B174196
Dissolved Magnesium (Mg)	mg/L	320	+/- 20	1.0	B174196
Dissolved Manganese (Mn)	mg/L	2.9	+/- 0.19	0.020	B174196
Dissolved Molybdenum (Mo)	mg/L	0.00062	+/- 0.00028	0.00020	B174245
Dissolved Nickel (Ni)	mg/L	0.0077	+/- 0.00066	0.00050	B174245
Dissolved Phosphorus (P)	mg/L	<0.50	N/A	0.50	B174196
Dissolved Potassium (K)	mg/L	10	+/- <RDL	1.5	B174196
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	B174245
Dissolved Silicon (Si)	mg/L	5.2	+/- <RDL	2.5	B174196
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B174245
Dissolved Sodium (Na)	mg/L	410	+/- 40	2.5	B174196
Dissolved Strontium (Sr)	mg/L	7.2	+/- 0.71	0.10	B174196

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
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N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCP853			
Sampling Date		2023/10/23 15:50			
COC Number		1 of 1			
	UNITS	MW16-10-15 Lab-Dup	MU	RDL	QC Batch
Dissolved Sulphur (S)	mg/L	880	+/- 59	1.0	B174196
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B174245
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B174245
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B174245
Dissolved Uranium (U)	mg/L	0.011	+/- 0.0010	0.00010	B174245
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B174245
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B174245

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C386148
Report Date: 2023/11/09

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CCP845			CCP846			CCP847			
Sampling Date		2023/10/23 09:26			2023/10/23 10:20			2023/10/23 10:55			
COC Number		1 of 1			1 of 1			1 of 1			
	UNITS	WS11-1	MU	RDL	RRMW16-17-8	MU	RDL	RRMW16-16-17	MU	RDL	QC Batch
Calculated Parameters											
Total Kjeldahl Nitrogen (Calc)	mg/L	0.631	N/A	0.020	2.10	N/A	0.10	1.83	N/A	0.020	B180419

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CCP848		CCP849		CCP850			CCP851			
Sampling Date		2023/10/23 12:35		2023/10/23 13:08		2023/10/23 13:50			2023/10/23 14:30			
COC Number		1 of 1		1 of 1		1 of 1			1 of 1			
	UNITS	MW16-3-7	MU	MW16-2-6	MU	MW16-4-22	MU	RDL	RMW16-5-12	MU	RDL	QC Batch
Calculated Parameters												
Total Kjeldahl Nitrogen (Calc)	mg/L	0.450	N/A	0.461	N/A	1.20	N/A	0.050	3.4	N/A	2.0	B180419

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CCP852			CCP853			
Sampling Date		2023/10/23 15:08			2023/10/23 15:50			
COC Number		1 of 1			1 of 1			
	UNITS	MW16-7-5	MU	RDL	MW16-10-15	MU	RDL	QC Batch
Calculated Parameters								
Total Kjeldahl Nitrogen (Calc)	mg/L	0.649	N/A	0.020	0.845	N/A	0.050	B180419

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C386148
Report Date: 2023/11/09

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCP845			CCP846		CCP846			
Sampling Date		2023/10/23 09:26			2023/10/23 10:20		2023/10/23 10:20			
COC Number		1 of 1			1 of 1		1 of 1			
	UNITS	WS11-1	MU	RDL	RRMW16-17-8	MU	RRMW16-17-8 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	2.5	+/- <RDL	0.50	22 (1)	+/- 2.5	N/A	N/A	1.0	B174353
Microbiological Param.										
E.Coli DST	MPN/100mL	<100 (2)	N/A	100	<100 (2)	N/A	N/A	N/A	100	B168351
Fecal Coliforms	MPN/100mL	<100 (2)	N/A	100	<100 (2)	N/A	N/A	N/A	100	B168332
Heterotrophic Plate Count	CFU/mL	870 (3)	N/A	1.0	26000 (2)	N/A	N/A	N/A	25	B167687
Total Coliforms DST	MPN/100mL	2300 (2)	N/A	100	610 (2)	N/A	N/A	N/A	100	B168351
Nutrients										
Total Ammonia (N)	mg/L	0.23	+/- 0.028	0.015	0.51	+/- 0.057	N/A	N/A	0.015	B169237
Orthophosphate (P)	mg/L	<0.0030	N/A	0.0030	0.0052	+/- 0.0035	N/A	N/A	0.0030	B170696
Total Nitrogen (N)	mg/L	0.761	+/- 0.075	0.020	2.19	+/- 0.21	N/A	N/A	0.10	B176357
Lab Filtered Nutrients										
Dissolved Phosphorus (P)	mg/L	0.062	+/- 0.0072	0.0030	<0.0030 (4)	N/A	<0.0030	N/A	0.0030	B172337

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to sample matrix.
(2) Detection limit raised due to matrix interference.
(3) Sample analyzed over hold time. Sample analysis is recommended within 24 hours of sampling.
(4) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C386148
Report Date: 2023/11/09

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCP847				CCP848			
Sampling Date		2023/10/23 10:55				2023/10/23 12:35			
COC Number		1 of 1				1 of 1			
	UNITS	RRMW16-16-17	MU	RDL	QC Batch	MW16-3-7	MU	RDL	QC Batch
Lab Filtered Inorganics									
Dissolved Organic Carbon (C)	mg/L	1.9	+/- <RDL	0.50	B174353	2.1	+/- <RDL	0.50	B174353
Microbiological Param.									
E.Coli DST	MPN/100mL	<100 (1)	N/A	100	B168351	<5.0 (1)	N/A	5.0	B168351
Fecal Coliforms	MPN/100mL	<100 (1)	N/A	100	B168332	5.0 (1)	N/A	5.0	B168332
Heterotrophic Plate Count	CFU/mL	500	N/A	1.0	B167687	1300	N/A	1.0	B168373
Total Coliforms DST	MPN/100mL	<100 (1)	N/A	100	B168351	170 (1)	N/A	5.0	B168351
Nutrients									
Total Ammonia (N)	mg/L	1.5	+/- 0.16	0.015	B169237	0.025	+/- <RDL	0.015	B169237
Orthophosphate (P)	mg/L	<0.0030	N/A	0.0030	B170696	0.0092	+/- 0.0037	0.0030	B170696
Total Nitrogen (N)	mg/L	1.83	+/- 0.175	0.020	B176357	0.450	+/- 0.047	0.020	B176357
Lab Filtered Nutrients									
Dissolved Phosphorus (P)	mg/L	<0.0030	N/A	0.0030	B172337	0.0061 (2)	+/- 0.0048	0.0030	B172337

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.
(2) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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Bureau Veritas Job #: C386148
Report Date: 2023/11/09

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCP849		CCP849				CCP850			
Sampling Date		2023/10/23 13:08		2023/10/23 13:08				2023/10/23 13:50			
COC Number		1 of 1		1 of 1				1 of 1			
	UNITS	MW16-2-6	MU	MW16-2-6 Lab-Dup	MU	RDL	QC Batch	MW16-4-22	MU	RDL	QC Batch
Lab Filtered Inorganics											
Dissolved Organic Carbon (C)	mg/L	3.2	+/- 0.54	N/A	N/A	0.50	B174353	4.5	+/- 0.65	0.50	B174353
Microbiological Param.											
E.Coli DST	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B168351	<2.0 (1)	N/A	2.0	B168351
Fecal Coliforms	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B168332	<2.0 (1)	N/A	2.0	B168332
Heterotrophic Plate Count	CFU/mL	1500	N/A	1300	N/A	1.0	B168373	>6000	N/A	1.0	B168373
Total Coliforms DST	MPN/100mL	12	N/A	N/A	N/A	1.0	B168351	<2.0 (1)	N/A	2.0	B168351
Nutrients											
Total Ammonia (N)	mg/L	0.17	+/- 0.022	N/A	N/A	0.015	B169237	0.92	+/- 0.10	0.015	B169237
Orthophosphate (P)	mg/L	0.0043	+/- 0.0035	N/A	N/A	0.0030	B170696	<0.0030	N/A	0.0030	B170696
Total Nitrogen (N)	mg/L	0.461	+/- 0.048	N/A	N/A	0.020	B176357	1.20	+/- 0.116	0.020	B176384
Lab Filtered Nutrients											
Dissolved Phosphorus (P)	mg/L	<0.0030 (2)	N/A	N/A	N/A	0.0030	B172337	0.014	+/- 0.0050	0.0030	B172337

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.
(2) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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Bureau Veritas Job #: C386148
Report Date: 2023/11/09

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCP850				CCP851			
Sampling Date		2023/10/23 13:50				2023/10/23 14:30			
COC Number		1 of 1				1 of 1			
	UNITS	MW16-4-22 Lab-Dup	MU	RDL	QC Batch	RMW16-5-12	MU	RDL	QC Batch
Lab Filtered Inorganics									
Dissolved Organic Carbon (C)	mg/L	4.5	+/- 0.65	0.50	B174353	1.2	+/- <RDL	0.50	B174239
Microbiological Param.									
E.Coli DST	MPN/100mL	N/A	N/A	2.0	B168351	<100 (1)	N/A	100	B168351
Fecal Coliforms	MPN/100mL	N/A	N/A	2.0	B168332	<100 (1)	N/A	100	B168332
Heterotrophic Plate Count	CFU/mL	N/A	N/A	1.0	B168373	4700 (1)	N/A	20	B168373
Total Coliforms DST	MPN/100mL	N/A	N/A	2.0	B168351	<100 (1)	N/A	100	B168351
Nutrients									
Total Ammonia (N)	mg/L	0.92	+/- 0.10	0.015	B169237	0.28	+/- 0.032	0.015	B169237
Orthophosphate (P)	mg/L	N/A	N/A	0.0030	B170696	0.0034	+/- 0.0034	0.0030	B170696
Total Nitrogen (N)	mg/L	N/A	N/A	0.020	B176384	3.4 (2)	+/- <RDL	2.0	B180238
Lab Filtered Nutrients									
Dissolved Phosphorus (P)	mg/L	N/A	N/A	0.0030	B172337	0.010	+/- 0.0049	0.0030	B172337

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.
(2) RDL raised due to sample matrix interference.

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Bureau Veritas Job #: C386148
Report Date: 2023/11/09

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCP851				CCP852			
Sampling Date		2023/10/23 14:30				2023/10/23 15:08			
COC Number		1 of 1				1 of 1			
	UNITS	RMW16-5-12 Lab-Dup	MU	RDL	QC Batch	MW16-7-5	MU	RDL	QC Batch
Lab Filtered Inorganics									
Dissolved Organic Carbon (C)	mg/L	N/A	N/A	0.50	B174239	2.2	+/- <RDL	0.50	B174353
Microbiological Param.									
E.Coli DST	MPN/100mL	N/A	N/A	100	B168351	<100 (1)	N/A	100	B168351
Fecal Coliforms	MPN/100mL	N/A	N/A	100	B168332	<100 (1)	N/A	100	B168332
Heterotrophic Plate Count	CFU/mL	N/A	N/A	20	B168373	710 (2)	N/A	1.0	B168373
Total Coliforms DST	MPN/100mL	N/A	N/A	100	B168351	310 (1)	N/A	100	B168351
Nutrients									
Total Ammonia (N)	mg/L	N/A	N/A	0.015	B169237	0.037	+/- <RDL	0.015	B169237
Orthophosphate (P)	mg/L	N/A	N/A	0.0030	B170696	0.0097	+/- 0.0037	0.0030	B170696
Total Nitrogen (N)	mg/L	3.6	+/- <RDL	2.0	B180238	0.649	+/- 0.065	0.020	B176384
Lab Filtered Nutrients									
Dissolved Phosphorus (P)	mg/L	N/A	N/A	0.0030	B172337	0.015	+/- 0.0050	0.0030	B172337

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.
(2) Spreader colony present. Quantitative colony reporting is not possible due to bacterial density.'

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Bureau Veritas Job #: C386148
Report Date: 2023/11/09

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCP853			
Sampling Date		2023/10/23 15:50			
COC Number		1 of 1			
	UNITS	MW16-10-15	MU	RDL	QC Batch
Lab Filtered Inorganics					
Dissolved Organic Carbon (C)	mg/L	1.6	+/- <RDL	0.50	B174353
Microbiological Param.					
E.Coli DST	MPN/100mL	<100 (1)	N/A	100	B168351
Fecal Coliforms	MPN/100mL	<100 (1)	N/A	100	B168332
Heterotrophic Plate Count	CFU/mL	2600	N/A	1.0	B168373
Total Coliforms DST	MPN/100mL	<100 (1)	N/A	100	B168351
Nutrients					
Total Ammonia (N)	mg/L	0.42	+/- 0.047	0.015	B169237
Orthophosphate (P)	mg/L	0.0043	+/- 0.0035	0.0030	B170696
Total Nitrogen (N)	mg/L	0.899	+/- 0.088	0.020	B176384
Lab Filtered Nutrients					
Dissolved Phosphorus (P)	mg/L	0.0057	+/- 0.0048	0.0030	B172337

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.

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MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID		CCP845				CCP846			
Sampling Date		2023/10/23 09:26				2023/10/23 10:20			
COC Number		1 of 1				1 of 1			
	UNITS	WS11-1	MU	RDL	QC Batch	RRMW16-17-8	MU	RDL	QC Batch
Elements									
Total Mercury (Hg)	ug/L	0.0022	+/- <RDL	0.0019	B174206	0.066	+/- <RDL	0.019	B174206
Lab Filtered Elements									
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	B174223	<0.0019	N/A	0.0019	B171360

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CCP847				CCP848		CCP848			
Sampling Date		2023/10/23 10:55				2023/10/23 12:35		2023/10/23 12:35			
COC Number		1 of 1				1 of 1		1 of 1			
	UNITS	RRMW16-16-17	MU	RDL	QC Batch	MW16-3-7	MU	MW16-3-7 Lab-Dup	MU	RDL	QC Batch
Elements											
Total Mercury (Hg)	ug/L	<0.019	N/A	0.019	B174206	0.0022	+/- <RDL	N/A	N/A	0.0019	B174206
Lab Filtered Elements											
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	B174223	<0.0019	N/A	<0.0019	N/A	0.0019	B174219

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CCP849			CCP850			
Sampling Date		2023/10/23 13:08			2023/10/23 13:50			
COC Number		1 of 1			1 of 1			
	UNITS	MW16-2-6	MU	QC Batch	MW16-4-22	MU	RDL	QC Batch
Elements								
Total Mercury (Hg)	ug/L	0.0088	+/- 0.0023	B174206	0.0019	+/- <RDL	0.0019	B174210
Lab Filtered Elements								
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	B174219	<0.0019	N/A	0.0019	B171360

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID		CCP851			CCP852			
Sampling Date		2023/10/23 14:30			2023/10/23 15:08			
COC Number		1 of 1			1 of 1			
	UNITS	RMW16-5-12	MU	RDL	MW16-7-5	MU	RDL	QC Batch
Elements								
Total Mercury (Hg)	ug/L	0.037	+/- <RDL	0.019	0.0062	+/- 0.0021	0.0019	B174206
Lab Filtered Elements								
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	<0.0019	N/A	0.0019	B174219

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CCP853			
Sampling Date		2023/10/23 15:50			
COC Number		1 of 1			
	UNITS	MW16-10-15	MU	RDL	QC Batch
Elements					
Total Mercury (Hg)	ug/L	0.049	+/- <RDL	0.019	B174210
Lab Filtered Elements					
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	B174223

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	-3.3°C
Package 2	-1.0°C

ROUTINE + DISS. REG. METALS – LAB FILT (WATER) Comments

Sample CCP851 [RMW16-5-12] Elements by ICP-Dissolved-Lab Filtered: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

MERCURY BY COLD VAPOR (WATER) Comments

Sample CCP846 [RRMW16-17-8] Mercury (Total) by CV: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
Sample CCP847 [RRMW16-16-17] Mercury (Total) by CV: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
Sample CCP851 [RMW16-5-12] Mercury (Total) by CV: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
Sample CCP853 [MW16-10-15] Mercury (Total) by CV: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B167687	SOG	RPD	Heterotrophic Plate Count	2023/10/26	0		%	N/A
B168332	SOG	Method Blank	Fecal Coliforms	2023/10/25	<1.0		MPN/100mL	
B168332	SOG	RPD	Fecal Coliforms	2023/10/25	19		%	N/A
B168344	CHA	Spiked Blank	O-TERPHENYL (sur.)	2023/10/26		106	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2023/10/26		100	%	60 - 140
B168344	CHA	Method Blank	O-TERPHENYL (sur.)	2023/10/26		98	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2023/10/26	<0.10		mg/L	
B168351	SOG	Method Blank	E.Coli DST	2023/10/25	<1.0		mpn/100mL	
			Total Coliforms DST	2023/10/25	<1.0		mpn/100mL	
B168351	SOG	RPD	E.Coli DST	2023/10/25	NC		%	N/A
			Total Coliforms DST	2023/10/25	NC		%	N/A
B168373	SOG	Method Blank	Heterotrophic Plate Count	2023/10/26	<1.0		CFU/mL	
B168373	SOG	RPD [CCP849-10]	Heterotrophic Plate Count	2023/10/26	13		%	N/A
B169237	AFI	Matrix Spike [CCP850-07]	Total Ammonia (N)	2023/10/25		100	%	80 - 120
B169237	AFI	Spiked Blank	Total Ammonia (N)	2023/10/25		99	%	80 - 120
B169237	AFI	Method Blank	Total Ammonia (N)	2023/10/25	<0.015		mg/L	
B169237	AFI	RPD [CCP850-07]	Total Ammonia (N)	2023/10/25	0.35		%	20
B169803	QW1	Matrix Spike [CCP848-06]	1,4-Difluorobenzene (sur.)	2023/10/29		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/10/29		105	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/10/29		109	%	50 - 140
			Benzene	2023/10/29		107	%	50 - 140
			Toluene	2023/10/29		100	%	50 - 140
			Ethylbenzene	2023/10/29		104	%	50 - 140
			m & p-Xylene	2023/10/29		96	%	50 - 140
			o-Xylene	2023/10/29		97	%	50 - 140
			F1 (C6-C10)	2023/10/29		99	%	60 - 140
B169803	QW1	Spiked Blank	1,4-Difluorobenzene (sur.)	2023/10/29		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/10/29		105	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/10/29		107	%	50 - 140
			Benzene	2023/10/29		108	%	60 - 130
			Toluene	2023/10/29		101	%	60 - 130
			Ethylbenzene	2023/10/29		105	%	60 - 130
			m & p-Xylene	2023/10/29		97	%	60 - 130
			o-Xylene	2023/10/29		96	%	60 - 130
			F1 (C6-C10)	2023/10/29		110	%	60 - 140
B169803	QW1	Method Blank	1,4-Difluorobenzene (sur.)	2023/10/29		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/10/29		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/10/29		109	%	50 - 140
			Benzene	2023/10/29	<0.00040		mg/L	
			Toluene	2023/10/29	<0.00040		mg/L	
			Ethylbenzene	2023/10/29	<0.00040		mg/L	
			m & p-Xylene	2023/10/29	<0.00080		mg/L	
			o-Xylene	2023/10/29	<0.00040		mg/L	
			F1 (C6-C10)	2023/10/29	<0.10		mg/L	
B169803	QW1	RPD [CCP845-06]	Benzene	2023/10/29	4.8		%	30
			Toluene	2023/10/29	NC		%	30
			Ethylbenzene	2023/10/29	NC		%	30
			m & p-Xylene	2023/10/29	NC		%	30
			o-Xylene	2023/10/29	NC		%	30
			F1 (C6-C10)	2023/10/29	NC		%	30
B170327	AFI	Matrix Spike	Nitrite (N)	2023/10/25		97	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/25		116	%	80 - 120
B170327	AFI	Spiked Blank	Nitrite (N)	2023/10/25		101	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Nitrate plus Nitrite (N)	2023/10/25		105	%	80 - 120
B170327	AFI	Method Blank	Nitrite (N)	2023/10/25	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2023/10/25	<0.010		mg/L	
B170327	AFI	RPD	Nitrite (N)	2023/10/25	NC		%	20
			Nitrate plus Nitrite (N)	2023/10/25	NC		%	20
B170332	AFI	Matrix Spike	Nitrite (N)	2023/10/25		91	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/25		114	%	80 - 120
B170332	AFI	Spiked Blank	Nitrite (N)	2023/10/25		101	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/25		103	%	80 - 120
B170332	AFI	Method Blank	Nitrite (N)	2023/10/25	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2023/10/25	<0.010		mg/L	
B170332	AFI	RPD	Nitrite (N)	2023/10/26	NC		%	20
			Nitrate plus Nitrite (N)	2023/10/26	NC		%	20
B170340	KH2	Matrix Spike	Dissolved Aluminum (Al)	2023/10/25		87	%	80 - 120
			Dissolved Antimony (Sb)	2023/10/25		94	%	80 - 120
			Dissolved Arsenic (As)	2023/10/25		90	%	80 - 120
			Dissolved Beryllium (Be)	2023/10/25		86	%	80 - 120
			Dissolved Chromium (Cr)	2023/10/25		91	%	80 - 120
			Dissolved Cobalt (Co)	2023/10/25		90	%	80 - 120
			Dissolved Copper (Cu)	2023/10/25		88	%	80 - 120
			Dissolved Lead (Pb)	2023/10/25		85	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/10/25		92	%	80 - 120
			Dissolved Nickel (Ni)	2023/10/25		87	%	80 - 120
			Dissolved Selenium (Se)	2023/10/25		90	%	80 - 120
			Dissolved Silver (Ag)	2023/10/25		87	%	80 - 120
			Dissolved Thallium (Tl)	2023/10/25		85	%	80 - 120
			Dissolved Tin (Sn)	2023/10/25		90	%	80 - 120
			Dissolved Titanium (Ti)	2023/10/25		90	%	80 - 120
			Dissolved Uranium (U)	2023/10/25		87	%	80 - 120
			Dissolved Vanadium (V)	2023/10/25		91	%	80 - 120
			Dissolved Zinc (Zn)	2023/10/25		85	%	80 - 120
B170340	KH2	Spiked Blank	Dissolved Aluminum (Al)	2023/10/25		102	%	80 - 120
			Dissolved Antimony (Sb)	2023/10/25		109	%	80 - 120
			Dissolved Arsenic (As)	2023/10/25		100	%	80 - 120
			Dissolved Beryllium (Be)	2023/10/25		99	%	80 - 120
			Dissolved Chromium (Cr)	2023/10/25		104	%	80 - 120
			Dissolved Cobalt (Co)	2023/10/25		102	%	80 - 120
			Dissolved Copper (Cu)	2023/10/25		101	%	80 - 120
			Dissolved Lead (Pb)	2023/10/25		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/10/25		104	%	80 - 120
			Dissolved Nickel (Ni)	2023/10/25		102	%	80 - 120
			Dissolved Selenium (Se)	2023/10/25		95	%	80 - 120
			Dissolved Silver (Ag)	2023/10/25		98	%	80 - 120
			Dissolved Thallium (Tl)	2023/10/25		97	%	80 - 120
			Dissolved Tin (Sn)	2023/10/25		104	%	80 - 120
			Dissolved Titanium (Ti)	2023/10/25		105	%	80 - 120
			Dissolved Uranium (U)	2023/10/25		97	%	80 - 120
			Dissolved Vanadium (V)	2023/10/25		103	%	80 - 120
			Dissolved Zinc (Zn)	2023/10/25		94	%	80 - 120
B170340	KH2	Method Blank	Dissolved Aluminum (Al)	2023/10/25	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2023/10/25	<0.00060		mg/L	
			Dissolved Arsenic (As)	2023/10/25	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2023/10/25	<0.0010		mg/L	

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			Dissolved Chromium (Cr)	2023/10/25	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2023/10/25	<0.00030		mg/L	
			Dissolved Copper (Cu)	2023/10/25	<0.0010		mg/L	
			Dissolved Lead (Pb)	2023/10/25	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2023/10/25	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2023/10/25	<0.00050		mg/L	
			Dissolved Selenium (Se)	2023/10/25	<0.00020		mg/L	
			Dissolved Silver (Ag)	2023/10/25	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2023/10/25	<0.00020		mg/L	
			Dissolved Tin (Sn)	2023/10/25	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2023/10/25	<0.0010		mg/L	
			Dissolved Uranium (U)	2023/10/25	<0.00010		mg/L	
			Dissolved Vanadium (V)	2023/10/25	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2023/10/25	<0.0030		mg/L	
B170340	KH2	RPD	Dissolved Aluminum (Al)	2023/10/25	7.7		%	20
			Dissolved Antimony (Sb)	2023/10/25	0.77		%	20
			Dissolved Arsenic (As)	2023/10/25	2.1		%	20
			Dissolved Beryllium (Be)	2023/10/25	NC		%	20
			Dissolved Chromium (Cr)	2023/10/25	NC		%	20
			Dissolved Cobalt (Co)	2023/10/25	0.91		%	20
			Dissolved Copper (Cu)	2023/10/25	NC		%	20
			Dissolved Lead (Pb)	2023/10/25	NC		%	20
			Dissolved Molybdenum (Mo)	2023/10/25	2.7		%	20
			Dissolved Nickel (Ni)	2023/10/25	0.47		%	20
			Dissolved Selenium (Se)	2023/10/25	1.2		%	20
			Dissolved Silver (Ag)	2023/10/25	NC		%	20
			Dissolved Thallium (Tl)	2023/10/25	NC		%	20
			Dissolved Tin (Sn)	2023/10/25	NC		%	20
			Dissolved Titanium (Ti)	2023/10/25	NC		%	20
			Dissolved Uranium (U)	2023/10/25	2.5		%	20
			Dissolved Vanadium (V)	2023/10/25	2.8		%	20
			Dissolved Zinc (Zn)	2023/10/25	NC		%	20
B170696	MAP	Matrix Spike	Orthophosphate (P)	2023/10/25		93	%	80 - 120
B170696	MAP	Spiked Blank	Orthophosphate (P)	2023/10/25		97	%	80 - 120
B170696	MAP	Method Blank	Orthophosphate (P)	2023/10/25	<0.0030		mg/L	
B170696	MAP	RPD	Orthophosphate (P)	2023/10/25	0.63		%	20
B171360	KKM	Matrix Spike	Dissolved Mercury (Hg)	2023/10/27		85	%	80 - 120
B171360	KKM	Spiked Blank	Dissolved Mercury (Hg)	2023/10/27		102	%	80 - 120
B171360	KKM	Method Blank	Dissolved Mercury (Hg)	2023/10/27	<0.0019		ug/L	
B171360	KKM	RPD	Dissolved Mercury (Hg)	2023/10/27	NC		%	20
B172337	CTU	Matrix Spike [CCP852-01]	Dissolved Phosphorus (P)	2023/10/28		103	%	80 - 120
B172337	CTU	QC Standard	Dissolved Phosphorus (P)	2023/10/28		93	%	80 - 120
B172337	CTU	Spiked Blank	Dissolved Phosphorus (P)	2023/10/28		98	%	80 - 120
B172337	CTU	Method Blank	Dissolved Phosphorus (P)	2023/10/28	<0.0030		mg/L	
B172337	CTU	RPD [CCP846-01]	Dissolved Phosphorus (P)	2023/10/28	NC		%	20
B172759	MPU	Matrix Spike [CCP852-01]	Dissolved Barium (Ba)	2023/10/26		106	%	80 - 120
			Dissolved Boron (B)	2023/10/26		117	%	80 - 120
			Dissolved Calcium (Ca)	2023/10/26		NC	%	80 - 120
			Dissolved Iron (Fe)	2023/10/26		120	%	80 - 120
			Dissolved Lithium (Li)	2023/10/26		117	%	80 - 120
			Dissolved Magnesium (Mg)	2023/10/26		NC	%	80 - 120
			Dissolved Manganese (Mn)	2023/10/26		124 (1)	%	80 - 120
			Dissolved Phosphorus (P)	2023/10/26		121 (1)	%	80 - 120

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			Dissolved Potassium (K)	2023/10/26		124 (1)	%	80 - 120
			Dissolved Silicon (Si)	2023/10/26		115	%	80 - 120
			Dissolved Sodium (Na)	2023/10/26		NC	%	80 - 120
			Dissolved Strontium (Sr)	2023/10/26		103	%	80 - 120
			Dissolved Sulphur (S)	2023/10/26		NC	%	80 - 120
B172759	MPU	Spiked Blank	Dissolved Barium (Ba)	2023/10/26		100	%	80 - 120
			Dissolved Boron (B)	2023/10/26		100	%	80 - 120
			Dissolved Calcium (Ca)	2023/10/26		103	%	80 - 120
			Dissolved Iron (Fe)	2023/10/26		103	%	80 - 120
			Dissolved Lithium (Li)	2023/10/26		103	%	80 - 120
			Dissolved Magnesium (Mg)	2023/10/26		105	%	80 - 120
			Dissolved Manganese (Mn)	2023/10/26		107	%	80 - 120
			Dissolved Phosphorus (P)	2023/10/26		101	%	80 - 120
			Dissolved Potassium (K)	2023/10/26		106	%	80 - 120
			Dissolved Silicon (Si)	2023/10/26		100	%	80 - 120
			Dissolved Sodium (Na)	2023/10/26		105	%	80 - 120
			Dissolved Strontium (Sr)	2023/10/26		99	%	80 - 120
			Dissolved Sulphur (S)	2023/10/26		99	%	80 - 120
B172759	MPU	Method Blank	Dissolved Barium (Ba)	2023/10/26	<0.010		mg/L	
			Dissolved Boron (B)	2023/10/26	<0.020		mg/L	
			Dissolved Calcium (Ca)	2023/10/26	<0.30		mg/L	
			Dissolved Iron (Fe)	2023/10/26	<0.060		mg/L	
			Dissolved Lithium (Li)	2023/10/26	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2023/10/26	<0.20		mg/L	
			Dissolved Manganese (Mn)	2023/10/26	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2023/10/26	<0.10		mg/L	
			Dissolved Potassium (K)	2023/10/26	<0.30		mg/L	
			Dissolved Silicon (Si)	2023/10/26	<0.50		mg/L	
			Dissolved Sodium (Na)	2023/10/26	<0.50		mg/L	
			Dissolved Strontium (Sr)	2023/10/26	<0.020		mg/L	
			Dissolved Sulphur (S)	2023/10/26	<0.20		mg/L	
B172759	MPU	RPD [CCP852-01]	Dissolved Barium (Ba)	2023/10/26	11		%	20
			Dissolved Boron (B)	2023/10/26	12		%	20
			Dissolved Calcium (Ca)	2023/10/26	2.6		%	20
			Dissolved Iron (Fe)	2023/10/26	NC		%	20
			Dissolved Lithium (Li)	2023/10/26	8.2		%	20
			Dissolved Magnesium (Mg)	2023/10/26	1.1		%	20
			Dissolved Manganese (Mn)	2023/10/26	1.9		%	20
			Dissolved Phosphorus (P)	2023/10/26	NC		%	20
			Dissolved Potassium (K)	2023/10/26	3.0		%	20
			Dissolved Silicon (Si)	2023/10/26	0.24		%	20
			Dissolved Sodium (Na)	2023/10/26	1.9		%	20
			Dissolved Strontium (Sr)	2023/10/26	1.8		%	20
			Dissolved Sulphur (S)	2023/10/26	3.5		%	20
B173541	TOR	Matrix Spike	Chloride (Cl)	2023/10/27		94	%	80 - 120
			Sulphate (SO4)	2023/10/27		NC	%	80 - 120
B173541	TOR	Spiked Blank	Chloride (Cl)	2023/10/27		101	%	80 - 120
			Sulphate (SO4)	2023/10/27		101	%	80 - 120
B173541	TOR	Method Blank	Chloride (Cl)	2023/10/27	<1.0		mg/L	
			Sulphate (SO4)	2023/10/27	<1.0		mg/L	
B173541	TOR	RPD	Chloride (Cl)	2023/10/27	0.10		%	20
			Sulphate (SO4)	2023/10/27	1.6		%	20
B174196	MPU	Matrix Spike [CCP853-01]	Dissolved Barium (Ba)	2023/10/27		45 (1)	%	80 - 120

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			Dissolved Boron (B)	2023/10/27		96	%	80 - 120
			Dissolved Calcium (Ca)	2023/10/27		NC	%	80 - 120
			Dissolved Iron (Fe)	2023/10/27		111	%	80 - 120
			Dissolved Lithium (Li)	2023/10/27		99	%	80 - 120
			Dissolved Magnesium (Mg)	2023/10/27		NC	%	80 - 120
			Dissolved Manganese (Mn)	2023/10/27		NC	%	80 - 120
			Dissolved Phosphorus (P)	2023/10/27		106	%	80 - 120
			Dissolved Potassium (K)	2023/10/27		105	%	80 - 120
			Dissolved Silicon (Si)	2023/10/27		97	%	80 - 120
			Dissolved Sodium (Na)	2023/10/27		NC	%	80 - 120
			Dissolved Strontium (Sr)	2023/10/27		NC	%	80 - 120
			Dissolved Sulphur (S)	2023/10/27		NC	%	80 - 120
B174196	MPU	Spiked Blank	Dissolved Barium (Ba)	2023/10/27		96	%	80 - 120
			Dissolved Boron (B)	2023/10/27		101	%	80 - 120
			Dissolved Calcium (Ca)	2023/10/27		101	%	80 - 120
			Dissolved Iron (Fe)	2023/10/27		109	%	80 - 120
			Dissolved Lithium (Li)	2023/10/27		100	%	80 - 120
			Dissolved Magnesium (Mg)	2023/10/27		103	%	80 - 120
			Dissolved Manganese (Mn)	2023/10/27		109	%	80 - 120
			Dissolved Phosphorus (P)	2023/10/27		101	%	80 - 120
			Dissolved Potassium (K)	2023/10/27		104	%	80 - 120
			Dissolved Silicon (Si)	2023/10/27		99	%	80 - 120
			Dissolved Sodium (Na)	2023/10/27		102	%	80 - 120
			Dissolved Strontium (Sr)	2023/10/27		98	%	80 - 120
			Dissolved Sulphur (S)	2023/10/27		100	%	80 - 120
B174196	MPU	Method Blank	Dissolved Barium (Ba)	2023/10/28	<0.010		mg/L	
			Dissolved Boron (B)	2023/10/28	<0.020		mg/L	
			Dissolved Calcium (Ca)	2023/10/28	<0.30		mg/L	
			Dissolved Iron (Fe)	2023/10/28	<0.060		mg/L	
			Dissolved Lithium (Li)	2023/10/28	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2023/10/28	<0.20		mg/L	
			Dissolved Manganese (Mn)	2023/10/28	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2023/10/28	<0.10		mg/L	
			Dissolved Potassium (K)	2023/10/28	<0.30		mg/L	
			Dissolved Silicon (Si)	2023/10/28	<0.50		mg/L	
			Dissolved Sodium (Na)	2023/10/28	<0.50		mg/L	
			Dissolved Strontium (Sr)	2023/10/28	<0.020		mg/L	
			Dissolved Sulphur (S)	2023/10/28	<0.20		mg/L	
B174196	MPU	RPD [CCP853-01]	Dissolved Barium (Ba)	2023/10/27	NC		%	20
			Dissolved Boron (B)	2023/10/27	NC		%	20
			Dissolved Calcium (Ca)	2023/10/27	1.1		%	20
			Dissolved Iron (Fe)	2023/10/27	NC		%	20
			Dissolved Lithium (Li)	2023/10/27	NC		%	20
			Dissolved Magnesium (Mg)	2023/10/27	2.0		%	20
			Dissolved Manganese (Mn)	2023/10/27	1.7		%	20
			Dissolved Phosphorus (P)	2023/10/27	NC		%	20
			Dissolved Potassium (K)	2023/10/27	6.6		%	20
			Dissolved Silicon (Si)	2023/10/27	6.4		%	20
			Dissolved Sodium (Na)	2023/10/27	0.92		%	20
			Dissolved Strontium (Sr)	2023/10/27	2.8		%	20
			Dissolved Sulphur (S)	2023/10/27	4.3		%	20
B174202	TOR	Matrix Spike	Chloride (Cl)	2023/10/27		99	%	80 - 120
			Sulphate (SO4)	2023/10/27		NC	%	80 - 120

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B174202	TOR	Spiked Blank	Chloride (Cl)	2023/10/27		101	%	80 - 120
			Sulphate (SO4)	2023/10/27		100	%	80 - 120
B174202	TOR	Method Blank	Chloride (Cl)	2023/10/27	<1.0		mg/L	
			Sulphate (SO4)	2023/10/27	<1.0		mg/L	
B174202	TOR	RPD	Chloride (Cl)	2023/10/27	12		%	20
			Sulphate (SO4)	2023/10/27	0.66		%	20
B174206	KKM	Matrix Spike	Total Mercury (Hg)	2023/10/31		91	%	80 - 120
B174206	KKM	Spiked Blank	Total Mercury (Hg)	2023/10/31		96	%	80 - 120
B174206	KKM	Method Blank	Total Mercury (Hg)	2023/10/31	<0.0019		ug/L	
B174206	KKM	RPD	Total Mercury (Hg)	2023/10/31	NC		%	20
B174210	KKM	Matrix Spike	Total Mercury (Hg)	2023/10/31		90	%	80 - 120
B174210	KKM	Spiked Blank	Total Mercury (Hg)	2023/10/31		99	%	80 - 120
B174210	KKM	Method Blank	Total Mercury (Hg)	2023/10/31	<0.0019		ug/L	
B174210	KKM	RPD	Total Mercury (Hg)	2023/10/31	NC		%	20
B174219	KKM	Matrix Spike [CCP849-09]	Dissolved Mercury (Hg)	2023/10/28		109	%	80 - 120
B174219	KKM	Spiked Blank	Dissolved Mercury (Hg)	2023/10/28		99	%	80 - 120
B174219	KKM	Method Blank	Dissolved Mercury (Hg)	2023/10/28	<0.0019		ug/L	
B174219	KKM	RPD [CCP848-09]	Dissolved Mercury (Hg)	2023/10/28	NC		%	20
B174223	KKM	Matrix Spike	Dissolved Mercury (Hg)	2023/10/28		98	%	80 - 120
B174223	KKM	Spiked Blank	Dissolved Mercury (Hg)	2023/10/28		100	%	80 - 120
B174223	KKM	Method Blank	Dissolved Mercury (Hg)	2023/10/28	<0.0019		ug/L	
B174223	KKM	RPD	Dissolved Mercury (Hg)	2023/10/28	NC		%	20
B174239	YHK	Matrix Spike	Dissolved Organic Carbon (C)	2023/10/28		110	%	80 - 120
B174239	YHK	Spiked Blank	Dissolved Organic Carbon (C)	2023/10/28		92	%	80 - 120
B174239	YHK	Method Blank	Dissolved Organic Carbon (C)	2023/10/28	<0.50		mg/L	
B174239	YHK	RPD	Dissolved Organic Carbon (C)	2023/10/28	3.7		%	20
B174245	JAB	Matrix Spike [CCP853-01]	Dissolved Aluminum (Al)	2023/10/27		101	%	80 - 120
			Dissolved Antimony (Sb)	2023/10/27		109	%	80 - 120
			Dissolved Arsenic (As)	2023/10/27		100	%	80 - 120
			Dissolved Beryllium (Be)	2023/10/27		94	%	80 - 120
			Dissolved Chromium (Cr)	2023/10/27		99	%	80 - 120
			Dissolved Cobalt (Co)	2023/10/27		95	%	80 - 120
			Dissolved Copper (Cu)	2023/10/27		92	%	80 - 120
			Dissolved Lead (Pb)	2023/10/27		91	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/10/27		108	%	80 - 120
			Dissolved Nickel (Ni)	2023/10/27		93	%	80 - 120
			Dissolved Selenium (Se)	2023/10/27		98	%	80 - 120
			Dissolved Silver (Ag)	2023/10/27		94	%	80 - 120
			Dissolved Thallium (Tl)	2023/10/27		93	%	80 - 120
			Dissolved Tin (Sn)	2023/10/27		102	%	80 - 120
			Dissolved Titanium (Ti)	2023/10/27		101	%	80 - 120
			Dissolved Uranium (U)	2023/10/27		95	%	80 - 120
			Dissolved Vanadium (V)	2023/10/27		101	%	80 - 120
			Dissolved Zinc (Zn)	2023/10/27		91	%	80 - 120
B174245	JAB	Spiked Blank	Dissolved Aluminum (Al)	2023/10/27		104	%	80 - 120
			Dissolved Antimony (Sb)	2023/10/27		107	%	80 - 120
			Dissolved Arsenic (As)	2023/10/27		99	%	80 - 120
			Dissolved Beryllium (Be)	2023/10/27		94	%	80 - 120
			Dissolved Chromium (Cr)	2023/10/27		97	%	80 - 120
			Dissolved Cobalt (Co)	2023/10/27		96	%	80 - 120
			Dissolved Copper (Cu)	2023/10/27		94	%	80 - 120
			Dissolved Lead (Pb)	2023/10/27		96	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/10/27		102	%	80 - 120

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			Dissolved Nickel (Ni)	2023/10/27		95	%	80 - 120
			Dissolved Selenium (Se)	2023/10/27		100	%	80 - 120
			Dissolved Silver (Ag)	2023/10/27		97	%	80 - 120
			Dissolved Thallium (Tl)	2023/10/27		95	%	80 - 120
			Dissolved Tin (Sn)	2023/10/27		98	%	80 - 120
			Dissolved Titanium (Ti)	2023/10/27		102	%	80 - 120
			Dissolved Uranium (U)	2023/10/27		96	%	80 - 120
			Dissolved Vanadium (V)	2023/10/27		97	%	80 - 120
			Dissolved Zinc (Zn)	2023/10/27		98	%	80 - 120
B174245	JAB	Method Blank	Dissolved Aluminum (Al)	2023/10/27	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2023/10/27	<0.00060		mg/L	
			Dissolved Arsenic (As)	2023/10/27	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2023/10/27	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2023/10/27	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2023/10/27	<0.00030		mg/L	
			Dissolved Copper (Cu)	2023/10/27	<0.0010		mg/L	
			Dissolved Lead (Pb)	2023/10/27	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2023/10/27	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2023/10/27	<0.00050		mg/L	
			Dissolved Selenium (Se)	2023/10/27	<0.00020		mg/L	
			Dissolved Silver (Ag)	2023/10/27	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2023/10/27	<0.00020		mg/L	
			Dissolved Tin (Sn)	2023/10/27	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2023/10/27	<0.0010		mg/L	
			Dissolved Uranium (U)	2023/10/27	<0.00010		mg/L	
			Dissolved Vanadium (V)	2023/10/27	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2023/10/27	<0.0030		mg/L	
B174245	JAB	RPD [CCP853-01]	Dissolved Aluminum (Al)	2023/10/27	NC		%	20
			Dissolved Antimony (Sb)	2023/10/27	NC		%	20
			Dissolved Arsenic (As)	2023/10/27	NC		%	20
			Dissolved Beryllium (Be)	2023/10/27	NC		%	20
			Dissolved Chromium (Cr)	2023/10/27	NC		%	20
			Dissolved Cobalt (Co)	2023/10/27	0.33		%	20
			Dissolved Copper (Cu)	2023/10/27	NC		%	20
			Dissolved Lead (Pb)	2023/10/27	NC		%	20
			Dissolved Molybdenum (Mo)	2023/10/27	5.9		%	20
			Dissolved Nickel (Ni)	2023/10/27	0.53		%	20
			Dissolved Selenium (Se)	2023/10/27	NC		%	20
			Dissolved Silver (Ag)	2023/10/27	NC		%	20
			Dissolved Thallium (Tl)	2023/10/27	NC		%	20
			Dissolved Tin (Sn)	2023/10/27	NC		%	20
			Dissolved Titanium (Ti)	2023/10/27	NC		%	20
			Dissolved Uranium (U)	2023/10/27	0.36		%	20
			Dissolved Vanadium (V)	2023/10/27	NC		%	20
			Dissolved Zinc (Zn)	2023/10/27	7.4		%	20
B174353	YHK	Matrix Spike [CCP850-01]	Dissolved Organic Carbon (C)	2023/10/29		104	%	80 - 120
B174353	YHK	Spiked Blank	Dissolved Organic Carbon (C)	2023/10/29		92	%	80 - 120
B174353	YHK	Method Blank	Dissolved Organic Carbon (C)	2023/10/29	<0.50		mg/L	
B174353	YHK	RPD [CCP850-01]	Dissolved Organic Carbon (C)	2023/10/29	0.044		%	20
B176357	IC4	Matrix Spike	Total Nitrogen (N)	2023/10/31		97	%	80 - 120
B176357	IC4	Spiked Blank	Total Nitrogen (N)	2023/10/31		95	%	80 - 120
B176357	IC4	Method Blank	Total Nitrogen (N)	2023/10/31	<0.020		mg/L	
B176357	IC4	RPD	Total Nitrogen (N)	2023/10/31	1.3		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B176384	IC4	Matrix Spike	Total Nitrogen (N)	2023/10/31		99	%	80 - 120
B176384	IC4	Spiked Blank	Total Nitrogen (N)	2023/10/31		95	%	80 - 120
B176384	IC4	Method Blank	Total Nitrogen (N)	2023/10/31	<0.020		mg/L	
B176384	IC4	RPD	Total Nitrogen (N)	2023/10/31	1.0		%	20
B176892	LQ1	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/03		94	%	80 - 120
B176892	LQ1	Method Blank	Alkalinity (PP as CaCO3)	2023/11/03	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/03	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/03	<1.0		mg/L	
			Carbonate (CO3)	2023/11/03	<1.0		mg/L	
			Hydroxide (OH)	2023/11/03	<1.0		mg/L	
B176892	LQ1	RPD	Alkalinity (PP as CaCO3)	2023/11/03	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/03	27 (1)		%	20
			Bicarbonate (HCO3)	2023/11/03	27 (1)		%	20
			Carbonate (CO3)	2023/11/03	NC		%	20
			Hydroxide (OH)	2023/11/03	NC		%	20
B176895	LQ1	Spiked Blank	Conductivity	2023/11/03		100	%	90 - 110
B176895	LQ1	Method Blank	Conductivity	2023/11/03	<2.0		uS/cm	
B176895	LQ1	RPD	Conductivity	2023/11/03	0.059		%	10
B176896	LQ1	Spiked Blank	pH	2023/11/03		100	%	97 - 103
B176896	LQ1	RPD	pH	2023/11/03	1.7		%	N/A
B178337	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/03		97	%	80 - 120
B178337	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/11/03	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/03	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/03	<1.0		mg/L	
			Carbonate (CO3)	2023/11/03	<1.0		mg/L	
			Hydroxide (OH)	2023/11/03	<1.0		mg/L	
B178337	JVM	RPD	Alkalinity (PP as CaCO3)	2023/11/03	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/03	1.7		%	20
			Bicarbonate (HCO3)	2023/11/03	1.7		%	20
			Carbonate (CO3)	2023/11/03	NC		%	20
			Hydroxide (OH)	2023/11/03	NC		%	20
B178340	JVM	Spiked Blank	Conductivity	2023/11/03		99	%	90 - 110
B178340	JVM	Method Blank	Conductivity	2023/11/03	<2.0		uS/cm	
B178340	JVM	RPD	Conductivity	2023/11/03	0.49		%	10
B178341	JVM	Spiked Blank	pH	2023/11/03		100	%	97 - 103
B178341	JVM	RPD	pH	2023/11/03	1.4		%	N/A
B180238	IC4	Matrix Spike [CCP851-02]	Total Nitrogen (N)	2023/11/02		NC	%	80 - 120
B180238	IC4	Spiked Blank	Total Nitrogen (N)	2023/11/02		97	%	80 - 120
B180238	IC4	Method Blank	Total Nitrogen (N)	2023/11/02	<0.020		mg/L	
B180238	IC4	RPD [CCP851-02]	Total Nitrogen (N)	2023/11/02	5.0		%	20
B187014	MB5	Matrix Spike	Chloride (Cl)	2023/11/06		101	%	80 - 120
			Sulphate (SO4)	2023/11/06		93	%	80 - 120
B187014	MB5	Spiked Blank	Chloride (Cl)	2023/11/06		98	%	80 - 120
			Sulphate (SO4)	2023/11/06		95	%	80 - 120
B187014	MB5	Method Blank	Chloride (Cl)	2023/11/06	<1.0		mg/L	
			Sulphate (SO4)	2023/11/06	<1.0		mg/L	
B187014	MB5	RPD	Sulphate (SO4)	2023/11/06	20		%	20
B190950	VSC	Matrix Spike	Dissolved Barium (Ba)	2023/11/08		90	%	80 - 120
			Dissolved Boron (B)	2023/11/08		NC	%	80 - 120
			Dissolved Calcium (Ca)	2023/11/08		91	%	80 - 120
			Dissolved Iron (Fe)	2023/11/08		101	%	80 - 120
			Dissolved Lithium (Li)	2023/11/08		89	%	80 - 120
			Dissolved Magnesium (Mg)	2023/11/08		97	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Manganese (Mn)	2023/11/08		96	%	80 - 120
			Dissolved Phosphorus (P)	2023/11/08		107	%	80 - 120
			Dissolved Potassium (K)	2023/11/08		95	%	80 - 120
			Dissolved Silicon (Si)	2023/11/08		95	%	80 - 120
			Dissolved Sodium (Na)	2023/11/08		NC	%	80 - 120
			Dissolved Strontium (Sr)	2023/11/08		86	%	80 - 120
			Dissolved Sulphur (S)	2023/11/08		NC	%	80 - 120
B190950	VSC	Spiked Blank	Dissolved Barium (Ba)	2023/11/08		91	%	80 - 120
			Dissolved Boron (B)	2023/11/08		88	%	80 - 120
			Dissolved Calcium (Ca)	2023/11/08		97	%	80 - 120
			Dissolved Iron (Fe)	2023/11/08		93	%	80 - 120
			Dissolved Lithium (Li)	2023/11/08		96	%	80 - 120
			Dissolved Magnesium (Mg)	2023/11/08		104	%	80 - 120
			Dissolved Manganese (Mn)	2023/11/08		88	%	80 - 120
			Dissolved Phosphorus (P)	2023/11/08		93	%	80 - 120
			Dissolved Potassium (K)	2023/11/08		99	%	80 - 120
			Dissolved Silicon (Si)	2023/11/08		89	%	80 - 120
			Dissolved Sodium (Na)	2023/11/08		96	%	80 - 120
			Dissolved Strontium (Sr)	2023/11/08		90	%	80 - 120
			Dissolved Sulphur (S)	2023/11/08		89	%	80 - 120
B190950	VSC	Method Blank	Dissolved Barium (Ba)	2023/11/08	<0.010		mg/L	
			Dissolved Boron (B)	2023/11/08	<0.020		mg/L	
			Dissolved Calcium (Ca)	2023/11/08	<0.30		mg/L	
			Dissolved Iron (Fe)	2023/11/08	<0.060		mg/L	
			Dissolved Lithium (Li)	2023/11/08	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2023/11/08	<0.20		mg/L	
			Dissolved Manganese (Mn)	2023/11/08	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2023/11/08	<0.10		mg/L	
			Dissolved Potassium (K)	2023/11/08	<0.30		mg/L	
			Dissolved Silicon (Si)	2023/11/08	<0.50		mg/L	
			Dissolved Sodium (Na)	2023/11/08	<0.50		mg/L	
			Dissolved Strontium (Sr)	2023/11/08	<0.020		mg/L	
			Dissolved Sulphur (S)	2023/11/08	<0.20		mg/L	
B190950	VSC	RPD	Dissolved Calcium (Ca)	2023/11/08	1.6		%	20
			Dissolved Iron (Fe)	2023/11/08	NC		%	20
			Dissolved Magnesium (Mg)	2023/11/08	0.40		%	20
			Dissolved Manganese (Mn)	2023/11/08	3.5		%	20
			Dissolved Potassium (K)	2023/11/08	1.5		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Sodium (Na)	2023/11/08	0.27		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

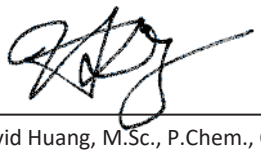
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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VALIDATION SIGNATURE PAGE

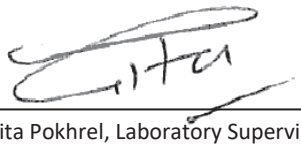
The analytical data and all QC contained in this report were reviewed and validated by:



David Huang, M.Sc., P.Chem., QP, Scientific Services Manager



Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics



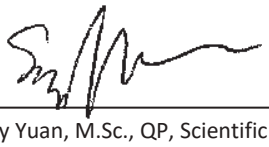
Gita Pokhrel, Laboratory Supervisor



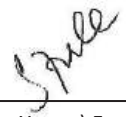
Maria Magdalena Florescu, Ph.D., P.Chem., QP, Inorganics Manager



Rahul Suryawanshi, Senior Analyst



Sandy Yuan, M.Sc., QP, Scientific Specialist



Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the

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VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by:

reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

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- [ ] Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Project Information	
Company:	Stantec	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	10220 103 Ave Suite # 300	Street Address:		Project #:	110773396
City:	Edmonton Prov: AB Postal Code: T5J 0K4	City:	Prov: Postal Code:	Site #:	
Phone:	780 969 2223	Phone:		Site Location:	SR1
Email:	dylan.king@stantec.com	Email:		Site Location Province:	
Copies:		Copies:		Sampled By:	WT / TH

mcal-10-1925 CBG148

Regulatory Criteria

- [x] AT1
- [ ] CCME
- [ ] Drinking Water - Canada
- [ ] Drinking Water - Manitoba
- [ ] Saskatchewan
- [ ] Drinking Water - Alberta
- [ ] Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)
- [x] 5 to 7 Day
- [ ] 10 Day

Rush Turnaround Time (TAT) Surcharges apply
- [ ] Same Day
- [ ] 1 Day
- [ ] 2 Day
- [ ] 3 Day
- [ ] 4 Day

Date Required: YY MM DD

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F1-F2	7 BTEX F3-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 Dissolved Phosphorus	14 Soluble (reactive) Phosphorus	15 Dissolved Ammonia	16 TKN	17 DOC	18 Bacteriology *	19	20	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE	Comments
1	WS11 - 1	23	10	23	09	26	Water			x			x		x		x	x	x	x	x	x	x	x	x			11		
2	RRMW16-17-8	23	10	23	10	20				x			x		x		x	x	x	x	x	x	x	x	x			11		
3	RMW16-16-17	23	10	23	10	55				x			x		x		x	x	x	x	x	x	x	x	x			11		
4	MW16-3-7	23	10	23	12	35				x			x		x		x	x	x	x	x	x	x	x	x			11		
5	MW16-2-6	23	10	23	13	08				x			x		x		x	x	x	x	x	x	x	x	x			11		
6	MW16-4-22	23	10	23	13	50				x			x		x		x	x	x	x	x	x	x	x	x			11		
7	RMW16-5-12	23	10	23	14	30				x			x		x		x	x	x	x	x	x	x	x	x			11		
8	MW16-7-5	23	10	23	15	08				x			x		x		x	x	x	x	x	x	x	x	x			11		
9	MW16-10-15	23	10	23	15	50				x			x		x		x	x	x	x	x	x	x	x	x			11		
10																														
11																														
12																														

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		-				
Seal intact		-				
Cooling media present	-			-5	-3	-2

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		-				
Seal intact		-				
Cooling media present	-			-1	-2	0

LAB USE ONLY	Yes	No	°C	1	2	3	Temperature reading by:
Seal present							
Seal intact							
Cooling media present							

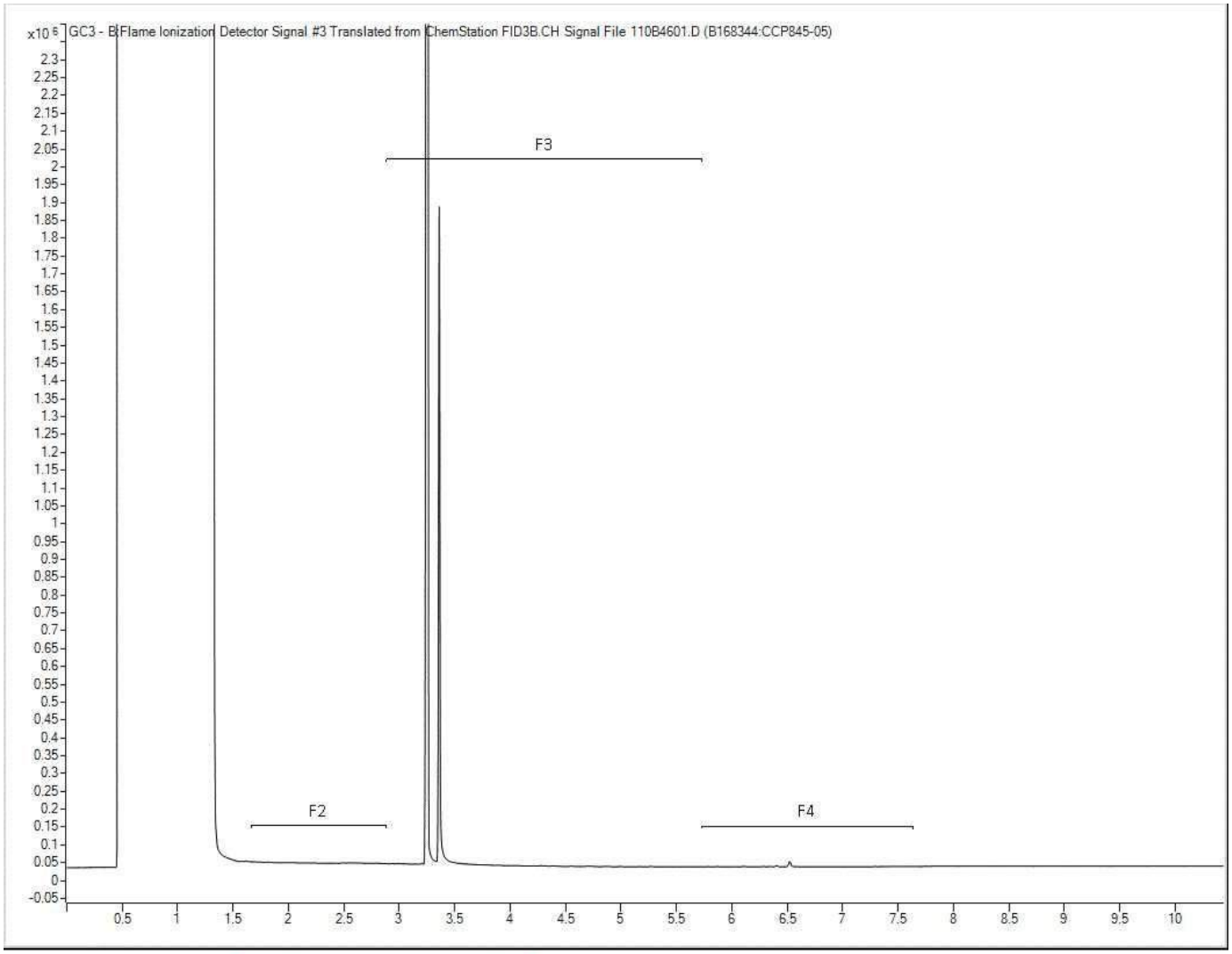
Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special instructions
1 Wesley Tsen	23	10	23	18	17	1 Ayn Amanda Hagen	2023	10	23	18	19	* Total coliforms, e.coli, fecal coliforms, heterotrophic plate count
2						2						

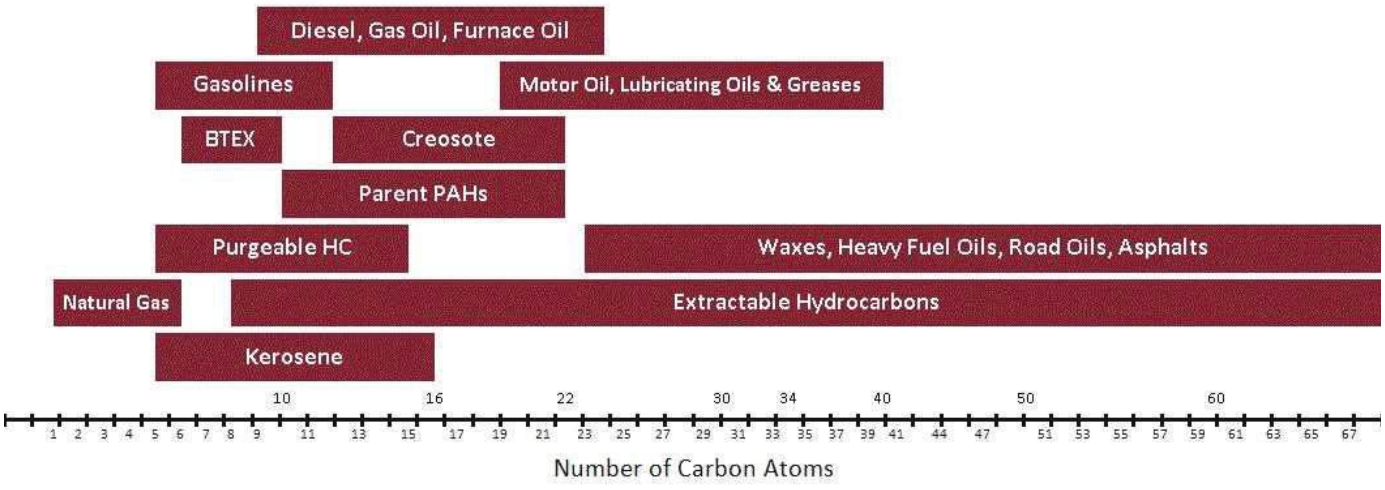
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Bureau Veritas Job #: C386148
Report Date: 2023/11/09
Bureau Veritas Sample: CCP845

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SR1
Client ID: WS11-1

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





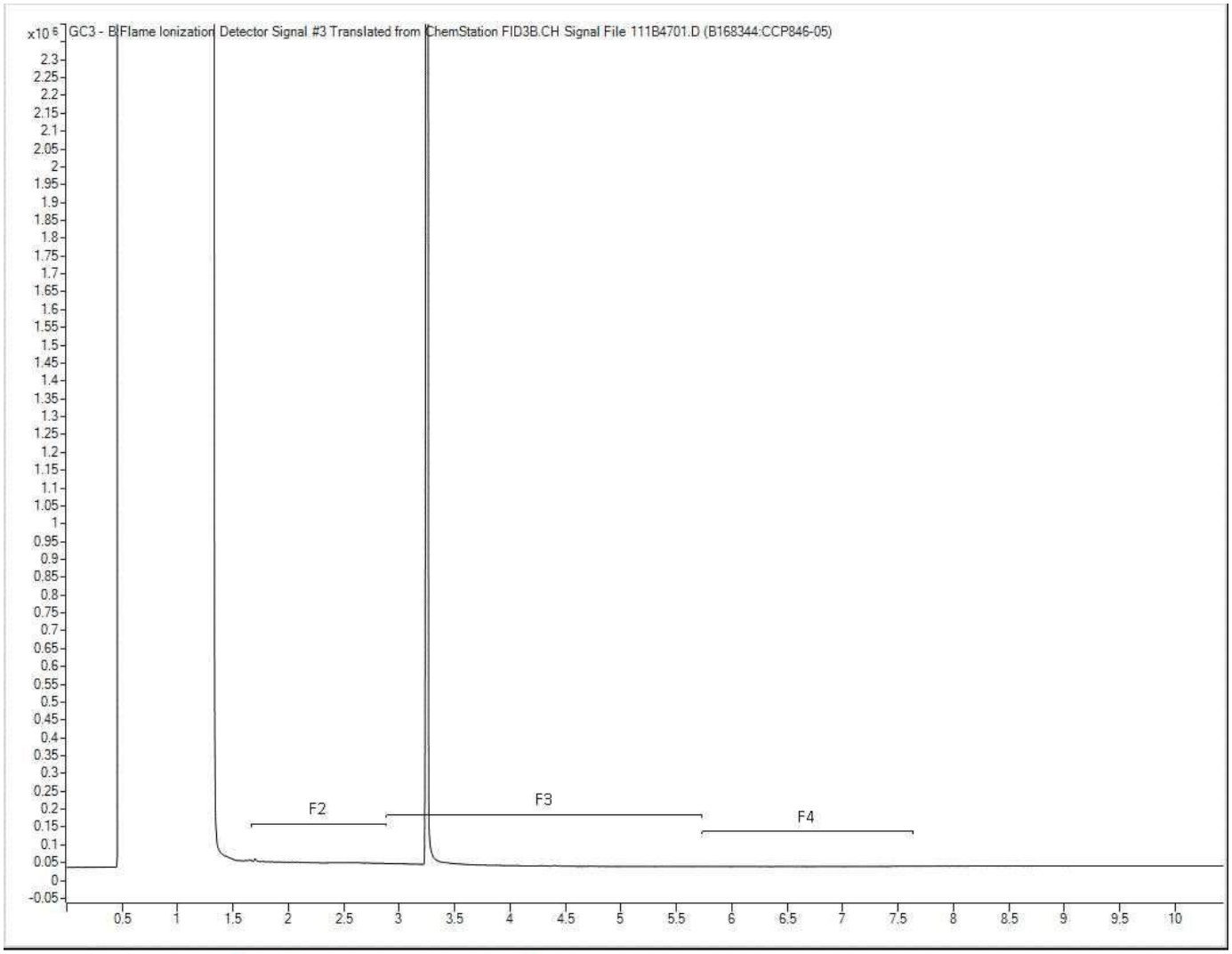
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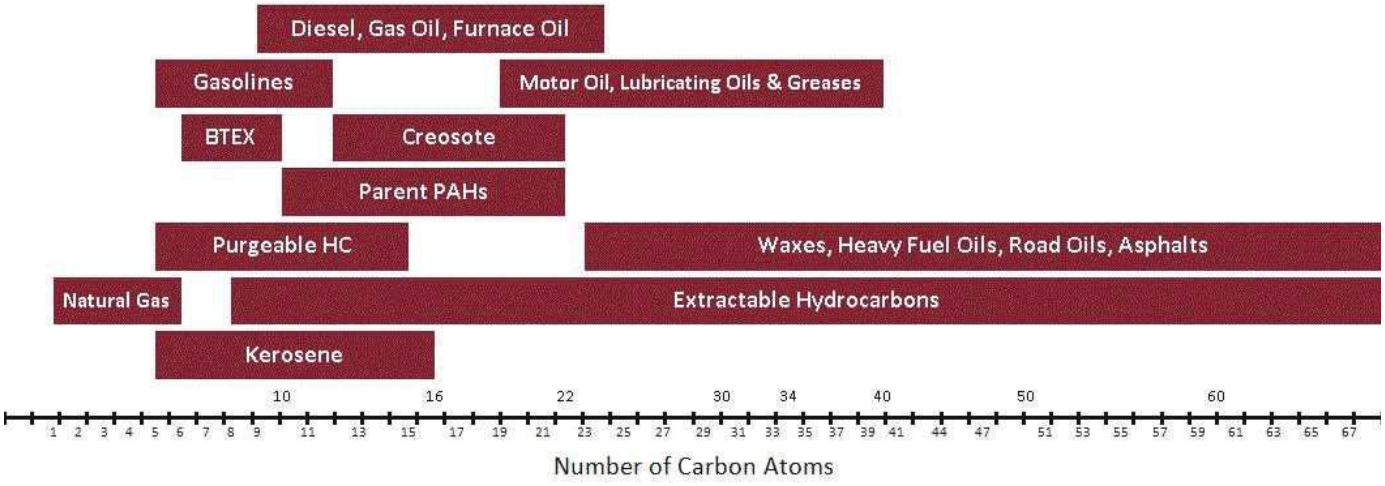
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386148
Report Date: 2023/11/09
Bureau Veritas Sample: CCP846

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SR1
Client ID: RRMW16-17-8

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





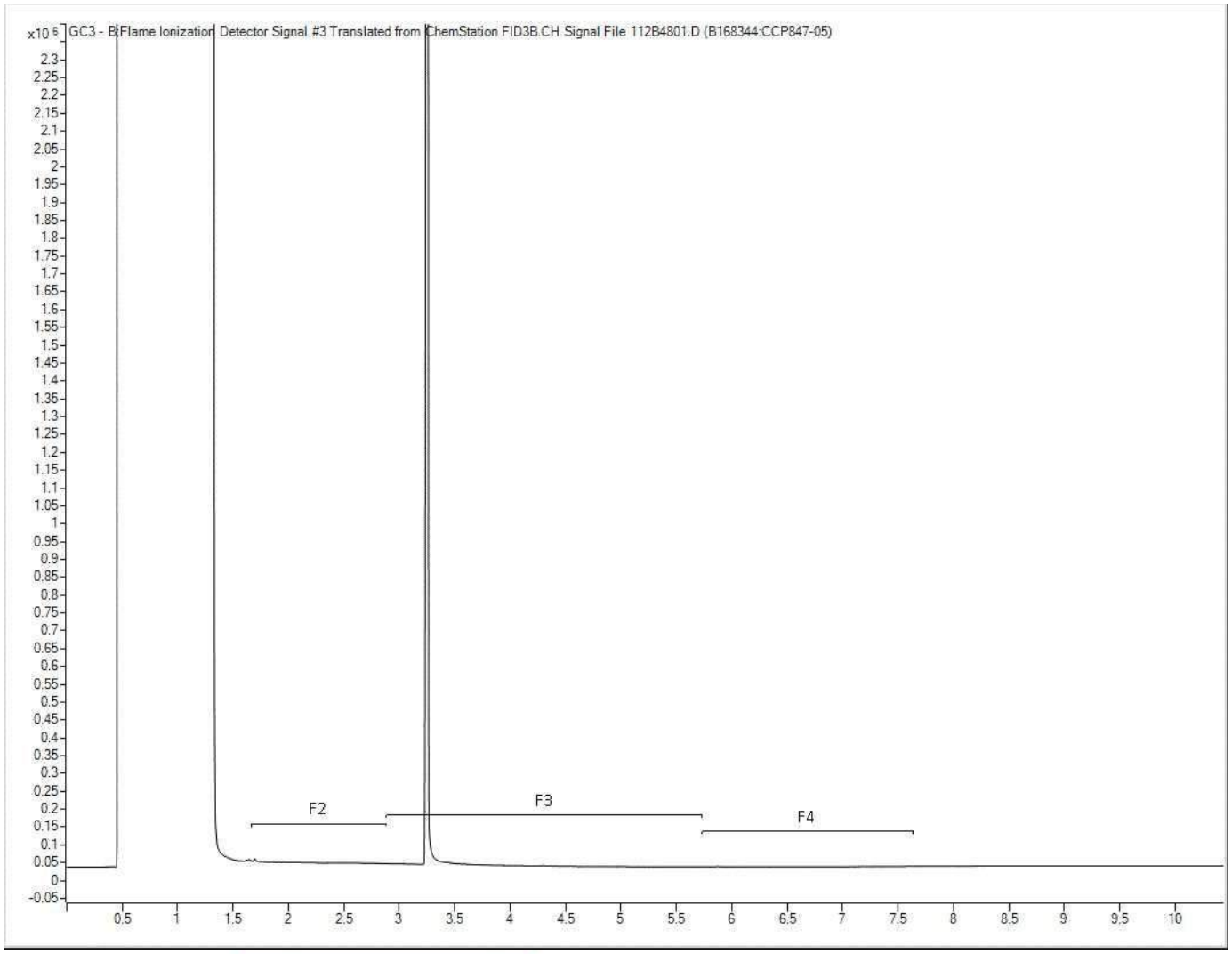
hpchem19\HPchem\1\DATA\2023\10\RUN1026

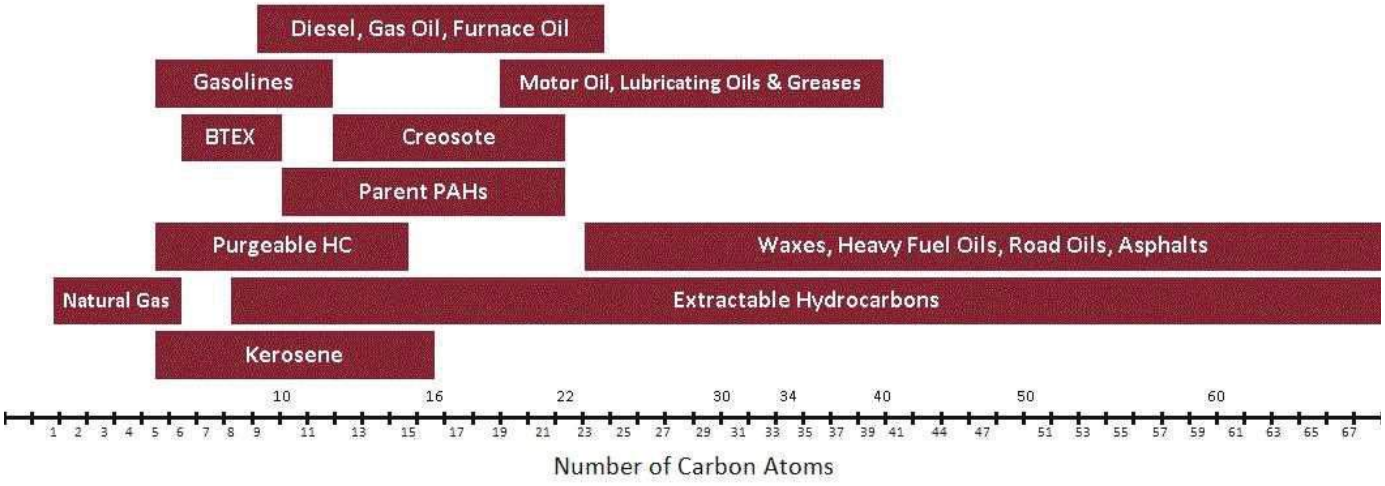
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386148
Report Date: 2023/11/09
Bureau Veritas Sample: CCP847

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SR1
Client ID: RRMW16-16-17

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





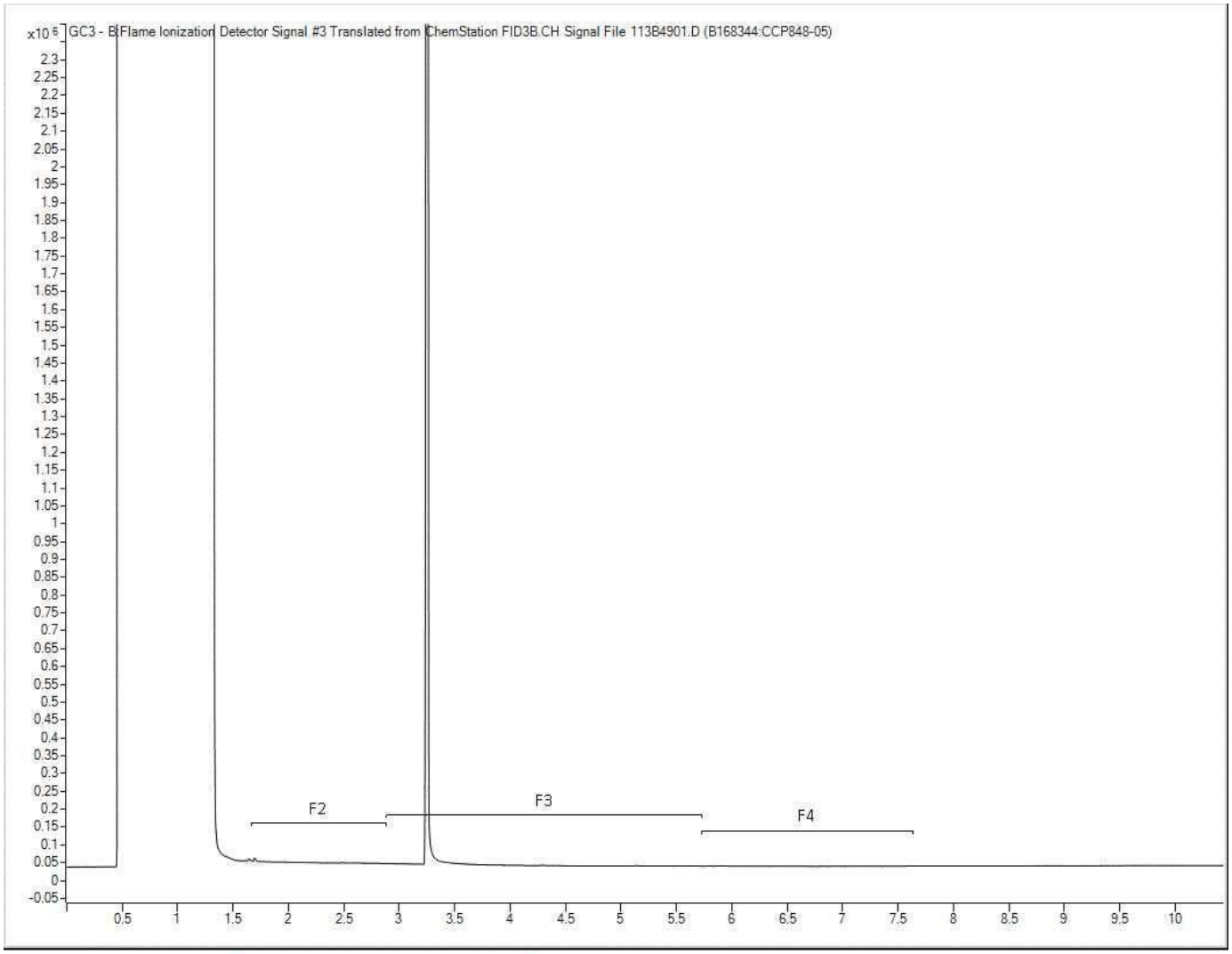
hpchem19\HPchem\1\DATA\2023\10\RUN1026

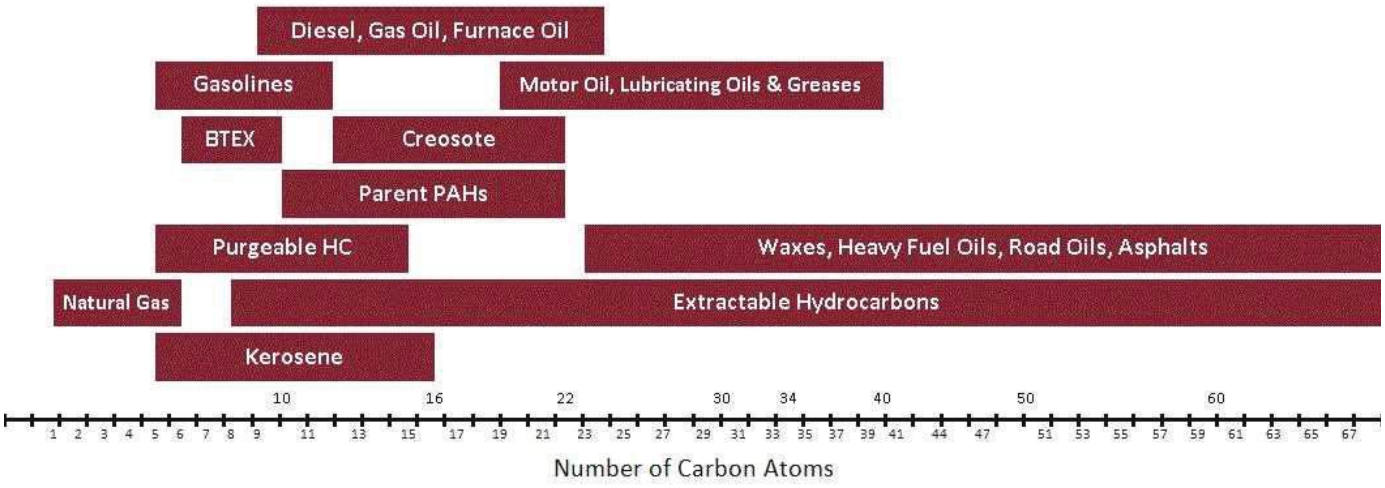
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386148
Report Date: 2023/11/09
Bureau Veritas Sample: CCP848

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SR1
Client ID: MW16-3-7

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





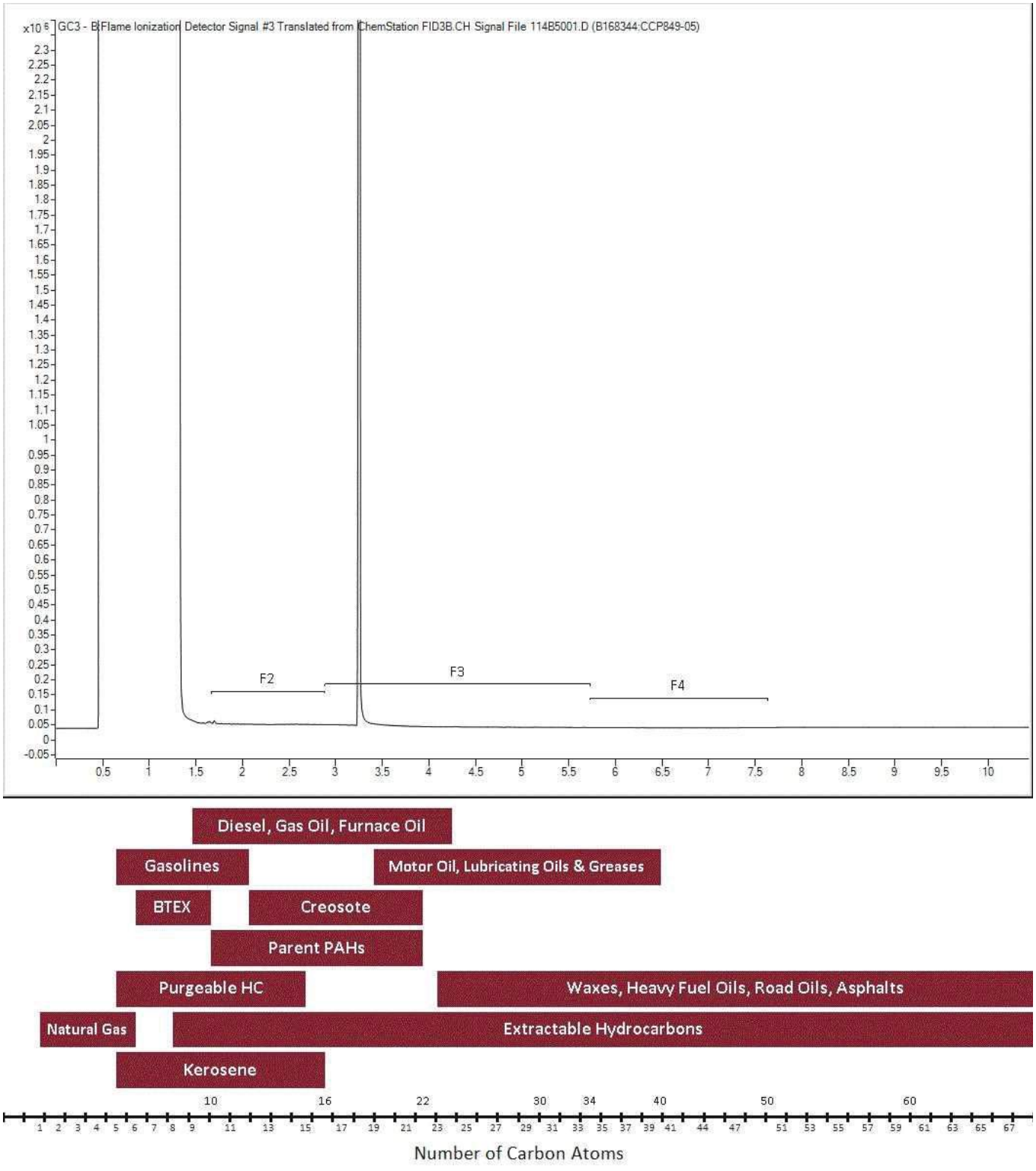
hpchem19\HPchem\1\DATA\2023\10\RUN1026

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386148
Report Date: 2023/11/09
Bureau Veritas Sample: CCP849

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SR1
Client ID: MW16-2-6

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

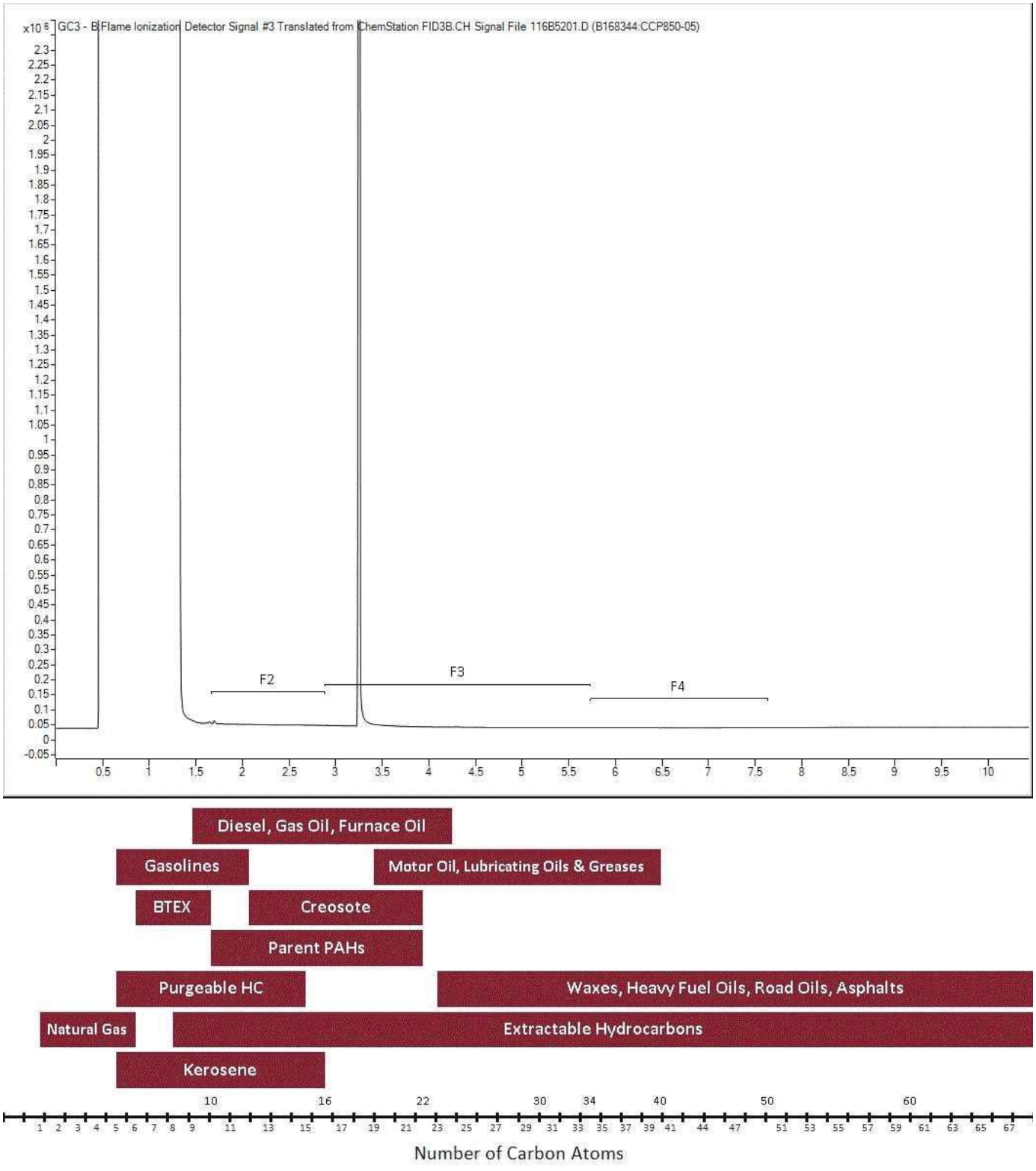


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386148
Report Date: 2023/11/09
Bureau Veritas Sample: CCP850

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SR1
Client ID: MW16-4-22

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

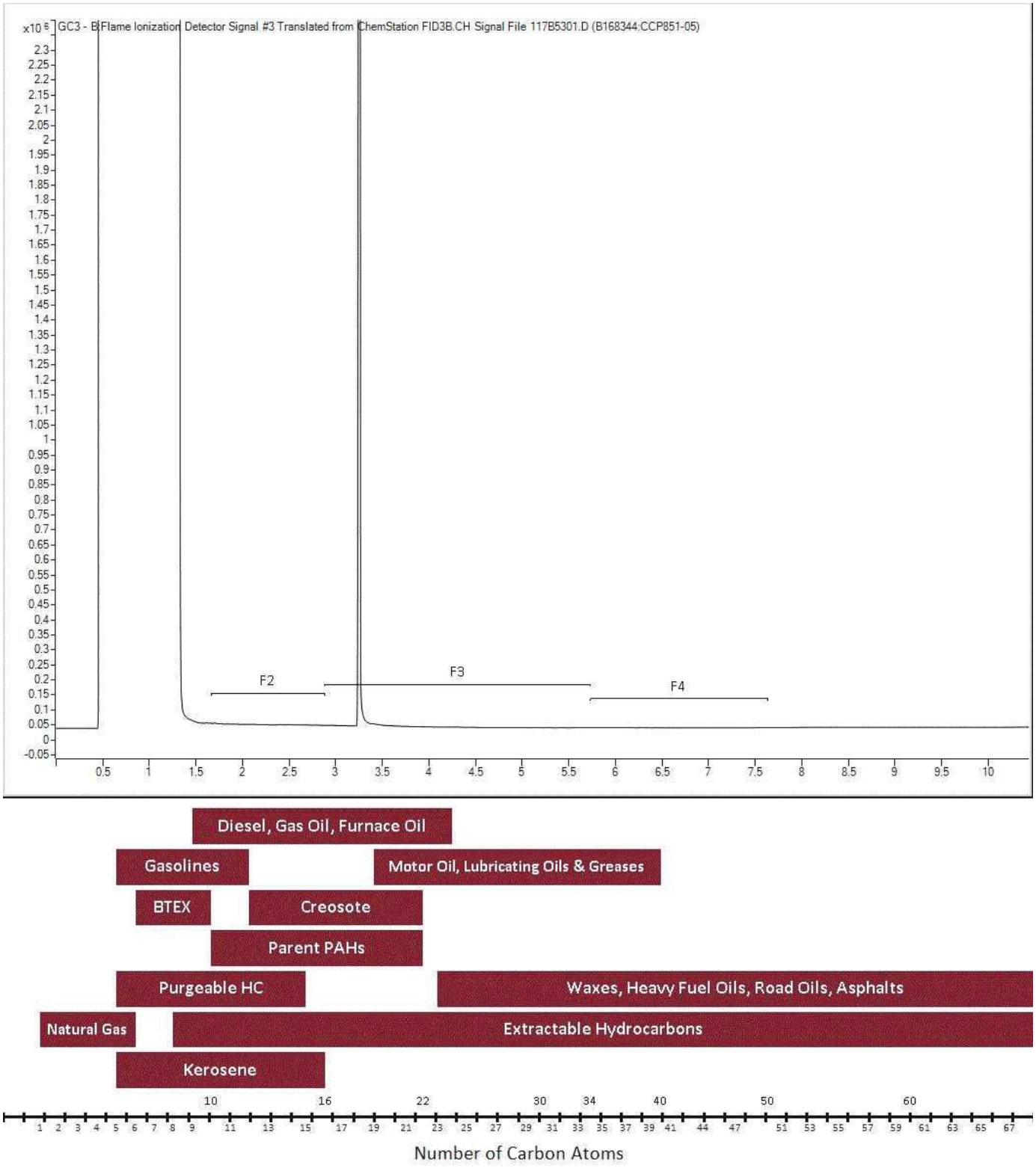


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386148
Report Date: 2023/11/09
Bureau Veritas Sample: CCP851

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SR1
Client ID: RMW16-5-12

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

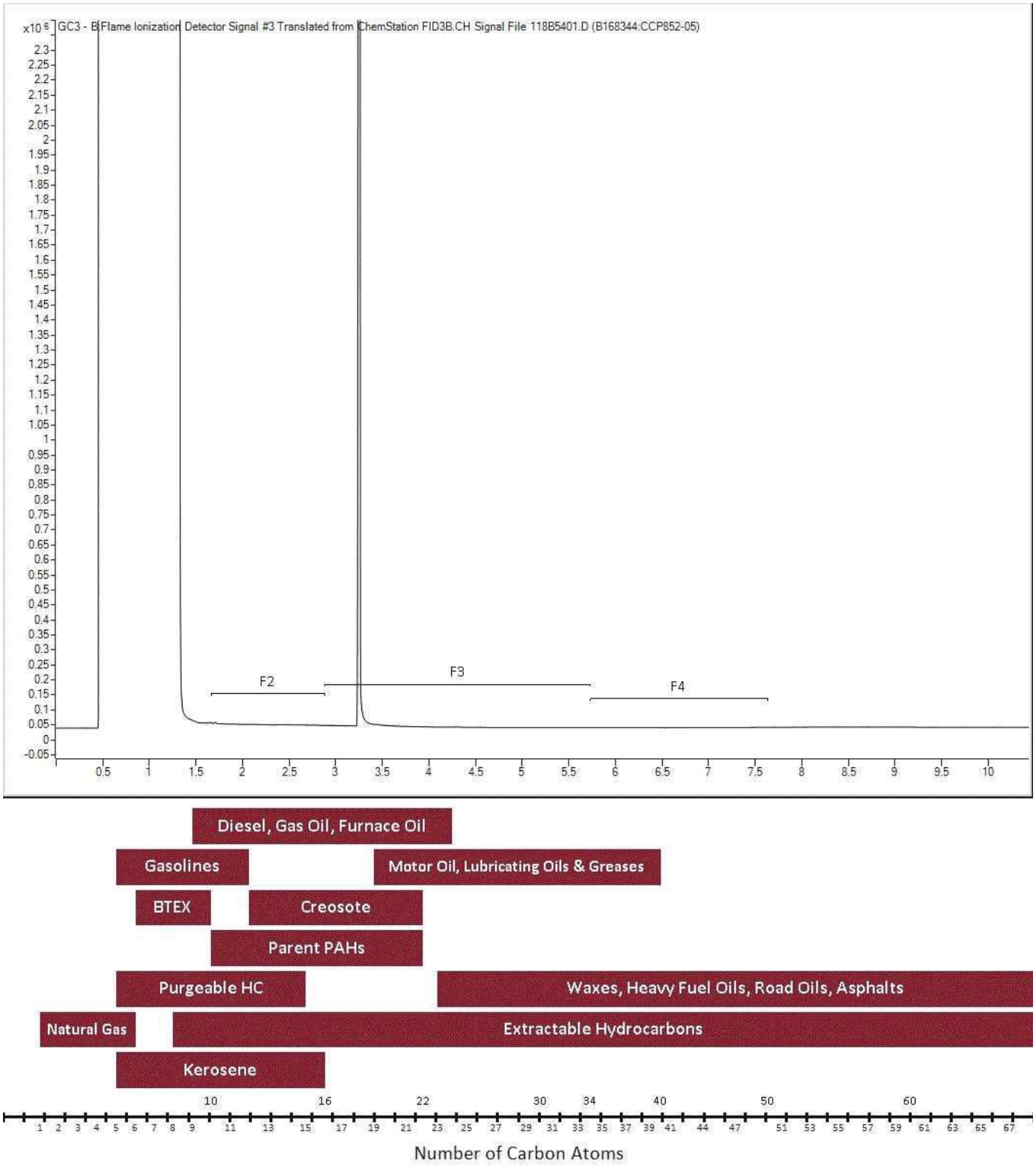


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386148
Report Date: 2023/11/09
Bureau Veritas Sample: CCP852

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SR1
Client ID: MW16-7-5

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

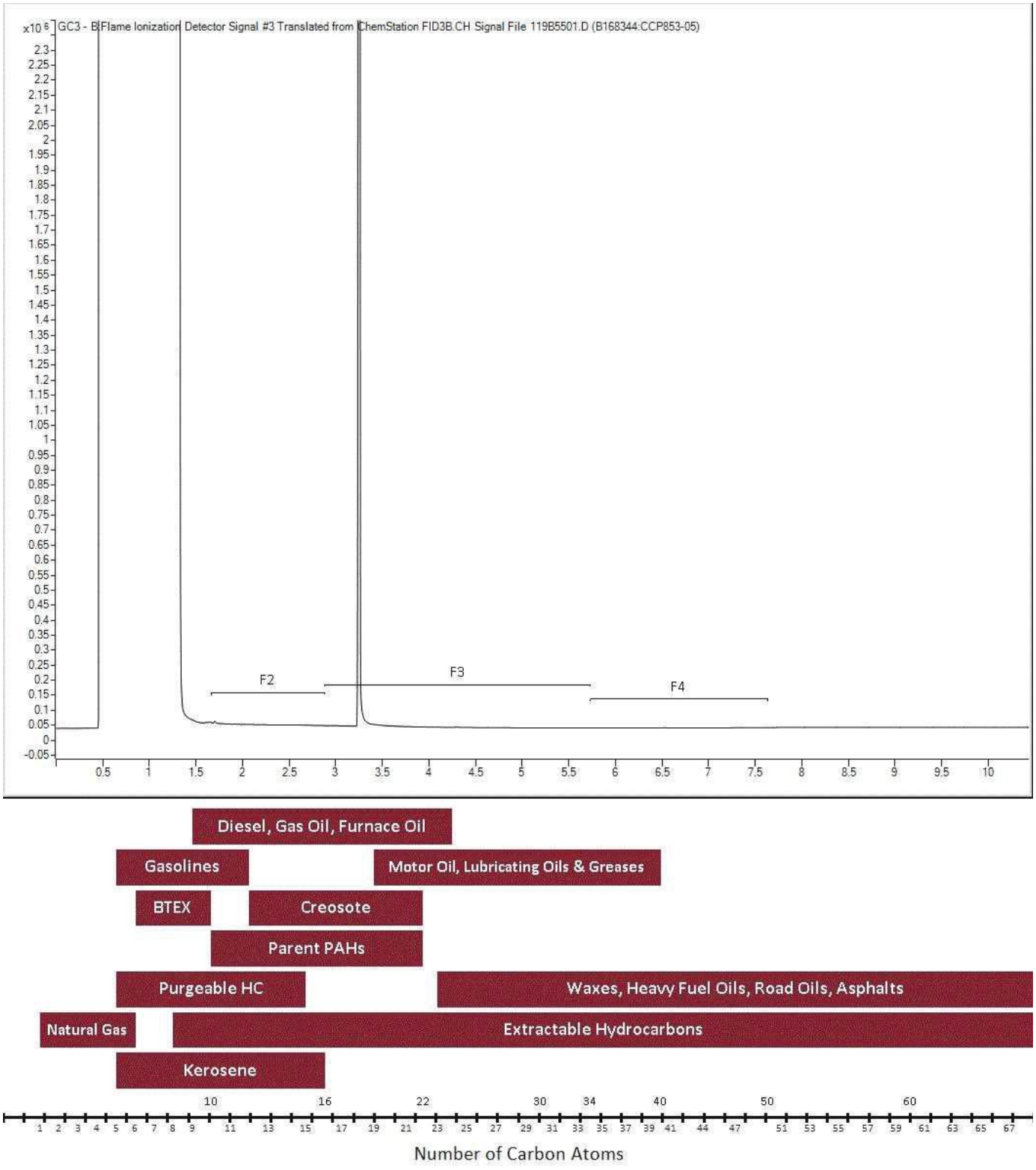


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386148
Report Date: 2023/11/09
Bureau Veritas Sample: CCP853

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SR1
Client ID: MW16-10-15

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 110773396
Site Location: SR1
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/08
Report #: R3424013
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C386477
Received: 2023/10/24, 17:52

Sample Matrix: Water
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2023/11/02	AB SOP-00005	SM 24 2320 B m
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2023/11/03	AB SOP-00005	SM 24 2320 B m
Alkalinity @25C (pp, total), CO3,HCO3,OH	4	N/A	2023/11/04	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	4	N/A	2023/10/29	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 in Water by HS GC/MS/FID	2	N/A	2023/10/30	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	6	N/A	2023/10/30		Auto Calc
Cadmium - low level CCME - Dissolved	6	N/A	2023/10/27		Auto Calc
Chloride/Sulphate by Auto Colourimetry	6	N/A	2023/10/27	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	6	2023/10/25	2023/10/26	AB SOP-00089	SM 23 9223 A,B m
Total Coliforms and E.Coli	6	2023/10/25	2023/10/26	AB SOP-00089	SM 23 9223 A,B m
Carbon (DOC) -Lab Filtered (2)	6	N/A	2023/10/30	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	1	N/A	2023/11/02	AB SOP-00005	SM 24 2510 B m
Conductivity @25C	1	N/A	2023/11/03	AB SOP-00005	SM 24 2510 B m
Conductivity @25C	4	N/A	2023/11/04	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (3)	6	2023/10/26	2023/10/27	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	3	N/A	2023/10/29		Auto Calc
Hardness	3	N/A	2023/10/30		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	4	2023/10/27	2023/10/28	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Dissolved) by CV-Lab Filtered	2	2023/10/31	2023/10/31	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	6	2023/10/26	2023/10/31	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (4)	4	N/A	2023/10/27	AB SOP-00042	EPA 6010d R5 m
Elements by ICP-Dissolved-Lab Filtered (4)	2	N/A	2023/10/28	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (5)	6	N/A	2023/10/27	AB SOP-00043	EPA 6020b R2 m
Ion Balance	1	N/A	2023/11/03		Auto Calc
Ion Balance	5	N/A	2023/11/04		Auto Calc
Sum of cations, anions	3	N/A	2023/10/29		Auto Calc
Sum of cations, anions	3	N/A	2023/10/30		Auto Calc
Nitrogen (Total) (1)	6	N/A	2023/10/31	BBY6SOP-00016	SM 24 4500-N C m
Ammonia-N (Total)	6	N/A	2023/10/25	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	6	N/A	2023/10/27		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	3	N/A	2023/10/26	AB SOP-00091	SM 24 4500 NO3m

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Site Location: SR1
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/08
Report #: R3424013
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C386477
Received: 2023/10/24, 17:52

Sample Matrix: Water
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 (N); NO2 (N) + NO3 (N) in Water	3	N/A	2023/10/27	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	6	2023/10/31	2023/10/31		Auto Calc
pH @25°C (6)	1	N/A	2023/11/02	AB SOP-00005	SM 24 4500-H+B m
pH @25°C (6)	1	N/A	2023/11/03	AB SOP-00005	SM 24 4500-H+B m
pH @25°C (6)	4	N/A	2023/11/04	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (7)	5	N/A	2023/10/27	AB SOP-00025	SM 24 4500-P A,F m
Orthophosphate by Automated Analyzer (7)	1	N/A	2023/10/28	AB SOP-00025	SM 24 4500-P A,F m
Heterotrophic Plate Count	6	2023/10/25	2023/10/27	CAL SOP-00012	SM 23 9215 A & B m
Total Dissolved Solids (Calculated)	1	N/A	2023/11/03		Auto Calc
Total Dissolved Solids (Calculated)	5	N/A	2023/11/04		Auto Calc
Total Kjeldahl Nitrogen (Total)	6	N/A	2023/11/08	BBY WI-00033	Auto Calc
Total Phosphorus-Dissolved-Lab Filtered (8)	6	2023/10/28	2023/10/31	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Site Location: SR1
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/08
Report #: R3424013
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C386477
Received: 2023/10/24, 17:52

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Vancouver, 4606 Canada Way , Burnaby, BC, V5G 1K5
(2) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(3) Silica gel clean up employed.
(4) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(5) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(6) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(7) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(8) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Encryption Key

AUTHORIZED REPORT
RAPPORT AUTORISÉ

Bureau Veritas
08 Nov 2023 17:51:11

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (780)577-7173

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Bureau Veritas Job #: C386477
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CCT428			CCT429		CCT430			
Sampling Date		2023/10/24 09:49			2023/10/24 11:14		2023/10/24 12:24			
COC Number		1/1			1/1		1/1			
	UNITS	SW11R4-2	MU	QC Batch	NE7R3-1	MU	WS62-1	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	B170765	<0.10	N/A	<0.10	N/A	0.10	B170765
Volatiles										
Benzene	mg/L	<0.00040	N/A	B169803	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
Toluene	mg/L	<0.00040	N/A	B169803	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
Ethylbenzene	mg/L	<0.00040	N/A	B169803	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
m & p-Xylene	mg/L	<0.00080	N/A	B169803	<0.00080	N/A	<0.00080	N/A	0.00080	B169803
o-Xylene	mg/L	<0.00040	N/A	B169803	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
Xylenes (Total)	mg/L	<0.00089	N/A	B167525	<0.00089	N/A	<0.00089	N/A	0.00089	B168999
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	B167525	<0.10	N/A	<0.10	N/A	0.10	B168999
F1 (C6-C10)	mg/L	<0.10	N/A	B169803	<0.10	N/A	<0.10	N/A	0.10	B169803
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	101	N/A	B169803	102	N/A	100	N/A	N/A	B169803
4-Bromofluorobenzene (sur.)	%	103	N/A	B169803	103	N/A	103	N/A	N/A	B169803
D4-1,2-Dichloroethane (sur.)	%	109	N/A	B169803	109	N/A	110	N/A	N/A	B169803
O-TERPHENYL (sur.)	%	93	N/A	B170765	94	N/A	93	N/A	N/A	B170765

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C386477
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CCT431		CCT432		CCT433			
Sampling Date		2023/10/24 14:10		2023/10/24 15:25		2023/10/24 15:57			
COC Number		1/1		1/1		1/1			
	UNITS	RMW16-13-37	MU	RMW16-15-39	MU	23-10	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B170765
Volatiles									
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B169803
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B169803
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B168999
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B168999
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B169803
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	101	N/A	101	N/A	102	N/A	N/A	B169803
4-Bromofluorobenzene (sur.)	%	105	N/A	104	N/A	103	N/A	N/A	B169803
D4-1,2-Dichloroethane (sur.)	%	108	N/A	110	N/A	108	N/A	N/A	B169803
O-TERPHENYL (sur.)	%	93	N/A	96	N/A	95	N/A	N/A	B170765

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCT428			CCT429			
Sampling Date		2023/10/24 09:49			2023/10/24 11:14			
COC Number		1/1			1/1			
	UNITS	SW11R4-2	MU	QC Batch	NE7R3-1	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	5.4	N/A	B168198	6.0	N/A	N/A	B168198
Cation Sum	meq/L	5.0	N/A	B168198	6.2	N/A	N/A	B168198
Hardness (CaCO3)	mg/L	56	N/A	B168790	290	N/A	0.50	B168790
Ion Balance (% Difference)	%	3.9	N/A	B168791	1.7	N/A	N/A	B168791
Nitrate (N)	mg/L	<0.010	N/A	B178234	0.32	N/A	0.010	B178234
Nitrate (NO3)	mg/L	<0.044	N/A	B168199	1.4	N/A	0.044	B168199
Nitrite (NO2)	mg/L	<0.033	N/A	B168199	<0.033	N/A	0.033	B168199
Calculated Total Dissolved Solids	mg/L	290	N/A	B168202	320	N/A	10	B168202
Elements								
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	B167527	<0.020	N/A	0.020	B167527
Misc. Inorganics								
Conductivity	uS/cm	490	+/- 13	B178333	530	+/- 14	2.0	B178361
pH	pH	7.99	+/- 0.0792	B178334	8.38	+/- 0.0830	N/A	B178363
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	B178330	5.0	+/- <RDL	1.0	B178356
Alkalinity (Total as CaCO3)	mg/L	210	+/- 15	B178330	220	+/- 17	1.0	B178356
Bicarbonate (HCO3)	mg/L	250	+/- 4.0	B178330	260	+/- 4.2	1.0	B178356
Carbonate (CO3)	mg/L	<1.0	N/A	B178330	5.9	N/A	1.0	B178356
Hydroxide (OH)	mg/L	<1.0	N/A	B178330	<1.0	N/A	1.0	B178356
Chloride (Cl)	mg/L	4.3	+/- 1.2	B174265	5.2	+/- 1.2	1.0	B174265
Sulphate (SO4)	mg/L	56	+/- 3.9	B174265	65	+/- 4.5	1.0	B174265
Nutrients								
Nitrite (N)	mg/L	<0.010	N/A	B172921	<0.010	N/A	0.010	B172930
Nitrate plus Nitrite (N)	mg/L	<0.010	N/A	B172921	0.32	+/- 0.033	0.010	B172930
Lab Filtered Elements								
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	B174245	<0.0030	N/A	0.0030	B174245
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	B174245	<0.00060	N/A	0.00060	B174245
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	B174245	<0.00020	N/A	0.00020	B174245
Dissolved Barium (Ba)	mg/L	0.074 (1)	+/- <RDL	B174209	0.13	+/- 0.011	0.010	B174196

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 0.07416

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCT428			CCT429			
Sampling Date		2023/10/24 09:49			2023/10/24 11:14			
COC Number		1/1			1/1			
	UNITS	SW11R4-2	MU	QC Batch	NE7R3-1	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	B174245	<0.0010	N/A	0.0010	B174245
Dissolved Boron (B)	mg/L	0.032 (1)	+/- <RDL	B174209	<0.020	N/A	0.020	B174196
Dissolved Calcium (Ca)	mg/L	14 (2)	+/- 1.4	B174209	81	+/- 8.2	0.30	B174196
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	B174245	<0.0010	N/A	0.0010	B174245
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	B174245	<0.00030	N/A	0.00030	B174245
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	B174245	<0.0010	N/A	0.0010	B174245
Dissolved Iron (Fe)	mg/L	<0.060 (3)	N/A	B174209	<0.060	N/A	0.060	B174196
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	B174245	<0.00020	N/A	0.00020	B174245
Dissolved Lithium (Li)	mg/L	0.021 (4)	+/- <RDL	B174209	<0.020	N/A	0.020	B174196
Dissolved Magnesium (Mg)	mg/L	5.0 (5)	+/- 0.33	B174209	21	+/- 1.4	0.20	B174196
Dissolved Manganese (Mn)	mg/L	0.059 (6)	+/- 0.0042	B174209	<0.0040	N/A	0.0040	B174196
Dissolved Molybdenum (Mo)	mg/L	0.0018	+/- 0.00051	B174245	0.00080	+/- 0.00031	0.00020	B174245
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	B174245	<0.00050	N/A	0.00050	B174245
Dissolved Phosphorus (P)	mg/L	<0.10 (7)	N/A	B174209	<0.10	N/A	0.10	B174196
Dissolved Potassium (K)	mg/L	0.84 (8)	+/- <RDL	B174209	4.5	+/- <RDL	0.30	B174196
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	B174245	0.00068	+/- <RDL	0.00020	B174245
Dissolved Silicon (Si)	mg/L	3.8 (9)	+/- 0.72	B174209	3.0	+/- 0.58	0.50	B174196
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	B174245	<0.00010	N/A	0.00010	B174245
Dissolved Sodium (Na)	mg/L	89 (10)	+/- 8.7	B174209	7.1	+/- 0.78	0.50	B174196
Dissolved Strontium (Sr)	mg/L	0.32 (11)	+/- 0.032	B174209	0.40	+/- 0.039	0.020	B174196

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 0.03301
(2) 13.9609
(3) -0.0009
(4) 0.01908
(5) 5.05369
(6) 0.05915
(7) -0.00570
(8) 0.75998
(9) 3.76139
(10) 88.5567
(11) 0.32153

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Bureau Veritas Job #: C386477
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCT428			CCT429			
Sampling Date		2023/10/24 09:49			2023/10/24 11:14			
COC Number		1/1			1/1			
	UNITS	SW11R4-2	MU	QC Batch	NE7R3-1	MU	RDL	QC Batch
Dissolved Sulphur (S)	mg/L	18 (1)	+/- 1.2	B174209	21	+/- 1.4	0.20	B174196
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	B174245	<0.00020	N/A	0.00020	B174245
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	B174245	<0.0010	N/A	0.0010	B174245
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	B174245	<0.0010	N/A	0.0010	B174245
Dissolved Uranium (U)	mg/L	<0.00010	N/A	B174245	0.00073	+/- <RDL	0.00010	B174245
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	B174245	<0.0010	N/A	0.0010	B174245
Dissolved Zinc (Zn)	mg/L	0.036	+/- 0.0032	B174245	0.20	+/- 0.018	0.0030	B174245

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 18.07575

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCT430			CCT431			
Sampling Date		2023/10/24 12:24			2023/10/24 14:10			
COC Number		1/1			1/1			
	UNITS	WS62-1	MU	QC Batch	RMW16-13-37	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	6.4	N/A	B168198	4.6	N/A	N/A	B168198
Cation Sum	meq/L	6.6	N/A	B168198	4.6	N/A	N/A	B168198
Hardness (CaCO3)	mg/L	310	N/A	B168790	69	N/A	0.50	B168790
Ion Balance (% Difference)	%	1.5	N/A	B168791	0.053	N/A	N/A	B168791
Nitrate (N)	mg/L	0.036	N/A	B178234	0.32	N/A	0.010	B178234
Nitrate (NO3)	mg/L	0.16	N/A	B169000	1.4	N/A	0.044	B169000
Nitrite (NO2)	mg/L	<0.033	N/A	B169000	<0.033	N/A	0.033	B169000
Calculated Total Dissolved Solids	mg/L	340	N/A	B168202	250	N/A	10	B168202
Elements								
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	B167527	<0.020	N/A	0.020	B167527
Misc. Inorganics								
Conductivity	uS/cm	580	+/- 16	B178352	420	+/- 12	2.0	B178361
pH	pH	8.09	+/- 0.0801	B178354	7.75	+/- 0.0768	N/A	B178363
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	B178350	<1.0	N/A	1.0	B178356
Alkalinity (Total as CaCO3)	mg/L	230	+/- 17	B178350	180	+/- 13	1.0	B178356
Bicarbonate (HCO3)	mg/L	280	+/- 4.5	B178350	220	+/- 3.6	1.0	B178356
Carbonate (CO3)	mg/L	<1.0	N/A	B178350	<1.0	N/A	1.0	B178356
Hydroxide (OH)	mg/L	<1.0	N/A	B178350	<1.0	N/A	1.0	B178356
Chloride (Cl)	mg/L	5.8	+/- 1.3	B174265	26	+/- 2.4	1.0	B174265
Sulphate (SO4)	mg/L	77	+/- 5.2	B174265	14	+/- 1.4	1.0	B174265
Nutrients								
Nitrite (N)	mg/L	<0.010	N/A	B172921	<0.010	N/A	0.010	B172930
Nitrate plus Nitrite (N)	mg/L	0.036	+/- 0.012	B172921	0.32	+/- 0.033	0.010	B172930
Lab Filtered Elements								
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	B174245	0.0059	+/- <RDL	0.0030	B174245
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	B174245	0.0017	+/- <RDL	0.00060	B174245
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	B174245	0.00028	+/- <RDL	0.00020	B174245
Dissolved Barium (Ba)	mg/L	0.069 (1)	+/- <RDL	B174209	0.054	+/- <RDL	0.010	B174196

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 0.06860

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCT430			CCT431			
Sampling Date		2023/10/24 12:24			2023/10/24 14:10			
COC Number		1/1			1/1			
	UNITS	WS62-1	MU	QC Batch	RMW16-13-37	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	B174245	<0.0010	N/A	0.0010	B174245
Dissolved Boron (B)	mg/L	<0.020 (1)	N/A	B174209	0.023	+/- <RDL	0.020	B174196
Dissolved Calcium (Ca)	mg/L	83 (2)	+/- 8.4	B174209	23	+/- 2.3	0.30	B174196
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	B174245	<0.0010	N/A	0.0010	B174245
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	B174245	<0.00030	N/A	0.00030	B174245
Dissolved Copper (Cu)	mg/L	0.048	+/- 0.013	B174245	0.0050	+/- 0.0014	0.0010	B174245
Dissolved Iron (Fe)	mg/L	<0.060 (3)	N/A	B174209	<0.060	N/A	0.060	B174196
Dissolved Lead (Pb)	mg/L	0.00066	+/- <RDL	B174245	<0.00020	N/A	0.00020	B174245
Dissolved Lithium (Li)	mg/L	<0.020 (4)	N/A	B174209	<0.020	N/A	0.020	B174196
Dissolved Magnesium (Mg)	mg/L	25 (5)	+/- 1.6	B174209	2.9	+/- <RDL	0.20	B174196
Dissolved Manganese (Mn)	mg/L	0.0045 (1)	+/- <RDL	B174209	0.019	+/- <RDL	0.0040	B174196
Dissolved Molybdenum (Mo)	mg/L	0.00054	+/- 0.00027	B174245	0.0071	+/- 0.0017	0.00020	B174245
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	B174245	0.0011	+/- <RDL	0.00050	B174245
Dissolved Phosphorus (P)	mg/L	<0.10 (6)	N/A	B174209	<0.10	N/A	0.10	B174196
Dissolved Potassium (K)	mg/L	1.8 (7)	+/- <RDL	B174209	2.4	+/- <RDL	0.30	B174196
Dissolved Selenium (Se)	mg/L	0.00066	+/- <RDL	B174245	0.00048	+/- <RDL	0.00020	B174245
Dissolved Silicon (Si)	mg/L	3.1 (8)	+/- 0.60	B174209	1.6	+/- <RDL	0.50	B174196
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	B174245	<0.00010	N/A	0.00010	B174245
Dissolved Sodium (Na)	mg/L	7.6 (9)	+/- 0.82	B174209	74	+/- 7.3	0.50	B174196
Dissolved Strontium (Sr)	mg/L	0.46 (10)	+/- 0.045	B174209	0.16	+/- <RDL	0.020	B174196
Dissolved Sulphur (S)	mg/L	26 (11)	+/- 1.8	B174209	4.6	+/- 0.33	0.20	B174196

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 0.00452
(2) 83.1187
(3) 0.0029
(4) 0.00247
(5) 25.19563
(6) -0.00166
(7) 1.71514
(8) 3.14660
(9) 7.5804
(10) 0.46405
(11) 26.07653

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCT430			CCT431			
Sampling Date		2023/10/24 12:24			2023/10/24 14:10			
COC Number		1/1			1/1			
	UNITS	WS62-1	MU	QC Batch	RMW16-13-37	MU	RDL	QC Batch
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	B174245	<0.00020	N/A	0.00020	B174245
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	B174245	0.010	+/- 0.0028	0.0010	B174245
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	B174245	<0.0010	N/A	0.0010	B174245
Dissolved Uranium (U)	mg/L	0.00070	+/- <RDL	B174245	0.0014	+/- 0.00014	0.00010	B174245
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	B174245	<0.0010	N/A	0.0010	B174245
Dissolved Zinc (Zn)	mg/L	0.057	+/- 0.0050	B174245	<0.0030	N/A	0.0030	B174245

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCT432		CCT432			
Sampling Date		2023/10/24 15:25		2023/10/24 15:25			
COC Number		1/1		1/1			
	UNITS	RMW16-15-39	MU	RMW16-15-39 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	11	N/A	N/A	N/A	N/A	B168198
Cation Sum	meq/L	12	N/A	N/A	N/A	N/A	B168198
Hardness (CaCO3)	mg/L	30	N/A	N/A	N/A	0.50	B168790
Ion Balance (% Difference)	%	2.5	N/A	N/A	N/A	N/A	B168791
Nitrate (N)	mg/L	0.012	N/A	N/A	N/A	0.010	B178234
Nitrate (NO3)	mg/L	0.052	N/A	N/A	N/A	0.044	B169000
Nitrite (NO2)	mg/L	<0.033	N/A	N/A	N/A	0.033	B169000
Calculated Total Dissolved Solids	mg/L	660	N/A	N/A	N/A	10	B168202
Elements							
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	N/A	N/A	0.020	B167527
Misc. Inorganics							
Conductivity	uS/cm	1100	+/- 28	1000	+/- 28	2.0	B178361
pH	pH	8.47	+/- 0.0839	8.60	+/- 0.0852	N/A	B178363
Anions							
Alkalinity (PP as CaCO3)	mg/L	7.9	+/- <RDL	11 (1)	+/- <RDL	1.0	B178356
Alkalinity (Total as CaCO3)	mg/L	350 (2)	+/- 26	350	+/- 26	1.0	B178356
Bicarbonate (HCO3)	mg/L	410	+/- 6.4	400	+/- 6.3	1.0	B178356
Carbonate (CO3)	mg/L	9.5	N/A	13 (1)	N/A	1.0	B178356
Hydroxide (OH)	mg/L	<1.0	N/A	<1.0	N/A	1.0	B178356
Chloride (Cl)	mg/L	42	+/- 3.5	N/A	N/A	1.0	B173580
Sulphate (SO4)	mg/L	140	+/- 9.1	N/A	N/A	5.0	B173580
Nutrients							
Nitrite (N)	mg/L	<0.010	N/A	N/A	N/A	0.010	B172921
Nitrate plus Nitrite (N)	mg/L	0.012	+/- 0.012	N/A	N/A	0.010	B172921
Lab Filtered Elements							
Dissolved Aluminum (Al)	mg/L	0.077	+/- 0.018	N/A	N/A	0.0030	B174245

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.
(2) Duplicate exceeds acceptance criteria due to sample non homogeneity.

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCT432		CCT432			
Sampling Date		2023/10/24 15:25		2023/10/24 15:25			
COC Number		1/1		1/1			
	UNITS	RMW16-15-39	MU	RMW16-15-39 Lab-Dup	MU	RDL	QC Batch
Dissolved Antimony (Sb)	mg/L	0.0041	+/- <RDL	N/A	N/A	0.00060	B174245
Dissolved Arsenic (As)	mg/L	0.00075	+/- <RDL	N/A	N/A	0.00020	B174245
Dissolved Barium (Ba)	mg/L	0.021	+/- <RDL	N/A	N/A	0.010	B174196
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B174245
Dissolved Boron (B)	mg/L	0.071	+/- <RDL	N/A	N/A	0.020	B174196
Dissolved Calcium (Ca)	mg/L	7.5	+/- 0.77	N/A	N/A	0.30	B174196
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B174245
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	N/A	N/A	0.00030	B174245
Dissolved Copper (Cu)	mg/L	0.0064	+/- 0.0018	N/A	N/A	0.0010	B174245
Dissolved Iron (Fe)	mg/L	<0.060	N/A	N/A	N/A	0.060	B174196
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B174245
Dissolved Lithium (Li)	mg/L	0.047	+/- <RDL	N/A	N/A	0.020	B174196
Dissolved Magnesium (Mg)	mg/L	2.7	+/- <RDL	N/A	N/A	0.20	B174196
Dissolved Manganese (Mn)	mg/L	0.022	+/- <RDL	N/A	N/A	0.0040	B174196
Dissolved Molybdenum (Mo)	mg/L	0.032	+/- 0.0074	N/A	N/A	0.00020	B174245
Dissolved Nickel (Ni)	mg/L	0.00095	+/- <RDL	N/A	N/A	0.00050	B174245
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	N/A	N/A	0.10	B174196
Dissolved Potassium (K)	mg/L	6.3	+/- 0.33	N/A	N/A	0.30	B174196
Dissolved Selenium (Se)	mg/L	0.0033	+/- 0.00031	N/A	N/A	0.00020	B174245
Dissolved Silicon (Si)	mg/L	2.5	+/- <RDL	N/A	N/A	0.50	B174196
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	N/A	N/A	0.00010	B174245
Dissolved Sodium (Na)	mg/L	250	+/- 25	N/A	N/A	0.50	B174196
Dissolved Strontium (Sr)	mg/L	0.11	+/- <RDL	N/A	N/A	0.020	B174196
Dissolved Sulphur (S)	mg/L	47	+/- 3.2	N/A	N/A	0.20	B174196
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B174245
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B174245
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B174245
Dissolved Uranium (U)	mg/L	0.00098	+/- 0.00011	N/A	N/A	0.00010	B174245
Dissolved Vanadium (V)	mg/L	0.0030	+/- <RDL	N/A	N/A	0.0010	B174245
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B174245

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCT433		CCT433			
Sampling Date		2023/10/24 15:57		2023/10/24 15:57			
COC Number		1/1		1/1			
	UNITS	23-10	MU	23-10 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	4.5	N/A	N/A	N/A	N/A	B168198
Cation Sum	meq/L	4.1	N/A	N/A	N/A	N/A	B168198
Hardness (CaCO3)	mg/L	64	N/A	N/A	N/A	0.50	B168790
Ion Balance (% Difference)	%	4.2	N/A	N/A	N/A	N/A	B168791
Nitrate (N)	mg/L	0.32	N/A	N/A	N/A	0.010	B178234
Nitrate (NO3)	mg/L	1.4	N/A	N/A	N/A	0.044	B169000
Nitrite (NO2)	mg/L	<0.033	N/A	N/A	N/A	0.033	B169000
Calculated Total Dissolved Solids	mg/L	240	N/A	N/A	N/A	10	B168202
Elements							
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	N/A	N/A	0.020	B167527
Misc. Inorganics							
Conductivity	uS/cm	410	+/- 11	N/A	N/A	2.0	B178361
pH	pH	7.71	+/- 0.0764	N/A	N/A	N/A	B178363
Anions							
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	B178356
Alkalinity (Total as CaCO3)	mg/L	170	+/- 13	N/A	N/A	1.0	B178356
Bicarbonate (HCO3)	mg/L	210	+/- 3.4	N/A	N/A	1.0	B178356
Carbonate (CO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	B178356
Hydroxide (OH)	mg/L	<1.0	N/A	N/A	N/A	1.0	B178356
Chloride (Cl)	mg/L	27	+/- 2.5	27	+/- 2.5	1.0	B174251
Sulphate (SO4)	mg/L	13	+/- 1.4	13	+/- 1.3	1.0	B174251
Nutrients							
Nitrite (N)	mg/L	<0.010	N/A	N/A	N/A	0.010	B172931
Nitrate plus Nitrite (N)	mg/L	0.32	+/- 0.033	N/A	N/A	0.010	B172931
Lab Filtered Elements							
Dissolved Aluminum (Al)	mg/L	0.028	+/- 0.0064	N/A	N/A	0.0030	B174245
Dissolved Antimony (Sb)	mg/L	0.0017	+/- <RDL	N/A	N/A	0.00060	B174245
Dissolved Arsenic (As)	mg/L	0.00030	+/- <RDL	N/A	N/A	0.00020	B174245

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCT433		CCT433			
Sampling Date		2023/10/24 15:57		2023/10/24 15:57			
COC Number		1/1		1/1			
	UNITS	23-10	MU	23-10 Lab-Dup	MU	RDL	QC Batch
Dissolved Barium (Ba)	mg/L	0.055 (1)	+/- <RDL	N/A	N/A	0.010	B174209
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B174245
Dissolved Boron (B)	mg/L	<0.020 (2)	N/A	N/A	N/A	0.020	B174209
Dissolved Calcium (Ca)	mg/L	21 (3)	+/- 2.1	N/A	N/A	0.30	B174209
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B174245
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	N/A	N/A	0.00030	B174245
Dissolved Copper (Cu)	mg/L	0.0019	+/- <RDL	N/A	N/A	0.0010	B174245
Dissolved Iron (Fe)	mg/L	<0.060 (4)	N/A	N/A	N/A	0.060	B174209
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B174245
Dissolved Lithium (Li)	mg/L	0.020 (5)	+/- <RDL	N/A	N/A	0.020	B174209
Dissolved Magnesium (Mg)	mg/L	3.0 (6)	+/- 0.20	N/A	N/A	0.20	B174209
Dissolved Manganese (Mn)	mg/L	<0.0040 (7)	N/A	N/A	N/A	0.0040	B174209
Dissolved Molybdenum (Mo)	mg/L	0.0053	+/- 0.0013	N/A	N/A	0.00020	B174245
Dissolved Nickel (Ni)	mg/L	0.00096	+/- <RDL	N/A	N/A	0.00050	B174245
Dissolved Phosphorus (P)	mg/L	<0.10 (8)	N/A	N/A	N/A	0.10	B174209
Dissolved Potassium (K)	mg/L	2.1 (9)	+/- <RDL	N/A	N/A	0.30	B174209
Dissolved Selenium (Se)	mg/L	0.00023	+/- <RDL	N/A	N/A	0.00020	B174245
Dissolved Silicon (Si)	mg/L	1.7 (10)	+/- <RDL	N/A	N/A	0.50	B174209
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	N/A	N/A	0.00010	B174245
Dissolved Sodium (Na)	mg/L	65 (11)	+/- 6.4	N/A	N/A	0.50	B174209

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 0.05537
(2) 0.01350
(3) 20.7537
(4) 0.0579
(5) 0.02123
(6) 3.00580
(7) 0.00095
(8) 0.01228
(9) 2.56401
(10) 1.73084
(11) 65.1865

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCT433		CCT433			
Sampling Date		2023/10/24 15:57		2023/10/24 15:57			
COC Number		1/1		1/1			
	UNITS	23-10	MU	23-10 Lab-Dup	MU	RDL	QC Batch
Dissolved Strontium (Sr)	mg/L	0.16 (1)	+/- <RDL	N/A	N/A	0.020	B174209
Dissolved Sulphur (S)	mg/L	4.2 (2)	+/- 0.30	N/A	N/A	0.20	B174209
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B174245
Dissolved Tin (Sn)	mg/L	0.0097	+/- 0.0027	N/A	N/A	0.0010	B174245
Dissolved Titanium (Ti)	mg/L	0.0016	+/- <RDL	N/A	N/A	0.0010	B174245
Dissolved Uranium (U)	mg/L	0.0011	+/- 0.00012	N/A	N/A	0.00010	B174245
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B174245
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B174245

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 0.15715
(2) 4.22173

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TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CCT428		CCT429		CCT430		CCT431			
Sampling Date		2023/10/24 09:49		2023/10/24 11:14		2023/10/24 12:24		2023/10/24 14:10			
COC Number		1/1		1/1		1/1		1/1			
	UNITS	SW11R4-2	MU	NE7R3-1	MU	WS62-1	MU	RMW16-13-37	MU	RDL	QC Batch
Calculated Parameters											
Total Kjeldahl Nitrogen (Calc)	mg/L	0.201	N/A	0.068	N/A	0.072	N/A	0.801	N/A	0.020	B186076

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CCT432		CCT433			
Sampling Date		2023/10/24 15:25		2023/10/24 15:57			
COC Number		1/1		1/1			
	UNITS	RMW16-15-39	MU	23-10	MU	RDL	QC Batch
Calculated Parameters							
Total Kjeldahl Nitrogen (Calc)	mg/L	0.941	N/A	0.805	N/A	0.020	B186076

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C386477
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCT428		CCT428			CCT429			
Sampling Date		2023/10/24 09:49		2023/10/24 09:49			2023/10/24 11:14			
COC Number		1/1		1/1			1/1			
	UNITS	SW11R4-2	MU	SW11R4-2 Lab-Dup	MU	QC Batch	NE7R3-1	MU	RDL	QC Batch
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	<0.50	N/A	N/A	N/A	B174545	0.88	+/- <RDL	0.50	B174545
Microbiological Param.										
E.Coli DST	MPN/100mL	<1.0	N/A	N/A	N/A	B169939	1.0	N/A	1.0	B169939
Fecal Coliforms	MPN/100mL	<1.0	N/A	N/A	N/A	B170386	<1.0	N/A	1.0	B170386
Heterotrophic Plate Count	CFU/mL	890	N/A	N/A	N/A	B169483	66	N/A	1.0	B169483
Total Coliforms DST	MPN/100mL	<1.0	N/A	N/A	N/A	B169939	31	N/A	1.0	B169939
Nutrients										
Total Ammonia (N)	mg/L	0.18	+/- 0.022	N/A	N/A	B169225	<0.015	N/A	0.015	B169244
Orthophosphate (P)	mg/L	0.0032	+/- 0.0034	0.0032	+/- 0.0034	B174537	0.0034	+/- 0.0034	0.0030	B174537
Total Nitrogen (N)	mg/L	0.201	+/- 0.028	N/A	N/A	B176384	0.391	+/- 0.042	0.020	B176384
Lab Filtered Nutrients										
Dissolved Phosphorus (P)	mg/L	<0.0030 (1)	N/A	N/A	N/A	B175209	<0.0030 (1)	N/A	0.0030	B175209

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C386477
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCT429		CCT430			CCT431			
Sampling Date		2023/10/24 11:14		2023/10/24 12:24			2023/10/24 14:10			
COC Number		1/1		1/1			1/1			
	UNITS	NE7R3-1 Lab-Dup	MU	WS62-1	MU	QC Batch	RMW16-13-37	MU	RDL	QC Batch
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	N/A	N/A	0.76	+/- <RDL	B174545	3.9	+/- 0.60	0.50	B174545
Microbiological Param.										
E.Coli DST	MPN/100mL	2.0	N/A	<1.0	N/A	B169939	1.0	N/A	1.0	B169939
Fecal Coliforms	MPN/100mL	<1.0	N/A	<1.0	N/A	B170386	31	N/A	1.0	B170386
Heterotrophic Plate Count	CFU/mL	46	N/A	8.0	N/A	B169483	>6000	N/A	1.0	B169483
Total Coliforms DST	MPN/100mL	38	N/A	<1.0	N/A	B169939	>2400	N/A	1.0	B169939
Nutrients										
Total Ammonia (N)	mg/L	<0.015	N/A	<0.015	N/A	B169244	0.038	+/- <RDL	0.015	B169225
Orthophosphate (P)	mg/L	N/A	N/A	<0.0030	N/A	B174537	0.0087	+/- 0.0036	0.0030	B174537
Total Nitrogen (N)	mg/L	N/A	N/A	0.108	+/- 0.022	B176384	1.12	+/- 0.109	0.020	B176384
Lab Filtered Nutrients										
Dissolved Phosphorus (P)	mg/L	N/A	N/A	<0.0030	N/A	B175209	0.0085 (1)	+/- 0.0049	0.0030	B175209

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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Bureau Veritas Job #: C386477
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCT432			CCT433		CCT433			
Sampling Date		2023/10/24 15:25			2023/10/24 15:57		2023/10/24 15:57			
COC Number		1/1			1/1		1/1			
	UNITS	RMW16-15-39	MU	RDL	23-10	MU	23-10 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	7.3	+/- 0.92	0.50	3.8	+/- 0.59	N/A	N/A	0.50	B174545
Microbiological Param.										
E.Coli DST	MPN/100mL	<10 (1)	N/A	10	5.0 (1)	N/A	N/A	N/A	5.0	B169939
Fecal Coliforms	MPN/100mL	<10 (1)	N/A	10	37 (1)	N/A	N/A	N/A	5.0	B170386
Heterotrophic Plate Count	CFU/mL	>6000	N/A	1.0	>6000	N/A	N/A	N/A	1.0	B169483
Total Coliforms DST	MPN/100mL	52 (1)	N/A	10	>12000 (1)	N/A	N/A	N/A	5.0	B169939
Nutrients										
Total Ammonia (N)	mg/L	0.58	+/- 0.064	0.015	0.038	+/- <RDL	N/A	N/A	0.015	B169244
Orthophosphate (P)	mg/L	<0.0030	N/A	0.0030	0.0094	+/- 0.0037	N/A	N/A	0.0030	B174537
Total Nitrogen (N)	mg/L	0.953	+/- 0.093	0.020	1.13	+/- 0.109	N/A	N/A	0.020	B176384
Lab Filtered Nutrients										
Dissolved Phosphorus (P)	mg/L	<0.0030	N/A	0.0030	0.012	+/- 0.0049	0.012	+/- 0.0049	0.0030	B175209

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.

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MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID		CCT428			CCT429		CCT430			
Sampling Date		2023/10/24 09:49			2023/10/24 11:14		2023/10/24 12:24			
COC Number		1/1			1/1		1/1			
	UNITS	SW11R4-2	MU	QC Batch	NE7R3-1	MU	WS62-1	MU	RDL	QC Batch
Elements										
Total Mercury (Hg)	ug/L	<0.0019	N/A	B177477	0.0035	+/- 0.0019	<0.0019	N/A	0.0019	B177477
Lab Filtered Elements										
Dissolved Mercury (Hg)	ug/L	0.0023	+/- 1.17	B177507	<0.0019	N/A	<0.0019	N/A	0.0019	B174223

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CCT431			CCT432			
Sampling Date		2023/10/24 14:10			2023/10/24 15:25			
COC Number		1/1			1/1			
	UNITS	RMW16-13-37	MU	RDL	RMW16-15-39	MU	RDL	QC Batch
Elements								
Total Mercury (Hg)	ug/L	0.0150	+/- 0.0031	0.0019	0.052	+/- <RDL	0.019	B177477
Lab Filtered Elements								
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	<0.0019	N/A	0.0019	B174223

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CCT433			
Sampling Date		2023/10/24 15:57			
COC Number		1/1			
	UNITS	23-10	MU	RDL	QC Batch
Elements					
Total Mercury (Hg)	ug/L	0.0174	+/- 0.0035	0.0019	B177477
Lab Filtered Elements					
Dissolved Mercury (Hg)	ug/L	0.0023	+/- 1.17	0.0019	B177507

RDL = Reportable Detection Limit
MU = Measurement Uncertainty

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	-2.7°C

Sample CCT428 [SW11R4-2] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

MERCURY BY COLD VAPOR (WATER) Comments

Sample CCT432 [RMW16-15-39] Mercury (Total) by CV: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B169225	AFI	Matrix Spike	Total Ammonia (N)	2023/10/25		100	%	80 - 120
B169225	AFI	Spiked Blank	Total Ammonia (N)	2023/10/25		100	%	80 - 120
B169225	AFI	Method Blank	Total Ammonia (N)	2023/10/25	<0.015		mg/L	
B169225	AFI	RPD	Total Ammonia (N)	2023/10/25	2.4		%	20
B169244	AFI	Matrix Spike [CCT429-10]	Total Ammonia (N)	2023/10/25		101	%	80 - 120
B169244	AFI	Spiked Blank	Total Ammonia (N)	2023/10/25		100	%	80 - 120
B169244	AFI	Method Blank	Total Ammonia (N)	2023/10/25	<0.015		mg/L	
B169244	AFI	RPD [CCT429-10]	Total Ammonia (N)	2023/10/25	NC		%	20
B169483	SOG	Method Blank	Heterotrophic Plate Count	2023/10/27	<1.0		CFU/mL	
B169483	SOG	RPD [CCT429-02]	Heterotrophic Plate Count	2023/10/27	36		%	N/A
B169803	QW1	Matrix Spike	1,4-Difluorobenzene (sur.)	2023/10/29		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/10/29		105	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/10/29		109	%	50 - 140
			Benzene	2023/10/29		107	%	50 - 140
			Toluene	2023/10/29		100	%	50 - 140
			Ethylbenzene	2023/10/29		104	%	50 - 140
			m & p-Xylene	2023/10/29		96	%	50 - 140
			o-Xylene	2023/10/29		97	%	50 - 140
			F1 (C6-C10)	2023/10/29		99	%	60 - 140
B169803	QW1	Spiked Blank	1,4-Difluorobenzene (sur.)	2023/10/29		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/10/29		105	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/10/29		107	%	50 - 140
			Benzene	2023/10/29		108	%	60 - 130
			Toluene	2023/10/29		101	%	60 - 130
			Ethylbenzene	2023/10/29		105	%	60 - 130
			m & p-Xylene	2023/10/29		97	%	60 - 130
			o-Xylene	2023/10/29		96	%	60 - 130
			F1 (C6-C10)	2023/10/29		110	%	60 - 140
B169803	QW1	Method Blank	1,4-Difluorobenzene (sur.)	2023/10/29		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/10/29		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/10/29		109	%	50 - 140
			Benzene	2023/10/29	<0.00040		mg/L	
			Toluene	2023/10/29	<0.00040		mg/L	
			Ethylbenzene	2023/10/29	<0.00040		mg/L	
			m & p-Xylene	2023/10/29	<0.00080		mg/L	
			o-Xylene	2023/10/29	<0.00040		mg/L	
			F1 (C6-C10)	2023/10/29	<0.10		mg/L	
B169803	QW1	RPD	Benzene	2023/10/29	4.8		%	30
			Toluene	2023/10/29	NC		%	30
			Ethylbenzene	2023/10/29	NC		%	30
			m & p-Xylene	2023/10/29	NC		%	30
			o-Xylene	2023/10/29	NC		%	30
			F1 (C6-C10)	2023/10/29	NC		%	30
B169939	SOG	Method Blank	E.Coli DST	2023/10/26	<1.0		mpn/100mL	
			Total Coliforms DST	2023/10/26	<1.0		mpn/100mL	
B169939	SOG	RPD [CCT429-02]	E.Coli DST	2023/10/26	67		%	N/A
			Total Coliforms DST	2023/10/26	22		%	N/A
B170386	SOG	Method Blank	Fecal Coliforms	2023/10/26	<1.0		MPN/100mL	
B170386	SOG	RPD [CCT429-02]	Fecal Coliforms	2023/10/26	NC		%	N/A
B170765	CHA	Spiked Blank	O-TERPHENYL (sur.)	2023/10/27		99	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2023/10/27		98	%	60 - 140
B170765	CHA	Method Blank	O-TERPHENYL (sur.)	2023/10/27		93	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2023/10/27	<0.10		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B172921	AFI	Matrix Spike	Nitrite (N)	2023/10/27		107	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/27		84	%	80 - 120
B172921	AFI	Spiked Blank	Nitrite (N)	2023/10/27		105	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/27		104	%	80 - 120
B172921	AFI	Method Blank	Nitrite (N)	2023/10/27	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2023/10/27	<0.010		mg/L	
B172921	AFI	RPD	Nitrite (N)	2023/10/27	NC		%	20
			Nitrate plus Nitrite (N)	2023/10/27	NC		%	20
B172930	AFI	Matrix Spike	Nitrite (N)	2023/10/26		100	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/26		111	%	80 - 120
B172930	AFI	Spiked Blank	Nitrite (N)	2023/10/26		101	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/26		104	%	80 - 120
B172930	AFI	Method Blank	Nitrite (N)	2023/10/26	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2023/10/26	<0.010		mg/L	
B172930	AFI	RPD	Nitrite (N)	2023/10/26	NC		%	20
			Nitrate plus Nitrite (N)	2023/10/26	NC		%	20
B172931	AFI	Matrix Spike	Nitrite (N)	2023/10/27		103	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/27		NC	%	80 - 120
B172931	AFI	Spiked Blank	Nitrite (N)	2023/10/26		103	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/26		104	%	80 - 120
B172931	AFI	Method Blank	Nitrite (N)	2023/10/26	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2023/10/26	<0.010		mg/L	
B172931	AFI	RPD	Nitrite (N)	2023/10/27	NC		%	20
			Nitrate plus Nitrite (N)	2023/10/27	0.98		%	20
B173580	TOR	Matrix Spike	Chloride (Cl)	2023/10/27		NC	%	80 - 120
			Sulphate (SO4)	2023/10/27		80	%	80 - 120
B173580	TOR	Spiked Blank	Chloride (Cl)	2023/10/27		102	%	80 - 120
			Sulphate (SO4)	2023/10/27		98	%	80 - 120
B173580	TOR	Method Blank	Chloride (Cl)	2023/10/27	<1.0		mg/L	
			Sulphate (SO4)	2023/10/27	<1.0		mg/L	
B173580	TOR	RPD	Chloride (Cl)	2023/10/27	0.047		%	20
B174196	MPU	Matrix Spike	Dissolved Barium (Ba)	2023/10/27		45 (1)	%	80 - 120
			Dissolved Boron (B)	2023/10/27		96	%	80 - 120
			Dissolved Calcium (Ca)	2023/10/27		NC	%	80 - 120
			Dissolved Iron (Fe)	2023/10/27		111	%	80 - 120
			Dissolved Lithium (Li)	2023/10/27		99	%	80 - 120
			Dissolved Magnesium (Mg)	2023/10/27		NC	%	80 - 120
			Dissolved Manganese (Mn)	2023/10/27		NC	%	80 - 120
			Dissolved Phosphorus (P)	2023/10/27		106	%	80 - 120
			Dissolved Potassium (K)	2023/10/27		105	%	80 - 120
			Dissolved Silicon (Si)	2023/10/27		97	%	80 - 120
			Dissolved Sodium (Na)	2023/10/27		NC	%	80 - 120
			Dissolved Strontium (Sr)	2023/10/27		NC	%	80 - 120
			Dissolved Sulphur (S)	2023/10/27		NC	%	80 - 120
B174196	MPU	Spiked Blank	Dissolved Barium (Ba)	2023/10/27		96	%	80 - 120
			Dissolved Boron (B)	2023/10/27		101	%	80 - 120
			Dissolved Calcium (Ca)	2023/10/27		101	%	80 - 120
			Dissolved Iron (Fe)	2023/10/27		109	%	80 - 120
			Dissolved Lithium (Li)	2023/10/27		100	%	80 - 120
			Dissolved Magnesium (Mg)	2023/10/27		103	%	80 - 120
			Dissolved Manganese (Mn)	2023/10/27		109	%	80 - 120
			Dissolved Phosphorus (P)	2023/10/27		101	%	80 - 120
			Dissolved Potassium (K)	2023/10/27		104	%	80 - 120

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			Dissolved Silicon (Si)	2023/10/27		99	%	80 - 120
			Dissolved Sodium (Na)	2023/10/27		102	%	80 - 120
			Dissolved Strontium (Sr)	2023/10/27		98	%	80 - 120
			Dissolved Sulphur (S)	2023/10/27		100	%	80 - 120
B174196	MPU	Method Blank	Dissolved Barium (Ba)	2023/10/28	<0.010		mg/L	
			Dissolved Boron (B)	2023/10/28	<0.020		mg/L	
			Dissolved Calcium (Ca)	2023/10/28	<0.30		mg/L	
			Dissolved Iron (Fe)	2023/10/28	<0.060		mg/L	
			Dissolved Lithium (Li)	2023/10/28	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2023/10/28	<0.20		mg/L	
			Dissolved Manganese (Mn)	2023/10/28	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2023/10/28	<0.10		mg/L	
			Dissolved Potassium (K)	2023/10/28	<0.30		mg/L	
			Dissolved Silicon (Si)	2023/10/28	<0.50		mg/L	
			Dissolved Sodium (Na)	2023/10/28	<0.50		mg/L	
			Dissolved Strontium (Sr)	2023/10/28	<0.020		mg/L	
			Dissolved Sulphur (S)	2023/10/28	<0.20		mg/L	
B174196	MPU	RPD	Dissolved Barium (Ba)	2023/10/27	NC		%	20
			Dissolved Boron (B)	2023/10/27	NC		%	20
			Dissolved Calcium (Ca)	2023/10/27	1.1		%	20
			Dissolved Iron (Fe)	2023/10/27	NC		%	20
			Dissolved Lithium (Li)	2023/10/27	NC		%	20
			Dissolved Magnesium (Mg)	2023/10/27	2.0		%	20
			Dissolved Manganese (Mn)	2023/10/27	1.7		%	20
			Dissolved Phosphorus (P)	2023/10/27	NC		%	20
			Dissolved Potassium (K)	2023/10/27	6.6		%	20
			Dissolved Silicon (Si)	2023/10/27	6.4		%	20
			Dissolved Sodium (Na)	2023/10/27	0.92		%	20
			Dissolved Strontium (Sr)	2023/10/27	2.8		%	20
			Dissolved Sulphur (S)	2023/10/27	4.3		%	20
B174209	MPU	Matrix Spike	Dissolved Barium (Ba)	2023/10/27		100	%	80 - 120
			Dissolved Boron (B)	2023/10/27		100	%	80 - 120
			Dissolved Calcium (Ca)	2023/10/27		NC	%	80 - 120
			Dissolved Iron (Fe)	2023/10/27		111	%	80 - 120
			Dissolved Lithium (Li)	2023/10/27		93	%	80 - 120
			Dissolved Magnesium (Mg)	2023/10/27		107	%	80 - 120
			Dissolved Manganese (Mn)	2023/10/27		111	%	80 - 120
			Dissolved Phosphorus (P)	2023/10/27		114	%	80 - 120
			Dissolved Potassium (K)	2023/10/27		101	%	80 - 120
			Dissolved Silicon (Si)	2023/10/27		105	%	80 - 120
			Dissolved Sodium (Na)	2023/10/27		92	%	80 - 120
			Dissolved Strontium (Sr)	2023/10/27		97	%	80 - 120
			Dissolved Sulphur (S)	2023/10/27		124 (1)	%	80 - 120
B174209	MPU	Spiked Blank	Dissolved Barium (Ba)	2023/10/27		98	%	80 - 120
			Dissolved Boron (B)	2023/10/27		96	%	80 - 120
			Dissolved Calcium (Ca)	2023/10/27		89	%	80 - 120
			Dissolved Iron (Fe)	2023/10/27		108	%	80 - 120
			Dissolved Lithium (Li)	2023/10/27		89	%	80 - 120
			Dissolved Magnesium (Mg)	2023/10/27		109	%	80 - 120
			Dissolved Manganese (Mn)	2023/10/27		107	%	80 - 120
			Dissolved Phosphorus (P)	2023/10/27		109	%	80 - 120
			Dissolved Potassium (K)	2023/10/27		96	%	80 - 120
			Dissolved Silicon (Si)	2023/10/27		104	%	80 - 120

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			Dissolved Sodium (Na)	2023/10/27		92	%	80 - 120
			Dissolved Strontium (Sr)	2023/10/27		97	%	80 - 120
			Dissolved Sulphur (S)	2023/10/27		108	%	80 - 120
B174209	MPU	Method Blank	Dissolved Barium (Ba)	2023/10/27	<0.010		mg/L	
			Dissolved Boron (B)	2023/10/27	<0.020		mg/L	
			Dissolved Calcium (Ca)	2023/10/27	<0.30		mg/L	
			Dissolved Iron (Fe)	2023/10/27	<0.060		mg/L	
			Dissolved Lithium (Li)	2023/10/27	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2023/10/27	<0.20		mg/L	
			Dissolved Manganese (Mn)	2023/10/27	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2023/10/27	<0.10		mg/L	
			Dissolved Potassium (K)	2023/10/27	<0.30		mg/L	
			Dissolved Silicon (Si)	2023/10/27	<0.50		mg/L	
			Dissolved Sodium (Na)	2023/10/27	<0.50		mg/L	
			Dissolved Strontium (Sr)	2023/10/27	<0.020		mg/L	
			Dissolved Sulphur (S)	2023/10/27	<0.20		mg/L	
B174209	MPU	RPD	Dissolved Barium (Ba)	2023/10/27	2.4 (2)		%	20
			Dissolved Boron (B)	2023/10/27	11 (3)		%	20
			Dissolved Calcium (Ca)	2023/10/27	2.1 (4)		%	20
			Dissolved Iron (Fe)	2023/10/27	NC (5)		%	20
			Dissolved Lithium (Li)	2023/10/27	0.82 (6)		%	20
			Dissolved Magnesium (Mg)	2023/10/27	0.86 (7)		%	20
			Dissolved Manganese (Mn)	2023/10/27	NC (8)		%	20
			Dissolved Phosphorus (P)	2023/10/27	NC (9)		%	20
			Dissolved Potassium (K)	2023/10/27	4.2 (10)		%	20
			Dissolved Silicon (Si)	2023/10/27	2.8 (11)		%	20
			Dissolved Sodium (Na)	2023/10/27	2.0 (12)		%	20
			Dissolved Strontium (Sr)	2023/10/27	3.1 (13)		%	20
			Dissolved Sulphur (S)	2023/10/27	0.23 (14)		%	20
B174223	KKM	Matrix Spike	Dissolved Mercury (Hg)	2023/10/28		98	%	80 - 120
B174223	KKM	Spiked Blank	Dissolved Mercury (Hg)	2023/10/28		100	%	80 - 120
B174223	KKM	Method Blank	Dissolved Mercury (Hg)	2023/10/28	<0.0019		ug/L	
B174223	KKM	RPD	Dissolved Mercury (Hg)	2023/10/28	NC		%	20
B174245	JAB	Matrix Spike	Dissolved Aluminum (Al)	2023/10/27		101	%	80 - 120
			Dissolved Antimony (Sb)	2023/10/27		109	%	80 - 120
			Dissolved Arsenic (As)	2023/10/27		100	%	80 - 120
			Dissolved Beryllium (Be)	2023/10/27		94	%	80 - 120
			Dissolved Chromium (Cr)	2023/10/27		99	%	80 - 120
			Dissolved Cobalt (Co)	2023/10/27		95	%	80 - 120
			Dissolved Copper (Cu)	2023/10/27		92	%	80 - 120
			Dissolved Lead (Pb)	2023/10/27		91	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/10/27		108	%	80 - 120
			Dissolved Nickel (Ni)	2023/10/27		93	%	80 - 120
			Dissolved Selenium (Se)	2023/10/27		98	%	80 - 120
			Dissolved Silver (Ag)	2023/10/27		94	%	80 - 120
			Dissolved Thallium (Tl)	2023/10/27		93	%	80 - 120
			Dissolved Tin (Sn)	2023/10/27		102	%	80 - 120
			Dissolved Titanium (Ti)	2023/10/27		101	%	80 - 120
			Dissolved Uranium (U)	2023/10/27		95	%	80 - 120
			Dissolved Vanadium (V)	2023/10/27		101	%	80 - 120
			Dissolved Zinc (Zn)	2023/10/27		91	%	80 - 120
B174245	JAB	Spiked Blank	Dissolved Aluminum (Al)	2023/10/27		104	%	80 - 120
			Dissolved Antimony (Sb)	2023/10/27		107	%	80 - 120

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			Dissolved Arsenic (As)	2023/10/27		99	%	80 - 120
			Dissolved Beryllium (Be)	2023/10/27		94	%	80 - 120
			Dissolved Chromium (Cr)	2023/10/27		97	%	80 - 120
			Dissolved Cobalt (Co)	2023/10/27		96	%	80 - 120
			Dissolved Copper (Cu)	2023/10/27		94	%	80 - 120
			Dissolved Lead (Pb)	2023/10/27		96	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/10/27		102	%	80 - 120
			Dissolved Nickel (Ni)	2023/10/27		95	%	80 - 120
			Dissolved Selenium (Se)	2023/10/27		100	%	80 - 120
			Dissolved Silver (Ag)	2023/10/27		97	%	80 - 120
			Dissolved Thallium (Tl)	2023/10/27		95	%	80 - 120
			Dissolved Tin (Sn)	2023/10/27		98	%	80 - 120
			Dissolved Titanium (Ti)	2023/10/27		102	%	80 - 120
			Dissolved Uranium (U)	2023/10/27		96	%	80 - 120
			Dissolved Vanadium (V)	2023/10/27		97	%	80 - 120
			Dissolved Zinc (Zn)	2023/10/27		98	%	80 - 120
B174245	JAB	Method Blank	Dissolved Aluminum (Al)	2023/10/27	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2023/10/27	<0.00060		mg/L	
			Dissolved Arsenic (As)	2023/10/27	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2023/10/27	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2023/10/27	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2023/10/27	<0.00030		mg/L	
			Dissolved Copper (Cu)	2023/10/27	<0.0010		mg/L	
			Dissolved Lead (Pb)	2023/10/27	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2023/10/27	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2023/10/27	<0.00050		mg/L	
			Dissolved Selenium (Se)	2023/10/27	<0.00020		mg/L	
			Dissolved Silver (Ag)	2023/10/27	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2023/10/27	<0.00020		mg/L	
			Dissolved Tin (Sn)	2023/10/27	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2023/10/27	<0.0010		mg/L	
			Dissolved Uranium (U)	2023/10/27	<0.00010		mg/L	
			Dissolved Vanadium (V)	2023/10/27	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2023/10/27	<0.0030		mg/L	
B174245	JAB	RPD	Dissolved Aluminum (Al)	2023/10/27	NC		%	20
			Dissolved Antimony (Sb)	2023/10/27	NC		%	20
			Dissolved Arsenic (As)	2023/10/27	NC		%	20
			Dissolved Beryllium (Be)	2023/10/27	NC		%	20
			Dissolved Chromium (Cr)	2023/10/27	NC		%	20
			Dissolved Cobalt (Co)	2023/10/27	0.33		%	20
			Dissolved Copper (Cu)	2023/10/27	NC		%	20
			Dissolved Lead (Pb)	2023/10/27	NC		%	20
			Dissolved Molybdenum (Mo)	2023/10/27	5.9		%	20
			Dissolved Nickel (Ni)	2023/10/27	0.53		%	20
			Dissolved Selenium (Se)	2023/10/27	NC		%	20
			Dissolved Silver (Ag)	2023/10/27	NC		%	20
			Dissolved Thallium (Tl)	2023/10/27	NC		%	20
			Dissolved Tin (Sn)	2023/10/27	NC		%	20
			Dissolved Titanium (Ti)	2023/10/27	NC		%	20
			Dissolved Uranium (U)	2023/10/27	0.36		%	20
			Dissolved Vanadium (V)	2023/10/27	NC		%	20
			Dissolved Zinc (Zn)	2023/10/27	7.4		%	20
B174251	TOR	Matrix Spike [CCT433-01]	Chloride (Cl)	2023/10/27		94	%	80 - 120

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			Sulphate (SO4)	2023/10/27		98	%	80 - 120
B174251	TOR	Spiked Blank	Chloride (Cl)	2023/10/27		105	%	80 - 120
			Sulphate (SO4)	2023/10/27		100	%	80 - 120
B174251	TOR	Method Blank	Chloride (Cl)	2023/10/27	<1.0		mg/L	
			Sulphate (SO4)	2023/10/27	<1.0		mg/L	
B174251	TOR	RPD [CCT433-01]	Chloride (Cl)	2023/10/27	0.14		%	20
			Sulphate (SO4)	2023/10/27	1.4		%	20
B174265	TOR	Matrix Spike	Chloride (Cl)	2023/10/27		NC	%	80 - 120
			Sulphate (SO4)	2023/10/27		113	%	80 - 120
B174265	TOR	Spiked Blank	Chloride (Cl)	2023/10/27		106	%	80 - 120
			Sulphate (SO4)	2023/10/27		98	%	80 - 120
B174265	TOR	Method Blank	Chloride (Cl)	2023/10/27	<1.0		mg/L	
			Sulphate (SO4)	2023/10/27	<1.0		mg/L	
B174265	TOR	RPD	Chloride (Cl)	2023/10/27	0.15		%	20
			Sulphate (SO4)	2023/10/27	0.36		%	20
B174537	MAP	Matrix Spike [CCT428-01]	Orthophosphate (P)	2023/10/28		98	%	80 - 120
B174537	MAP	Spiked Blank	Orthophosphate (P)	2023/10/27		99	%	80 - 120
B174537	MAP	Method Blank	Orthophosphate (P)	2023/10/27	<0.0030		mg/L	
B174537	MAP	RPD [CCT428-01]	Orthophosphate (P)	2023/10/28	1.3		%	20
B174545	MDO	Matrix Spike	Dissolved Organic Carbon (C)	2023/10/30		NC	%	80 - 120
B174545	MDO	Spiked Blank	Dissolved Organic Carbon (C)	2023/10/30		103	%	80 - 120
B174545	MDO	Method Blank	Dissolved Organic Carbon (C)	2023/10/30	<0.50		mg/L	
B174545	MDO	RPD	Dissolved Organic Carbon (C)	2023/10/30	0.70		%	20
B175209	CTU	Matrix Spike [CCT433-01]	Dissolved Phosphorus (P)	2023/10/31		98	%	80 - 120
B175209	CTU	QC Standard	Dissolved Phosphorus (P)	2023/10/31		87	%	80 - 120
B175209	CTU	Spiked Blank	Dissolved Phosphorus (P)	2023/10/31		100	%	80 - 120
B175209	CTU	Method Blank	Dissolved Phosphorus (P)	2023/10/31	<0.0030		mg/L	
B175209	CTU	RPD [CCT433-01]	Dissolved Phosphorus (P)	2023/10/31	1.4		%	20
B176384	IC4	Matrix Spike	Total Nitrogen (N)	2023/10/31		99	%	80 - 120
B176384	IC4	Spiked Blank	Total Nitrogen (N)	2023/10/31		95	%	80 - 120
B176384	IC4	Method Blank	Total Nitrogen (N)	2023/10/31	<0.020		mg/L	
B176384	IC4	RPD	Total Nitrogen (N)	2023/10/31	1.0		%	20
B177477	KKM	Matrix Spike	Total Mercury (Hg)	2023/10/31		85	%	80 - 120
B177477	KKM	Spiked Blank	Total Mercury (Hg)	2023/10/31		96	%	80 - 120
B177477	KKM	Method Blank	Total Mercury (Hg)	2023/10/31	<0.0019		ug/L	
B177477	KKM	RPD	Total Mercury (Hg)	2023/10/31	NC		%	20
B177507	KKM	Matrix Spike	Dissolved Mercury (Hg)	2023/10/31		94	%	80 - 120
B177507	KKM	Spiked Blank	Dissolved Mercury (Hg)	2023/10/31		101	%	80 - 120
B177507	KKM	Method Blank	Dissolved Mercury (Hg)	2023/10/31	<0.0019		ug/L	
B177507	KKM	RPD	Dissolved Mercury (Hg)	2023/10/31	NC		%	20
B178330	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/03		99	%	80 - 120
B178330	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/11/03	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/03	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/03	<1.0		mg/L	
			Carbonate (CO3)	2023/11/03	<1.0		mg/L	
			Hydroxide (OH)	2023/11/03	<1.0		mg/L	
B178330	JVM	RPD	Alkalinity (PP as CaCO3)	2023/11/03	21 (1)		%	20
			Alkalinity (Total as CaCO3)	2023/11/03	0.25		%	20
			Bicarbonate (HCO3)	2023/11/03	1.3		%	20
			Carbonate (CO3)	2023/11/03	21 (1)		%	20
			Hydroxide (OH)	2023/11/03	NC		%	20
B178333	JVM	Spiked Blank	Conductivity	2023/11/03		100	%	90 - 110
B178333	JVM	Method Blank	Conductivity	2023/11/03	<2.0		uS/cm	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B178333	JVM	RPD	Conductivity	2023/11/03	1.2		%	10
B178334	JVM	Spiked Blank	pH	2023/11/03		100	%	97 - 103
B178334	JVM	RPD	pH	2023/11/03	0.70		%	N/A
B178350	LQ1	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/02		94	%	80 - 120
B178350	LQ1	Method Blank	Alkalinity (PP as CaCO3)	2023/11/02	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/02	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/02	<1.0		mg/L	
			Carbonate (CO3)	2023/11/02	<1.0		mg/L	
			Hydroxide (OH)	2023/11/02	<1.0		mg/L	
B178350	LQ1	RPD	Alkalinity (PP as CaCO3)	2023/11/02	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/02	0.53		%	20
			Bicarbonate (HCO3)	2023/11/02	0.53		%	20
			Carbonate (CO3)	2023/11/02	NC		%	20
			Hydroxide (OH)	2023/11/02	NC		%	20
B178352	LQ1	Spiked Blank	Conductivity	2023/11/02		100	%	90 - 110
B178352	LQ1	Method Blank	Conductivity	2023/11/02	<2.0		uS/cm	
B178352	LQ1	RPD	Conductivity	2023/11/02	0.75		%	10
B178354	LQ1	Spiked Blank	pH	2023/11/02		99	%	97 - 103
B178354	LQ1	RPD	pH	2023/11/02	1.2		%	N/A
B178356	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/04		98	%	80 - 120
B178356	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/11/04	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/04	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/04	<1.0		mg/L	
			Carbonate (CO3)	2023/11/04	<1.0		mg/L	
			Hydroxide (OH)	2023/11/04	<1.0		mg/L	
B178356	JVM	RPD [CCT432-01]	Alkalinity (PP as CaCO3)	2023/11/04	34 (1)		%	20
			Alkalinity (Total as CaCO3)	2023/11/04	0.58		%	20
			Bicarbonate (HCO3)	2023/11/04	2.5		%	20
			Carbonate (CO3)	2023/11/04	34 (1)		%	20
			Hydroxide (OH)	2023/11/04	NC		%	20
B178361	JVM	Spiked Blank	Conductivity	2023/11/04		100	%	90 - 110
B178361	JVM	Method Blank	Conductivity	2023/11/04	<2.0		uS/cm	
B178361	JVM	RPD [CCT432-01]	Conductivity	2023/11/04	2.2		%	10
B178363	JVM	Spiked Blank	pH	2023/11/04		100	%	97 - 103

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B178363	JVM	RPD [CCT432-01]	pH	2023/11/04	1.5		%	N/A

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(2) 0.07193

(3) 0.03199

(4) 104.6838

(5) 0.0031

(6) 0.03390

(7) 50.68051

(8) 0.00395

(9) -0.00844

(10) 1.94567

(11) 3.33405

(12) 35.2797

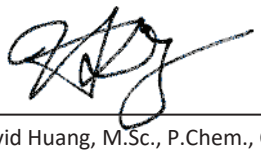
(13) 0.66580

(14) 28.80460

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VALIDATION SIGNATURE PAGE

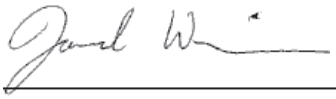
The analytical data and all QC contained in this report were reviewed and validated by:



David Huang, M.Sc., P.Chem., QP, Scientific Services Manager



Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics



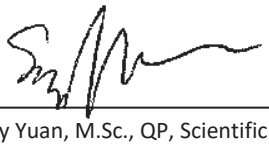
Jared Wiseman, B.Sc., P.Chem., QP, Senior Analyst, Organics



Maria Magdalena Florescu, Ph.D., P.Chem., QP, Inorganics Manager



Rahul Suryawanshi, Senior Analyst



Sandy Yuan, M.Sc., QP, Scientific Specialist



Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the

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VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by:

reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

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- ☐ Edmonton, AB: 9331-48 St. T6B 2R4 Toll Free (800) 386-7247
- ☐ Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

Page 1 of 1

Invoice Information (Invoice to (requires report) ☑)		Report Information (if differs from invoice)		Project Information	
Company:	Stantec	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	10220 103 Ave Suite # 300	Street Address:		Project #:	110773396
City: Edmonton Prov: AB Postal Code: T5J 0K4		City: Prov: Postal Code:		Site #:	
Phone:	780 969 2223	Phone:		Site Location:	SR1
Email:	dylan.king@stantec.com	Email:		Site Location Province:	
Copies:		Copies:		Sampled By:	WT / TH

LAB USE ONLY - PLACE STICKER HERE

Rush Confirmation #:

Regulatory Criteria

☑ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba ☐ Saskatchewan ☐ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)
☑ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply
☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F1-F2	7 BTEX F1-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 TKN	14 DOC	15 Texture (% sand, silt, clay)	16 Basic class II landfill	17 Dissolved Phosphorus	18 Phosphate	19 Ammonia	20 Bacteriological +	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE
1	SW1R4-2	23	10	24	09	49	Water			X			X		X		X	X	X	X	X			X	X	X	X	11	
2	NE7R3-1	23	10	24	11	14				X			X		X		X	X	X	X	X			X	X	X	X	11	
3	WS62-1	23	10	24	12	24				X			X		X		X	X	X	X	X			X	X	X	X	11	
4	RMW16-13-37	23	10	24	14	10				X			X		X		X	X	X	X	X			X	X	X	X	11	
5	RMW16-15-39	23	10	24	15	25				X			X		X		X	X	X	X	X			X	X	X	X	11	
6	23-10	23	10	24	15	57	↓			X			X		X		X	X	X	X	X			X	X	X	X	11	
7																													
8																													
9																													
10																													
11																													
12																													

24-Oct-23 17:52
Geraldlyn Gouthro
C386477
mcal-10-2003 JJO INS-0003

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKN
AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		✓				
Seal intact		✓				
Cooling media present	✓			-4	-2	-2

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present						
Seal intact						
Cooling media present						

LAB USE ONLY
Seal present
Seal intact
Cooling media present

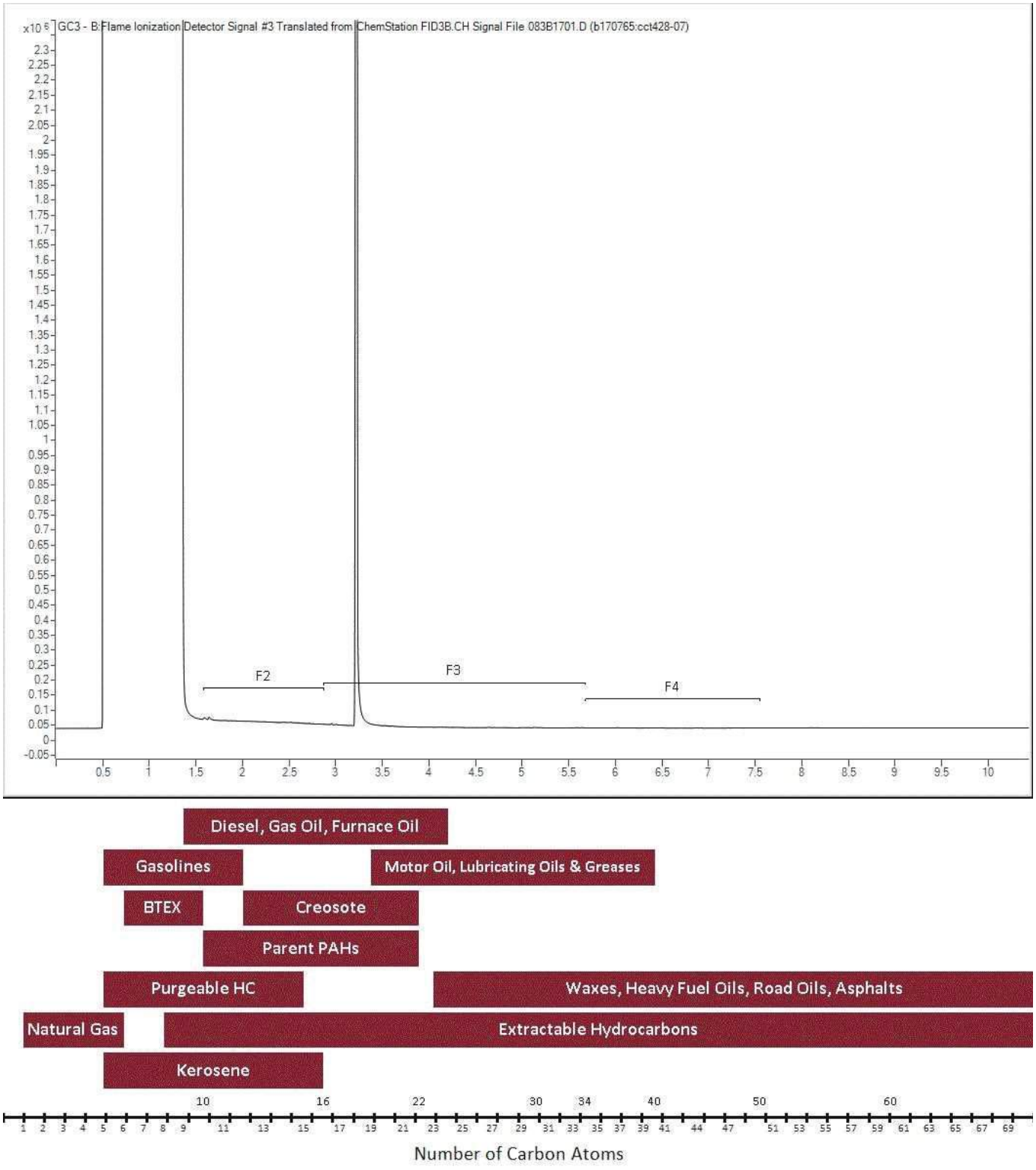
Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special Instructions
1 [illegible] / Hayley Tran	23	10	24	17	52	1 Jess Major	23	10	24	17	52	* Total coliforms, e.coli, fecal coliforms, heterotrophic plate counts
2						2						

Dissolved parameters not field filtered or preserved - please lab filter

Bureau Veritas Job #: C386477
Report Date: 2023/11/08
Bureau Veritas Sample: CCT428

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SR1
Client ID: SW11R4-2

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

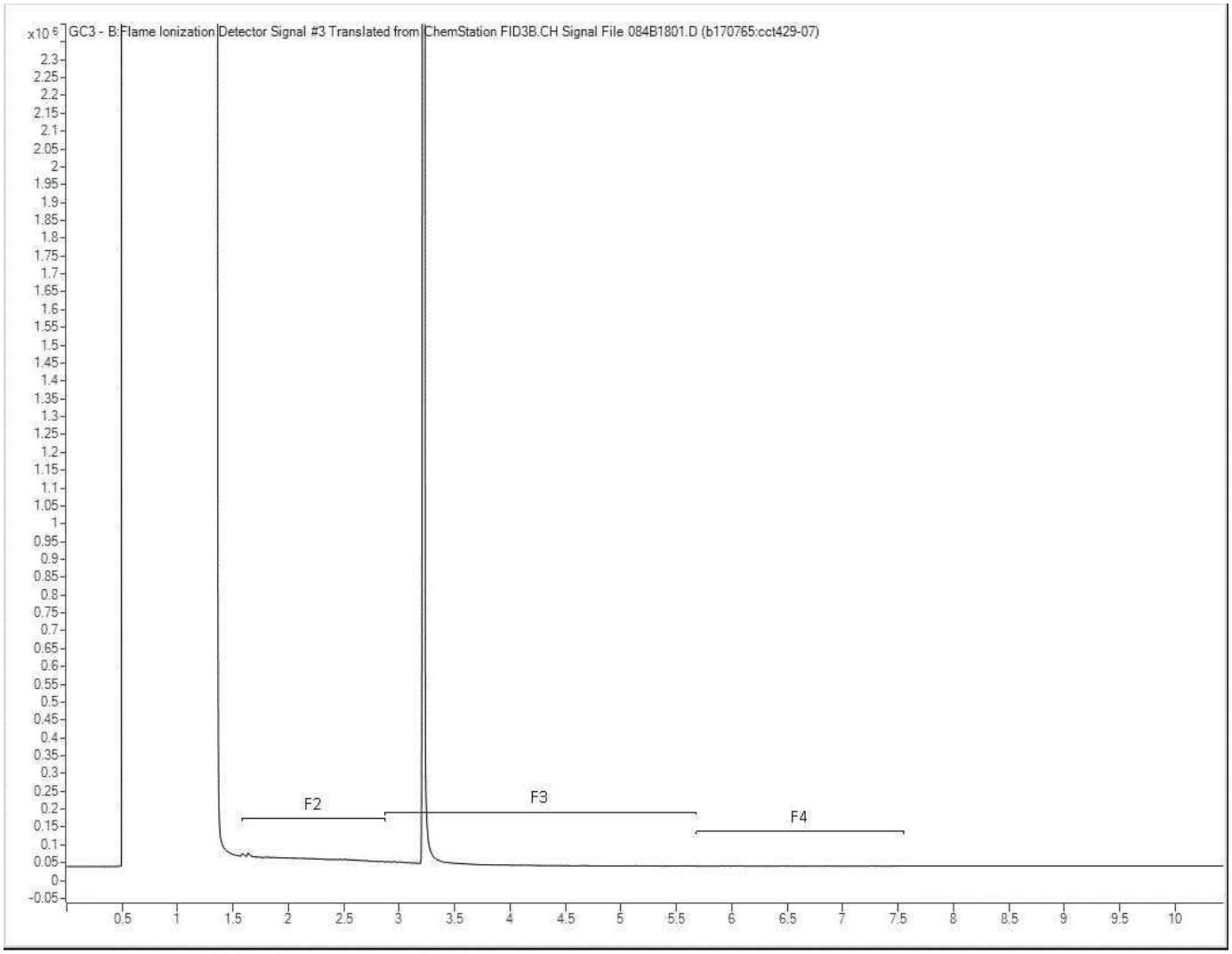


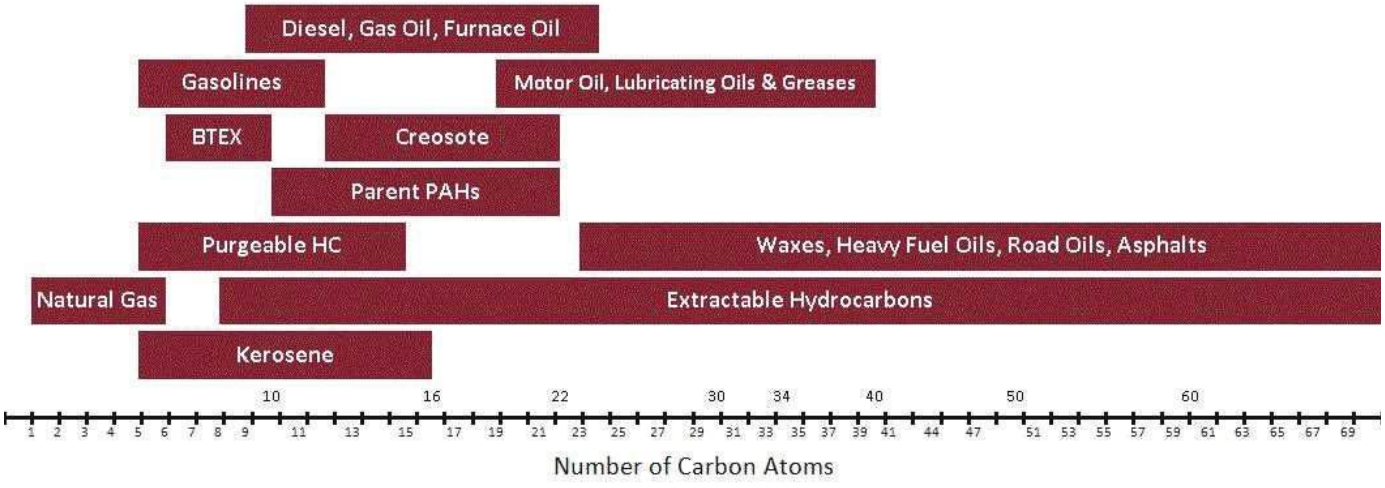
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386477
Report Date: 2023/11/08
Bureau Veritas Sample: CCT429

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SR1
Client ID: NE7R3-1

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





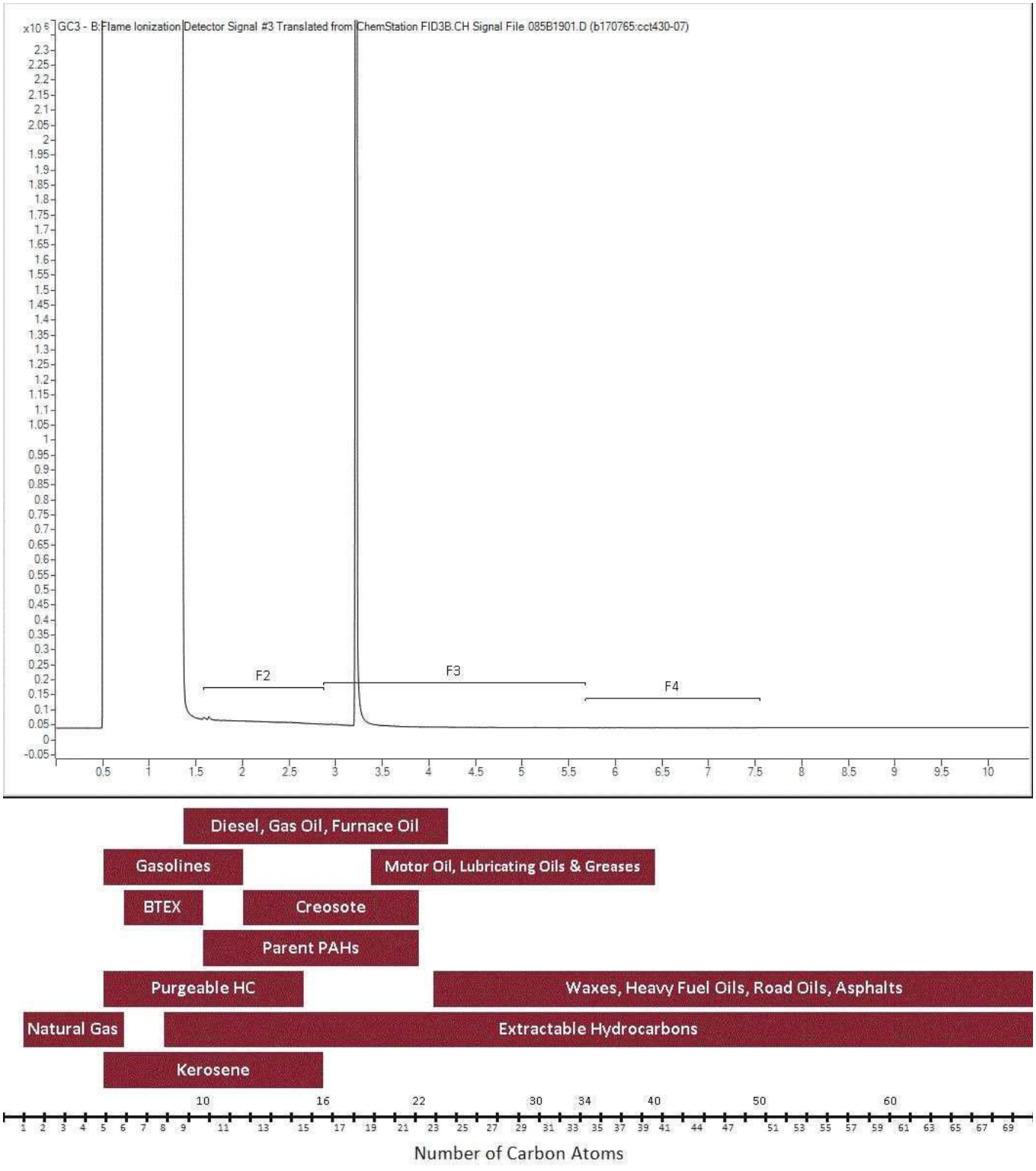
hpchem20\HPchem\1\DATA\2023\10\RUN1027

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386477
Report Date: 2023/11/08
Bureau Veritas Sample: CCT430

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SR1
Client ID: WS62-1

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

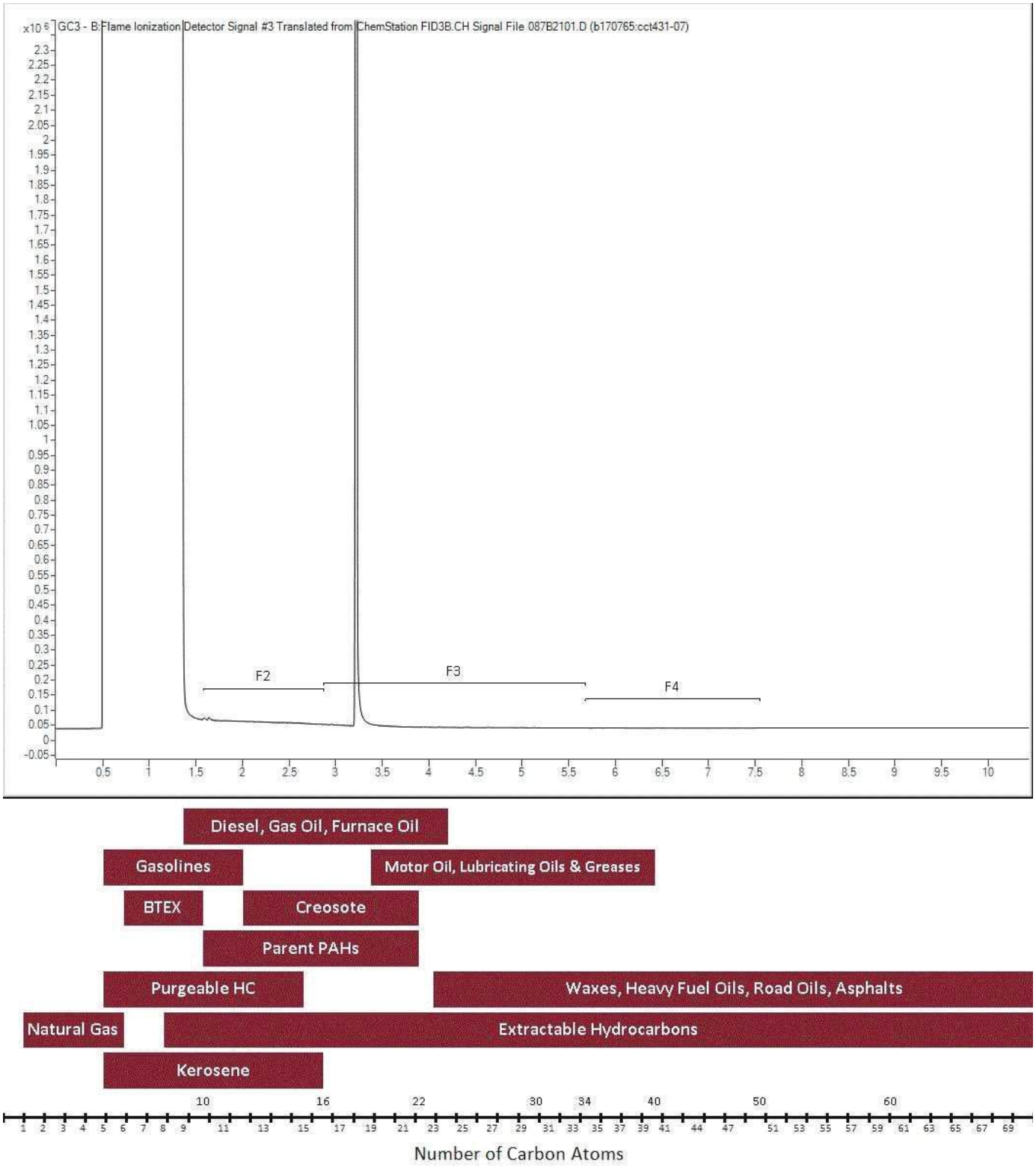


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386477
Report Date: 2023/11/08
Bureau Veritas Sample: CCT431

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SR1
Client ID: RMW16-13-37

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

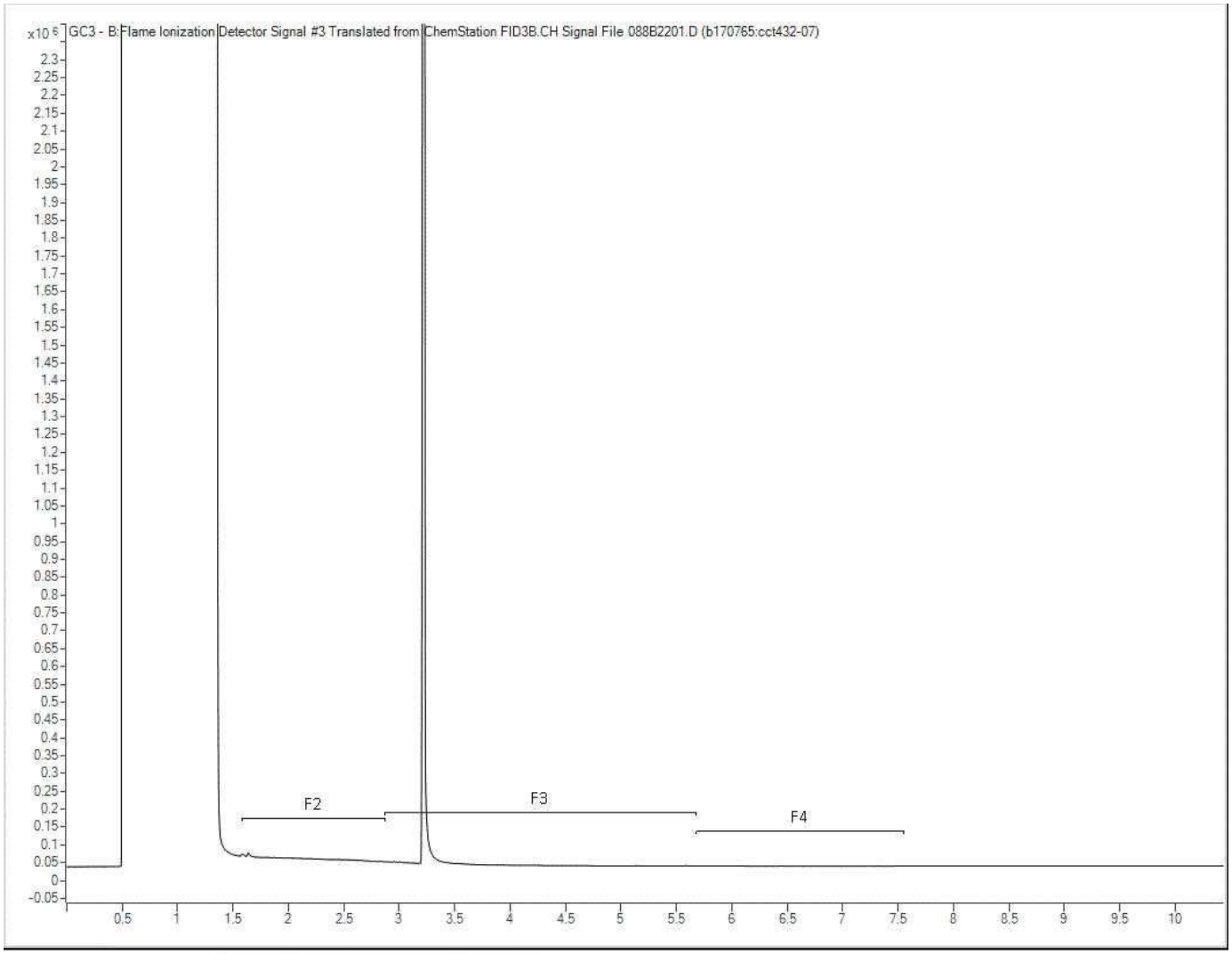


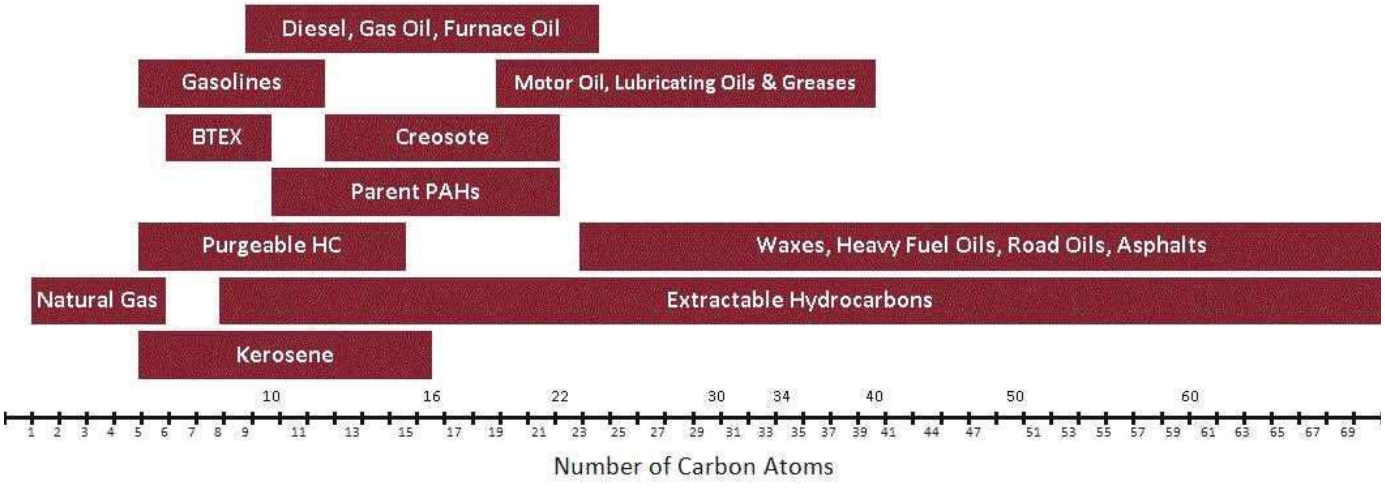
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Bureau Veritas Job #: C386477
Report Date: 2023/11/08
Bureau Veritas Sample: CCT432

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SR1
Client ID: RMW16-15-39

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





hpchem20\HPchem\1\DATA\2023\10\RUN1027

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 110773396
Site Location: SRI
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/05
Report #: R3421723
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C386944
Received: 2023/10/25, 17:59

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	5	N/A	2023/11/03	AB SOP-00005	SM 24 2320 B m
Alkalinity @25C (pp, total), CO3,HCO3,OH	2	N/A	2023/11/04	AB SOP-00005	SM 24 2320 B m
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2023/11/05	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	8	N/A	2023/11/02	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	8	N/A	2023/11/02		Auto Calc
Cadmium - low level CCME - Dissolved	7	N/A	2023/10/28		Auto Calc
Cadmium - low level CCME - Dissolved	1	N/A	2023/10/31		Auto Calc
Chloride/Sulphate by Auto Colourimetry	1	N/A	2023/10/27	AB SOP-00020	SM24-4500-Cl/SO4-E m
Chloride/Sulphate by Auto Colourimetry	7	N/A	2023/10/28	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	8	2023/10/26	2023/10/27	AB SOP-00089	SM 23 9223 A,B m
Total Coliforms and E.Coli	8	2023/10/26	2023/10/27	AB SOP-00089	SM 23 9223 A,B m
Carbon (DOC) -Lab Filtered (1)	7	N/A	2023/10/31	AB SOP-00087	MMCW 119 1996 m
Carbon (DOC) -Lab Filtered (1)	1	N/A	2023/11/01	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	5	N/A	2023/11/03	AB SOP-00005	SM 24 2510 B m
Conductivity @25C	2	N/A	2023/11/04	AB SOP-00005	SM 24 2510 B m
Conductivity @25C	1	N/A	2023/11/05	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	4	2023/10/27	2023/10/28	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	1	2023/10/31	2023/10/31	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	3	2023/10/31	2023/11/01	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	7	N/A	2023/10/30		Auto Calc
Hardness	1	N/A	2023/11/02		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	8	2023/10/31	2023/10/31	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	8	2023/10/26	2023/10/31	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (3)	6	N/A	2023/10/27	AB SOP-00042	EPA 6010d R5 m
Elements by ICP-Dissolved-Lab Filtered (3)	1	N/A	2023/10/30	AB SOP-00042	EPA 6010d R5 m
Elements by ICP-Dissolved-Lab Filtered (3)	1	N/A	2023/11/01	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	7	N/A	2023/10/27	AB SOP-00043	EPA 6020b R2 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	1	N/A	2023/10/30	AB SOP-00043	EPA 6020b R2 m
Ion Balance	7	N/A	2023/11/04		Auto Calc

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Site Location: SRI
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/05
Report #: R3421723
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C386944
Received: 2023/10/25, 17:59

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Ion Balance	1	N/A	2023/11/05		Auto Calc
Sum of cations, anions	7	N/A	2023/10/30		Auto Calc
Sum of cations, anions	1	N/A	2023/11/02		Auto Calc
Ammonia-N (Total)	1	N/A	2023/10/27	AB SOP-00007	SM 24 4500 NH3 A G m
Ammonia-N (Total)	7	N/A	2023/10/28	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	7	N/A	2023/10/27		Auto Calc
Nitrate and Nitrite	1	N/A	2023/10/28		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	8	N/A	2023/10/27	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	8	2023/10/31	2023/10/31		Auto Calc
pH @25°C (5)	5	N/A	2023/11/03	AB SOP-00005	SM 24 4500-H+B m
pH @25°C (5)	2	N/A	2023/11/04	AB SOP-00005	SM 24 4500-H+B m
pH @25°C (5)	1	N/A	2023/11/05	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (6)	7	N/A	2023/10/27	AB SOP-00025	SM 24 4500-P A,F m
Orthophosphate by Automated Analyzer (6)	1	N/A	2023/10/28	AB SOP-00025	SM 24 4500-P A,F m
Heterotrophic Plate Count	8	2023/10/26	2023/10/28	CAL SOP-00012	SM 23 9215 A & B m
Total Dissolved Solids (Calculated)	7	N/A	2023/11/04		Auto Calc
Total Dissolved Solids (Calculated)	1	N/A	2023/11/05		Auto Calc
Total Kjeldahl Nitrogen (Total)	1	N/A	2023/11/01	BBY WI-00033	Auto Calc
Total Kjeldahl Nitrogen (Total)	7	N/A	2023/11/02	BBY WI-00033	Auto Calc
Nitrogen (Total)	8	2023/10/27	2023/10/28	AB SOP-00093	SM 24 4500-N C m
Total Phosphorus-Dissolved-Lab Filtered (7)	1	2023/10/28	2023/10/30	AB SOP-00024	SM 24 4500-P A,B,F m
Total Phosphorus-Dissolved-Lab Filtered (7)	6	2023/10/28	2023/10/31	AB SOP-00024	SM 24 4500-P A,B,F m
Total Phosphorus-Dissolved-Lab Filtered (7)	1	2023/10/31	2023/10/31	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Site Location: SRI
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/05
Report #: R3421723
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C386944
Received: 2023/10/25, 17:59

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(7) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Encryption Key

AUTHORIZED REPORT
RAPPORT AUTORISÉ

Bureau Veritas
05 Nov 2023 15:59:18

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (780)577-7173

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Bureau Veritas Job #: C386944
Report Date: 2023/11/05

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SRI
Sampler Initials: WT

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CCW509		CCW510		CCW511		CCW512			
Sampling Date		2023/10/25 09:52		2023/10/25 10:31		2023/10/25 12:48		2023/10/25 13:12			
COC Number		1/1		1/1		1/1		1/1			
	UNITS	WS81-2	MU	WS81-1	MU	RMW16-23-7	MU	RMW16-23-14	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B172635
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B173433
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B173433
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B173433
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B173433
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B173433
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B170825
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B170825
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B173433
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	104	N/A	105	N/A	106	N/A	105	N/A	N/A	B173433
4-Bromofluorobenzene (sur.)	%	100	N/A	100	N/A	100	N/A	101	N/A	N/A	B173433
D4-1,2-Dichloroethane (sur.)	%	95	N/A	95	N/A	98	N/A	98	N/A	N/A	B173433
O-TERPHENYL (sur.)	%	101	N/A	101	N/A	96	N/A	100	N/A	N/A	B172635

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C386944
Report Date: 2023/11/05

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SRI
Sampler Initials: WT

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CCW513		CCW514		CCW515		CCW516			
Sampling Date		2023/10/25 12:58		2023/10/25 15:35		2023/10/25 16:13		2023/10/25 16:40			
COC Number		1/1		1/1		1/1		1/1			
	UNITS	RMW16-23-32	MU	MW16-22-26	MU	MW16-11-15	MU	23-11	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B172675
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B173433
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B173433
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B173433
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B173433
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B173433
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B170825
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B170825
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B173433
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	106	N/A	106	N/A	106	N/A	104	N/A	N/A	B173433
4-Bromofluorobenzene (sur.)	%	99	N/A	99	N/A	101	N/A	99	N/A	N/A	B173433
D4-1,2-Dichloroethane (sur.)	%	97	N/A	99	N/A	98	N/A	97	N/A	N/A	B173433
O-TERPHENYL (sur.)	%	101	N/A	103	N/A	103	N/A	101	N/A	N/A	B172675

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW509				CCW510			
Sampling Date		2023/10/25 09:52				2023/10/25 10:31			
COC Number		1/1				1/1			
	UNITS	WS81-2	MU	RDL	QC Batch	WS81-1	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	18	N/A	N/A	B170608	14	N/A	N/A	B171038
Cation Sum	meq/L	18	N/A	N/A	B170608	15	N/A	N/A	B171038
Hardness (CaCO3)	mg/L	240	N/A	0.50	B170853	470	N/A	0.50	B170853
Ion Balance (% Difference)	%	0.10	N/A	N/A	B171018	3.9	N/A	N/A	B171018
Nitrate (N)	mg/L	0.027	N/A	0.010	B178436	7.5	N/A	0.10	B178436
Nitrate (NO3)	mg/L	0.12	N/A	0.044	B170966	33	N/A	0.44	B170966
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B170966	<0.033	N/A	0.033	B170966
Calculated Total Dissolved Solids	mg/L	1000	N/A	10	B170612	790	N/A	10	B171037
Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	B170971	<0.020	N/A	0.020	B170971
Misc. Inorganics									
Conductivity	uS/cm	1600	+/- 43	2.0	B179941	1300	+/- 34	2.0	B180011
pH	pH	8.37	+/- 0.0829	N/A	B179942	8.08	+/- 0.0801	N/A	B180015
Anions									
Alkalinity (PP as CaCO3)	mg/L	7.2	+/- <RDL	1.0	B179939	<1.0	N/A	1.0	B179944
Alkalinity (Total as CaCO3)	mg/L	580	+/- 43	1.0	B179939	420	+/- 31	1.0	B179944
Bicarbonate (HCO3)	mg/L	700	+/- 11	1.0	B179939	510	+/- 7.9	1.0	B179944
Carbonate (CO3)	mg/L	8.6	N/A	1.0	B179939	<1.0	N/A	1.0	B179944
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B179939	<1.0	N/A	1.0	B179944
Chloride (Cl)	mg/L	19	+/- 1.9	1.0	B174580	54	+/- 4.3	1.0	B174580
Sulphate (SO4)	mg/L	270	+/- 17	5.0	B174580	170	+/- 11	5.0	B174580
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B174014	<0.010	N/A	0.010	B173625
Nitrate plus Nitrite (N)	mg/L	0.027	+/- 0.012	0.010	B174014	7.5	+/- 0.64	0.10	B173625
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B174038	<0.0030	N/A	0.0030	B174038
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B174038	<0.00060	N/A	0.00060	B174038
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	0.00020	B174038	<0.00020	N/A	0.00020	B174038

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW509				CCW510			
Sampling Date		2023/10/25 09:52				2023/10/25 10:31			
COC Number		1/1				1/1			
	UNITS	WS81-2	MU	RDL	QC Batch	WS81-1	MU	RDL	QC Batch
Dissolved Barium (Ba)	mg/L	0.036 (1)	+/- <RDL	0.010	B174218	0.025 (2)	+/- <RDL	0.010	B174218
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Boron (B)	mg/L	0.18 (3)	+/- <RDL	0.020	B174218	0.13 (4)	+/- <RDL	0.020	B174218
Dissolved Calcium (Ca)	mg/L	51 (5)	+/- 5.2	0.30	B174218	91 (6)	+/- 9.2	0.30	B174218
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	B174038	<0.00030	N/A	0.00030	B174038
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B174038	0.010	+/- 0.0028	0.0010	B174038
Dissolved Iron (Fe)	mg/L	<0.060 (7)	N/A	0.060	B174218	<0.060 (8)	N/A	0.060	B174218
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B174038	0.00050	+/- <RDL	0.00020	B174038
Dissolved Lithium (Li)	mg/L	0.049 (9)	+/- <RDL	0.020	B174218	0.041 (10)	+/- <RDL	0.020	B174218
Dissolved Magnesium (Mg)	mg/L	28 (11)	+/- 1.8	0.20	B174218	59 (12)	+/- 3.8	0.20	B174218
Dissolved Manganese (Mn)	mg/L	0.075 (13)	+/- 0.0053	0.0040	B174218	<0.0040 (14)	N/A	0.0040	B174218
Dissolved Molybdenum (Mo)	mg/L	0.0015	+/- 0.00044	0.00020	B174038	0.0045	+/- 0.0011	0.00020	B174038
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	0.00050	B174038	0.00056	+/- <RDL	0.00050	B174038
Dissolved Phosphorus (P)	mg/L	<0.10 (15)	N/A	0.10	B174218	<0.10 (16)	N/A	0.10	B174218

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 0.03596
(2) 0.02489
(3) 0.17960
(4) 0.12884
(5) 51.1136
(6) 90.7046
(7) 0.0563
(8) 0.0030
(9) 0.04841
(10) 0.04111
(11) 27.92982
(12) 59.30869
(13) 0.07535
(14) 0.00044
(15) -0.00894
(16) -0.00459

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW509				CCW510			
Sampling Date		2023/10/25 09:52				2023/10/25 10:31			
COC Number		1/1				1/1			
	UNITS	WS81-2	MU	RDL	QC Batch	WS81-1	MU	RDL	QC Batch
Dissolved Potassium (K)	mg/L	1.5 (1)	+/- <RDL	0.30	B174218	2.3 (2)	+/- <RDL	0.30	B174218
Dissolved Selenium (Se)	mg/L	0.00059	+/- <RDL	0.00020	B174038	0.0025	+/- 0.00024	0.00020	B174038
Dissolved Silicon (Si)	mg/L	3.2 (3)	+/- 0.60	0.50	B174218	3.4 (4)	+/- 0.65	0.50	B174218
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B174038	<0.00010	N/A	0.00010	B174038
Dissolved Sodium (Na)	mg/L	300 (5)	+/- 29	0.50	B174218	130 (6)	+/- 13	0.50	B174218
Dissolved Strontium (Sr)	mg/L	0.94 (7)	+/- 0.092	0.020	B174218	1.3 (8)	+/- 0.12	0.020	B174218
Dissolved Sulphur (S)	mg/L	95 (9)	+/- 6.3	0.20	B174218	53 (10)	+/- 3.5	0.20	B174218
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B174038	<0.00020	N/A	0.00020	B174038
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Uranium (U)	mg/L	0.0049	+/- 0.00045	0.00010	B174038	0.0036	+/- 0.00034	0.00010	B174038
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B174038	0.0087	+/- <RDL	0.0030	B174038

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 1.51032
(2) 2.36606
(3) 3.16481
(4) 3.38227
(5) 298.5594
(6) 130.0858
(7) 0.93704
(8) 1.23579
(9) 95.04583
(10) 52.85031

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C386944
Report Date: 2023/11/05

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SRI
Sampler Initials: WT

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW511			CCW512		CCW512			
Sampling Date		2023/10/25 12:48			2023/10/25 13:12		2023/10/25 13:12			
COC Number		1/1			1/1		1/1			
	UNITS	RMW16-23-7	MU	QC Batch	RMW16-23-14	MU	RMW16-23-14 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	11	N/A	B171038	12	N/A	N/A	N/A	N/A	B171038
Cation Sum	meq/L	11	N/A	B171038	14	N/A	N/A	N/A	N/A	B171038
Hardness (CaCO3)	mg/L	460	N/A	B170853	320	N/A	N/A	N/A	0.50	B170853
Ion Balance (% Difference)	%	1.0	N/A	B171018	7.0	N/A	N/A	N/A	N/A	B171018
Nitrate (N)	mg/L	<0.010	N/A	B178436	<0.010	N/A	N/A	N/A	0.010	B178436
Nitrate (NO3)	mg/L	<0.044	N/A	B170966	<0.044	N/A	N/A	N/A	0.044	B170966
Nitrite (NO2)	mg/L	<0.033	N/A	B170966	<0.033	N/A	N/A	N/A	0.033	B170966
Calculated Total Dissolved Solids	mg/L	580	N/A	B171037	750	N/A	N/A	N/A	10	B171037
Elements										
Dissolved Cadmium (Cd)	ug/L	0.021	+/- <RDL	B170971	0.020	+/- <RDL	N/A	N/A	0.020	B170971
Misc. Inorganics										
Conductivity	uS/cm	990	+/- 26	B179917	1100	+/- 29	N/A	N/A	2.0	B180021
pH	pH	8.06	+/- 0.0799	B179918	8.03	+/- 0.0796	N/A	N/A	N/A	B180022
Anions										
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	B179916	<1.0	N/A	N/A	N/A	1.0	B180017
Alkalinity (Total as CaCO3)	mg/L	330	+/- 24	B179916	350	+/- 26	N/A	N/A	1.0	B180017
Bicarbonate (HCO3)	mg/L	400	+/- 6.2	B179916	430	+/- 6.7	N/A	N/A	1.0	B180017
Carbonate (CO3)	mg/L	<1.0	N/A	B179916	<1.0	N/A	N/A	N/A	1.0	B180017
Hydroxide (OH)	mg/L	<1.0	N/A	B179916	<1.0	N/A	N/A	N/A	1.0	B180017
Chloride (Cl)	mg/L	49	+/- 3.9	B174580	17	+/- 1.8	N/A	N/A	1.0	B175064
Sulphate (SO4)	mg/L	140	+/- 9.2	B174580	230	+/- 15	N/A	N/A	5.0	B175064
Nutrients										
Nitrite (N)	mg/L	<0.010	N/A	B173929	<0.010	N/A	<0.010	N/A	0.010	B174597
Nitrate plus Nitrite (N)	mg/L	<0.010	N/A	B173929	<0.010	N/A	<0.010	N/A	0.010	B174597
Lab Filtered Elements										
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	B174038	<0.0030	N/A	N/A	N/A	0.0030	B175325
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	B174038	<0.00060	N/A	N/A	N/A	0.00060	B175325
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	B174038	<0.00020	N/A	N/A	N/A	0.00020	B175325

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW511			CCW512		CCW512			
Sampling Date		2023/10/25 12:48			2023/10/25 13:12		2023/10/25 13:12			
COC Number		1/1			1/1		1/1			
	UNITS	RMW16-23-7	MU	QC Batch	RMW16-23-14	MU	RMW16-23-14 Lab-Dup	MU	RDL	QC Batch
Dissolved Barium (Ba)	mg/L	0.063 (1)	+/- <RDL	B174218	0.017	+/- <RDL	N/A	N/A	0.010	B179915
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	B174038	<0.0010	N/A	N/A	N/A	0.0010	B175325
Dissolved Boron (B)	mg/L	0.024 (2)	+/- <RDL	B174218	0.064	+/- <RDL	N/A	N/A	0.020	B179915
Dissolved Calcium (Ca)	mg/L	100 (3)	+/- 10	B174218	82	+/- 8.3	N/A	N/A	0.30	B179915
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	B174038	<0.0010	N/A	N/A	N/A	0.0010	B175325
Dissolved Cobalt (Co)	mg/L	0.00072	+/- <RDL	B174038	<0.00030	N/A	N/A	N/A	0.00030	B175325
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	B174038	<0.0010	N/A	N/A	N/A	0.0010	B175325
Dissolved Iron (Fe)	mg/L	<0.060 (4)	N/A	B174218	<0.060	N/A	N/A	N/A	0.060	B179915
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	B174038	<0.00020	N/A	N/A	N/A	0.00020	B175325
Dissolved Lithium (Li)	mg/L	0.023 (5)	+/- <RDL	B174218	0.041	+/- <RDL	N/A	N/A	0.020	B179915
Dissolved Magnesium (Mg)	mg/L	48 (6)	+/- 3.1	B174218	29	+/- 1.8	N/A	N/A	0.20	B179915
Dissolved Manganese (Mn)	mg/L	0.41 (7)	+/- 0.027	B174218	0.17	+/- 0.011	N/A	N/A	0.0040	B179915
Dissolved Molybdenum (Mo)	mg/L	0.0012	+/- 0.00039	B174038	0.0014	+/- 0.00043	N/A	N/A	0.00020	B175325
Dissolved Nickel (Ni)	mg/L	0.0014	+/- <RDL	B174038	<0.00050	N/A	N/A	N/A	0.00050	B175325
Dissolved Phosphorus (P)	mg/L	<0.10 (8)	N/A	B174218	<0.10	N/A	N/A	N/A	0.10	B179915
Dissolved Potassium (K)	mg/L	4.8 (9)	+/- <RDL	B174218	4.8	+/- <RDL	N/A	N/A	0.30	B179915
Dissolved Selenium (Se)	mg/L	0.00020	+/- <RDL	B174038	<0.00020	N/A	N/A	N/A	0.00020	B175325
Dissolved Silicon (Si)	mg/L	3.8 (10)	+/- 0.73	B174218	4.3	+/- 0.83	N/A	N/A	0.50	B179915
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	B174038	<0.00010	N/A	N/A	N/A	0.00010	B175325
Dissolved Sodium (Na)	mg/L	42 (11)	+/- 4.1	B174218	170	+/- 17	N/A	N/A	0.50	B179915

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 0.06255
(2) 0.02397
(3) 103.6524
(4) -0.0004
(5) 0.02372
(6) 48.06228
(7) 0.40499
(8) -0.00257
(9) 5.11824
(10) 3.78901
(11) 41.7643

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW511			CCW512		CCW512			
Sampling Date		2023/10/25 12:48			2023/10/25 13:12		2023/10/25 13:12			
COC Number		1/1			1/1		1/1			
	UNITS	RMW16-23-7	MU	QC Batch	RMW16-23-14	MU	RMW16-23-14 Lab-Dup	MU	RDL	QC Batch
Dissolved Strontium (Sr)	mg/L	0.70 (1)	+/- 0.068	B174218	1.0	+/- 0.098	N/A	N/A	0.020	B179915
Dissolved Sulphur (S)	mg/L	46 (2)	+/- 3.0	B174218	77	+/- 5.1	N/A	N/A	0.20	B179915
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	B174038	<0.00020	N/A	N/A	N/A	0.00020	B175325
Dissolved Tin (Sn)	mg/L	0.0010	+/- <RDL	B174038	<0.0010	N/A	N/A	N/A	0.0010	B175325
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	B174038	<0.0010	N/A	N/A	N/A	0.0010	B175325
Dissolved Uranium (U)	mg/L	0.0022	+/- 0.00021	B174038	0.00028	+/- <RDL	N/A	N/A	0.00010	B175325
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	B174038	<0.0010	N/A	N/A	N/A	0.0010	B175325
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	B174038	<0.0030	N/A	N/A	N/A	0.0030	B175325

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 0.70402
(2) 45.48459

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW513		CCW513			
Sampling Date		2023/10/25 12:58		2023/10/25 12:58			
COC Number		1/1		1/1			
	UNITS	RMW16-23-32	MU	RMW16-23-32 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	12	N/A	N/A	N/A	N/A	B171038
Cation Sum	meq/L	13	N/A	N/A	N/A	N/A	B171038
Hardness (CaCO3)	mg/L	65	N/A	N/A	N/A	0.50	B170853
Ion Balance (% Difference)	%	1.0	N/A	N/A	N/A	N/A	B171018
Nitrate (N)	mg/L	0.013	N/A	N/A	N/A	0.010	B178436
Nitrate (NO3)	mg/L	0.056	N/A	N/A	N/A	0.044	B170966
Nitrite (NO2)	mg/L	<0.033	N/A	N/A	N/A	0.033	B170966
Calculated Total Dissolved Solids	mg/L	700	N/A	N/A	N/A	10	B171037
Elements							
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	N/A	N/A	0.020	B170971
Misc. Inorganics							
Conductivity	uS/cm	1200	+/- 31	N/A	N/A	2.0	B180011
pH	pH	8.28	+/- 0.0820	N/A	N/A	N/A	B180015
Anions							
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	B179944
Alkalinity (Total as CaCO3)	mg/L	510	+/- 38	N/A	N/A	1.0	B179944
Bicarbonate (HCO3)	mg/L	620	+/- 9.5	N/A	N/A	1.0	B179944
Carbonate (CO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	B179944
Hydroxide (OH)	mg/L	<1.0	N/A	N/A	N/A	1.0	B179944
Chloride (Cl)	mg/L	<1.0	N/A	<1.0	N/A	1.0	B174580
Sulphate (SO4)	mg/L	110	+/- 7.2	120	+/- 7.6	1.0	B174580
Nutrients							
Nitrite (N)	mg/L	<0.010	N/A	N/A	N/A	0.010	B174014
Nitrate plus Nitrite (N)	mg/L	0.013	+/- 0.012	N/A	N/A	0.010	B174014
Lab Filtered Elements							
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B174038
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	N/A	N/A	0.00060	B174038
Dissolved Arsenic (As)	mg/L	0.00052	+/- <RDL	N/A	N/A	0.00020	B174038

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW513		CCW513			
Sampling Date		2023/10/25 12:58		2023/10/25 12:58			
COC Number		1/1		1/1			
	UNITS	RMW16-23-32	MU	RMW16-23-32 Lab-Dup	MU	RDL	QC Batch
Dissolved Barium (Ba)	mg/L	0.017 (1)	+/- <RDL	N/A	N/A	0.010	B174218
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B174038
Dissolved Boron (B)	mg/L	0.074 (2)	+/- <RDL	N/A	N/A	0.020	B174218
Dissolved Calcium (Ca)	mg/L	16 (3)	+/- 1.7	N/A	N/A	0.30	B174218
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B174038
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	N/A	N/A	0.00030	B174038
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B174038
Dissolved Iron (Fe)	mg/L	<0.060 (4)	N/A	N/A	N/A	0.060	B174218
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B174038
Dissolved Lithium (Li)	mg/L	0.055 (5)	+/- <RDL	N/A	N/A	0.020	B174218
Dissolved Magnesium (Mg)	mg/L	5.9 (6)	+/- 0.39	N/A	N/A	0.20	B174218
Dissolved Manganese (Mn)	mg/L	0.022 (7)	+/- <RDL	N/A	N/A	0.0040	B174218
Dissolved Molybdenum (Mo)	mg/L	0.0022	+/- 0.00059	N/A	N/A	0.00020	B174038
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	N/A	N/A	0.00050	B174038
Dissolved Phosphorus (P)	mg/L	<0.10 (8)	N/A	N/A	N/A	0.10	B174218
Dissolved Potassium (K)	mg/L	2.3 (9)	+/- <RDL	N/A	N/A	0.30	B174218
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B174038
Dissolved Silicon (Si)	mg/L	3.4 (10)	+/- 0.66	N/A	N/A	0.50	B174218
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	N/A	N/A	0.00010	B174038
Dissolved Sodium (Na)	mg/L	260 (11)	+/- 26	N/A	N/A	0.50	B174218

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 0.01706
(2) 0.07544
(3) 16.5294
(4) 0.0243
(5) 0.05440
(6) 5.97781
(7) 0.02252
(8) -0.00161
(9) 2.69175
(10) 3.46131
(11) 261.9384

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW513		CCW513			
Sampling Date		2023/10/25 12:58		2023/10/25 12:58			
COC Number		1/1		1/1			
	UNITS	RMW16-23-32	MU	RMW16-23-32 Lab-Dup	MU	RDL	QC Batch
Dissolved Strontium (Sr)	mg/L	0.32 (1)	+/- 0.031	N/A	N/A	0.020	B174218
Dissolved Sulphur (S)	mg/L	38 (2)	+/- 2.5	N/A	N/A	0.20	B174218
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B174038
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B174038
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B174038
Dissolved Uranium (U)	mg/L	0.00017	+/- <RDL	N/A	N/A	0.00010	B174038
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B174038
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B174038

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 0.32053
(2) 38.13288

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW514				CCW515			
Sampling Date		2023/10/25 15:35				2023/10/25 16:13			
COC Number		1/1				1/1			
	UNITS	MW16-22-26	MU	RDL	QC Batch	MW16-11-15	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	24	N/A	N/A	B171038	40	N/A	N/A	B171038
Cation Sum	meq/L	23	N/A	N/A	B171038	40	N/A	N/A	B171038
Hardness (CaCO3)	mg/L	670	N/A	0.50	B170853	1300	N/A	0.50	B170853
Ion Balance (% Difference)	%	2.2	N/A	N/A	B171018	0.31	N/A	N/A	B171018
Nitrate (N)	mg/L	0.020	N/A	0.010	B178436	<0.050	N/A	0.050	B178436
Nitrate (NO3)	mg/L	0.089	N/A	0.044	B170966	<0.22	N/A	0.22	B170966
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B170966	<0.033	N/A	0.033	B170966
Calculated Total Dissolved Solids	mg/L	1500	N/A	25	B171037	2500	N/A	25	B171037
Elements									
Dissolved Cadmium (Cd)	ug/L	0.081	+/- 0.036	0.020	B170971	0.088	+/- 0.039	0.020	B170971
Misc. Inorganics									
Conductivity	uS/cm	1900	+/- 51	2.0	B180011	3000	+/- 77	2.0	B180011
pH	pH	8.04	+/- 0.0797	N/A	B180015	8.02	+/- 0.0795	N/A	B180015
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B179944	<1.0	N/A	1.0	B179944
Alkalinity (Total as CaCO3)	mg/L	170	+/- 12	1.0	B179944	360	+/- 26	1.0	B179944
Bicarbonate (HCO3)	mg/L	210	+/- 3.4	1.0	B179944	430	+/- 6.7	1.0	B179944
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B179944	<1.0	N/A	1.0	B179944
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B179944	<1.0	N/A	1.0	B179944
Chloride (Cl)	mg/L	1.9	+/- 1.2	1.0	B174580	1.3	+/- 1.2	1.0	B174202
Sulphate (SO4)	mg/L	970	+/- 62	25	B174580	1600	+/- 100	25	B174202
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B174014	<0.010	N/A	0.010	B174014
Nitrate plus Nitrite (N)	mg/L	0.020	+/- 0.012	0.010	B174014	<0.050 (1)	N/A	0.050	B174014
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B174038	<0.0030	N/A	0.0030	B174038
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B174038	<0.00060	N/A	0.00060	B174038
Dissolved Arsenic (As)	mg/L	0.00055	+/- <RDL	0.00020	B174038	0.00025	+/- <RDL	0.00020	B174038

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW514				CCW515			
Sampling Date		2023/10/25 15:35				2023/10/25 16:13			
COC Number		1/1				1/1			
	UNITS	MW16-22-26	MU	RDL	QC Batch	MW16-11-15	MU	RDL	QC Batch
Dissolved Barium (Ba)	mg/L	0.015 (1)	+/- <RDL	0.010	B174218	0.011 (2)	+/- <RDL	0.010	B174218
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Boron (B)	mg/L	0.13 (3)	+/- <RDL	0.020	B174218	0.10 (4)	+/- <RDL	0.020	B174218
Dissolved Calcium (Ca)	mg/L	160 (5)	+/- 16	0.30	B174218	290 (6)	+/- 30	0.30	B174218
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Cobalt (Co)	mg/L	0.00044	+/- <RDL	0.00030	B174038	0.0014	+/- <RDL	0.00030	B174038
Dissolved Copper (Cu)	mg/L	0.0011	+/- <RDL	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Iron (Fe)	mg/L	<0.060 (7)	N/A	0.060	B174218	<0.060 (8)	N/A	0.060	B174218
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B174038	<0.00020	N/A	0.00020	B174038
Dissolved Lithium (Li)	mg/L	0.061 (9)	+/- <RDL	0.020	B174218	0.057 (10)	+/- <RDL	0.020	B174218
Dissolved Magnesium (Mg)	mg/L	66 (11)	+/- 4.2	0.20	B174218	140 (12)	+/- 9.1	0.20	B174218
Dissolved Manganese (Mn)	mg/L	0.46 (13)	+/- 0.031	0.0040	B174218	1.2 (14)	+/- 0.079	0.0040	B174218
Dissolved Molybdenum (Mo)	mg/L	0.0027	+/- 0.00072	0.00020	B174038	0.00050	+/- 0.00026	0.00020	B174038
Dissolved Nickel (Ni)	mg/L	0.0012	+/- <RDL	0.00050	B174038	0.0024	+/- <RDL	0.00050	B174038
Dissolved Phosphorus (P)	mg/L	<0.10 (15)	N/A	0.10	B174218	<0.10 (16)	N/A	0.10	B174218

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 0.01542
(2) 0.01058
(3) 0.12566
(4) 0.10487
(5) 158.5130
(6) 293.1120
(7) 0.0048
(8) 0.0027
(9) 0.06280
(10) 0.05809
(11) 65.79032
(12) 143.32263
(13) 0.45730
(14) 1.17184
(15) 0.01286
(16) 0.00265

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW514				CCW515			
Sampling Date		2023/10/25 15:35				2023/10/25 16:13			
COC Number		1/1				1/1			
	UNITS	MW16-22-26	MU	RDL	QC Batch	MW16-11-15	MU	RDL	QC Batch
Dissolved Potassium (K)	mg/L	6.7 (1)	+/- 0.35	0.30	B174218	5.9 (2)	+/- 0.31	0.30	B174218
Dissolved Selenium (Se)	mg/L	0.00035	+/- <RDL	0.00020	B174038	<0.00020	N/A	0.00020	B174038
Dissolved Silicon (Si)	mg/L	3.9 (3)	+/- 0.75	0.50	B174218	4.8 (4)	+/- 0.92	0.50	B174218
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B174038	<0.00010	N/A	0.00010	B174038
Dissolved Sodium (Na)	mg/L	210 (5)	+/- 21	0.50	B174218	310 (6)	+/- 31	0.50	B174218
Dissolved Strontium (Sr)	mg/L	3.0 (7)	+/- 0.29	0.020	B174218	3.0 (8)	+/- 0.30	0.020	B174218
Dissolved Sulphur (S)	mg/L	320 (9)	+/- 21	0.20	B174218	580	+/- 39	1.0	B174218
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B174038	<0.00020	N/A	0.00020	B174038
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Uranium (U)	mg/L	0.0022	+/- 0.00021	0.00010	B174038	0.0060	+/- 0.00055	0.00010	B174038
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B174038	<0.0030	N/A	0.0030	B174038

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 7.08629
(2) 5.96728
(3) 3.92987
(4) 4.85515
(5) 210.2084
(6) 311.8994
(7) 2.97784
(8) 3.04869
(9) 321.80886

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW515				CCW516			
Sampling Date		2023/10/25 16:13				2023/10/25 16:40			
COC Number		1/1				1/1			
	UNITS	MW16-11-15 Lab-Dup	MU	RDL	QC Batch	23-11	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	N/A	N/A	N/A	B171038	13	N/A	N/A	B171038
Cation Sum	meq/L	N/A	N/A	N/A	B171038	12	N/A	N/A	B171038
Hardness (CaCO3)	mg/L	N/A	N/A	0.50	B170853	64	N/A	0.50	B170853
Ion Balance (% Difference)	%	N/A	N/A	N/A	B171018	0.93	N/A	N/A	B171018
Nitrate (N)	mg/L	N/A	N/A	0.050	B178436	0.019	N/A	0.010	B178439
Nitrate (NO3)	mg/L	N/A	N/A	0.22	B170966	0.082	N/A	0.044	B170966
Nitrite (NO2)	mg/L	N/A	N/A	0.033	B170966	<0.033	N/A	0.033	B170966
Calculated Total Dissolved Solids	mg/L	N/A	N/A	25	B171037	710	N/A	10	B171037
Elements									
Dissolved Cadmium (Cd)	ug/L	N/A	N/A	0.020	B170971	<0.020	N/A	0.020	B170971
Misc. Inorganics									
Conductivity	uS/cm	N/A	N/A	2.0	B180011	1200	+/- 31	2.0	B180011
pH	pH	N/A	N/A	N/A	B180015	8.44	+/- 0.0836	N/A	B180015
Anions									
Alkalinity (PP as CaCO3)	mg/L	N/A	N/A	1.0	B179944	6.8	+/- <RDL	1.0	B179944
Alkalinity (Total as CaCO3)	mg/L	N/A	N/A	1.0	B179944	510	+/- 38	1.0	B179944
Bicarbonate (HCO3)	mg/L	N/A	N/A	1.0	B179944	610	+/- 9.3	1.0	B179944
Carbonate (CO3)	mg/L	N/A	N/A	1.0	B179944	8.2	N/A	1.0	B179944
Hydroxide (OH)	mg/L	N/A	N/A	1.0	B179944	<1.0	N/A	1.0	B179944
Chloride (Cl)	mg/L	1.2	+/- 1.2	1.0	B174202	<1.0	N/A	1.0	B174580
Sulphate (SO4)	mg/L	1600	+/- 100	25	B174202	120	+/- 7.8	1.0	B174580
Nutrients									
Nitrite (N)	mg/L	N/A	N/A	0.010	B174014	<0.010	N/A	0.010	B174014
Nitrate plus Nitrite (N)	mg/L	N/A	N/A	0.050	B174014	0.019	+/- 0.012	0.010	B174014
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	N/A	N/A	0.0030	B174038	<0.0030	N/A	0.0030	B174038
Dissolved Antimony (Sb)	mg/L	N/A	N/A	0.00060	B174038	<0.00060	N/A	0.00060	B174038
Dissolved Arsenic (As)	mg/L	N/A	N/A	0.00020	B174038	0.00049	+/- <RDL	0.00020	B174038

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW515				CCW516			
Sampling Date		2023/10/25 16:13				2023/10/25 16:40			
COC Number		1/1				1/1			
	UNITS	MW16-11-15 Lab-Dup	MU	RDL	QC Batch	23-11	MU	RDL	QC Batch
Dissolved Barium (Ba)	mg/L	N/A	N/A	0.010	B174218	0.017 (1)	+/- <RDL	0.010	B174218
Dissolved Beryllium (Be)	mg/L	N/A	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Boron (B)	mg/L	N/A	N/A	0.020	B174218	0.076 (2)	+/- <RDL	0.020	B174218
Dissolved Calcium (Ca)	mg/L	N/A	N/A	0.30	B174218	16 (3)	+/- 1.6	0.30	B174218
Dissolved Chromium (Cr)	mg/L	N/A	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Cobalt (Co)	mg/L	N/A	N/A	0.00030	B174038	<0.00030	N/A	0.00030	B174038
Dissolved Copper (Cu)	mg/L	N/A	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Iron (Fe)	mg/L	N/A	N/A	0.060	B174218	<0.060 (4)	N/A	0.060	B174218
Dissolved Lead (Pb)	mg/L	N/A	N/A	0.00020	B174038	<0.00020	N/A	0.00020	B174038
Dissolved Lithium (Li)	mg/L	N/A	N/A	0.020	B174218	0.054 (5)	+/- <RDL	0.020	B174218
Dissolved Magnesium (Mg)	mg/L	N/A	N/A	0.20	B174218	5.9 (6)	+/- 0.38	0.20	B174218
Dissolved Manganese (Mn)	mg/L	N/A	N/A	0.0040	B174218	0.022 (7)	+/- <RDL	0.0040	B174218
Dissolved Molybdenum (Mo)	mg/L	N/A	N/A	0.00020	B174038	0.0022	+/- 0.00060	0.00020	B174038
Dissolved Nickel (Ni)	mg/L	N/A	N/A	0.00050	B174038	<0.00050	N/A	0.00050	B174038
Dissolved Phosphorus (P)	mg/L	N/A	N/A	0.10	B174218	<0.10 (8)	N/A	0.10	B174218
Dissolved Potassium (K)	mg/L	N/A	N/A	0.30	B174218	2.3 (9)	+/- <RDL	0.30	B174218
Dissolved Selenium (Se)	mg/L	N/A	N/A	0.00020	B174038	<0.00020	N/A	0.00020	B174038
Dissolved Silicon (Si)	mg/L	N/A	N/A	0.50	B174218	3.5 (10)	+/- 0.66	0.50	B174218
Dissolved Silver (Ag)	mg/L	N/A	N/A	0.00010	B174038	<0.00010	N/A	0.00010	B174038
Dissolved Sodium (Na)	mg/L	N/A	N/A	0.50	B174218	250 (11)	+/- 25	0.50	B174218

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 0.01671
(2) 0.07507
(3) 15.8682
(4) 0.0231
(5) 0.05396
(6) 5.98154
(7) 0.02204
(8) -0.00601
(9) 2.66980
(10) 3.47589
(11) 252.9645

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCW515				CCW516			
Sampling Date		2023/10/25 16:13				2023/10/25 16:40			
COC Number		1/1				1/1			
	UNITS	MW16-11-15 Lab-Dup	MU	RDL	QC Batch	23-11	MU	RDL	QC Batch
Dissolved Strontium (Sr)	mg/L	N/A	N/A	0.020	B174218	0.31 (1)	+/- 0.031	0.020	B174218
Dissolved Sulphur (S)	mg/L	N/A	N/A	1.0	B174218	39 (2)	+/- 2.6	0.20	B174218
Dissolved Thallium (Tl)	mg/L	N/A	N/A	0.00020	B174038	<0.00020	N/A	0.00020	B174038
Dissolved Tin (Sn)	mg/L	N/A	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Titanium (Ti)	mg/L	N/A	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Uranium (U)	mg/L	N/A	N/A	0.00010	B174038	0.00016	+/- <RDL	0.00010	B174038
Dissolved Vanadium (V)	mg/L	N/A	N/A	0.0010	B174038	<0.0010	N/A	0.0010	B174038
Dissolved Zinc (Zn)	mg/L	N/A	N/A	0.0030	B174038	<0.0030	N/A	0.0030	B174038

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) 0.30512
(2) 38.76606

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TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CCW509			CCW510			CCW511			
Sampling Date		2023/10/25 09:52			2023/10/25 10:31			2023/10/25 12:48			
COC Number		1/1			1/1			1/1			
	UNITS	WS81-2	MU	RDL	WS81-1	MU	RDL	RMW16-23-7	MU	RDL	QC Batch
Calculated Parameters											
Total Kjeldahl Nitrogen (Calc)	mg/L	0.254	N/A	0.020	<0.20	N/A	0.20	0.117	N/A	0.020	B180612
Nutrients											
Total Nitrogen (N)	mg/L	0.28	+/- 0.056	0.020	6.7 (1)	+/- 0.97	0.20	0.12	+/- 0.039	0.020	B173713

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Nitrogen < Nitrate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Bureau Veritas ID		CCW512		CCW513		CCW513			
Sampling Date		2023/10/25 13:12		2023/10/25 12:58		2023/10/25 12:58			
COC Number		1/1		1/1		1/1			
	UNITS	RMW16-23-14	MU	RMW16-23-32	MU	RMW16-23-32 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters									
Total Kjeldahl Nitrogen (Calc)	mg/L	0.611	N/A	0.809	N/A	N/A	N/A	0.020	B180612
Nutrients									
Total Nitrogen (N)	mg/L	0.61 (1)	+/- 0.099	0.82	+/- 0.13	0.82	+/- 0.13	0.020	B173713

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Nitrogen < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Bureau Veritas ID		CCW514			CCW515			CCW516			
Sampling Date		2023/10/25 15:35			2023/10/25 16:13			2023/10/25 16:40			
COC Number		1/1			1/1			1/1			
	UNITS	MW16-22-26	MU	RDL	MW16-11-15	MU	RDL	23-11	MU	RDL	QC Batch
Calculated Parameters											
Total Kjeldahl Nitrogen (Calc)	mg/L	0.86	N/A	0.20	0.51	N/A	0.40	0.866	N/A	0.020	B180612
Nutrients											
Total Nitrogen (N)	mg/L	0.88 (1)	+/- <RDL	0.20	0.51 (1)	+/- <RDL	0.40	0.88	+/- 0.14	0.020	B173713

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

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Bureau Veritas Job #: C386944
Report Date: 2023/11/05

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SRI
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCW509		CCW509			CCW510			
Sampling Date		2023/10/25 09:52		2023/10/25 09:52			2023/10/25 10:31			
COC Number		1/1		1/1			1/1			
	UNITS	WS81-2	MU	WS81-2 Lab-Dup	MU	QC Batch	WS81-1	MU	RDL	QC Batch
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	3.0	+/- 0.52	N/A	N/A	B178342	2.2	+/- <RDL	0.50	B178342
Microbiological Param.										
E.Coli DST	MPN/100mL	<1.0	N/A	N/A	N/A	B172485	<1.0	N/A	1.0	B172485
Fecal Coliforms	MPN/100mL	<1.0	N/A	N/A	N/A	B172486	<1.0	N/A	1.0	B172486
Heterotrophic Plate Count	CFU/mL	1.0	N/A	N/A	N/A	B172495	2.0	N/A	1.0	B172495
Total Coliforms DST	MPN/100mL	<1.0	N/A	N/A	N/A	B172485	26	N/A	1.0	B172485
Nutrients										
Total Ammonia (N)	mg/L	0.075	+/- <RDL	N/A	N/A	B175088	<0.015	N/A	0.015	B175088
Orthophosphate (P)	mg/L	<0.0030	N/A	N/A	N/A	B174537	<0.0030	N/A	0.0030	B174537
Lab Filtered Nutrients										
Dissolved Phosphorus (P)	mg/L	<0.0030	N/A	<0.0030	N/A	B175212	<0.0030	N/A	0.0030	B175209

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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Bureau Veritas Job #: C386944
Report Date: 2023/11/05

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Site Location: SRI
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCW511				CCW512			
Sampling Date		2023/10/25 12:48				2023/10/25 13:12			
COC Number		1/1				1/1			
	UNITS	RMW16-23-7	MU	RDL	QC Batch	RMW16-23-14	MU	RDL	QC Batch
Lab Filtered Inorganics									
Dissolved Organic Carbon (C)	mg/L	0.97	+/- <RDL	0.50	B178342	1.4	+/- <RDL	0.50	B179365
Microbiological Param.									
E.Coli DST	MPN/100mL	<2.0 (1)	N/A	2.0	B172485	<1.0	N/A	1.0	B172485
Fecal Coliforms	MPN/100mL	<2.0 (1)	N/A	2.0	B172486	<1.0	N/A	1.0	B172486
Heterotrophic Plate Count	CFU/mL	790	N/A	1.0	B172495	110	N/A	1.0	B172495
Total Coliforms DST	MPN/100mL	4.0 (1)	N/A	2.0	B172485	<1.0	N/A	1.0	B172485
Nutrients									
Total Ammonia (N)	mg/L	0.046	+/- <RDL	0.015	B173857	0.66	+/- 0.072	0.015	B173857
Orthophosphate (P)	mg/L	<0.0030	N/A	0.0030	B174537	<0.0030	N/A	0.0030	B175196
Lab Filtered Nutrients									
Dissolved Phosphorus (P)	mg/L	<0.0030	N/A	0.0030	B175209	<0.0030	N/A	0.0030	B178087

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.

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STANTEC CONSULTING LTD
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Site Location: SRI
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCW512			CCW513		CCW513			
Sampling Date		2023/10/25 13:12			2023/10/25 12:58		2023/10/25 12:58			
COC Number		1/1			1/1		1/1			
	UNITS	RMW16-23-14 Lab-Dup	MU	QC Batch	RMW16-23-32	MU	RMW16-23-32 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	N/A	N/A	B179365	1.1	+/- <RDL	N/A	N/A	0.50	B178342
Microbiological Param.										
E.Coli DST	MPN/100mL	<1.0	N/A	B172485	<1.0	N/A	N/A	N/A	1.0	B172485
Fecal Coliforms	MPN/100mL	<1.0	N/A	B172486	<1.0	N/A	N/A	N/A	1.0	B172486
Heterotrophic Plate Count	CFU/mL	140	N/A	B172495	2.0	N/A	N/A	N/A	1.0	B172495
Total Coliforms DST	MPN/100mL	<1.0	N/A	B172485	<1.0	N/A	N/A	N/A	1.0	B172485
Nutrients										
Total Ammonia (N)	mg/L	N/A	N/A	B173857	0.76	+/- 0.083	0.77	+/- 0.084	0.015	B173839
Orthophosphate (P)	mg/L	N/A	N/A	B175196	0.0074	+/- 0.0036	N/A	N/A	0.0030	B174537
Lab Filtered Nutrients										
Dissolved Phosphorus (P)	mg/L	N/A	N/A	B178087	0.0033 (1)	+/- 0.0048	N/A	N/A	0.0030	B175209

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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Site Location: SRI
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCW514			CCW515			
Sampling Date		2023/10/25 15:35			2023/10/25 16:13			
COC Number		1/1			1/1			
	UNITS	MW16-22-26	MU	QC Batch	MW16-11-15	MU	RDL	QC Batch
Lab Filtered Inorganics								
Dissolved Organic Carbon (C)	mg/L	1.4	+/- <RDL	B178342	2.8	+/- 0.51	0.50	B178342
Microbiological Param.								
E.Coli DST	MPN/100mL	<5.0 (1)	N/A	B172485	<5.0 (1)	N/A	5.0	B172485
Fecal Coliforms	MPN/100mL	<5.0 (1)	N/A	B172486	<5.0 (1)	N/A	5.0	B172486
Heterotrophic Plate Count	CFU/mL	1000	N/A	B172495	3900	N/A	1.0	B172495
Total Coliforms DST	MPN/100mL	10 (1)	N/A	B172485	<5.0 (1)	N/A	5.0	B172485
Nutrients								
Total Ammonia (N)	mg/L	0.58	+/- 0.063	B173852	0.39	+/- 0.044	0.015	B175088
Orthophosphate (P)	mg/L	0.0073	+/- 0.0036	B174537	<0.0030	N/A	0.0030	B174537
Lab Filtered Nutrients								
Dissolved Phosphorus (P)	mg/L	0.0051 (2)	+/- 0.0048	B175209	<0.0030	N/A	0.0030	B175209

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.
(2) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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Bureau Veritas Job #: C386944
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STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SRI
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCW516		CCW516			
Sampling Date		2023/10/25 16:40		2023/10/25 16:40			
COC Number		1/1		1/1			
	UNITS	23-11	MU	23-11 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Inorganics							
Dissolved Organic Carbon (C)	mg/L	1.1	+/- <RDL	N/A	N/A	0.50	B178342
Microbiological Param.							
E.Coli DST	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B172485
Fecal Coliforms	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B172486
Heterotrophic Plate Count	CFU/mL	1.0	N/A	N/A	N/A	1.0	B172495
Total Coliforms DST	MPN/100mL	1.0	N/A	N/A	N/A	1.0	B172485
Nutrients							
Total Ammonia (N)	mg/L	0.83	+/- 0.091	0.82	+/- 0.090	0.015	B175088
Orthophosphate (P)	mg/L	0.0073	+/- 0.0036	N/A	N/A	0.0030	B174537
Lab Filtered Nutrients							
Dissolved Phosphorus (P)	mg/L	0.0050 (1)	+/- 0.0048	N/A	N/A	0.0030	B175209

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID		CCW509		CCW510		CCW511		CCW512			
Sampling Date		2023/10/25 09:52		2023/10/25 10:31		2023/10/25 12:48		2023/10/25 13:12			
COC Number		1/1		1/1		1/1		1/1			
	UNITS	WS81-2	MU	WS81-1	MU	RMW16-23-7	MU	RMW16-23-14	MU	RDL	QC Batch
Elements											
Total Mercury (Hg)	ug/L	0.0020	+/- <RDL	<0.0019	N/A	0.0022	+/- <RDL	<0.0019	N/A	0.0019	B178032
Lab Filtered Elements											
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0032	+/- 1.17	<0.0019	N/A	<0.0019	N/A	0.0019	B177507

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CCW513		CCW513			CCW514			
Sampling Date		2023/10/25 12:58		2023/10/25 12:58			2023/10/25 15:35			
COC Number		1/1		1/1			1/1			
	UNITS	RMW16-23-32	MU	RMW16-23-32 Lab-Dup	MU	RDL	MW16-22-26	MU	RDL	QC Batch
Elements										
Total Mercury (Hg)	ug/L	0.0023	+/- <RDL	<0.0019	N/A	0.0019	0.037	+/- <RDL	0.019	B178032
Lab Filtered Elements										
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	N/A	N/A	0.0019	0.0028	+/- 1.17	0.0019	B177507

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CCW515		CCW516			
Sampling Date		2023/10/25 16:13		2023/10/25 16:40			
COC Number		1/1		1/1			
	UNITS	MW16-11-15	MU	23-11	MU	RDL	QC Batch
Elements							
Total Mercury (Hg)	ug/L	<0.0019	N/A	<0.0019	N/A	0.0019	B178036
Lab Filtered Elements							
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0022	+/- 1.17	0.0019	B177507

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	-4.3°C
Package 2	-3.0°C

MERCURY BY COLD VAPOR (WATER) Comments

Sample CCW514 [MW16-22-26] Mercury (Total) by CV: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B172485	SOG	Method Blank	E.Coli DST	2023/10/27	<1.0		mpn/100mL	
			Total Coliforms DST	2023/10/27	<1.0		mpn/100mL	
B172485	SOG	RPD [CCW512-02]	E.Coli DST	2023/10/27	NC		%	N/A
			Total Coliforms DST	2023/10/27	NC		%	N/A
B172486	SOG	Method Blank	Fecal Coliforms	2023/10/27	<1.0		MPN/100mL	
B172486	SOG	RPD [CCW512-02]	Fecal Coliforms	2023/10/27	NC		%	N/A
B172495	SOG	Method Blank	Heterotrophic Plate Count	2023/10/28	<1.0		CFU/mL	
B172495	SOG	RPD [CCW512-02]	Heterotrophic Plate Count	2023/10/28	25		%	N/A
B172635	RRA	Spiked Blank	O-TERPHENYL (sur.)	2023/10/31		104	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2023/10/31		100	%	60 - 140
B172635	RRA	Method Blank	O-TERPHENYL (sur.)	2023/10/31		105	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2023/10/31	<0.10		mg/L	
B172675	VP4	Spiked Blank	O-TERPHENYL (sur.)	2023/10/27		98	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2023/10/27		92	%	60 - 140
B172675	VP4	Method Blank	O-TERPHENYL (sur.)	2023/10/27		99	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2023/10/27	<0.10		mg/L	
B173433	WPK	Matrix Spike	1,4-Difluorobenzene (sur.)	2023/11/02		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/11/02		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/11/02		98	%	50 - 140
			Benzene	2023/11/02		91	%	50 - 140
			Toluene	2023/11/02		92	%	50 - 140
			Ethylbenzene	2023/11/02		94	%	50 - 140
			m & p-Xylene	2023/11/02		90	%	50 - 140
			o-Xylene	2023/11/02		91	%	50 - 140
			F1 (C6-C10)	2023/11/02		83	%	60 - 140
B173433	WPK	Spiked Blank	1,4-Difluorobenzene (sur.)	2023/11/02		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/11/02		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/11/02		96	%	50 - 140
			Benzene	2023/11/02		91	%	60 - 130
			Toluene	2023/11/02		94	%	60 - 130
			Ethylbenzene	2023/11/02		96	%	60 - 130
			m & p-Xylene	2023/11/02		91	%	60 - 130
			o-Xylene	2023/11/02		92	%	60 - 130
			F1 (C6-C10)	2023/11/02		103	%	60 - 140
B173433	WPK	Method Blank	1,4-Difluorobenzene (sur.)	2023/11/02		107	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/11/02		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/11/02		98	%	50 - 140
			Benzene	2023/11/02	<0.00040		mg/L	
			Toluene	2023/11/02	<0.00040		mg/L	
			Ethylbenzene	2023/11/02	<0.00040		mg/L	
			m & p-Xylene	2023/11/02	<0.00080		mg/L	
			o-Xylene	2023/11/02	<0.00040		mg/L	
			F1 (C6-C10)	2023/11/02	<0.10		mg/L	
B173433	WPK	RPD	Benzene	2023/11/02	NC		%	30
			Toluene	2023/11/02	NC		%	30
			Ethylbenzene	2023/11/02	NC		%	30
			m & p-Xylene	2023/11/02	NC		%	30
			o-Xylene	2023/11/02	NC		%	30
			F1 (C6-C10)	2023/11/02	NC		%	30
B173625	MB5	Matrix Spike	Nitrite (N)	2023/10/27		98	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/27		101	%	80 - 120
B173625	MB5	Spiked Blank	Nitrite (N)	2023/10/27		102	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/27		104	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B173625	MB5	Method Blank	Nitrite (N)	2023/10/27	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2023/10/27	<0.010		mg/L	
B173625	MB5	RPD	Nitrite (N)	2023/10/27	NC		%	20
			Nitrate plus Nitrite (N)	2023/10/27	NC		%	20
B173713	CTU	Matrix Spike [CCW516-03]	Total Nitrogen (N)	2023/10/28		89	%	80 - 120
B173713	CTU	QC Standard	Total Nitrogen (N)	2023/10/28		101	%	80 - 120
B173713	CTU	Spiked Blank	Total Nitrogen (N)	2023/10/28		96	%	80 - 120
B173713	CTU	Method Blank	Total Nitrogen (N)	2023/10/28	<0.020		mg/L	
B173713	CTU	RPD [CCW513-03]	Total Nitrogen (N)	2023/10/28	0.073		%	20
B173839	SKM	Matrix Spike [CCW513-05]	Total Ammonia (N)	2023/10/27		96	%	80 - 120
B173839	SKM	Spiked Blank	Total Ammonia (N)	2023/10/27		101	%	80 - 120
B173839	SKM	Method Blank	Total Ammonia (N)	2023/10/27	<0.015		mg/L	
B173839	SKM	RPD [CCW513-05]	Total Ammonia (N)	2023/10/27	1.9		%	20
B173852	ISW	Matrix Spike	Total Ammonia (N)	2023/10/28		84	%	80 - 120
B173852	ISW	Spiked Blank	Total Ammonia (N)	2023/10/28		102	%	80 - 120
B173852	ISW	Method Blank	Total Ammonia (N)	2023/10/28	<0.015		mg/L	
B173852	ISW	RPD	Total Ammonia (N)	2023/10/28	3.7		%	20
B173857	ISW	Matrix Spike	Total Ammonia (N)	2023/10/28		89	%	80 - 120
B173857	ISW	Spiked Blank	Total Ammonia (N)	2023/10/28		101	%	80 - 120
B173857	ISW	Method Blank	Total Ammonia (N)	2023/10/28	<0.015		mg/L	
B173857	ISW	RPD	Total Ammonia (N)	2023/10/28	0.45		%	20
B173929	MB5	Matrix Spike	Nitrite (N)	2023/10/27		98	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/27		87	%	80 - 120
B173929	MB5	Spiked Blank	Nitrite (N)	2023/10/27		103	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/27		102	%	80 - 120
B173929	MB5	Method Blank	Nitrite (N)	2023/10/27	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2023/10/27	<0.010		mg/L	
B173929	MB5	RPD	Nitrite (N)	2023/10/27	0.45		%	20
			Nitrate plus Nitrite (N)	2023/10/27	2.6		%	20
B174014	MB5	Matrix Spike	Nitrite (N)	2023/10/27		102	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/27		117	%	80 - 120
B174014	MB5	Spiked Blank	Nitrite (N)	2023/10/27		103	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/27		104	%	80 - 120
B174014	MB5	Method Blank	Nitrite (N)	2023/10/27	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2023/10/27	<0.010		mg/L	
B174014	MB5	RPD	Nitrite (N)	2023/10/27	NC		%	20
			Nitrate plus Nitrite (N)	2023/10/27	NC		%	20
B174038	JAB	Matrix Spike	Dissolved Aluminum (Al)	2023/10/27		102	%	80 - 120
			Dissolved Antimony (Sb)	2023/10/27		108	%	80 - 120
			Dissolved Arsenic (As)	2023/10/27		103	%	80 - 120
			Dissolved Beryllium (Be)	2023/10/27		99	%	80 - 120
			Dissolved Chromium (Cr)	2023/10/27		98	%	80 - 120
			Dissolved Cobalt (Co)	2023/10/27		97	%	80 - 120
			Dissolved Copper (Cu)	2023/10/27		95	%	80 - 120
			Dissolved Lead (Pb)	2023/10/27		96	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/10/27		105	%	80 - 120
			Dissolved Nickel (Ni)	2023/10/27		98	%	80 - 120
			Dissolved Selenium (Se)	2023/10/27		106	%	80 - 120
			Dissolved Silver (Ag)	2023/10/27		97	%	80 - 120
			Dissolved Thallium (Tl)	2023/10/27		97	%	80 - 120
			Dissolved Tin (Sn)	2023/10/27		102	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Titanium (Ti)	2023/10/27		106	%	80 - 120
			Dissolved Uranium (U)	2023/10/27		97	%	80 - 120
			Dissolved Vanadium (V)	2023/10/27		100	%	80 - 120
			Dissolved Zinc (Zn)	2023/10/27		101	%	80 - 120
B174038	JAB	Spiked Blank	Dissolved Aluminum (Al)	2023/10/27		108	%	80 - 120
			Dissolved Antimony (Sb)	2023/10/27		113	%	80 - 120
			Dissolved Arsenic (As)	2023/10/27		108	%	80 - 120
			Dissolved Beryllium (Be)	2023/10/27		101	%	80 - 120
			Dissolved Chromium (Cr)	2023/10/27		103	%	80 - 120
			Dissolved Cobalt (Co)	2023/10/27		103	%	80 - 120
			Dissolved Copper (Cu)	2023/10/27		103	%	80 - 120
			Dissolved Lead (Pb)	2023/10/27		103	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/10/27		105	%	80 - 120
			Dissolved Nickel (Ni)	2023/10/27		101	%	80 - 120
			Dissolved Selenium (Se)	2023/10/27		108	%	80 - 120
			Dissolved Silver (Ag)	2023/10/27		102	%	80 - 120
			Dissolved Thallium (Tl)	2023/10/27		101	%	80 - 120
			Dissolved Tin (Sn)	2023/10/27		105	%	80 - 120
			Dissolved Titanium (Ti)	2023/10/27		101	%	80 - 120
			Dissolved Uranium (U)	2023/10/27		101	%	80 - 120
			Dissolved Vanadium (V)	2023/10/27		102	%	80 - 120
			Dissolved Zinc (Zn)	2023/10/27		107	%	80 - 120
B174038	JAB	Method Blank	Dissolved Aluminum (Al)	2023/10/27	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2023/10/27	<0.00060		mg/L	
			Dissolved Arsenic (As)	2023/10/27	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2023/10/27	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2023/10/27	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2023/10/27	<0.00030		mg/L	
			Dissolved Copper (Cu)	2023/10/27	<0.0010		mg/L	
			Dissolved Lead (Pb)	2023/10/27	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2023/10/27	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2023/10/27	<0.00050		mg/L	
			Dissolved Selenium (Se)	2023/10/27	<0.00020		mg/L	
			Dissolved Silver (Ag)	2023/10/27	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2023/10/27	<0.00020		mg/L	
			Dissolved Tin (Sn)	2023/10/27	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2023/10/27	<0.0010		mg/L	
			Dissolved Uranium (U)	2023/10/27	<0.00010		mg/L	
			Dissolved Vanadium (V)	2023/10/27	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2023/10/27	<0.0030		mg/L	
B174038	JAB	RPD	Dissolved Aluminum (Al)	2023/10/27	NC		%	20
			Dissolved Antimony (Sb)	2023/10/27	NC		%	20
			Dissolved Arsenic (As)	2023/10/27	4.8		%	20
			Dissolved Beryllium (Be)	2023/10/27	NC		%	20
			Dissolved Chromium (Cr)	2023/10/27	NC		%	20
			Dissolved Cobalt (Co)	2023/10/27	NC		%	20
			Dissolved Copper (Cu)	2023/10/27	NC		%	20
			Dissolved Lead (Pb)	2023/10/27	NC		%	20
			Dissolved Molybdenum (Mo)	2023/10/27	NC		%	20
			Dissolved Nickel (Ni)	2023/10/27	10		%	20
			Dissolved Selenium (Se)	2023/10/27	NC		%	20
			Dissolved Silver (Ag)	2023/10/27	NC		%	20
			Dissolved Thallium (Tl)	2023/10/27	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Tin (Sn)	2023/10/27	NC		%	20
			Dissolved Titanium (Ti)	2023/10/27	NC		%	20
			Dissolved Uranium (U)	2023/10/27	5.1		%	20
			Dissolved Vanadium (V)	2023/10/27	NC		%	20
			Dissolved Zinc (Zn)	2023/10/27	NC		%	20
B174202	TOR	Matrix Spike [CCW515-01]	Chloride (Cl)	2023/10/27		99	%	80 - 120
			Sulphate (SO4)	2023/10/27		NC	%	80 - 120
B174202	TOR	Spiked Blank	Chloride (Cl)	2023/10/27		101	%	80 - 120
			Sulphate (SO4)	2023/10/27		100	%	80 - 120
B174202	TOR	Method Blank	Chloride (Cl)	2023/10/27	<1.0		mg/L	
			Sulphate (SO4)	2023/10/27	<1.0		mg/L	
B174202	TOR	RPD [CCW515-01]	Chloride (Cl)	2023/10/27	12		%	20
			Sulphate (SO4)	2023/10/27	0.66		%	20
B174218	MPU	Matrix Spike	Dissolved Barium (Ba)	2023/10/27		92	%	80 - 120
			Dissolved Boron (B)	2023/10/27		94	%	80 - 120
			Dissolved Calcium (Ca)	2023/10/27		83	%	80 - 120
			Dissolved Iron (Fe)	2023/10/27		101	%	80 - 120
			Dissolved Lithium (Li)	2023/10/27		86	%	80 - 120
			Dissolved Magnesium (Mg)	2023/10/27		103	%	80 - 120
			Dissolved Manganese (Mn)	2023/10/27		101	%	80 - 120
			Dissolved Phosphorus (P)	2023/10/27		103	%	80 - 120
			Dissolved Potassium (K)	2023/10/27		94	%	80 - 120
			Dissolved Silicon (Si)	2023/10/27		96	%	80 - 120
			Dissolved Sodium (Na)	2023/10/27		88	%	80 - 120
			Dissolved Strontium (Sr)	2023/10/27		91	%	80 - 120
			Dissolved Sulphur (S)	2023/10/27		111	%	80 - 120
B174218	MPU	Spiked Blank	Dissolved Barium (Ba)	2023/10/27		97	%	80 - 120
			Dissolved Boron (B)	2023/10/27		96	%	80 - 120
			Dissolved Calcium (Ca)	2023/10/27		90	%	80 - 120
			Dissolved Iron (Fe)	2023/10/27		108	%	80 - 120
			Dissolved Lithium (Li)	2023/10/27		90	%	80 - 120
			Dissolved Magnesium (Mg)	2023/10/27		110	%	80 - 120
			Dissolved Manganese (Mn)	2023/10/27		108	%	80 - 120
			Dissolved Phosphorus (P)	2023/10/27		109	%	80 - 120
			Dissolved Potassium (K)	2023/10/27		96	%	80 - 120
			Dissolved Silicon (Si)	2023/10/27		104	%	80 - 120
			Dissolved Sodium (Na)	2023/10/27		93	%	80 - 120
			Dissolved Strontium (Sr)	2023/10/27		96	%	80 - 120
			Dissolved Sulphur (S)	2023/10/27		108	%	80 - 120
B174218	MPU	Method Blank	Dissolved Barium (Ba)	2023/10/27	<0.010		mg/L	
			Dissolved Boron (B)	2023/10/27	<0.020		mg/L	
			Dissolved Calcium (Ca)	2023/10/27	<0.30		mg/L	
			Dissolved Iron (Fe)	2023/10/27	<0.060		mg/L	
			Dissolved Lithium (Li)	2023/10/27	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2023/10/27	<0.20		mg/L	
			Dissolved Manganese (Mn)	2023/10/27	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2023/10/27	<0.10		mg/L	
			Dissolved Potassium (K)	2023/10/27	<0.30		mg/L	
			Dissolved Silicon (Si)	2023/10/27	<0.50		mg/L	
			Dissolved Sodium (Na)	2023/10/27	<0.50		mg/L	
			Dissolved Strontium (Sr)	2023/10/27	<0.020		mg/L	
			Dissolved Sulphur (S)	2023/10/27	<0.20		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B174218	MPU	RPD	Dissolved Calcium (Ca)	2023/10/27	0.29 (1)		%	20
			Dissolved Iron (Fe)	2023/10/27	NC (2)		%	20
			Dissolved Magnesium (Mg)	2023/10/27	0.51 (3)		%	20
			Dissolved Manganese (Mn)	2023/10/27	NC (4)		%	20
			Dissolved Potassium (K)	2023/10/27	10 (5)		%	20
			Dissolved Sodium (Na)	2023/10/27	0.12 (6)		%	20
B174537	MAP	Matrix Spike	Orthophosphate (P)	2023/10/28		98	%	80 - 120
B174537	MAP	Spiked Blank	Orthophosphate (P)	2023/10/27		99	%	80 - 120
B174537	MAP	Method Blank	Orthophosphate (P)	2023/10/27	<0.0030		mg/L	
B174537	MAP	RPD	Orthophosphate (P)	2023/10/28	1.3		%	20
B174580	TOR	Matrix Spike [CCW513-01]	Chloride (Cl)	2023/10/28		107	%	80 - 120
			Sulphate (SO4)	2023/10/28		NC	%	80 - 120
B174580	TOR	Spiked Blank	Chloride (Cl)	2023/10/28		104	%	80 - 120
			Sulphate (SO4)	2023/10/28		99	%	80 - 120
B174580	TOR	Method Blank	Chloride (Cl)	2023/10/28	<1.0		mg/L	
			Sulphate (SO4)	2023/10/28	<1.0		mg/L	
B174580	TOR	RPD [CCW513-01]	Chloride (Cl)	2023/10/28	NC		%	20
			Sulphate (SO4)	2023/10/28	6.1		%	20
B174597	SKM	Matrix Spike [CCW512-01]	Nitrite (N)	2023/10/27		100	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/27		109	%	80 - 120
B174597	SKM	Spiked Blank	Nitrite (N)	2023/10/27		102	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/27		105	%	80 - 120
B174597	SKM	Method Blank	Nitrite (N)	2023/10/27	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2023/10/27	<0.010		mg/L	
B174597	SKM	RPD [CCW512-01]	Nitrite (N)	2023/10/27	NC		%	20
			Nitrate plus Nitrite (N)	2023/10/27	NC		%	20
B175064	TOR	Matrix Spike	Chloride (Cl)	2023/10/28		NC	%	80 - 120
			Sulphate (SO4)	2023/10/28		113	%	80 - 120
B175064	TOR	Spiked Blank	Chloride (Cl)	2023/10/28		99	%	80 - 120
			Sulphate (SO4)	2023/10/28		101	%	80 - 120
B175064	TOR	Method Blank	Chloride (Cl)	2023/10/28	<1.0		mg/L	
			Sulphate (SO4)	2023/10/28	<1.0		mg/L	
B175064	TOR	RPD	Chloride (Cl)	2023/10/28	0.092		%	20
			Sulphate (SO4)	2023/10/28	NC (7)		%	20
B175088	ISW	Matrix Spike [CCW516-05]	Total Ammonia (N)	2023/10/28		93	%	80 - 120
B175088	ISW	Spiked Blank	Total Ammonia (N)	2023/10/28		100	%	80 - 120
B175088	ISW	Method Blank	Total Ammonia (N)	2023/10/28	<0.015		mg/L	
B175088	ISW	RPD [CCW516-05]	Total Ammonia (N)	2023/10/28	0.94		%	20
B175196	CTU	Matrix Spike	Orthophosphate (P)	2023/10/28		98	%	80 - 120
B175196	CTU	Spiked Blank	Orthophosphate (P)	2023/10/28		100	%	80 - 120
B175196	CTU	Method Blank	Orthophosphate (P)	2023/10/28	<0.0030		mg/L	
B175196	CTU	RPD	Orthophosphate (P)	2023/10/28	NC		%	20
B175209	CTU	Matrix Spike	Dissolved Phosphorus (P)	2023/10/31		98	%	80 - 120
B175209	CTU	QC Standard	Dissolved Phosphorus (P)	2023/10/31		87	%	80 - 120
B175209	CTU	Spiked Blank	Dissolved Phosphorus (P)	2023/10/31		100	%	80 - 120
B175209	CTU	Method Blank	Dissolved Phosphorus (P)	2023/10/31	<0.0030		mg/L	
B175209	CTU	RPD	Dissolved Phosphorus (P)	2023/10/31	1.4		%	20
B175212	MAP	Matrix Spike [CCW509-01]	Dissolved Phosphorus (P)	2023/10/30		100	%	80 - 120
B175212	MAP	QC Standard	Dissolved Phosphorus (P)	2023/10/30		91	%	80 - 120

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B175212	MAP	Spiked Blank	Dissolved Phosphorus (P)	2023/10/30		99	%	80 - 120
B175212	MAP	Method Blank	Dissolved Phosphorus (P)	2023/10/30	<0.0030		mg/L	
B175212	MAP	RPD [CCW509-01]	Dissolved Phosphorus (P)	2023/10/30	NC		%	20
B175325	KH2	Matrix Spike	Dissolved Aluminum (Al)	2023/10/30		105	%	80 - 120
			Dissolved Antimony (Sb)	2023/10/30		109	%	80 - 120
			Dissolved Arsenic (As)	2023/10/30		113	%	80 - 120
			Dissolved Beryllium (Be)	2023/10/30		102	%	80 - 120
			Dissolved Chromium (Cr)	2023/10/30		100	%	80 - 120
			Dissolved Cobalt (Co)	2023/10/30		96	%	80 - 120
			Dissolved Copper (Cu)	2023/10/30		98	%	80 - 120
			Dissolved Lead (Pb)	2023/10/30		92	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/10/30		108	%	80 - 120
			Dissolved Nickel (Ni)	2023/10/30		98	%	80 - 120
			Dissolved Selenium (Se)	2023/10/30		114	%	80 - 120
			Dissolved Silver (Ag)	2023/10/30		88	%	80 - 120
			Dissolved Thallium (Tl)	2023/10/30		93	%	80 - 120
			Dissolved Tin (Sn)	2023/10/30		102	%	80 - 120
			Dissolved Titanium (Ti)	2023/10/30		105	%	80 - 120
			Dissolved Uranium (U)	2023/10/30		100	%	80 - 120
			Dissolved Vanadium (V)	2023/10/30		102	%	80 - 120
			Dissolved Zinc (Zn)	2023/10/30		NC	%	80 - 120
B175325	KH2	Spiked Blank	Dissolved Aluminum (Al)	2023/10/30		108	%	80 - 120
			Dissolved Antimony (Sb)	2023/10/30		104	%	80 - 120
			Dissolved Arsenic (As)	2023/10/30		94	%	80 - 120
			Dissolved Beryllium (Be)	2023/10/30		97	%	80 - 120
			Dissolved Chromium (Cr)	2023/10/30		96	%	80 - 120
			Dissolved Cobalt (Co)	2023/10/30		96	%	80 - 120
			Dissolved Copper (Cu)	2023/10/30		96	%	80 - 120
			Dissolved Lead (Pb)	2023/10/30		96	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/10/30		99	%	80 - 120
			Dissolved Nickel (Ni)	2023/10/30		95	%	80 - 120
			Dissolved Selenium (Se)	2023/10/30		91	%	80 - 120
			Dissolved Silver (Ag)	2023/10/30		95	%	80 - 120
			Dissolved Thallium (Tl)	2023/10/30		95	%	80 - 120
			Dissolved Tin (Sn)	2023/10/30		99	%	80 - 120
			Dissolved Titanium (Ti)	2023/10/30		96	%	80 - 120
			Dissolved Uranium (U)	2023/10/30		97	%	80 - 120
			Dissolved Vanadium (V)	2023/10/30		98	%	80 - 120
			Dissolved Zinc (Zn)	2023/10/30		89	%	80 - 120
B175325	KH2	Method Blank	Dissolved Aluminum (Al)	2023/10/30	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2023/10/30	<0.00060		mg/L	
			Dissolved Arsenic (As)	2023/10/30	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2023/10/30	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2023/10/30	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2023/10/30	<0.00030		mg/L	
			Dissolved Copper (Cu)	2023/10/30	<0.0010		mg/L	
			Dissolved Lead (Pb)	2023/10/30	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2023/10/30	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2023/10/30	<0.00050		mg/L	
			Dissolved Selenium (Se)	2023/10/30	<0.00020		mg/L	
			Dissolved Silver (Ag)	2023/10/30	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2023/10/30	<0.00020		mg/L	
			Dissolved Tin (Sn)	2023/10/30	<0.0010		mg/L	

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			Dissolved Titanium (Ti)	2023/10/30	<0.0010		mg/L	
			Dissolved Uranium (U)	2023/10/30	<0.00010		mg/L	
			Dissolved Vanadium (V)	2023/10/30	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2023/10/30	<0.0030		mg/L	
B175325	KH2	RPD	Dissolved Aluminum (Al)	2023/10/30	0.81		%	20
			Dissolved Antimony (Sb)	2023/10/30	NC		%	20
			Dissolved Arsenic (As)	2023/10/30	1.3		%	20
			Dissolved Beryllium (Be)	2023/10/30	NC		%	20
			Dissolved Chromium (Cr)	2023/10/30	1.6		%	20
			Dissolved Cobalt (Co)	2023/10/30	0.27		%	20
			Dissolved Copper (Cu)	2023/10/30	5.2		%	20
			Dissolved Lead (Pb)	2023/10/30	NC		%	20
			Dissolved Molybdenum (Mo)	2023/10/30	2.8		%	20
			Dissolved Nickel (Ni)	2023/10/30	0.024		%	20
			Dissolved Selenium (Se)	2023/10/30	2.6		%	20
			Dissolved Silver (Ag)	2023/10/30	NC		%	20
			Dissolved Thallium (Tl)	2023/10/30	NC		%	20
			Dissolved Tin (Sn)	2023/10/30	NC		%	20
			Dissolved Titanium (Ti)	2023/10/30	NC		%	20
			Dissolved Uranium (U)	2023/10/30	1.5		%	20
			Dissolved Vanadium (V)	2023/10/30	NC		%	20
			Dissolved Zinc (Zn)	2023/10/30	8.3		%	20
B177507	KKM	Matrix Spike	Dissolved Mercury (Hg)	2023/10/31		94	%	80 - 120
B177507	KKM	Spiked Blank	Dissolved Mercury (Hg)	2023/10/31		101	%	80 - 120
B177507	KKM	Method Blank	Dissolved Mercury (Hg)	2023/10/31	<0.0019		ug/L	
B177507	KKM	RPD	Dissolved Mercury (Hg)	2023/10/31	NC		%	20
B178032	KKM	Matrix Spike [CCW510-09]	Total Mercury (Hg)	2023/10/31		93	%	80 - 120
B178032	KKM	Spiked Blank	Total Mercury (Hg)	2023/10/31		92	%	80 - 120
B178032	KKM	Method Blank	Total Mercury (Hg)	2023/10/31	<0.0019		ug/L	
B178032	KKM	RPD [CCW513-09]	Total Mercury (Hg)	2023/10/31	NC		%	20
B178036	KKM	Matrix Spike	Total Mercury (Hg)	2023/10/31		89	%	80 - 120
B178036	KKM	Spiked Blank	Total Mercury (Hg)	2023/10/31		92	%	80 - 120
B178036	KKM	Method Blank	Total Mercury (Hg)	2023/10/31	<0.0019		ug/L	
B178036	KKM	RPD	Total Mercury (Hg)	2023/10/31	NC		%	20
B178087	CTU	Matrix Spike [CCW512-01]	Dissolved Phosphorus (P)	2023/10/31		92	%	80 - 120
B178087	CTU	QC Standard	Dissolved Phosphorus (P)	2023/10/31		86	%	80 - 120
B178087	CTU	Spiked Blank	Dissolved Phosphorus (P)	2023/10/31		101	%	80 - 120
B178087	CTU	Method Blank	Dissolved Phosphorus (P)	2023/10/31	<0.0030		mg/L	
B178087	CTU	RPD	Dissolved Phosphorus (P)	2023/11/01	1.3		%	20
B178342	MDO	Matrix Spike	Dissolved Organic Carbon (C)	2023/10/31		98	%	80 - 120
B178342	MDO	Spiked Blank	Dissolved Organic Carbon (C)	2023/10/31		106	%	80 - 120
B178342	MDO	Method Blank	Dissolved Organic Carbon (C)	2023/10/31	<0.50		mg/L	
B178342	MDO	RPD	Dissolved Organic Carbon (C)	2023/10/31	NC		%	20
B179365	YHK	Matrix Spike	Dissolved Organic Carbon (C)	2023/11/01		84	%	80 - 120
B179365	YHK	Spiked Blank	Dissolved Organic Carbon (C)	2023/11/01		110	%	80 - 120
B179365	YHK	Method Blank	Dissolved Organic Carbon (C)	2023/11/01	<0.50		mg/L	
B179365	YHK	RPD	Dissolved Organic Carbon (C)	2023/11/01	4.7		%	20
B179915	IK0	Matrix Spike	Dissolved Barium (Ba)	2023/11/01		102	%	80 - 120
			Dissolved Boron (B)	2023/11/01		100	%	80 - 120
			Dissolved Calcium (Ca)	2023/11/01		100	%	80 - 120
			Dissolved Iron (Fe)	2023/11/01		102	%	80 - 120

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Lithium (Li)	2023/11/01		102	%	80 - 120
			Dissolved Magnesium (Mg)	2023/11/01		94	%	80 - 120
			Dissolved Manganese (Mn)	2023/11/01		101	%	80 - 120
			Dissolved Phosphorus (P)	2023/11/01		95	%	80 - 120
			Dissolved Potassium (K)	2023/11/01		110	%	80 - 120
			Dissolved Silicon (Si)	2023/11/01		97	%	80 - 120
			Dissolved Sodium (Na)	2023/11/01		103	%	80 - 120
			Dissolved Strontium (Sr)	2023/11/01		100	%	80 - 120
			Dissolved Sulphur (S)	2023/11/01		98	%	80 - 120
B179915	IK0	Spiked Blank	Dissolved Barium (Ba)	2023/11/01		104	%	80 - 120
			Dissolved Boron (B)	2023/11/01		100	%	80 - 120
			Dissolved Calcium (Ca)	2023/11/01		106	%	80 - 120
			Dissolved Iron (Fe)	2023/11/01		108	%	80 - 120
			Dissolved Lithium (Li)	2023/11/01		104	%	80 - 120
			Dissolved Magnesium (Mg)	2023/11/01		99	%	80 - 120
			Dissolved Manganese (Mn)	2023/11/01		106	%	80 - 120
			Dissolved Phosphorus (P)	2023/11/01		98	%	80 - 120
			Dissolved Potassium (K)	2023/11/01		110	%	80 - 120
			Dissolved Silicon (Si)	2023/11/01		103	%	80 - 120
			Dissolved Sodium (Na)	2023/11/01		106	%	80 - 120
			Dissolved Strontium (Sr)	2023/11/01		103	%	80 - 120
			Dissolved Sulphur (S)	2023/11/01		99	%	80 - 120
B179915	IK0	Method Blank	Dissolved Barium (Ba)	2023/11/01	<0.010		mg/L	
			Dissolved Boron (B)	2023/11/01	<0.020		mg/L	
			Dissolved Calcium (Ca)	2023/11/01	<0.30		mg/L	
			Dissolved Iron (Fe)	2023/11/01	<0.060		mg/L	
			Dissolved Lithium (Li)	2023/11/01	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2023/11/01	<0.20		mg/L	
			Dissolved Manganese (Mn)	2023/11/01	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2023/11/01	<0.10		mg/L	
			Dissolved Potassium (K)	2023/11/01	<0.30		mg/L	
			Dissolved Silicon (Si)	2023/11/01	<0.50		mg/L	
			Dissolved Sodium (Na)	2023/11/01	<0.50		mg/L	
			Dissolved Strontium (Sr)	2023/11/01	<0.020		mg/L	
			Dissolved Sulphur (S)	2023/11/01	<0.20		mg/L	
B179915	IK0	RPD	Dissolved Calcium (Ca)	2023/11/01	0.50		%	20
			Dissolved Iron (Fe)	2023/11/01	NC		%	20
			Dissolved Magnesium (Mg)	2023/11/01	0.78		%	20
			Dissolved Manganese (Mn)	2023/11/01	NC		%	20
			Dissolved Potassium (K)	2023/11/01	NC		%	20
			Dissolved Sodium (Na)	2023/11/01	0.020		%	20
B179916	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/04		97	%	80 - 120
B179916	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/11/04	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/04	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/04	<1.0		mg/L	
			Carbonate (CO3)	2023/11/04	<1.0		mg/L	
			Hydroxide (OH)	2023/11/04	<1.0		mg/L	
B179916	JVM	RPD	Alkalinity (PP as CaCO3)	2023/11/04	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/04	17		%	20
			Bicarbonate (HCO3)	2023/11/04	17		%	20
			Carbonate (CO3)	2023/11/04	NC		%	20
			Hydroxide (OH)	2023/11/04	NC		%	20
B179917	JVM	Spiked Blank	Conductivity	2023/11/04		100	%	90 - 110

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B179917	JVM	Method Blank	Conductivity	2023/11/04	<2.0		uS/cm	
B179917	JVM	RPD	Conductivity	2023/11/04	3.3		%	10
B179918	JVM	Spiked Blank	pH	2023/11/04		101	%	97 - 103
B179918	JVM	RPD	pH	2023/11/04	0.62		%	N/A
B179939	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/04		95	%	80 - 120
B179939	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/11/04	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/04	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/04	<1.0		mg/L	
			Carbonate (CO3)	2023/11/04	<1.0		mg/L	
			Hydroxide (OH)	2023/11/04	<1.0		mg/L	
B179939	JVM	RPD	Alkalinity (PP as CaCO3)	2023/11/04	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/04	0.52		%	20
			Bicarbonate (HCO3)	2023/11/04	0.52		%	20
			Carbonate (CO3)	2023/11/04	NC		%	20
			Hydroxide (OH)	2023/11/04	NC		%	20
B179941	JVM	Spiked Blank	Conductivity	2023/11/04		100	%	90 - 110
B179941	JVM	Method Blank	Conductivity	2023/11/04	<2.0		uS/cm	
B179941	JVM	RPD	Conductivity	2023/11/04	0.52		%	10
B179942	JVM	Spiked Blank	pH	2023/11/04		101	%	97 - 103
B179942	JVM	RPD	pH	2023/11/04	1.3		%	N/A
B179944	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/03		95	%	80 - 120
B179944	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/11/03	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/03	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/03	<1.0		mg/L	
			Carbonate (CO3)	2023/11/03	<1.0		mg/L	
			Hydroxide (OH)	2023/11/03	<1.0		mg/L	
B179944	JVM	RPD	Alkalinity (PP as CaCO3)	2023/11/03	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/03	2.9		%	20
			Bicarbonate (HCO3)	2023/11/03	2.9		%	20
			Carbonate (CO3)	2023/11/03	NC		%	20
			Hydroxide (OH)	2023/11/03	NC		%	20
B180011	JVM	Spiked Blank	Conductivity	2023/11/03		100	%	90 - 110
B180011	JVM	Method Blank	Conductivity	2023/11/03	<2.0		uS/cm	
B180011	JVM	RPD	Conductivity	2023/11/03	0.53		%	10
B180015	JVM	Spiked Blank	pH	2023/11/03		101	%	97 - 103
B180015	JVM	RPD	pH	2023/11/03	1.2		%	N/A
B180017	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/05		101	%	80 - 120
B180017	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/11/05	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/05	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/05	<1.0		mg/L	
			Carbonate (CO3)	2023/11/05	<1.0		mg/L	
			Hydroxide (OH)	2023/11/05	<1.0		mg/L	
B180017	JVM	RPD	Alkalinity (PP as CaCO3)	2023/11/05	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/05	0.37		%	20
			Bicarbonate (HCO3)	2023/11/05	0.37		%	20
			Carbonate (CO3)	2023/11/05	NC		%	20
			Hydroxide (OH)	2023/11/05	NC		%	20
B180021	JVM	Spiked Blank	Conductivity	2023/11/05		100	%	90 - 110
B180021	JVM	Method Blank	Conductivity	2023/11/05	<2.0		uS/cm	
B180021	JVM	RPD	Conductivity	2023/11/05	1.5		%	10
B180022	JVM	Spiked Blank	pH	2023/11/05		100	%	97 - 103

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B180022	JVM	RPD	pH	2023/11/05	1.6		%	N/A

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) 48.9246

(2) 0.0065

(3) 23.86870

(4) 0.00137

(5) 1.82116

(6) 13.7093

(7) Detection limits raised due to matrix interference.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C386944
Report Date: 2023/11/05

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SRI
Sampler Initials: WT

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Gita Pokhrel, Laboratory Supervisor

Janet Gao, B.Sc., QP, Supervisor, Organics

Jared Wiseman, B.Sc., P.Chem., QP, Senior Analyst, Organics

Sandy Yuan, M.Sc., QP, Scientific Specialist

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Automated Statchk

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Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

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- ☐ Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

CHAIN OF CUSTODY REC(
ENV COC - 00013v3

mcal-10-2101

C386944

1

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Project Information	
Company:	Stantec	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	10220 103 Ave Suite # 300	Street Address:		Project #:	110773396
City: Edmonton	Prov: AB Postal Code: T5J 3K4	City:	Prov: Postal Code:	Site #:	
Phone:	780 969 2223	Phone:		Site Location:	SR1
Email:	dylan.king@stantec.com	Email:		Site Location Province:	
Copies:		Copies:		Sampled By:	WT / TH

Rush Confirmation #:

Regulatory Criteria

☑ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba
☐ Saskatchewan ☐ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)
☑ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply
☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

Comments

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F1-F2	7 BTEX F1-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 TKN	14 DOC	15 Texture (% sand, silt, clay)	16 Basic class II landfill	17 Dissolved Phosphorus	18 Phosphate	19 Ammonia	20 Bacteriological #	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE
1	WS81-2	23	10	25	09	52	Water			x			x		x		x	x	x	x	x			x	x	x	x	11	
2	WS81-1	23	10	25	10	31				x			x		x		x	x	x	x	x			x	x	x	x	11	
3	RMW16-23-7	23	10	25	12	48				x			x		x		x	x	x	x	x			x	x	x	x	11	
4	RMW16-23-14	23	10	25	13	12				x			x		x		x	x	x	x	x			x	x	x	x	11	
5	RMW16-23-32	23	10	25	12	58				x			x		x		x	x	x	x	x			x	x	x	x	11	
6	MW16-22-26	23	10	25	15	35				x			x		x		x	x	x	x	x			x	x	x	x	11	
7	MW16-11-15	23	10	25	16	13				✓			x		x		x	x	x	x	x			x	x	x	x	11	
8	23-11	23	10	25	16	40	↓			x			x		x		x	x	x	x	x			x	x	x	x	11	
9																													
10																													
11																													
12																													

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		✓				
Seal intact		✓				
Cooling media present		✓		-3	-7	-3

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		✓				
Seal intact		✓				
Cooling media present		✓		-1	-3	-5

LAB USE ONLY	Yes	No	°C	1	2	3	Temperature reading by:
Seal present							
Seal intact							
Cooling media present							

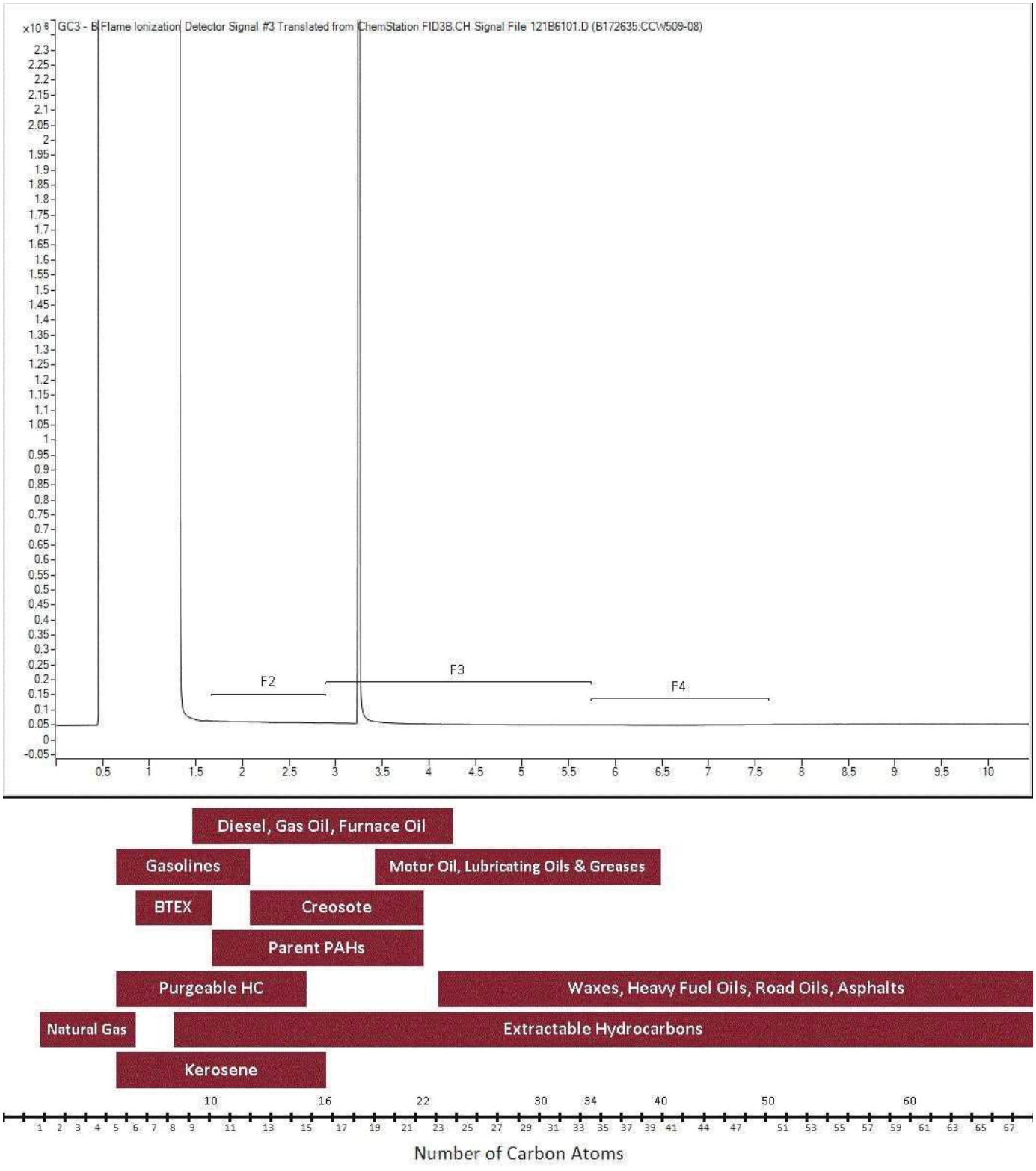
Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special instructions
1 Wesley Tsen	23	10	25	17	57	1 SNEHA MATHEWS	2023	10	25	17	59	* Total coliforms, E. coli, Fecal coliforms, Heterotrophic plate count
2						2						

Dissolved parameters not field filtered or preserved - please lab filter

Bureau Veritas Job #: C386944
Report Date: 2023/11/05
Bureau Veritas Sample: CCW509

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SRI
Client ID: WS81-2

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

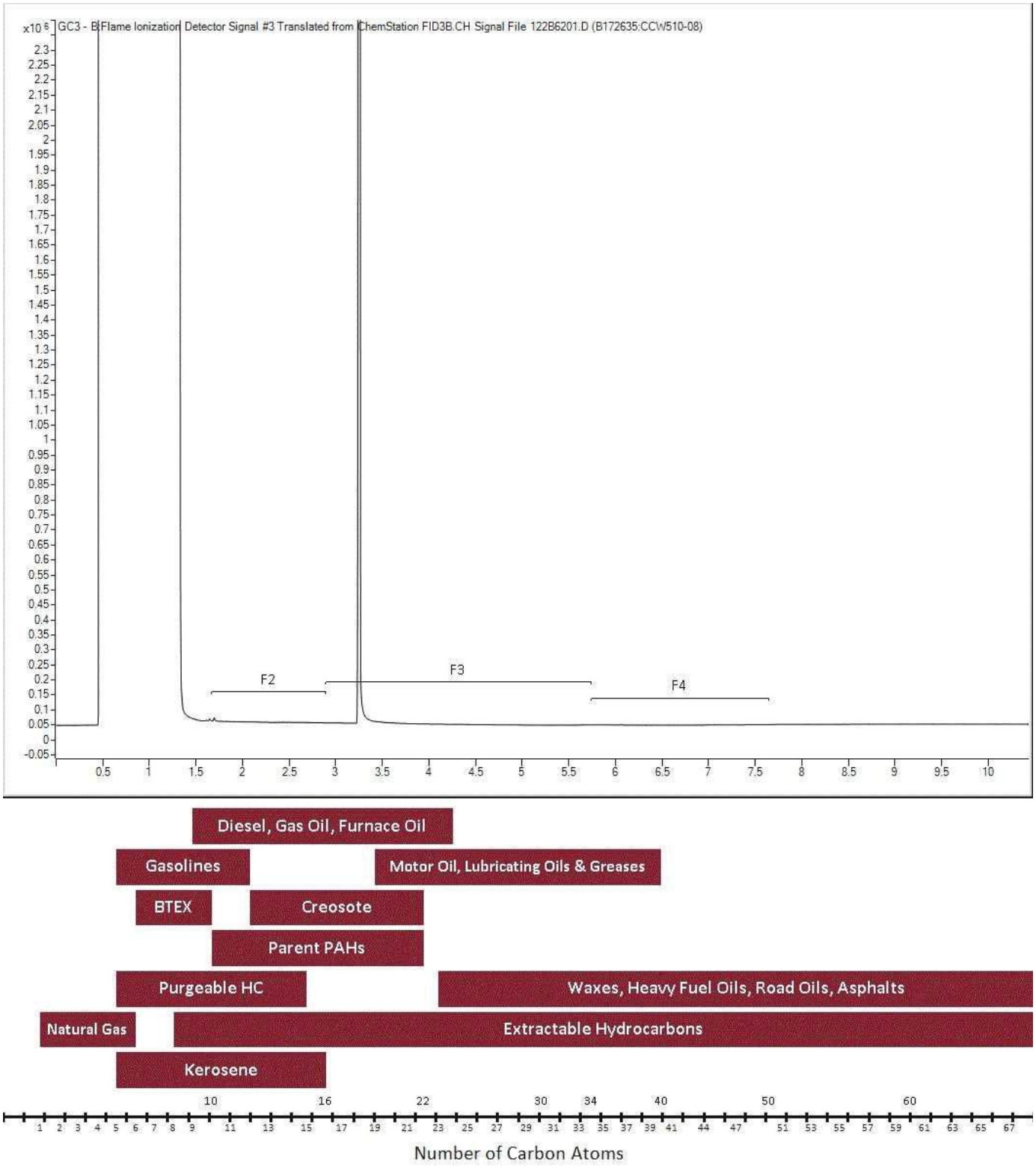


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386944
Report Date: 2023/11/05
Bureau Veritas Sample: CCW510

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SRI
Client ID: WS81-1

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

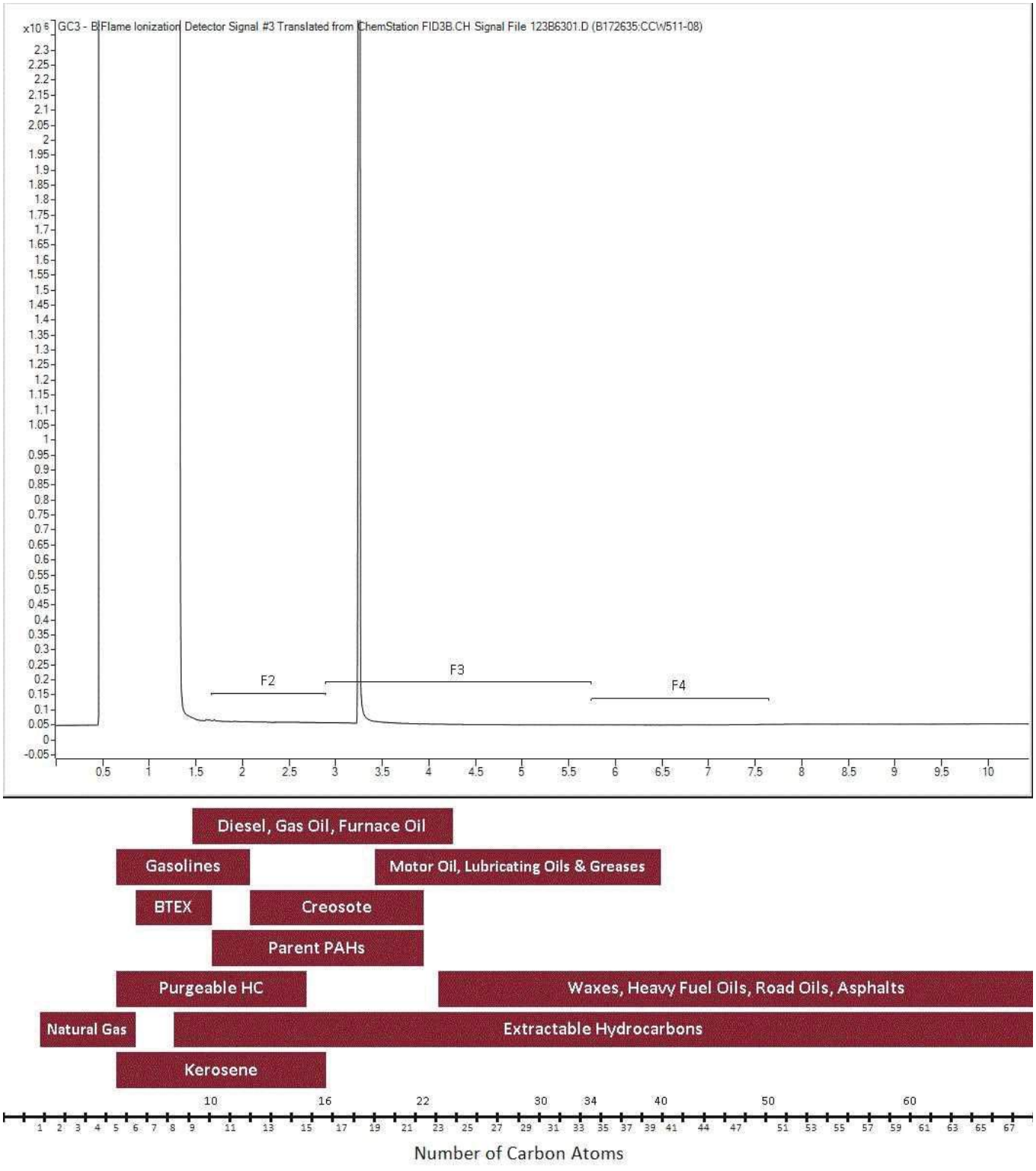


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386944
Report Date: 2023/11/05
Bureau Veritas Sample: CCW511

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SRI
Client ID: RMW16-23-7

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

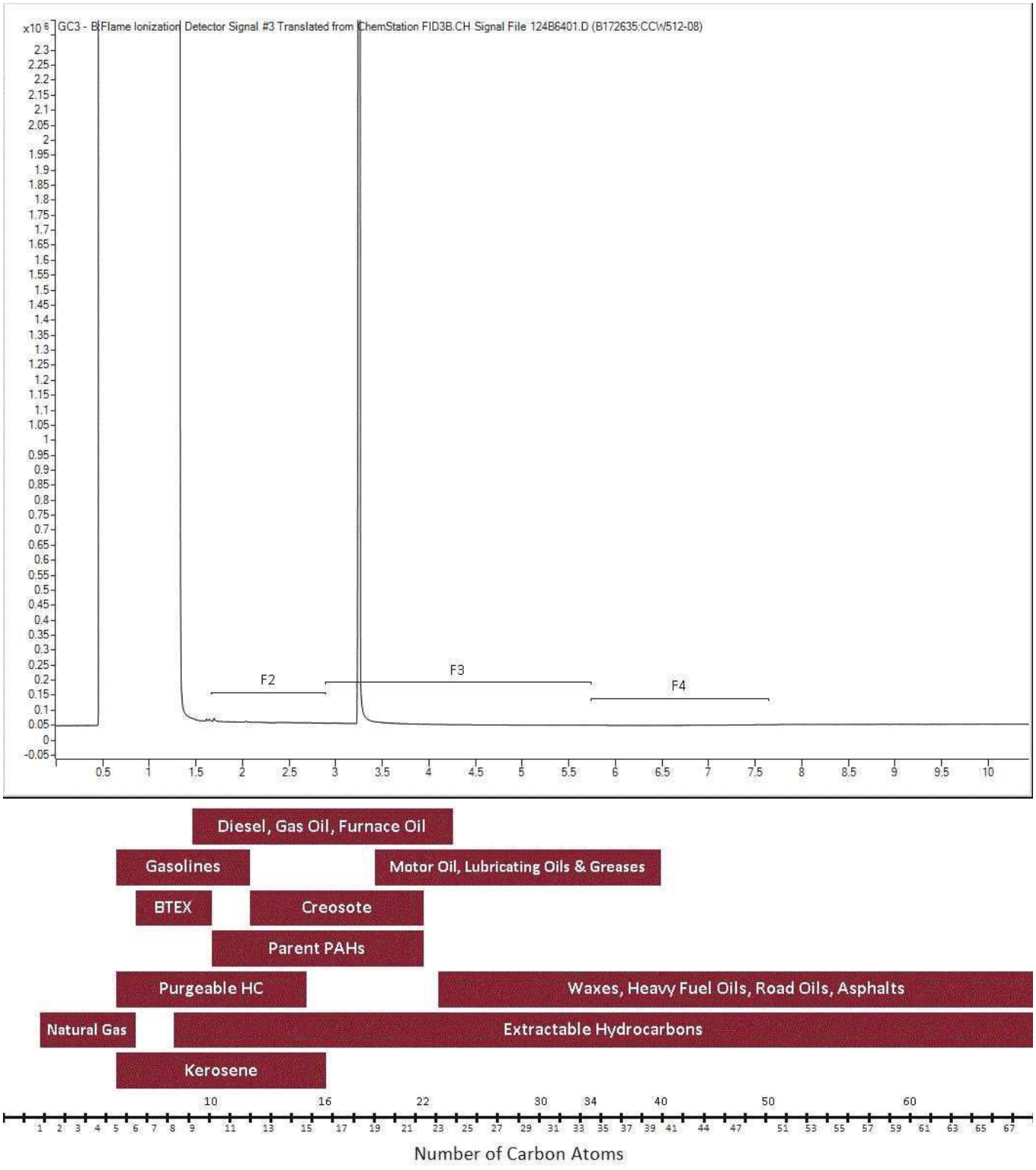


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386944
Report Date: 2023/11/05
Bureau Veritas Sample: CCW512

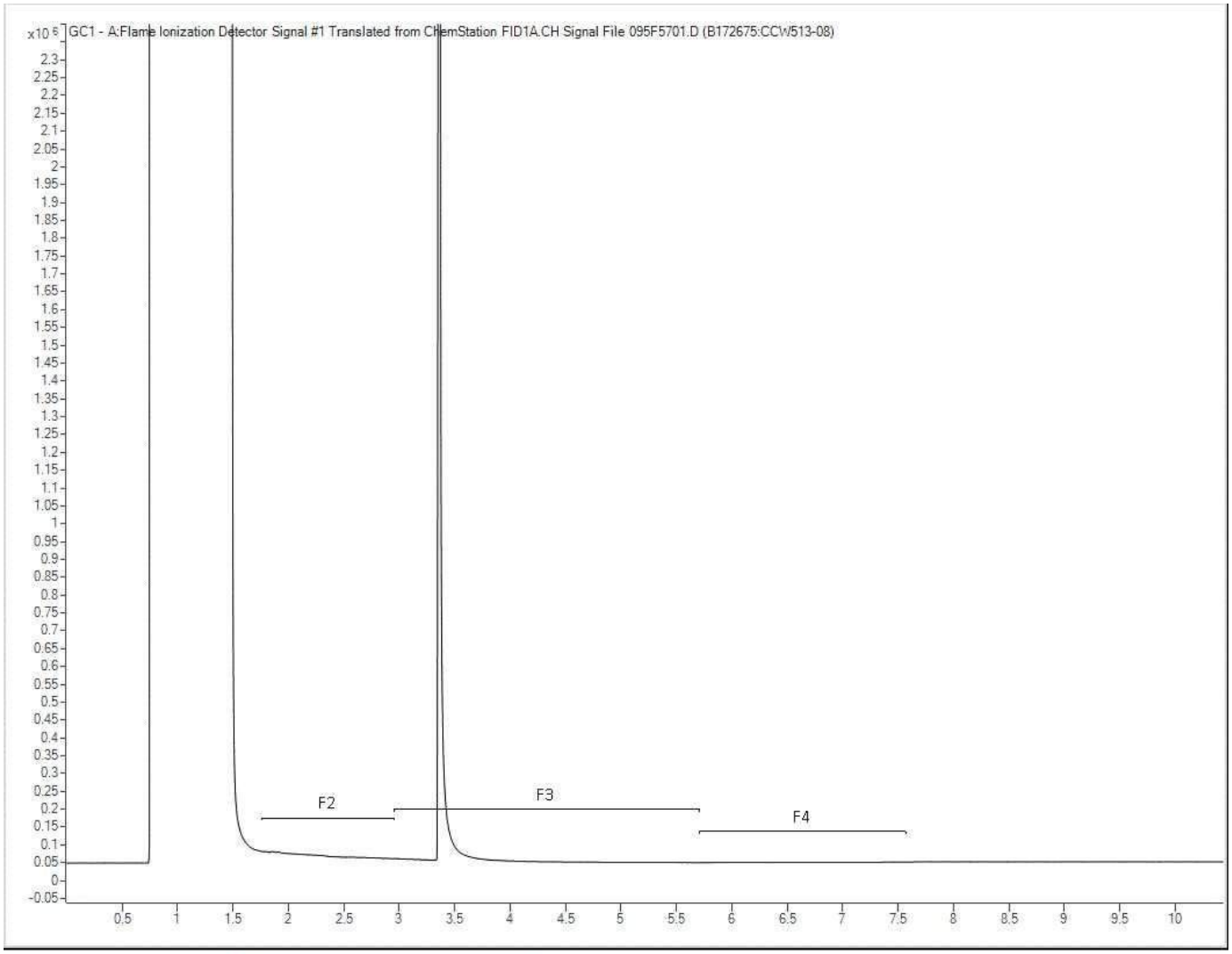
STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SRI
Client ID: RMW16-23-14

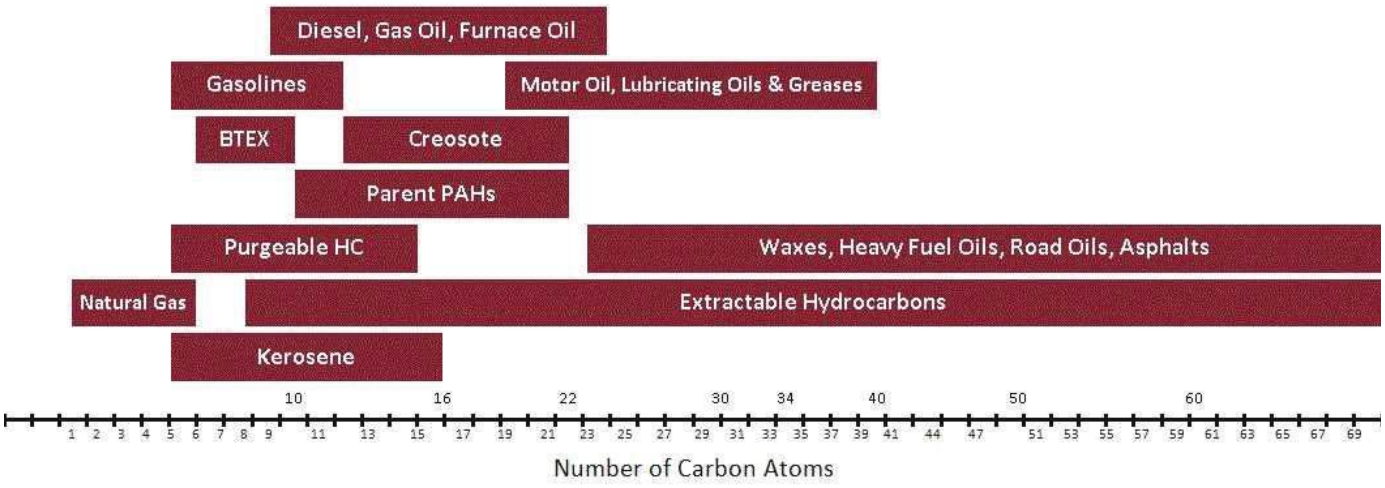
CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





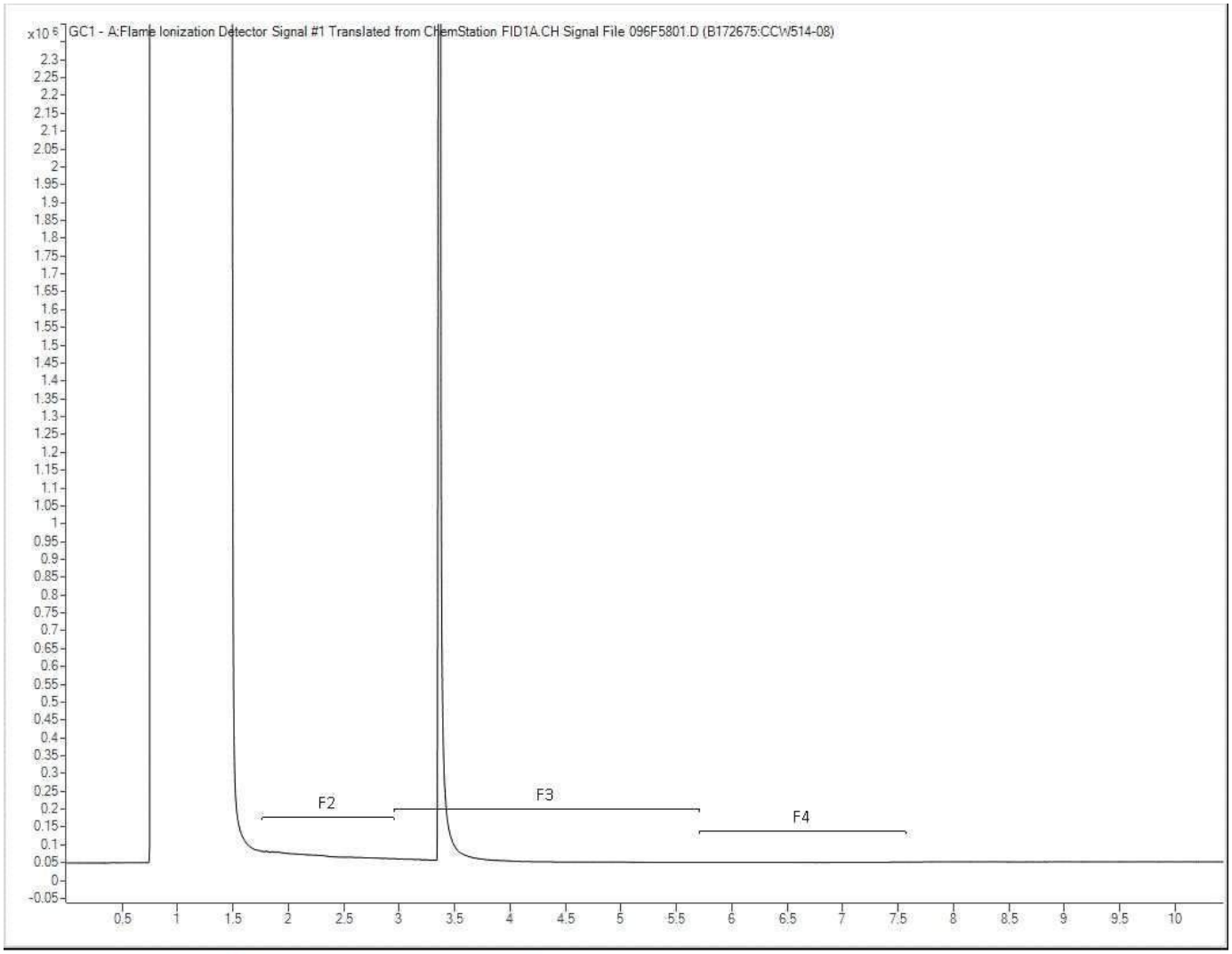
Hpchem10\HPchem\1\DATA\2023\10\RUN1027

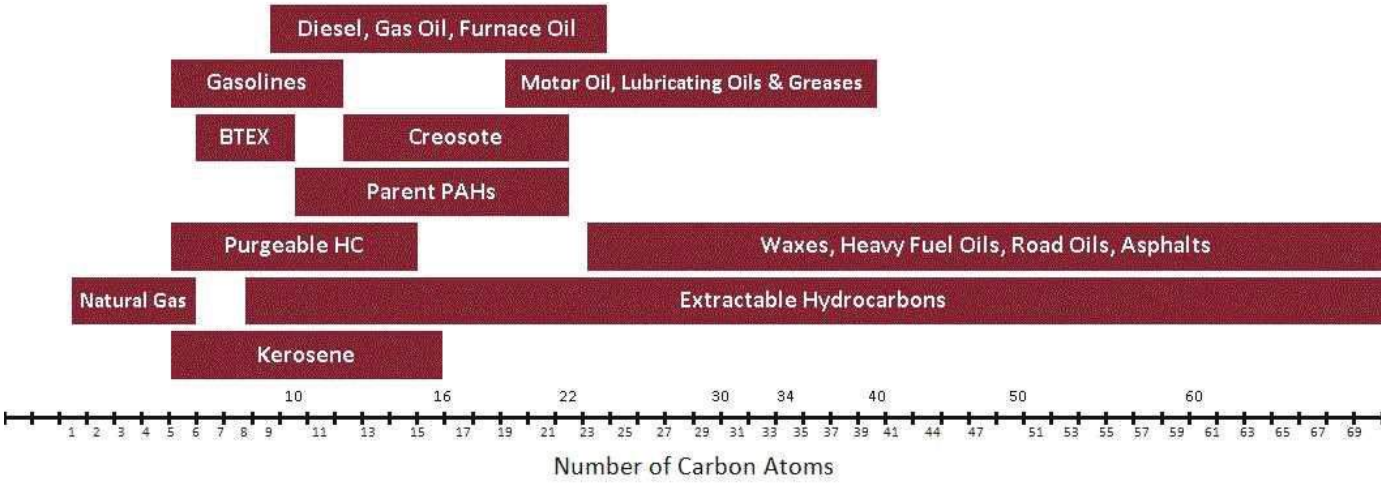
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Bureau Veritas Job #: C386944
Report Date: 2023/11/05
Bureau Veritas Sample: CCW514

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SRI
Client ID: MW16-22-26

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





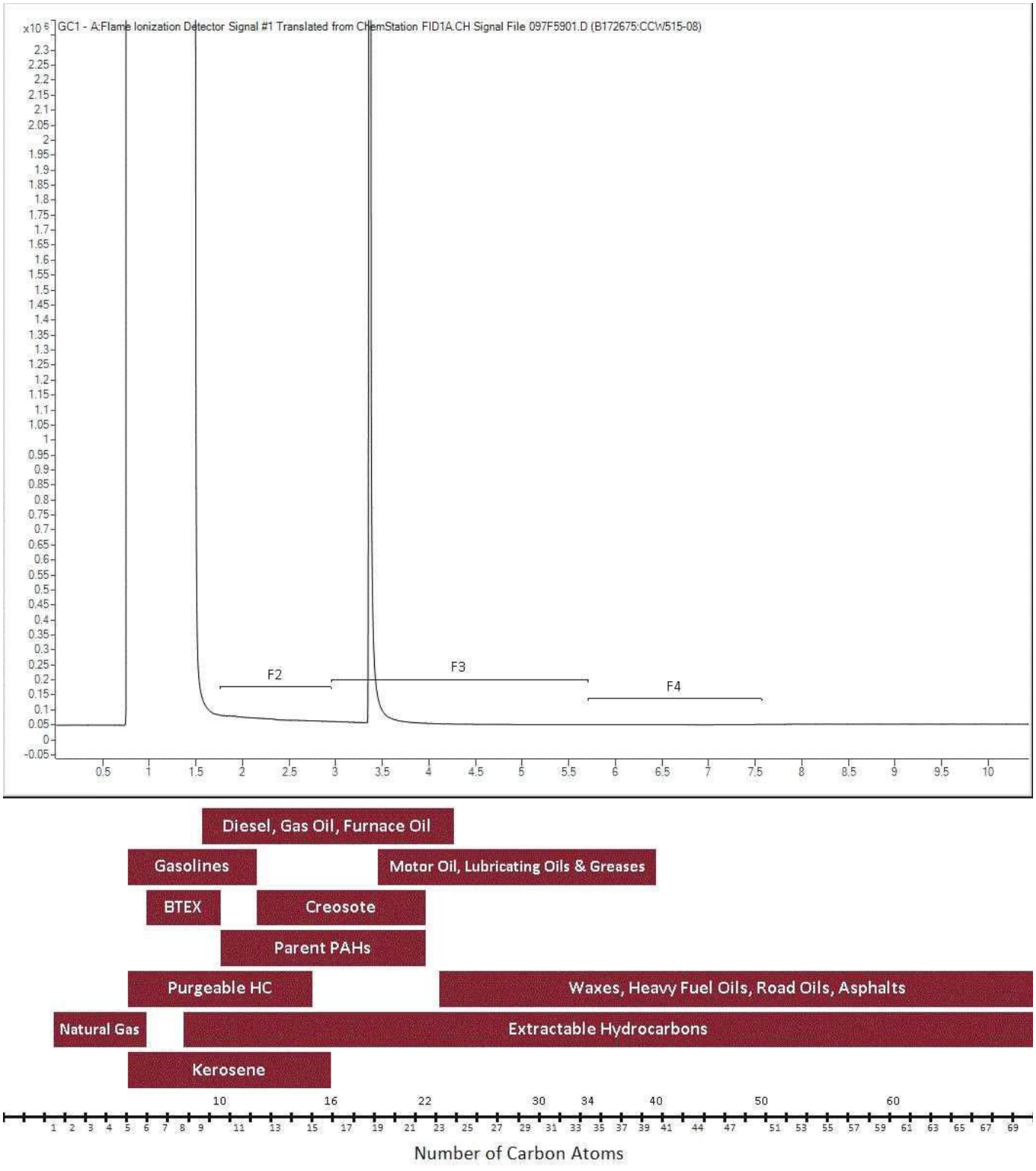
Hpchem10\HPchem\1\DATA\2023\10\RUN1027

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386944
Report Date: 2023/11/05
Bureau Veritas Sample: CCW515

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SRI
Client ID: MW16-11-15

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

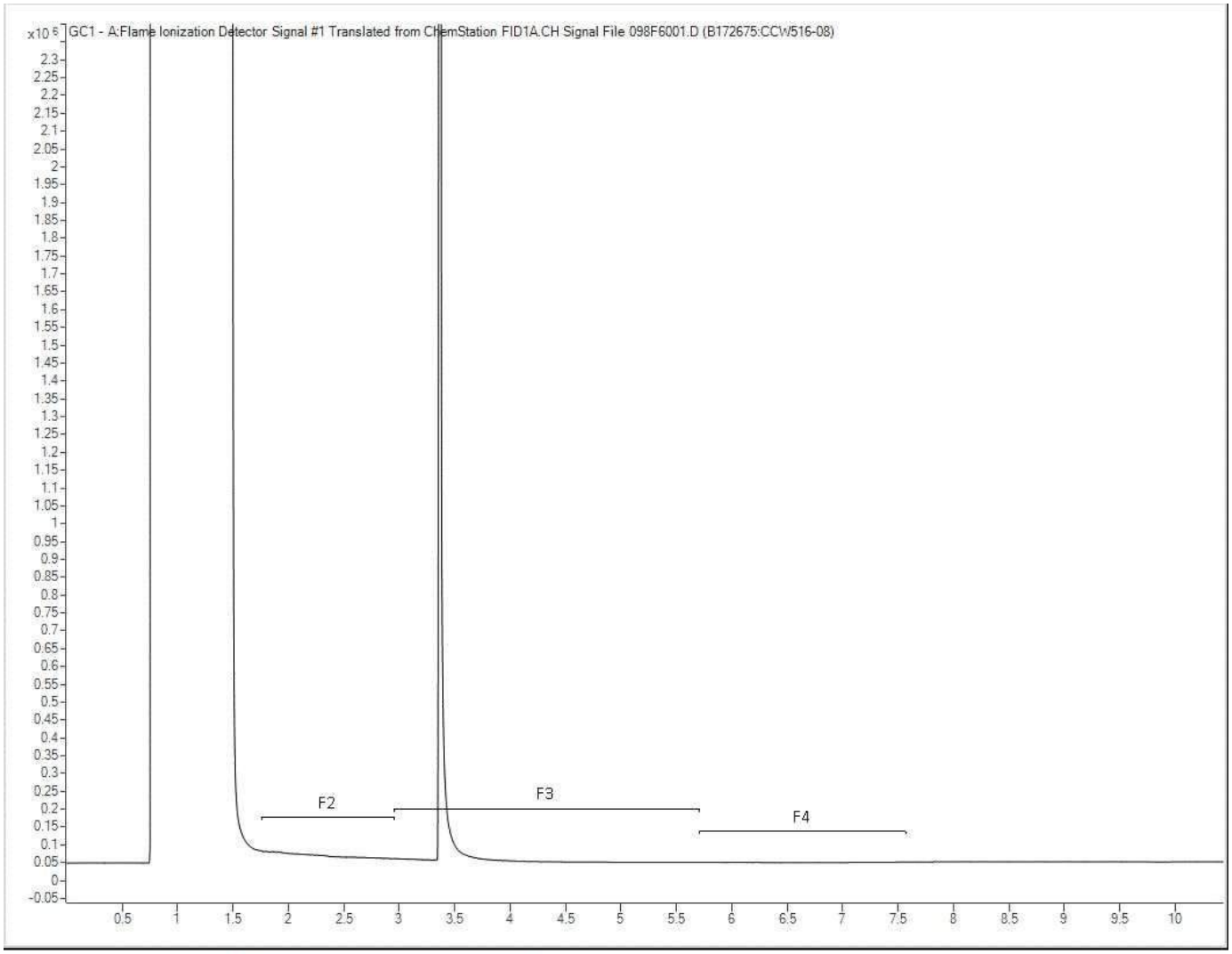


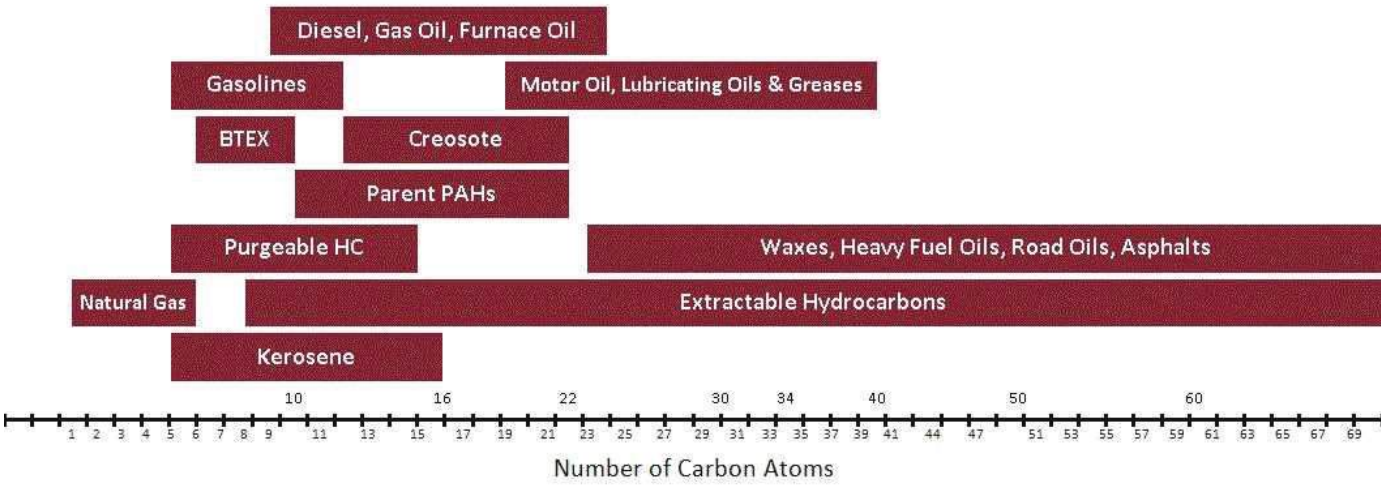
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C386944
Report Date: 2023/11/05
Bureau Veritas Sample: CCW516

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Reference: SRI
Client ID: 23-11

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





Hpchem10\HPchem\1\DATA\2023\10\RUN1027

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 110773396
Site Location: SR1
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/07
Report #: R3423226
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C387360
Received: 2023/10/26, 18:57

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2023/11/04	AB SOP-00005	SM 24 2320 B m
Alkalinity @25C (pp, total), CO3,HCO3,OH	4	N/A	2023/11/05	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	5	N/A	2023/11/01	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	5	N/A	2023/11/01		Auto Calc
Cadmium - low level CCME - Dissolved	5	N/A	2023/11/01		Auto Calc
Chloride/Sulphate by Auto Colourimetry	5	N/A	2023/10/31	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	5	2023/10/27	2023/10/28	AB SOP-00089	SM 23 9223 A,B m
Total Coliforms and E.Coli	5	2023/10/27	2023/10/28	AB SOP-00089	SM 23 9223 A,B m
Carbon (DOC) -Lab Filtered (1)	5	N/A	2023/11/01	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	1	N/A	2023/11/04	AB SOP-00005	SM 24 2510 B m
Conductivity @25C	4	N/A	2023/11/05	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	5	2023/10/30	2023/10/31	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	5	N/A	2023/11/05		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	5	2023/11/01	2023/11/02	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	1	2023/10/27	2023/10/31	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	4	2023/10/27	2023/11/01	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (3)	5	N/A	2023/11/03	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	4	N/A	2023/10/31	AB SOP-00043	EPA 6020b R2 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	1	N/A	2023/11/01	AB SOP-00043	EPA 6020b R2 m
Ion Balance	5	N/A	2023/11/06		Auto Calc
Sum of cations, anions	5	N/A	2023/11/05		Auto Calc
Ammonia-N (Total)	4	N/A	2023/10/29	AB SOP-00007	SM 24 4500 NH3 A G m
Ammonia-N (Total)	1	N/A	2023/11/07	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	5	N/A	2023/11/01		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	5	N/A	2023/10/31	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	5	2023/10/31	2023/11/01		Auto Calc
pH @25°C (5)	1	N/A	2023/11/04	AB SOP-00005	SM 24 4500-H+B m
pH @25°C (5)	4	N/A	2023/11/05	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (6)	5	N/A	2023/10/31	AB SOP-00025	SM 24 4500-P A,F m
Heterotrophic Plate Count	5	2023/10/27	2023/10/29	CAL SOP-00012	SM 23 9215 A & B m
Total Dissolved Solids (Calculated)	5	N/A	2023/11/06		Auto Calc

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Site Location: SR1
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/07
Report #: R3423226
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C387360
Received: 2023/10/26, 18:57

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Kjeldahl Nitrogen (Total)	5	N/A	2023/11/01	BBY WI-00033	Auto Calc
Nitrogen (Total)	4	2023/10/31	2023/10/31	AB SOP-00093	SM 24 4500-N C m
Nitrogen (Total)	1	2023/11/07	2023/11/07	AB SOP-00093	SM 24 4500-N C m
Total Phosphorus-Dissolved-Lab Filtered (7)	5	2023/11/01	2023/11/02	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Site Location: SR1
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/07
Report #: R3423226
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C387360

Received: 2023/10/26, 18:57

(7) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Encryption Key



Bureau Veritas
07 Nov 2023 18:05:28

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (780)577-7173

==========

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Bureau Veritas Job #: C387360
Report Date: 2023/11/07

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CCY427		CCY428		CCY429		CCY430			
Sampling Date		2023/10/26 14:26		2023/10/26 17:30		2023/10/26 08:58		2023/10/26 08:48			
COC Number		1/1		1/1		1/1		1/1			
	UNITS	SW35R4-1	MU	NE20R3-2	MU	MW21-6-12	MU	MW21-6-7	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B174466
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175215
Toluene	mg/L	<0.00040	N/A	0.0031	+/- 0.00052	<0.00040	N/A	<0.00040	N/A	0.00040	B175215
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175215
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B175215
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175215
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B172943
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B172943
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B175215
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	101	N/A	102	N/A	101	N/A	101	N/A	N/A	B175215
4-Bromofluorobenzene (sur.)	%	103	N/A	103	N/A	102	N/A	102	N/A	N/A	B175215
D4-1,2-Dichloroethane (sur.)	%	109	N/A	111	N/A	109	N/A	110	N/A	N/A	B175215
O-TERPHENYL (sur.)	%	100	N/A	101	N/A	94	N/A	101	N/A	N/A	B174466

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C387360
Report Date: 2023/11/07

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CCY431			
Sampling Date		2023/10/26 15:14			
COC Number		1/1			
	UNITS	MW21-3-15	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	0.10	B174466
Volatiles					
Benzene	mg/L	<0.00040	N/A	0.00040	B175215
Toluene	mg/L	<0.00040	N/A	0.00040	B175215
Ethylbenzene	mg/L	<0.00040	N/A	0.00040	B175215
m & p-Xylene	mg/L	<0.00080	N/A	0.00080	B175215
o-Xylene	mg/L	<0.00040	N/A	0.00040	B175215
Xylenes (Total)	mg/L	<0.00089	N/A	0.00089	B172943
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	0.10	B172943
F1 (C6-C10)	mg/L	<0.10	N/A	0.10	B175215
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	102	N/A	N/A	B175215
4-Bromofluorobenzene (sur.)	%	103	N/A	N/A	B175215
D4-1,2-Dichloroethane (sur.)	%	110	N/A	N/A	B175215
O-TERPHENYL (sur.)	%	101	N/A	N/A	B174466

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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCY427		CCY427			
Sampling Date		2023/10/26 14:26		2023/10/26 14:26			
COC Number		1/1		1/1			
	UNITS	SW35R4-1	MU	SW35R4-1 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	15	N/A	N/A	N/A	N/A	B172850
Cation Sum	meq/L	18	N/A	N/A	N/A	N/A	B172850
Hardness (CaCO3)	mg/L	96	N/A	N/A	N/A	0.50	B172945
Ion Balance (% Difference)	%	9.0	N/A	N/A	N/A	N/A	B172842
Nitrate (N)	mg/L	1.5	N/A	N/A	N/A	0.050	B178446
Nitrate (NO3)	mg/L	6.7	N/A	N/A	N/A	0.22	B172951
Nitrite (NO2)	mg/L	0.068	N/A	N/A	N/A	0.033	B172951
Calculated Total Dissolved Solids	mg/L	940	N/A	N/A	N/A	10	B172851
Elements							
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	N/A	N/A	0.020	B172716
Misc. Inorganics							
Conductivity	uS/cm	1400	+/- 38	N/A	N/A	2.0	B180656
pH	pH	8.67	+/- 0.0859	N/A	N/A	N/A	B180657
Anions							
Alkalinity (PP as CaCO3)	mg/L	38	+/- 2.9	N/A	N/A	1.0	B180653
Alkalinity (Total as CaCO3)	mg/L	580	+/- 43	N/A	N/A	1.0	B180653
Bicarbonate (HCO3)	mg/L	610	+/- 9.3	N/A	N/A	1.0	B180653
Carbonate (CO3)	mg/L	46	N/A	N/A	N/A	1.0	B180653
Hydroxide (OH)	mg/L	<1.0	N/A	N/A	N/A	1.0	B180653
Chloride (Cl)	mg/L	4.6	+/- 1.2	N/A	N/A	1.0	B178813
Sulphate (SO4)	mg/L	170	+/- 11	N/A	N/A	5.0	B178813
Nutrients							
Nitrite (N)	mg/L	0.021	+/- <RDL	N/A	N/A	0.010	B178467
Nitrate plus Nitrite (N)	mg/L	1.5	+/- 0.13	N/A	N/A	0.050	B178467
Lab Filtered Elements							
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	<0.0030	N/A	0.0030	B178520
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	<0.00060	N/A	0.00060	B178520
Dissolved Arsenic (As)	mg/L	0.00049	+/- <RDL	0.00055	+/- <RDL	0.00020	B178520
Dissolved Barium (Ba)	mg/L	0.026	+/- <RDL	N/A	N/A	0.010	B179151

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCY427		CCY427			
Sampling Date		2023/10/26 14:26		2023/10/26 14:26			
COC Number		1/1		1/1			
	UNITS	SW35R4-1	MU	SW35R4-1 Lab-Dup	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	B178520
Dissolved Boron (B)	mg/L	0.085	+/- <RDL	N/A	N/A	0.020	B179151
Dissolved Calcium (Ca)	mg/L	24	+/- 2.5	N/A	N/A	0.30	B179151
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	B178520
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	<0.00030	N/A	0.00030	B178520
Dissolved Copper (Cu)	mg/L	0.0034	+/- 0.0010	0.0034	+/- 0.0010	0.0010	B178520
Dissolved Iron (Fe)	mg/L	<0.060	N/A	N/A	N/A	0.060	B179151
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	<0.00020	N/A	0.00020	B178520
Dissolved Lithium (Li)	mg/L	0.096	+/- <RDL	N/A	N/A	0.020	B179151
Dissolved Magnesium (Mg)	mg/L	8.6	+/- 0.56	N/A	N/A	0.20	B179151
Dissolved Manganese (Mn)	mg/L	0.011	+/- <RDL	N/A	N/A	0.0040	B179151
Dissolved Molybdenum (Mo)	mg/L	0.0047	+/- 0.0012	0.0048	+/- 0.0012	0.00020	B178520
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	<0.00050	N/A	0.00050	B178520
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	N/A	N/A	0.10	B179151
Dissolved Potassium (K)	mg/L	3.3	+/- <RDL	N/A	N/A	0.30	B179151
Dissolved Selenium (Se)	mg/L	0.0018	+/- <RDL	0.0018	+/- <RDL	0.00020	B178520
Dissolved Silicon (Si)	mg/L	3.5	+/- 0.67	N/A	N/A	0.50	B179151
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	<0.00010	N/A	0.00010	B178520
Dissolved Sodium (Na)	mg/L	380	+/- 37	N/A	N/A	0.50	B179151
Dissolved Strontium (Sr)	mg/L	0.35	+/- 0.034	N/A	N/A	0.020	B179151
Dissolved Sulphur (S)	mg/L	65	+/- 4.3	N/A	N/A	0.20	B179151
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	<0.00020	N/A	0.00020	B178520
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	B178520
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	B178520
Dissolved Uranium (U)	mg/L	0.00057	+/- <RDL	0.00056	+/- <RDL	0.00010	B178520
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	B178520
Dissolved Zinc (Zn)	mg/L	0.020	+/- <RDL	0.020	+/- <RDL	0.0030	B178520

RDL = Reportable Detection Limit
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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCY428			CCY429			
Sampling Date		2023/10/26 17:30			2023/10/26 08:58			
COC Number		1/1			1/1			
	UNITS	NE20R3-2	MU	QC Batch	MW21-6-12	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	15	N/A	B172850	15	N/A	N/A	B172850
Cation Sum	meq/L	21	N/A	B172850	21	N/A	N/A	B172850
Hardness (CaCO3)	mg/L	680	N/A	B172945	410	N/A	0.50	B172945
Ion Balance (% Difference)	%	15	N/A	B172842	15	N/A	N/A	B172842
Nitrate (N)	mg/L	0.15	N/A	B178446	<0.010	N/A	0.010	B178446
Nitrate (NO3)	mg/L	0.65	N/A	B172951	<0.044	N/A	0.044	B172951
Nitrite (NO2)	mg/L	<0.033	N/A	B172951	<0.033	N/A	0.033	B172951
Calculated Total Dissolved Solids	mg/L	960	N/A	B172851	990	N/A	10	B172851
Elements								
Dissolved Cadmium (Cd)	ug/L	0.093	+/- 0.040	B172716	0.034	+/- 0.020	0.020	B172716
Misc. Inorganics								
Conductivity	uS/cm	1400	+/- 37	B180656	1400	+/- 38	2.0	B180686
pH	pH	8.12	+/- 0.0805	B180657	8.25	+/- 0.0818	N/A	B180688
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	B180653	<1.0	N/A	1.0	B180684
Alkalinity (Total as CaCO3)	mg/L	390	+/- 29	B180653	440	+/- 33	1.0	B180684
Bicarbonate (HCO3)	mg/L	480	+/- 7.4	B180653	540	+/- 8.3	1.0	B180684
Carbonate (CO3)	mg/L	<1.0	N/A	B180653	<1.0	N/A	1.0	B180684
Hydroxide (OH)	mg/L	<1.0	N/A	B180653	<1.0	N/A	1.0	B180684
Chloride (Cl)	mg/L	49	+/- 3.9	B178813	52	+/- 4.2	1.0	B178813
Sulphate (SO4)	mg/L	290	+/- 19	B178813	240	+/- 15	5.0	B178813
Nutrients								
Nitrite (N)	mg/L	<0.010	N/A	B178467	<0.010	N/A	0.010	B178467
Nitrate plus Nitrite (N)	mg/L	0.15	+/- 0.019	B178467	<0.010	N/A	0.010	B178467
Lab Filtered Elements								
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	B178520	<0.0030	N/A	0.0030	B178520
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	B178520	<0.00060	N/A	0.00060	B178520
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	B178520	0.00059	+/- <RDL	0.00020	B178520
Dissolved Barium (Ba)	mg/L	0.018	+/- <RDL	B179151	0.016	+/- <RDL	0.010	B179151
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	B178520	<0.0010	N/A	0.0010	B178520

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCY428			CCY429			
Sampling Date		2023/10/26 17:30			2023/10/26 08:58			
COC Number		1/1			1/1			
	UNITS	NE20R3-2	MU	QC Batch	MW21-6-12	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.059	+/- <RDL	B179151	0.23	+/- 0.023	0.020	B179151
Dissolved Calcium (Ca)	mg/L	150	+/- 15	B179151	110	+/- 11	0.30	B179151
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	B178520	0.00044	+/- <RDL	0.00030	B178520
Dissolved Copper (Cu)	mg/L	0.0028	+/- <RDL	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Iron (Fe)	mg/L	<0.060	N/A	B179151	<0.060	N/A	0.060	B179151
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	B178520	<0.00020	N/A	0.00020	B178520
Dissolved Lithium (Li)	mg/L	0.059	+/- <RDL	B179151	0.056	+/- <RDL	0.020	B179151
Dissolved Magnesium (Mg)	mg/L	77	+/- 4.9	B179151	35	+/- 2.2	0.20	B179151
Dissolved Manganese (Mn)	mg/L	0.066	+/- 0.0047	B179151	0.084	+/- 0.0059	0.0040	B179151
Dissolved Molybdenum (Mo)	mg/L	0.00088	+/- 0.00032	B178520	0.0010	+/- 0.00035	0.00020	B178520
Dissolved Nickel (Ni)	mg/L	0.0026	+/- <RDL	B178520	0.0019	+/- <RDL	0.00050	B178520
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	B179151	<0.10	N/A	0.10	B179151
Dissolved Potassium (K)	mg/L	7.2	+/- 0.37	B179151	5.1	+/- <RDL	0.30	B179151
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	B178520	<0.00020	N/A	0.00020	B178520
Dissolved Silicon (Si)	mg/L	4.7	+/- 0.90	B179151	4.9	+/- 0.94	0.50	B179151
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	B178520	<0.00010	N/A	0.00010	B178520
Dissolved Sodium (Na)	mg/L	160	+/- 15	B179151	280	+/- 28	0.50	B179151
Dissolved Strontium (Sr)	mg/L	1.8	+/- 0.17	B179151	1.7	+/- 0.16	0.020	B179151
Dissolved Sulphur (S)	mg/L	110	+/- 7.6	B179151	89	+/- 5.9	0.20	B179151
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	B178520	<0.00020	N/A	0.00020	B178520
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Uranium (U)	mg/L	0.0026	+/- 0.00025	B178520	0.0064	+/- 0.00058	0.00010	B178520
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Zinc (Zn)	mg/L	0.066	+/- 0.0059	B178520	<0.0030	N/A	0.0030	B178520

RDL = Reportable Detection Limit
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Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCY430		CCY431			
Sampling Date		2023/10/26 08:48		2023/10/26 15:14			
COC Number		1/1		1/1			
	UNITS	MW21-6-7	MU	MW21-3-15	MU	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	15	N/A	14	N/A	N/A	B172850
Cation Sum	meq/L	22	N/A	16	N/A	N/A	B172850
Hardness (CaCO3)	mg/L	460	N/A	16	N/A	0.50	B172945
Ion Balance (% Difference)	%	17	N/A	7.3	N/A	N/A	B172842
Nitrate (N)	mg/L	0.013	N/A	<0.010	N/A	0.010	B178446
Nitrate (NO3)	mg/L	0.056	N/A	<0.044	N/A	0.044	B172951
Nitrite (NO2)	mg/L	<0.033	N/A	<0.033	N/A	0.033	B172951
Calculated Total Dissolved Solids	mg/L	1000	N/A	840	N/A	10	B172851
Elements							
Dissolved Cadmium (Cd)	ug/L	0.032	+/- <RDL	<0.020	N/A	0.020	B172716
Misc. Inorganics							
Conductivity	uS/cm	1400	+/- 38	1300	+/- 34	2.0	B180656
pH	pH	8.16	+/- 0.0808	8.66	+/- 0.0858	N/A	B180657
Anions							
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	23	+/- 1.7	1.0	B180653
Alkalinity (Total as CaCO3)	mg/L	460	+/- 34	500	+/- 37	1.0	B180653
Bicarbonate (HCO3)	mg/L	570	+/- 8.7	560	+/- 8.6	1.0	B180653
Carbonate (CO3)	mg/L	<1.0	N/A	28	N/A	1.0	B180653
Hydroxide (OH)	mg/L	<1.0	N/A	<1.0	N/A	1.0	B180653
Chloride (Cl)	mg/L	32	+/- 2.8	1.4	+/- 1.2	1.0	B178813
Sulphate (SO4)	mg/L	250	+/- 16	170	+/- 11	5.0	B178813
Nutrients							
Nitrite (N)	mg/L	<0.010	N/A	<0.010	N/A	0.010	B178467
Nitrate plus Nitrite (N)	mg/L	0.013	+/- 0.012	<0.010	N/A	0.010	B178467
Lab Filtered Elements							
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.22	+/- 0.052	0.0030	B178520
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	<0.00060	N/A	0.00060	B178520
Dissolved Arsenic (As)	mg/L	0.00021	+/- <RDL	0.0019	+/- 0.00022	0.00020	B178520
Dissolved Barium (Ba)	mg/L	0.027	+/- <RDL	0.021	+/- <RDL	0.010	B179151
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	B178520

RDL = Reportable Detection Limit
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CCY430		CCY431			
Sampling Date		2023/10/26 08:48		2023/10/26 15:14			
COC Number		1/1		1/1			
	UNITS	MW21-6-7	MU	MW21-3-15	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.21	+/- 0.022	0.22	+/- 0.023	0.020	B179151
Dissolved Calcium (Ca)	mg/L	120	+/- 12	5.8	+/- 0.60	0.30	B179151
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	B178520
Dissolved Cobalt (Co)	mg/L	0.00053	+/- <RDL	<0.00030	N/A	0.00030	B178520
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0013	+/- <RDL	0.0010	B178520
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.13	+/- <RDL	0.060	B179151
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	<0.00020	N/A	0.00020	B178520
Dissolved Lithium (Li)	mg/L	0.046	+/- <RDL	0.038	+/- <RDL	0.020	B179151
Dissolved Magnesium (Mg)	mg/L	38	+/- 2.5	0.48	+/- <RDL	0.20	B179151
Dissolved Manganese (Mn)	mg/L	0.22	+/- 0.015	0.0041	+/- <RDL	0.0040	B179151
Dissolved Molybdenum (Mo)	mg/L	0.0012	+/- 0.00038	0.0026	+/- 0.00068	0.00020	B178520
Dissolved Nickel (Ni)	mg/L	0.0024	+/- <RDL	0.00080	+/- <RDL	0.00050	B178520
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	<0.10	N/A	0.10	B179151
Dissolved Potassium (K)	mg/L	5.5	+/- 0.30	0.73	+/- <RDL	0.30	B179151
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00041	+/- <RDL	0.00020	B178520
Dissolved Silicon (Si)	mg/L	5.3	+/- 1.0	4.2	+/- 0.80	0.50	B179151
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	<0.00010	N/A	0.00010	B178520
Dissolved Sodium (Na)	mg/L	280	+/- 28	360	+/- 35	0.50	B179151
Dissolved Strontium (Sr)	mg/L	1.2	+/- 0.11	0.066	+/- <RDL	0.020	B179151
Dissolved Sulphur (S)	mg/L	88	+/- 5.9	60	+/- 4.0	0.20	B179151
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	<0.00020	N/A	0.00020	B178520
Dissolved Tin (Sn)	mg/L	0.0017	+/- <RDL	<0.0010	N/A	0.0010	B178520
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0078	+/- 0.0022	0.0010	B178520
Dissolved Uranium (U)	mg/L	0.0081	+/- 0.00073	0.00078	+/- <RDL	0.00010	B178520
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0018	+/- <RDL	0.0010	B178520
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	<0.0030	N/A	0.0030	B178520

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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Bureau Veritas Job #: C387360
Report Date: 2023/11/07

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CCY427				CCY428		CCY429			
Sampling Date		2023/10/26 14:26				2023/10/26 17:30		2023/10/26 08:58			
COC Number		1/1				1/1		1/1			
	UNITS	SW35R4-1	MU	RDL	QC Batch	NE20R3-2	MU	MW21-6-12	MU	RDL	QC Batch
Calculated Parameters											
Total Kjeldahl Nitrogen (Calc)	mg/L	0.29	N/A	0.20	B180607	0.614	N/A	0.243	N/A	0.020	B180607
Nutrients											
Total Nitrogen (N)	mg/L	1.8 (1)	+/- 0.27	0.20	B188318	0.76	+/- 0.12	0.24	+/- 0.051	0.020	B178608

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CCY430			CCY431			
Sampling Date		2023/10/26 08:48			2023/10/26 15:14			
COC Number		1/1			1/1			
	UNITS	MW21-6-7	MU	RDL	MW21-3-15	MU	RDL	QC Batch
Calculated Parameters								
Total Kjeldahl Nitrogen (Calc)	mg/L	8.2	N/A	1.0	<0.40	N/A	0.40	B180607
Nutrients								
Total Nitrogen (N)	mg/L	8.2	+/- 1.2	1.0	<0.40 (1)	N/A	0.40	B178608

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
Nitrogen < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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Bureau Veritas Job #: C387360
Report Date: 2023/11/07

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCY427		CCY427			CCY428			
Sampling Date		2023/10/26 14:26		2023/10/26 14:26			2023/10/26 17:30			
COC Number		1/1		1/1			1/1			
	UNITS	SW35R4-1	MU	SW35R4-1 Lab-Dup	MU	QC Batch	NE20R3-2	MU	RDL	QC Batch
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	1.2 (1)	+/- <RDL	N/A	N/A	B179338	2.0 (1)	+/- <RDL	0.50	B179338
Microbiological Param.										
E.Coli DST	MPN/100mL	<1.0	N/A	<1.0	N/A	B174068	<1.0	N/A	1.0	B174068
Fecal Coliforms	MPN/100mL	<1.0	N/A	N/A	N/A	B174081	<1.0	N/A	1.0	B174081
Heterotrophic Plate Count	CFU/mL	26	N/A	22	N/A	B174434	16	N/A	1.0	B174434
Total Coliforms DST	MPN/100mL	<1.0	N/A	<1.0	N/A	B174068	<1.0	N/A	1.0	B174068
Nutrients										
Total Ammonia (N)	mg/L	0.19	+/- 0.024	0.19	+/- 0.023	B189069	0.65	+/- 0.071	0.015	B175473
Orthophosphate (P)	mg/L	0.0086	+/- 0.0036	N/A	N/A	B178203	<0.0030	N/A	0.0030	B178203
Lab Filtered Nutrients										
Dissolved Phosphorus (P)	mg/L	0.0060 (2)	+/- 0.0048	N/A	N/A	B179677	<0.0030 (1)	N/A	0.0030	B179677

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Sample filtered and preserved past method specified hold time
(2) Sample filtered and preserved past method specified hold time Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCY428				CCY429		CCY429			
Sampling Date		2023/10/26 17:30				2023/10/26 08:58		2023/10/26 08:58			
COC Number		1/1				1/1		1/1			
	UNITS	NE20R3-2 Lab-Dup	MU	RDL	QC Batch	MW21-6-12	MU	MW21-6-12 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Inorganics											
Dissolved Organic Carbon (C)	mg/L	N/A	N/A	0.50	B179338	2.6 (1)	+/- <RDL	N/A	N/A	0.50	B179338
Microbiological Param.											
E.Coli DST	MPN/100mL	N/A	N/A	1.0	B174068	<100 (2)	N/A	N/A	N/A	100	B174068
Fecal Coliforms	MPN/100mL	<1.0	N/A	1.0	B174081	<1.0	N/A	N/A	N/A	1.0	B174081
Heterotrophic Plate Count	CFU/mL	N/A	N/A	1.0	B174434	47 (3)	N/A	N/A	N/A	1.0	B174434
Total Coliforms DST	MPN/100mL	N/A	N/A	1.0	B174068	<100 (2)	N/A	N/A	N/A	100	B174068
Nutrients											
Total Ammonia (N)	mg/L	N/A	N/A	0.015	B175473	0.13	+/- 0.018	N/A	N/A	0.015	B175474
Orthophosphate (P)	mg/L	N/A	N/A	0.0030	B178203	<0.0030	N/A	N/A	N/A	0.0030	B178203
Lab Filtered Nutrients											
Dissolved Phosphorus (P)	mg/L	N/A	N/A	0.0030	B179677	<0.0030 (1)	N/A	<0.0030	N/A	0.0030	B179677

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Sample filtered and preserved past method specified hold time
(2) Detection limit raised due to matrix interference.
(3) Sample analyzed over hold time. Sample analysis is recommended within 24 hours of sampling.

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STANTEC CONSULTING LTD
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Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CCY430			CCY431			
Sampling Date		2023/10/26 08:48			2023/10/26 15:14			
COC Number		1/1			1/1			
	UNITS	MW21-6-7	MU	RDL	MW21-3-15	MU	RDL	QC Batch
Lab Filtered Inorganics								
Dissolved Organic Carbon (C)	mg/L	3.4 (1)	+/- 0.56	0.50	1.9 (1)	+/- <RDL	0.50	B179338
Microbiological Param.								
E.Coli DST	MPN/100mL	<100 (2)	N/A	100	<10 (2)	N/A	10	B174068
Fecal Coliforms	MPN/100mL	<100 (2)	N/A	100	<10 (2)	N/A	10	B174081
Heterotrophic Plate Count	CFU/mL	1100 (3)	N/A	20	>6000	N/A	1.0	B174434
Total Coliforms DST	MPN/100mL	<100 (2)	N/A	100	<10 (2)	N/A	10	B174068
Nutrients								
Total Ammonia (N)	mg/L	0.061	+/- <RDL	0.015	0.33	+/- 0.038	0.015	B175474
Orthophosphate (P)	mg/L	0.0034	+/- 0.0034	0.0030	0.026	+/- 0.0048	0.0030	B178203
Lab Filtered Nutrients								
Dissolved Phosphorus (P)	mg/L	<0.0030 (4)	N/A	0.0030	0.027 (1)	+/- 0.0054	0.0030	B179677

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Sample filtered and preserved past method specified hold time
(2) Detection limit raised due to matrix interference.
(3) Sample analyzed over hold time. Sample analysis is recommended within 24 hours of sampling.
Detection limit raised due to matrix interference
(4) Sample filtered and preserved past method specified hold time Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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Bureau Veritas Job #: C387360
Report Date: 2023/11/07

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID		CCY427		CCY427		CCY428		CCY429			
Sampling Date		2023/10/26 14:26		2023/10/26 14:26		2023/10/26 17:30		2023/10/26 08:58			
COC Number		1/1		1/1		1/1		1/1			
	UNITS	SW35R4-1	MU	SW35R4-1 Lab-Dup	MU	NE20R3-2	MU	MW21-6-12	MU	RDL	QC Batch
Elements											
Total Mercury (Hg)	ug/L	<0.0019	N/A	<0.0019	N/A	0.0056	+/- 0.0020	<0.0019	N/A	0.0019	B178964
Lab Filtered Elements											
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	N/A	N/A	<0.0019	N/A	<0.0019	N/A	0.0019	B179471

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CCY430		CCY430				CCY431			
Sampling Date		2023/10/26 08:48		2023/10/26 08:48				2023/10/26 15:14			
COC Number		1/1		1/1				1/1			
	UNITS	MW21-6-7	MU	MW21-6-7 Lab-Dup	MU	RDL	QC Batch	MW21-3-15	MU	RDL	QC Batch
Elements											
Total Mercury (Hg)	ug/L	0.375	+/- 0.064	N/A	N/A	0.019	B178032	0.0334	+/- 0.0060	0.0019	B178964
Lab Filtered Elements											
Dissolved Mercury (Hg)	ug/L	0.0021	+/- 1.17	<0.0019	N/A	0.0019	B179471	0.0024	+/- 1.17	0.0019	B179471

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	3.3°C

Sample CCY427 [SW35R4-1] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes. NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CCY428 [NE20R3-2] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes. NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CCY429 [MW21-6-12] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes. NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CCY430 [MW21-6-7] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes. NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CCY431 [MW21-3-15] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes. NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes.

MERCURY BY COLD VAPOR (WATER) Comments

Sample CCY430 [MW21-6-7] Mercury (Total) by CV: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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Bureau Veritas Job #: C387360
Report Date: 2023/11/07

STANTEC CONSULTING LTD
Client Project #: 110773396
Site Location: SR1
Sampler Initials: WT

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B174068	SOG	Method Blank	E.Coli DST	2023/10/28	<1.0		mpn/100mL	
			Total Coliforms DST	2023/10/28	<1.0		mpn/100mL	
B174068	SOG	RPD [CCY427-05]	E.Coli DST	2023/10/28	NC		%	N/A
			Total Coliforms DST	2023/10/28	NC		%	N/A
B174081	SOG	Method Blank	Fecal Coliforms	2023/10/28	<1.0		MPN/100mL	
B174081	SOG	RPD [CCY428-05]	Fecal Coliforms	2023/10/28	NC		%	N/A
B174434	SOG	Method Blank	Heterotrophic Plate Count	2023/10/29	<1.0		CFU/mL	
B174434	SOG	RPD [CCY427-05]	Heterotrophic Plate Count	2023/10/29	17		%	N/A
B174466	BQU	Spiked Blank	O-TERPHENYL (sur.)	2023/10/30		103	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2023/10/30		98	%	60 - 140
B174466	BQU	Method Blank	O-TERPHENYL (sur.)	2023/10/30		101	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2023/10/30	<0.10		mg/L	
B175215	WPK	Matrix Spike	1,4-Difluorobenzene (sur.)	2023/11/01		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/11/01		105	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/11/01		113	%	50 - 140
			Benzene	2023/11/01		104	%	50 - 140
			Toluene	2023/11/01		98	%	50 - 140
			Ethylbenzene	2023/11/01		101	%	50 - 140
			m & p-Xylene	2023/11/01		94	%	50 - 140
			o-Xylene	2023/11/01		95	%	50 - 140
			F1 (C6-C10)	2023/11/01		91	%	60 - 140
B175215	WPK	Spiked Blank	1,4-Difluorobenzene (sur.)	2023/11/01		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/11/01		105	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/11/01		110	%	50 - 140
			Benzene	2023/11/01		106	%	60 - 130
			Toluene	2023/11/01		100	%	60 - 130
			Ethylbenzene	2023/11/01		104	%	60 - 130
			m & p-Xylene	2023/11/01		96	%	60 - 130
			o-Xylene	2023/11/01		97	%	60 - 130
			F1 (C6-C10)	2023/11/01		107	%	60 - 140
B175215	WPK	Method Blank	1,4-Difluorobenzene (sur.)	2023/11/01		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/11/01		104	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/11/01		108	%	50 - 140
			Benzene	2023/11/01	<0.00040		mg/L	
			Toluene	2023/11/01	<0.00040		mg/L	
			Ethylbenzene	2023/11/01	<0.00040		mg/L	
			m & p-Xylene	2023/11/01	<0.00080		mg/L	
			o-Xylene	2023/11/01	<0.00040		mg/L	
			F1 (C6-C10)	2023/11/01	<0.10		mg/L	
B175215	WPK	RPD	Benzene	2023/11/01	NC		%	30
			Toluene	2023/11/01	NC		%	30
			Ethylbenzene	2023/11/01	NC		%	30
			m & p-Xylene	2023/11/01	NC		%	30
			o-Xylene	2023/11/01	NC		%	30
			F1 (C6-C10)	2023/11/01	NC		%	30
B175473	ISW	Matrix Spike	Total Ammonia (N)	2023/10/29		91	%	80 - 120
B175473	ISW	Spiked Blank	Total Ammonia (N)	2023/10/29		100	%	80 - 120
B175473	ISW	Method Blank	Total Ammonia (N)	2023/10/29	<0.015		mg/L	
B175473	ISW	RPD	Total Ammonia (N)	2023/10/29	0.54		%	20
B175474	ISW	Matrix Spike [CCY427-08]	Total Ammonia (N)	2023/10/29		96	%	80 - 120
B175474	ISW	Spiked Blank	Total Ammonia (N)	2023/10/29		100	%	80 - 120
B175474	ISW	Method Blank	Total Ammonia (N)	2023/10/29	<0.015		mg/L	
B178032	KKM	Matrix Spike	Total Mercury (Hg)	2023/10/31		93	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B178032	KKM	Spiked Blank	Total Mercury (Hg)	2023/10/31		92	%	80 - 120
B178032	KKM	Method Blank	Total Mercury (Hg)	2023/10/31	<0.0019		ug/L	
B178032	KKM	RPD	Total Mercury (Hg)	2023/10/31	NC		%	20
B178203	CTU	Matrix Spike	Orthophosphate (P)	2023/10/31		90	%	80 - 120
B178203	CTU	Spiked Blank	Orthophosphate (P)	2023/10/31		99	%	80 - 120
B178203	CTU	Method Blank	Orthophosphate (P)	2023/10/31	<0.0030		mg/L	
B178203	CTU	RPD	Orthophosphate (P)	2023/10/31	4.0		%	20
B178467	AFI	Matrix Spike	Nitrite (N)	2023/10/31		102	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/31		98	%	80 - 120
B178467	AFI	Spiked Blank	Nitrite (N)	2023/10/31		103	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/31		106	%	80 - 120
B178467	AFI	Method Blank	Nitrite (N)	2023/10/31	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2023/10/31	<0.010		mg/L	
B178467	AFI	RPD	Nitrite (N)	2023/10/31	NC		%	20
			Nitrate plus Nitrite (N)	2023/10/31	NC		%	20
B178520	KH2	Matrix Spike [CCY427-01]	Dissolved Aluminum (Al)	2023/11/01		101	%	80 - 120
			Dissolved Antimony (Sb)	2023/11/01		109	%	80 - 120
			Dissolved Arsenic (As)	2023/11/01		105	%	80 - 120
			Dissolved Beryllium (Be)	2023/11/01		98	%	80 - 120
			Dissolved Chromium (Cr)	2023/11/01		98	%	80 - 120
			Dissolved Cobalt (Co)	2023/11/01		96	%	80 - 120
			Dissolved Copper (Cu)	2023/11/01		95	%	80 - 120
			Dissolved Lead (Pb)	2023/11/01		94	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/11/01		104	%	80 - 120
			Dissolved Nickel (Ni)	2023/11/01		95	%	80 - 120
			Dissolved Selenium (Se)	2023/11/01		104	%	80 - 120
			Dissolved Silver (Ag)	2023/11/01		95	%	80 - 120
			Dissolved Thallium (Tl)	2023/11/01		93	%	80 - 120
			Dissolved Tin (Sn)	2023/11/01		102	%	80 - 120
			Dissolved Titanium (Ti)	2023/11/01		100	%	80 - 120
			Dissolved Uranium (U)	2023/11/01		97	%	80 - 120
			Dissolved Vanadium (V)	2023/11/01		101	%	80 - 120
			Dissolved Zinc (Zn)	2023/11/01		101	%	80 - 120
B178520	KH2	Spiked Blank	Dissolved Aluminum (Al)	2023/10/31		116	%	80 - 120
			Dissolved Antimony (Sb)	2023/10/31		109	%	80 - 120
			Dissolved Arsenic (As)	2023/10/31		103	%	80 - 120
			Dissolved Beryllium (Be)	2023/10/31		98	%	80 - 120
			Dissolved Chromium (Cr)	2023/10/31		100	%	80 - 120
			Dissolved Cobalt (Co)	2023/10/31		99	%	80 - 120
			Dissolved Copper (Cu)	2023/10/31		99	%	80 - 120
			Dissolved Lead (Pb)	2023/10/31		98	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/10/31		100	%	80 - 120
			Dissolved Nickel (Ni)	2023/10/31		97	%	80 - 120
			Dissolved Selenium (Se)	2023/10/31		103	%	80 - 120
			Dissolved Silver (Ag)	2023/10/31		96	%	80 - 120
			Dissolved Thallium (Tl)	2023/10/31		96	%	80 - 120
			Dissolved Tin (Sn)	2023/10/31		99	%	80 - 120
			Dissolved Titanium (Ti)	2023/10/31		102	%	80 - 120
			Dissolved Uranium (U)	2023/10/31		97	%	80 - 120
			Dissolved Vanadium (V)	2023/10/31		101	%	80 - 120
			Dissolved Zinc (Zn)	2023/10/31		104	%	80 - 120
B178520	KH2	Method Blank	Dissolved Aluminum (Al)	2023/10/31	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2023/10/31	<0.00060		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Arsenic (As)	2023/10/31	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2023/10/31	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2023/10/31	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2023/10/31	<0.00030		mg/L	
			Dissolved Copper (Cu)	2023/10/31	<0.0010		mg/L	
			Dissolved Lead (Pb)	2023/10/31	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2023/10/31	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2023/10/31	<0.00050		mg/L	
			Dissolved Selenium (Se)	2023/10/31	<0.00020		mg/L	
			Dissolved Silver (Ag)	2023/10/31	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2023/10/31	<0.00020		mg/L	
			Dissolved Tin (Sn)	2023/10/31	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2023/10/31	<0.0010		mg/L	
			Dissolved Uranium (U)	2023/10/31	<0.00010		mg/L	
			Dissolved Vanadium (V)	2023/10/31	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2023/10/31	<0.0030		mg/L	
B178520	KH2	RPD [CCY427-01]	Dissolved Aluminum (Al)	2023/10/31	NC		%	20
			Dissolved Antimony (Sb)	2023/10/31	NC		%	20
			Dissolved Arsenic (As)	2023/10/31	10		%	20
			Dissolved Beryllium (Be)	2023/10/31	NC		%	20
			Dissolved Chromium (Cr)	2023/10/31	NC		%	20
			Dissolved Cobalt (Co)	2023/10/31	NC		%	20
			Dissolved Copper (Cu)	2023/10/31	1.3		%	20
			Dissolved Lead (Pb)	2023/10/31	NC		%	20
			Dissolved Molybdenum (Mo)	2023/10/31	1.5		%	20
			Dissolved Nickel (Ni)	2023/10/31	NC		%	20
			Dissolved Selenium (Se)	2023/10/31	1.9		%	20
			Dissolved Silver (Ag)	2023/10/31	NC		%	20
			Dissolved Thallium (Tl)	2023/10/31	NC		%	20
			Dissolved Tin (Sn)	2023/10/31	NC		%	20
			Dissolved Titanium (Ti)	2023/10/31	NC		%	20
			Dissolved Uranium (U)	2023/10/31	1.9		%	20
			Dissolved Vanadium (V)	2023/10/31	NC		%	20
			Dissolved Zinc (Zn)	2023/10/31	3.2		%	20
B178608	CTU	Matrix Spike	Total Nitrogen (N)	2023/11/01		NC	%	80 - 120
B178608	CTU	QC Standard	Total Nitrogen (N)	2023/10/31		93	%	80 - 120
B178608	CTU	Spiked Blank	Total Nitrogen (N)	2023/10/31		92	%	80 - 120
B178608	CTU	Method Blank	Total Nitrogen (N)	2023/10/31	<0.020		mg/L	
B178608	CTU	RPD	Total Nitrogen (N)	2023/11/01	8.4		%	20
B178813	TOR	Matrix Spike	Chloride (Cl)	2023/10/31		NC	%	80 - 120
			Sulphate (SO4)	2023/10/31		NC	%	80 - 120
B178813	TOR	Spiked Blank	Chloride (Cl)	2023/10/31		100	%	80 - 120
			Sulphate (SO4)	2023/10/31		101	%	80 - 120
B178813	TOR	Method Blank	Chloride (Cl)	2023/10/31	<1.0		mg/L	
			Sulphate (SO4)	2023/10/31	<1.0		mg/L	
B178813	TOR	RPD	Chloride (Cl)	2023/10/31	0.089		%	20
			Sulphate (SO4)	2023/10/31	0.20		%	20
B178964	KKM	Matrix Spike	Total Mercury (Hg)	2023/11/01		98	%	80 - 120
B178964	KKM	Spiked Blank	Total Mercury (Hg)	2023/11/01		97	%	80 - 120
B178964	KKM	Method Blank	Total Mercury (Hg)	2023/11/01	<0.0019		ug/L	
B178964	KKM	RPD [CCY427-09]	Total Mercury (Hg)	2023/11/01	NC		%	20
B179151	HQV	Matrix Spike	Dissolved Barium (Ba)	2023/11/03		88	%	80 - 120
			Dissolved Boron (B)	2023/11/03		NC	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Calcium (Ca)	2023/11/03		NC	%	80 - 120
			Dissolved Iron (Fe)	2023/11/03		107	%	80 - 120
			Dissolved Lithium (Li)	2023/11/03		78 (1)	%	80 - 120
			Dissolved Magnesium (Mg)	2023/11/03		NC	%	80 - 120
			Dissolved Manganese (Mn)	2023/11/03		100	%	80 - 120
			Dissolved Phosphorus (P)	2023/11/03		108	%	80 - 120
			Dissolved Potassium (K)	2023/11/03		98	%	80 - 120
			Dissolved Silicon (Si)	2023/11/03		97	%	80 - 120
			Dissolved Sodium (Na)	2023/11/03		NC	%	80 - 120
			Dissolved Strontium (Sr)	2023/11/03		NC	%	80 - 120
			Dissolved Sulphur (S)	2023/11/03		NC	%	80 - 120
B179151	HQV	Spiked Blank	Dissolved Barium (Ba)	2023/11/03		96	%	80 - 120
			Dissolved Boron (B)	2023/11/03		97	%	80 - 120
			Dissolved Calcium (Ca)	2023/11/03		101	%	80 - 120
			Dissolved Iron (Fe)	2023/11/03		105	%	80 - 120
			Dissolved Lithium (Li)	2023/11/03		90	%	80 - 120
			Dissolved Magnesium (Mg)	2023/11/03		107	%	80 - 120
			Dissolved Manganese (Mn)	2023/11/03		98	%	80 - 120
			Dissolved Phosphorus (P)	2023/11/03		106	%	80 - 120
			Dissolved Potassium (K)	2023/11/03		102	%	80 - 120
			Dissolved Silicon (Si)	2023/11/03		100	%	80 - 120
			Dissolved Sodium (Na)	2023/11/03		102	%	80 - 120
			Dissolved Strontium (Sr)	2023/11/03		95	%	80 - 120
			Dissolved Sulphur (S)	2023/11/03		101	%	80 - 120
B179151	HQV	Method Blank	Dissolved Barium (Ba)	2023/11/03	<0.010		mg/L	
			Dissolved Boron (B)	2023/11/03	<0.020		mg/L	
			Dissolved Calcium (Ca)	2023/11/03	<0.30		mg/L	
			Dissolved Iron (Fe)	2023/11/03	<0.060		mg/L	
			Dissolved Lithium (Li)	2023/11/03	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2023/11/03	<0.20		mg/L	
			Dissolved Manganese (Mn)	2023/11/03	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2023/11/03	<0.10		mg/L	
			Dissolved Potassium (K)	2023/11/03	<0.30		mg/L	
			Dissolved Silicon (Si)	2023/11/03	<0.50		mg/L	
			Dissolved Sodium (Na)	2023/11/03	<0.50		mg/L	
			Dissolved Strontium (Sr)	2023/11/03	<0.020		mg/L	
			Dissolved Sulphur (S)	2023/11/03	<0.20		mg/L	
B179151	HQV	RPD	Dissolved Calcium (Ca)	2023/11/04	0.80		%	20
			Dissolved Iron (Fe)	2023/11/04	NC		%	20
			Dissolved Magnesium (Mg)	2023/11/04	6.4		%	20
			Dissolved Manganese (Mn)	2023/11/04	2.3		%	20
			Dissolved Potassium (K)	2023/11/04	5.8		%	20
			Dissolved Sodium (Na)	2023/11/04	0.91		%	20
B179338	YHK	Matrix Spike	Dissolved Organic Carbon (C)	2023/11/01		91	%	80 - 120
B179338	YHK	Spiked Blank	Dissolved Organic Carbon (C)	2023/11/01		104	%	80 - 120
B179338	YHK	Method Blank	Dissolved Organic Carbon (C)	2023/11/01	<0.50		mg/L	
B179338	YHK	RPD	Dissolved Organic Carbon (C)	2023/11/01	2.0		%	20
B179471	KKM	Matrix Spike [CCY429-10]	Dissolved Mercury (Hg)	2023/11/02		95	%	80 - 120
B179471	KKM	Spiked Blank	Dissolved Mercury (Hg)	2023/11/02		97	%	80 - 120
B179471	KKM	Method Blank	Dissolved Mercury (Hg)	2023/11/02	<0.0019		ug/L	
B179471	KKM	RPD [CCY430-10]	Dissolved Mercury (Hg)	2023/11/02	11		%	20
B179677	MAP	Matrix Spike [CCY431-01]	Dissolved Phosphorus (P)	2023/11/02		117	%	80 - 120
B179677	MAP	QC Standard	Dissolved Phosphorus (P)	2023/11/02		91	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B179677	MAP	Spiked Blank	Dissolved Phosphorus (P)	2023/11/02		101	%	80 - 120
B179677	MAP	Method Blank	Dissolved Phosphorus (P)	2023/11/02	<0.0030		mg/L	
B179677	MAP	RPD [CCY429-01]	Dissolved Phosphorus (P)	2023/11/02	NC		%	20
B180653	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/05		95	%	80 - 120
B180653	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/11/05	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/05	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/05	<1.0		mg/L	
			Carbonate (CO3)	2023/11/05	<1.0		mg/L	
			Hydroxide (OH)	2023/11/05	<1.0		mg/L	
B180653	JVM	RPD	Alkalinity (PP as CaCO3)	2023/11/05	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/05	NC		%	20
			Bicarbonate (HCO3)	2023/11/05	NC		%	20
			Carbonate (CO3)	2023/11/05	NC		%	20
			Hydroxide (OH)	2023/11/05	NC		%	20
B180656	JVM	Spiked Blank	Conductivity	2023/11/05		101	%	90 - 110
B180656	JVM	Method Blank	Conductivity	2023/11/05	<2.0		uS/cm	
B180656	JVM	RPD	Conductivity	2023/11/05	NC		%	10
B180657	JVM	Spiked Blank	pH	2023/11/05		101	%	97 - 103
B180657	JVM	RPD	pH	2023/11/05	1.9		%	N/A
B180684	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/04		96	%	80 - 120
B180684	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/11/04	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/04	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/04	<1.0		mg/L	
			Carbonate (CO3)	2023/11/04	<1.0		mg/L	
			Hydroxide (OH)	2023/11/04	<1.0		mg/L	
B180684	JVM	RPD	Alkalinity (PP as CaCO3)	2023/11/04	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/04	0.74		%	20
			Bicarbonate (HCO3)	2023/11/04	0.74		%	20
			Carbonate (CO3)	2023/11/04	NC		%	20
			Hydroxide (OH)	2023/11/04	NC		%	20
B180686	JVM	Spiked Blank	Conductivity	2023/11/04		101	%	90 - 110
B180686	JVM	Method Blank	Conductivity	2023/11/04	<2.0		uS/cm	
B180686	JVM	RPD	Conductivity	2023/11/04	2.0		%	10
B180688	JVM	Spiked Blank	pH	2023/11/04		101	%	97 - 103
B180688	JVM	RPD	pH	2023/11/04	0.64		%	N/A
B188318	MAP	Matrix Spike	Total Nitrogen (N)	2023/11/07		NC	%	80 - 120
B188318	MAP	QC Standard	Total Nitrogen (N)	2023/11/07		107	%	80 - 120
B188318	MAP	Spiked Blank	Total Nitrogen (N)	2023/11/07		108	%	80 - 120
B188318	MAP	Method Blank	Total Nitrogen (N)	2023/11/07	<0.020		mg/L	
B188318	MAP	RPD	Total Nitrogen (N)	2023/11/07	0.39		%	20
B189069	AFI	Matrix Spike [CCY427-08]	Total Ammonia (N)	2023/11/07		101	%	80 - 120
B189069	AFI	Spiked Blank	Total Ammonia (N)	2023/11/07		101	%	80 - 120
B189069	AFI	Method Blank	Total Ammonia (N)	2023/11/07	<0.015		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B189069	AFI	RPD [CCY427-08]	Total Ammonia (N)	2023/11/07	1.9		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

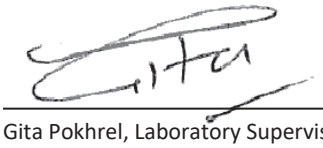
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



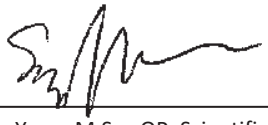
Gita Pokhrel, Laboratory Supervisor



Janet Gao, B.Sc., QP, Supervisor, Organics



Maria Magdalena Florescu, Ph.D., P.Chem., QP, Inorganics Manager



Sandy Yuan, M.Sc., QP, Scientific Specialist



Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist



Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

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CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

C38736

mcal-10-2184

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Project Information	
Company:	Stantec	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	10220 103 Ave Suite # 320	Street Address:		Project #:	110773376
City:	Edmonton Prov: AB Postal Code: T5J 0K4	City:	Prov: Postal Code:	Site #:	
Phone:	780 969 2223	Phone:		Site Location:	SR1
Email:	dylan.king@stantec.com	Email:		Site Location Province:	
Copies:		Copies:		Sampled By:	WT / TH

Regulatory Criteria

☐ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba ☐ Saskatchewan ☐ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT): ☐ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply: ☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F1-F2	7 BTEX F3-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 TKN	14 DOC	15 Texture (%sand, silt, clay)	16 Basic class II landfill	17 Dissolved Phosphorus	18 Phosphate	19 Ammonia	20 Bacteriological *	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE	Comments
1	SW35R4-1	23	10	26	14	06	Water			X			X		X		X	X	X	X	X			X	X	X	X	11		
2	NE20R3-2	23	10	26	17	30	Water			X			X		X		X	X	X	X	X			X	X	X	X	11		
3	MW21-6-12	23	10	26	08	58	Water			X			X		X		X	X	X	X	X			X	X	X	X	11		
4	MW21-6-7	23	10	26	08	48	Water			X			X		X		X	X	X	X	X			X	X	X	X	11		
5	MW21-3-15	23	10	26	15	14	Water			X			X		X		X	X	X	X	X			X	X	X	X	11		
6																														
7																														
8																														
9																														
10																														
11																														
12																														

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C	Temperature reading by:
Seal present		✓	4 2 4 (1 2 3)	
Seal intact		✓		
Cooling media present	✓			

LAB USE ONLY	Yes	No	°C	Temperature reading by:
Seal present			(1 2 3)	
Seal intact				
Cooling media present				

LAB USE ONLY	Yes	No	°C	Temperature reading by:
Seal present			(1 2 3)	
Seal intact				
Cooling media present				

	Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special instructions
1	[signature] / Wes Gay Tsen	23	10	26	18	56	1 N Nirkamal Soni	23	10	26	18	57	* Total coliforms, ecoli, feacal coliforms, heterotrophic plate count
2							2						

Dissolved parameters not field filtered or preserved – please lab filter

Your Project #: 11077396
Site Location: SR1
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/08
Report #: R3423607
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C387774
Received: 2023/10/27, 18:02

Sample Matrix: Water
Samples Received: 13

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	9	N/A	2023/11/04	AB SOP-00005	SM 24 2320 B m
Alkalinity @25C (pp, total), CO3,HCO3,OH	3	N/A	2023/11/05	AB SOP-00005	SM 24 2320 B m
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2023/11/07	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	13	N/A	2023/11/03	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	13	N/A	2023/11/04		Auto Calc
Cadmium - low level CCME - Dissolved	13	N/A	2023/11/01		Auto Calc
Chloride/Sulphate by Auto Colourimetry	1	N/A	2023/11/01	AB SOP-00020	SM24-4500-Cl/SO4-E m
Chloride/Sulphate by Auto Colourimetry	12	N/A	2023/11/02	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	13	2023/10/28	2023/10/29	AB SOP-00089	SM 23 9223 A,B m
Total Coliforms and E.Coli	13	2023/10/28	2023/10/29	AB SOP-00089	SM 23 9223 A,B m
Carbon (DOC) -Lab Filtered (1)	13	N/A	2023/11/01	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	9	N/A	2023/11/04	AB SOP-00005	SM 24 2510 B m
Conductivity @25C	3	N/A	2023/11/05	AB SOP-00005	SM 24 2510 B m
Conductivity @25C	1	N/A	2023/11/07	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	13	2023/11/02	2023/11/03	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	5	N/A	2023/11/02		Auto Calc
Hardness	2	N/A	2023/11/03		Auto Calc
Hardness	6	N/A	2023/11/06		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	3	2023/10/31	2023/10/31	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Dissolved) by CV-Lab Filtered	10	2023/11/01	2023/11/02	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	13	2023/10/31	2023/11/02	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (3)	5	N/A	2023/11/01	AB SOP-00042	EPA 6010d R5 m
Elements by ICP-Dissolved-Lab Filtered (3)	6	N/A	2023/11/02	AB SOP-00042	EPA 6010d R5 m
Elements by ICP-Dissolved-Lab Filtered (3)	2	N/A	2023/11/06	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	13	N/A	2023/10/31	AB SOP-00043	EPA 6020b R2 m
Ion Balance	3	N/A	2023/11/04		Auto Calc
Ion Balance	4	N/A	2023/11/05		Auto Calc
Ion Balance	6	N/A	2023/11/06		Auto Calc
Sum of cations, anions	5	N/A	2023/11/02		Auto Calc
Sum of cations, anions	2	N/A	2023/11/03		Auto Calc
Sum of cations, anions	6	N/A	2023/11/06		Auto Calc

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 11077396
Site Location: SR1
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/08
Report #: R3423607
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C387774
Received: 2023/10/27, 18:02

Sample Matrix: Water
Samples Received: 13

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Ammonia-N (Total)	1	N/A	2023/10/30	AB SOP-00007	SM 24 4500 NH3 A G m
Ammonia-N (Total)	11	N/A	2023/11/01	AB SOP-00007	SM 24 4500 NH3 A G m
Ammonia-N (Total)	1	N/A	2023/11/02	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	13	N/A	2023/10/31		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	13	N/A	2023/10/30	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	13	2023/11/01	2023/11/01		Auto Calc
pH @25°C (5)	9	N/A	2023/11/04	AB SOP-00005	SM 24 4500-H+B m
pH @25°C (5)	4	N/A	2023/11/05	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (6)	13	N/A	2023/10/31	AB SOP-00025	SM 24 4500-P A,F m
Heterotrophic Plate Count	13	2023/10/28	2023/10/30	CAL SOP-00012	SM 23 9215 A & B m
Total Dissolved Solids (Calculated)	3	N/A	2023/11/04		Auto Calc
Total Dissolved Solids (Calculated)	4	N/A	2023/11/05		Auto Calc
Total Dissolved Solids (Calculated)	6	N/A	2023/11/06		Auto Calc
Total Kjeldahl Nitrogen (Total)	12	N/A	2023/11/02	BBY WI-00033	Auto Calc
Total Kjeldahl Nitrogen (Total)	1	N/A	2023/11/03	BBY WI-00033	Auto Calc
Nitrogen (Total)	13	2023/11/02	2023/11/02	AB SOP-00093	SM 24 4500-N C m
Total Phosphorus-Dissolved-Lab Filtered (7)	11	2023/11/01	2023/11/01	AB SOP-00024	SM 24 4500-P A,B,F m
Total Phosphorus-Dissolved-Lab Filtered (7)	2	2023/11/01	2023/11/02	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 11077396
Site Location: SR1
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/11/08
Report #: R3423607
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C387774
Received: 2023/10/27, 18:02

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(7) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Encryption Key



Bureau Veritas
08 Nov 2023 13:41:59

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (780)577-7173

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

Bureau Veritas Job #: C387774
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Location: SR1
Sampler Initials: WT

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CDB047		CDB047		CDB048		CDB049			
Sampling Date		2023/10/27 09:12		2023/10/27 09:12		2023/10/27 08:55		2023/10/27 10:21			
COC Number		1/1		1/1		1/1		1/1			
	UNITS	MW16-8-19	MU	MW16-8-19 Lab-Dup	MU	MW16-8-8	MU	MW16-6-11	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	N/A	N/A	<0.10	N/A	<0.10	N/A	0.10	B175281
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B175388
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
Xylenes (Total)	mg/L	<0.00089	N/A	N/A	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B174700
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	N/A	N/A	<0.10	N/A	<0.10	N/A	0.10	B174700
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B175388
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	99	N/A	99	N/A	98	N/A	98	N/A	N/A	B175388
4-Bromofluorobenzene (sur.)	%	100	N/A	103	N/A	98	N/A	99	N/A	N/A	B175388
D4-1,2-Dichloroethane (sur.)	%	79	N/A	81	N/A	79	N/A	82	N/A	N/A	B175388
O-TERPHENYL (sur.)	%	98	N/A	N/A	N/A	96	N/A	97	N/A	N/A	B175281

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C387774
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Location: SR1
Sampler Initials: WT

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CDB050		CDB051		CDB052		CDB053			
Sampling Date		2023/10/27 10:30		2023/10/27 11:40		2023/10/27 11:45		2023/10/27 12:45			
COC Number		1/1		1/1		1/1		1/1			
	UNITS	MW16-6-20	MU	RMW16-19-10	MU	RMW16-19-19	MU	RMW16-18-5	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B175281
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B175388
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B174700
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B174700
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B175388
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	99	N/A	97	N/A	100	N/A	98	N/A	N/A	B175388
4-Bromofluorobenzene (sur.)	%	97	N/A	101	N/A	97	N/A	102	N/A	N/A	B175388
D4-1,2-Dichloroethane (sur.)	%	81	N/A	78	N/A	83	N/A	78	N/A	N/A	B175388
O-TERPHENYL (sur.)	%	96	N/A	100	N/A	98	N/A	97	N/A	N/A	B175281

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C387774
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Location: SR1
Sampler Initials: WT

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CDB054		CDB055		CDB056		CDB057			
Sampling Date		2023/10/27 12:56		2023/10/27 14:12		2023/10/27 14:30		2023/10/27 14:41			
COC Number		1/1		1/1		1/1		1/1			
	UNITS	RMW16-18-13	MU	MW16-1-15	MU	23-12	MU	23-13	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B175281
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B175388
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B174700
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B174700
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B175388
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	100	N/A	99	N/A	97	N/A	96	N/A	N/A	B175388
4-Bromofluorobenzene (sur.)	%	100	N/A	99	N/A	101	N/A	97	N/A	N/A	B175388
D4-1,2-Dichloroethane (sur.)	%	80	N/A	81	N/A	81	N/A	80	N/A	N/A	B175388
O-TERPHENYL (sur.)	%	98	N/A	97	N/A	98	N/A	99	N/A	N/A	B175281

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C387774
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Location: SR1
Sampler Initials: WT

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CDB058		CDB059			
Sampling Date		2023/10/27 14:58		2023/10/27 15:30			
COC Number		1/1		1/1			
	UNITS	23-14	MU	23-15	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	0.10	B175281
Volatiles							
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	0.00080	B175388
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	0.00040	B175388
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	0.00089	B174700
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	0.10	B174700
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	0.10	B175388
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	104	N/A	103	N/A	N/A	B175388
4-Bromofluorobenzene (sur.)	%	96	N/A	99	N/A	N/A	B175388
D4-1,2-Dichloroethane (sur.)	%	79	N/A	82	N/A	N/A	B175388
O-TERPHENYL (sur.)	%	97	N/A	98	N/A	N/A	B175281

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB047				CDB048			
Sampling Date		2023/10/27 09:12				2023/10/27 08:55			
COC Number		1/1				1/1			
	UNITS	MW16-8-19	MU	RDL	QC Batch	MW16-8-8	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	13	N/A	N/A	B174716	14	N/A	N/A	B174716
Cation Sum	meq/L	17	N/A	N/A	B174716	15	N/A	N/A	B174716
Hardness (CaCO3)	mg/L	710	N/A	0.50	B174712	670	N/A	0.50	B174712
Ion Balance (% Difference)	%	14	N/A	N/A	B174713	6.7	N/A	N/A	B174714
Nitrate (N)	mg/L	0.60	N/A	0.010	B180726	0.31	N/A	0.010	B180726
Nitrate (NO3)	mg/L	2.6	N/A	0.044	B174717	1.4	N/A	0.044	B174717
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B174717	<0.033	N/A	0.033	B174717
Calculated Total Dissolved Solids	mg/L	750	N/A	10	B174718	780	N/A	10	B174718
Elements									
Dissolved Cadmium (Cd)	ug/L	0.028	+/- <RDL	0.020	B174703	0.022	+/- <RDL	0.020	B174704
Misc. Inorganics									
Conductivity	uS/cm	1200	+/- 31	2.0	B180852	1100	+/- 28	2.0	B184523
pH	pH	7.82	+/- 0.0775	N/A	B180854	7.73	+/- 0.0766	N/A	B184522
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B180851	<1.0	N/A	1.0	B184520
Alkalinity (Total as CaCO3)	mg/L	390	+/- 29	1.0	B180851	340	+/- 25	1.0	B184520
Bicarbonate (HCO3)	mg/L	470	+/- 7.3	1.0	B180851	420	+/- 6.5	1.0	B184520
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B180851	<1.0	N/A	1.0	B184520
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B180851	<1.0	N/A	1.0	B184520
Chloride (Cl)	mg/L	110	+/- 8.7	1.0	B182898	66	+/- 5.2	1.0	B182253
Sulphate (SO4)	mg/L	92	+/- 6.1	1.0	B182898	230	+/- 15	5.0	B182253
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B177173	<0.010	N/A	0.010	B177186
Nitrate plus Nitrite (N)	mg/L	0.60	+/- 0.056	0.010	B177173	0.31	+/- 0.032	0.010	B177186
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B178520	<0.0030	N/A	0.0030	B178525
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B178520	0.00068	+/- <RDL	0.00060	B178525
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	0.00020	B178520	<0.00020	N/A	0.00020	B178525
Dissolved Barium (Ba)	mg/L	0.071	+/- <RDL	0.010	B183032	0.050	+/- <RDL	0.010	B180614
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178525

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C387774
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Location: SR1
Sampler Initials: WT

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB047				CDB048			
Sampling Date		2023/10/27 09:12				2023/10/27 08:55			
COC Number		1/1				1/1			
	UNITS	MW16-8-19	MU	RDL	QC Batch	MW16-8-8	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.045	+/- <RDL	0.020	B183032	0.030	+/- <RDL	0.020	B180614
Dissolved Calcium (Ca)	mg/L	170	+/- 17	0.30	B183032	150	+/- 15	0.30	B180614
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178525
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	B178520	<0.00030	N/A	0.00030	B178525
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178525
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B183032	<0.060	N/A	0.060	B180614
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B178520	<0.00020	N/A	0.00020	B178525
Dissolved Lithium (Li)	mg/L	<0.020	N/A	0.020	B183032	<0.020	N/A	0.020	B180614
Dissolved Magnesium (Mg)	mg/L	71	+/- 4.5	0.20	B183032	71	+/- 4.6	0.20	B180614
Dissolved Manganese (Mn)	mg/L	<0.0040	N/A	0.0040	B183032	0.010	+/- <RDL	0.0040	B180614
Dissolved Molybdenum (Mo)	mg/L	0.00070	+/- 0.00029	0.00020	B178520	0.0010	+/- 0.00036	0.00020	B178525
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	0.00050	B178520	0.0010	+/- <RDL	0.00050	B178525
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B183032	<0.10	N/A	0.10	B180614
Dissolved Potassium (K)	mg/L	7.4	+/- 0.39	0.30	B183032	6.8	+/- 0.36	0.30	B180614
Dissolved Selenium (Se)	mg/L	0.0071	+/- 0.00064	0.00020	B178520	0.0022	+/- 0.00021	0.00020	B178525
Dissolved Silicon (Si)	mg/L	4.2	+/- 0.80	0.50	B183032	4.2	+/- 0.81	0.50	B180614
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B178520	0.00042	+/- 0.00025	0.00010	B178525
Dissolved Sodium (Na)	mg/L	62	+/- 6.1	0.50	B183032	42	+/- 4.1	0.50	B180614
Dissolved Strontium (Sr)	mg/L	1.7	+/- 0.17	0.020	B183032	1.3	+/- 0.13	0.020	B180614
Dissolved Sulphur (S)	mg/L	28	+/- 1.9	0.20	B183032	120	+/- 7.9	0.20	B180614
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B178520	<0.00020	N/A	0.00020	B178525
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B178520	0.0037	+/- 0.0011	0.0010	B178525
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178525
Dissolved Uranium (U)	mg/L	0.0057	+/- 0.00052	0.00010	B178520	0.014	+/- 0.0012	0.00010	B178525
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178525
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B178520	<0.0030	N/A	0.0030	B178525

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB048				CDB049			
Sampling Date		2023/10/27 08:55				2023/10/27 10:21			
COC Number		1/1				1/1			
	UNITS	MW16-8-8 Lab-Dup	MU	RDL	QC Batch	MW16-6-11	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	N/A	N/A	N/A	B174716	40	N/A	N/A	B174716
Cation Sum	meq/L	N/A	N/A	N/A	B174716	44	N/A	N/A	B174716
Hardness (CaCO3)	mg/L	N/A	N/A	0.50	B174712	1400	N/A	0.50	B174712
Ion Balance (% Difference)	%	N/A	N/A	N/A	B174714	4.9	N/A	N/A	B174714
Nitrate (N)	mg/L	N/A	N/A	0.010	B180726	0.048	N/A	0.010	B180726
Nitrate (NO3)	mg/L	N/A	N/A	0.044	B174717	0.21	N/A	0.044	B174717
Nitrite (NO2)	mg/L	N/A	N/A	0.033	B174717	<0.033	N/A	0.033	B174717
Calculated Total Dissolved Solids	mg/L	N/A	N/A	10	B174718	2600	N/A	25	B174718
Elements									
Dissolved Cadmium (Cd)	ug/L	N/A	N/A	0.020	B174704	0.075	+/- 0.034	0.020	B174704
Misc. Inorganics									
Conductivity	uS/cm	1100	+/- 28	2.0	B184523	3300	+/- 87	2.0	B184554
pH	pH	7.83	+/- 0.0776	N/A	B184522	7.94	+/- 0.0786	N/A	B184552
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B184520	<1.0	N/A	1.0	B184550
Alkalinity (Total as CaCO3)	mg/L	340	+/- 25	1.0	B184520	350	+/- 26	1.0	B184550
Bicarbonate (HCO3)	mg/L	420	+/- 6.5	1.0	B184520	430	+/- 6.7	1.0	B184550
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B184520	<1.0	N/A	1.0	B184550
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B184520	<1.0	N/A	1.0	B184550
Chloride (Cl)	mg/L	N/A	N/A	1.0	B182253	1.1	+/- 1.2	1.0	B182253
Sulphate (SO4)	mg/L	N/A	N/A	5.0	B182253	1600	+/- 100	25	B182253
Nutrients									
Nitrite (N)	mg/L	N/A	N/A	0.010	B177186	<0.010	N/A	0.010	B177186
Nitrate plus Nitrite (N)	mg/L	N/A	N/A	0.010	B177186	0.048	+/- 0.013	0.010	B177186
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	N/A	N/A	0.0030	B178525	<0.0030	N/A	0.0030	B178525
Dissolved Antimony (Sb)	mg/L	N/A	N/A	0.00060	B178525	<0.00060	N/A	0.00060	B178525
Dissolved Arsenic (As)	mg/L	N/A	N/A	0.00020	B178525	0.00043	+/- <RDL	0.00020	B178525
Dissolved Barium (Ba)	mg/L	N/A	N/A	0.010	B180614	0.012	+/- <RDL	0.010	B180623

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB048				CDB049			
Sampling Date		2023/10/27 08:55				2023/10/27 10:21			
COC Number		1/1				1/1			
	UNITS	MW16-8-8 Lab-Dup	MU	RDL	QC Batch	MW16-6-11	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	N/A	N/A	0.0010	B178525	<0.0010	N/A	0.0010	B178525
Dissolved Boron (B)	mg/L	N/A	N/A	0.020	B180614	0.12	+/- <RDL	0.020	B180623
Dissolved Calcium (Ca)	mg/L	N/A	N/A	0.30	B180614	330	+/- 33	0.30	B180623
Dissolved Chromium (Cr)	mg/L	N/A	N/A	0.0010	B178525	<0.0010	N/A	0.0010	B178525
Dissolved Cobalt (Co)	mg/L	N/A	N/A	0.00030	B178525	0.0015	+/- <RDL	0.00030	B178525
Dissolved Copper (Cu)	mg/L	N/A	N/A	0.0010	B178525	<0.0010	N/A	0.0010	B178525
Dissolved Iron (Fe)	mg/L	N/A	N/A	0.060	B180614	<0.060	N/A	0.060	B180623
Dissolved Lead (Pb)	mg/L	N/A	N/A	0.00020	B178525	<0.00020	N/A	0.00020	B178525
Dissolved Lithium (Li)	mg/L	N/A	N/A	0.020	B180614	0.050	+/- <RDL	0.020	B180623
Dissolved Magnesium (Mg)	mg/L	N/A	N/A	0.20	B180614	130	+/- 8.3	0.20	B180623
Dissolved Manganese (Mn)	mg/L	N/A	N/A	0.0040	B180614	0.96	+/- 0.065	0.0040	B180623
Dissolved Molybdenum (Mo)	mg/L	N/A	N/A	0.00020	B178525	0.0010	+/- 0.00035	0.00020	B178525
Dissolved Nickel (Ni)	mg/L	N/A	N/A	0.00050	B178525	0.0036	+/- <RDL	0.00050	B178525
Dissolved Phosphorus (P)	mg/L	N/A	N/A	0.10	B180614	<0.10	N/A	0.10	B180623
Dissolved Potassium (K)	mg/L	N/A	N/A	0.30	B180614	7.9	+/- 0.41	0.30	B180623
Dissolved Selenium (Se)	mg/L	N/A	N/A	0.00020	B178525	0.00046	+/- <RDL	0.00020	B178525
Dissolved Silicon (Si)	mg/L	N/A	N/A	0.50	B180614	4.3	+/- 0.83	0.50	B180623
Dissolved Silver (Ag)	mg/L	N/A	N/A	0.00010	B178525	<0.00010	N/A	0.00010	B178525
Dissolved Sodium (Na)	mg/L	N/A	N/A	0.50	B180614	380	+/- 37	0.50	B180623
Dissolved Strontium (Sr)	mg/L	N/A	N/A	0.020	B180614	3.1	+/- 0.30	0.020	B180623
Dissolved Sulphur (S)	mg/L	N/A	N/A	0.20	B180614	610	+/- 40	1.0	B180623
Dissolved Thallium (Tl)	mg/L	N/A	N/A	0.00020	B178525	<0.00020	N/A	0.00020	B178525
Dissolved Tin (Sn)	mg/L	N/A	N/A	0.0010	B178525	<0.0010	N/A	0.0010	B178525
Dissolved Titanium (Ti)	mg/L	N/A	N/A	0.0010	B178525	<0.0010	N/A	0.0010	B178525
Dissolved Uranium (U)	mg/L	N/A	N/A	0.00010	B178525	0.0059	+/- 0.00054	0.00010	B178525
Dissolved Vanadium (V)	mg/L	N/A	N/A	0.0010	B178525	<0.0010	N/A	0.0010	B178525
Dissolved Zinc (Zn)	mg/L	N/A	N/A	0.0030	B178525	<0.0030	N/A	0.0030	B178525

RDL = Reportable Detection Limit
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB050				CDB051			
Sampling Date		2023/10/27 10:30				2023/10/27 11:40			
COC Number		1/1				1/1			
	UNITS	MW16-6-20	MU	RDL	QC Batch	RMW16-19-10	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	22	N/A	N/A	B174716	26	N/A	N/A	B174716
Cation Sum	meq/L	26	N/A	N/A	B174716	32	N/A	N/A	B174716
Hardness (CaCO3)	mg/L	230	N/A	0.50	B174712	810	N/A	0.50	B174712
Ion Balance (% Difference)	%	8.2	N/A	N/A	B174714	9.3	N/A	N/A	B174714
Nitrate (N)	mg/L	<0.010	N/A	0.010	B180726	<0.010	N/A	0.010	B180726
Nitrate (NO3)	mg/L	<0.044	N/A	0.044	B174717	<0.044	N/A	0.044	B174717
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B174717	<0.033	N/A	0.033	B174717
Calculated Total Dissolved Solids	mg/L	1500	N/A	11	B174718	1800	N/A	10	B174718
Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	B174704	0.098	+/- 0.042	0.020	B174704
Misc. Inorganics									
Conductivity	uS/cm	2200	+/- 59	2.0	B184591	2400	+/- 62	2.0	B184591
pH	pH	8.30	+/- 0.0822	N/A	B184589	8.00	+/- 0.0793	N/A	B184589
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B184587	<1.0	N/A	1.0	B184587
Alkalinity (Total as CaCO3)	mg/L	270	+/- 20	1.0	B184587	390	+/- 29	1.0	B184587
Bicarbonate (HCO3)	mg/L	330	+/- 5.2	1.0	B184587	480	+/- 7.4	1.0	B184587
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B184587	<1.0	N/A	1.0	B184587
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B184587	<1.0	N/A	1.0	B184587
Chloride (Cl)	mg/L	<1.0	N/A	1.0	B182898	<1.0	N/A	1.0	B182898
Sulphate (SO4)	mg/L	790	+/- 50	10	B182898	890	+/- 57	10	B182898
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B177173	<0.010	N/A	0.010	B177173
Nitrate plus Nitrite (N)	mg/L	<0.010	N/A	0.010	B177173	<0.010	N/A	0.010	B177173
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B178520	<0.0030	N/A	0.0030	B178520
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B178520	<0.00060	N/A	0.00060	B178520
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	0.00020	B178520	<0.00020	N/A	0.00020	B178520
Dissolved Barium (Ba)	mg/L	<0.050	N/A	0.050	B183032	<0.010	N/A	0.010	B180623
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520

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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB050				CDB051			
Sampling Date		2023/10/27 10:30				2023/10/27 11:40			
COC Number		1/1				1/1			
	UNITS	MW16-6-20	MU	RDL	QC Batch	RMW16-19-10	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.15	+/- <RDL	0.10	B183032	0.12	+/- <RDL	0.020	B180623
Dissolved Calcium (Ca)	mg/L	60	+/- 6.0	1.5	B183032	200	+/- 20	0.30	B180623
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	B178520	0.00064	+/- <RDL	0.00030	B178520
Dissolved Copper (Cu)	mg/L	0.0026	+/- <RDL	0.0010	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Iron (Fe)	mg/L	<0.30	N/A	0.30	B183032	<0.060	N/A	0.060	B180623
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B178520	0.00082	+/- <RDL	0.00020	B178520
Dissolved Lithium (Li)	mg/L	<0.10	N/A	0.10	B183032	0.022	+/- <RDL	0.020	B180623
Dissolved Magnesium (Mg)	mg/L	19	+/- 1.2	1.0	B183032	75	+/- 4.8	0.20	B180623
Dissolved Manganese (Mn)	mg/L	0.11	+/- <RDL	0.020	B183032	0.75	+/- 0.051	0.0040	B180623
Dissolved Molybdenum (Mo)	mg/L	0.0022	+/- 0.00060	0.00020	B178520	0.00093	+/- 0.00033	0.00020	B178520
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	0.00050	B178520	0.0014	+/- <RDL	0.00050	B178520
Dissolved Phosphorus (P)	mg/L	<0.50	N/A	0.50	B183032	<0.10	N/A	0.10	B180623
Dissolved Potassium (K)	mg/L	4.2	+/- <RDL	1.5	B183032	6.7	+/- 0.35	0.30	B180623
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	B178520	0.00043	+/- <RDL	0.00020	B178520
Dissolved Silicon (Si)	mg/L	3.9	+/- <RDL	2.5	B183032	4.1	+/- 0.79	0.50	B180623
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B178520	<0.00010	N/A	0.00010	B178520
Dissolved Sodium (Na)	mg/L	490	+/- 48	2.5	B183032	360	+/- 35	0.50	B180623
Dissolved Strontium (Sr)	mg/L	1.1	+/- 0.11	0.10	B183032	1.6	+/- 0.16	0.020	B180623
Dissolved Sulphur (S)	mg/L	330	+/- 22	1.0	B183032	280	+/- 19	0.20	B180623
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B178520	<0.00020	N/A	0.00020	B178520
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Uranium (U)	mg/L	<0.00010	N/A	0.00010	B178520	0.010	+/- 0.00093	0.00010	B178520
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B178520	<0.0030	N/A	0.0030	B178520

RDL = Reportable Detection Limit
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB052		CDB052			
Sampling Date		2023/10/27 11:45		2023/10/27 11:45			
COC Number		1/1		1/1			
	UNITS	RMW16-19-19	MU	RMW16-19-19 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	33	N/A	N/A	N/A	N/A	B174716
Cation Sum	meq/L	35	N/A	N/A	N/A	N/A	B174716
Hardness (CaCO3)	mg/L	520	N/A	N/A	N/A	0.50	B174712
Ion Balance (% Difference)	%	3.6	N/A	N/A	N/A	N/A	B174714
Nitrate (N)	mg/L	<0.010	N/A	N/A	N/A	0.010	B180726
Nitrate (NO3)	mg/L	<0.044	N/A	N/A	N/A	0.044	B174717
Nitrite (NO2)	mg/L	<0.033	N/A	N/A	N/A	0.033	B174717
Calculated Total Dissolved Solids	mg/L	2100	N/A	N/A	N/A	25	B174718
Elements							
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	N/A	N/A	0.020	B174704
Misc. Inorganics							
Conductivity	uS/cm	2700	+/- 70	N/A	N/A	2.0	B184591
pH	pH	8.00	+/- 0.0792	N/A	N/A	N/A	B184589
Anions							
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	B184587
Alkalinity (Total as CaCO3)	mg/L	530	+/- 39	N/A	N/A	1.0	B184587
Bicarbonate (HCO3)	mg/L	640	+/- 9.8	N/A	N/A	1.0	B184587
Carbonate (CO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	B184587
Hydroxide (OH)	mg/L	<1.0	N/A	N/A	N/A	1.0	B184587
Chloride (Cl)	mg/L	<1.0	N/A	<1.0	N/A	1.0	B179764
Sulphate (SO4)	mg/L	1100	+/- 67	1100	+/- 67	25	B179764
Nutrients							
Nitrite (N)	mg/L	<0.010	N/A	N/A	N/A	0.010	B177173
Nitrate plus Nitrite (N)	mg/L	<0.010	N/A	N/A	N/A	0.010	B177173
Lab Filtered Elements							
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B178520
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	N/A	N/A	0.00060	B178520
Dissolved Arsenic (As)	mg/L	0.00020	+/- <RDL	N/A	N/A	0.00020	B178520
Dissolved Barium (Ba)	mg/L	<0.010	N/A	N/A	N/A	0.010	B180623

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB052		CDB052			
Sampling Date		2023/10/27 11:45		2023/10/27 11:45			
COC Number		1/1		1/1			
	UNITS	RMW16-19-19	MU	RMW16-19-19 Lab-Dup	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B178520
Dissolved Boron (B)	mg/L	0.12	+/- <RDL	N/A	N/A	0.020	B180623
Dissolved Calcium (Ca)	mg/L	120	+/- 12	N/A	N/A	0.30	B180623
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B178520
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	N/A	N/A	0.00030	B178520
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B178520
Dissolved Iron (Fe)	mg/L	<0.060	N/A	N/A	N/A	0.060	B180623
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B178520
Dissolved Lithium (Li)	mg/L	0.056	+/- <RDL	N/A	N/A	0.020	B180623
Dissolved Magnesium (Mg)	mg/L	52	+/- 3.3	N/A	N/A	0.20	B180623
Dissolved Manganese (Mn)	mg/L	0.33	+/- 0.022	N/A	N/A	0.0040	B180623
Dissolved Molybdenum (Mo)	mg/L	0.0012	+/- 0.00039	N/A	N/A	0.00020	B178520
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	N/A	N/A	0.00050	B178520
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	N/A	N/A	0.10	B180623
Dissolved Potassium (K)	mg/L	5.4	+/- <RDL	N/A	N/A	0.30	B180623
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B178520
Dissolved Silicon (Si)	mg/L	3.5	+/- 0.68	N/A	N/A	0.50	B180623
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	N/A	N/A	0.00010	B178520
Dissolved Sodium (Na)	mg/L	560	+/- 55	N/A	N/A	2.5	B180623
Dissolved Strontium (Sr)	mg/L	1.9	+/- 0.19	N/A	N/A	0.020	B180623
Dissolved Sulphur (S)	mg/L	310	+/- 21	N/A	N/A	0.20	B180623
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B178520
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B178520
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B178520
Dissolved Uranium (U)	mg/L	0.00090	+/- 0.00010	N/A	N/A	0.00010	B178520
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B178520
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B178520

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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB053		CDB053			
Sampling Date		2023/10/27 12:45		2023/10/27 12:45			
COC Number		1/1		1/1			
	UNITS	RMW16-18-5	MU	RMW16-18-5 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	12	N/A	N/A	N/A	N/A	B174716
Cation Sum	meq/L	14	N/A	N/A	N/A	N/A	B174716
Hardness (CaCO3)	mg/L	280	N/A	N/A	N/A	0.50	B174712
Ion Balance (% Difference)	%	8.4	N/A	N/A	N/A	N/A	B174714
Nitrate (N)	mg/L	0.21	N/A	N/A	N/A	0.010	B180726
Nitrate (NO3)	mg/L	0.92	N/A	N/A	N/A	0.044	B174717
Nitrite (NO2)	mg/L	<0.033	N/A	N/A	N/A	0.033	B174717
Calculated Total Dissolved Solids	mg/L	680	N/A	N/A	N/A	10	B174718
Elements							
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	N/A	N/A	0.020	B174704
Misc. Inorganics							
Conductivity	uS/cm	1100	+/- 29	N/A	N/A	2.0	B180852
pH	pH	8.15	+/- 0.0807	N/A	N/A	N/A	B180854
Anions							
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	B180851
Alkalinity (Total as CaCO3)	mg/L	390	+/- 29	N/A	N/A	1.0	B180851
Bicarbonate (HCO3)	mg/L	480	+/- 7.3	N/A	N/A	1.0	B180851
Carbonate (CO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	B180851
Hydroxide (OH)	mg/L	<1.0	N/A	N/A	N/A	1.0	B180851
Chloride (Cl)	mg/L	91	+/- 6.9	N/A	N/A	1.0	B182898
Sulphate (SO4)	mg/L	72	+/- 4.9	N/A	N/A	1.0	B182898
Nutrients							
Nitrite (N)	mg/L	<0.010	N/A	<0.010	N/A	0.010	B177173
Nitrate plus Nitrite (N)	mg/L	0.21	+/- 0.024	0.20	+/- 0.023	0.010	B177173
Lab Filtered Elements							
Dissolved Aluminum (Al)	mg/L	0.0033	+/- <RDL	N/A	N/A	0.0030	B178520
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	N/A	N/A	0.00060	B178520
Dissolved Arsenic (As)	mg/L	0.00026	+/- <RDL	N/A	N/A	0.00020	B178520
Dissolved Barium (Ba)	mg/L	0.066	+/- <RDL	N/A	N/A	0.010	B183032

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB053		CDB053			
Sampling Date		2023/10/27 12:45		2023/10/27 12:45			
COC Number		1/1		1/1			
	UNITS	RMW16-18-5	MU	RMW16-18-5 Lab-Dup	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B178520
Dissolved Boron (B)	mg/L	0.12	+/- <RDL	N/A	N/A	0.020	B183032
Dissolved Calcium (Ca)	mg/L	56	+/- 5.7	N/A	N/A	0.30	B183032
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B178520
Dissolved Cobalt (Co)	mg/L	0.00044	+/- <RDL	N/A	N/A	0.00030	B178520
Dissolved Copper (Cu)	mg/L	0.0010	+/- <RDL	N/A	N/A	0.0010	B178520
Dissolved Iron (Fe)	mg/L	<0.060	N/A	N/A	N/A	0.060	B183032
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B178520
Dissolved Lithium (Li)	mg/L	<0.020	N/A	N/A	N/A	0.020	B183032
Dissolved Magnesium (Mg)	mg/L	33	+/- 2.1	N/A	N/A	0.20	B183032
Dissolved Manganese (Mn)	mg/L	0.13	+/- 0.0091	N/A	N/A	0.0040	B183032
Dissolved Molybdenum (Mo)	mg/L	0.0045	+/- 0.0011	N/A	N/A	0.00020	B178520
Dissolved Nickel (Ni)	mg/L	0.0012	+/- <RDL	N/A	N/A	0.00050	B178520
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	N/A	N/A	0.10	B183032
Dissolved Potassium (K)	mg/L	3.0	+/- <RDL	N/A	N/A	0.30	B183032
Dissolved Selenium (Se)	mg/L	0.00053	+/- <RDL	N/A	N/A	0.00020	B178520
Dissolved Silicon (Si)	mg/L	5.0	+/- 0.96	N/A	N/A	0.50	B183032
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	N/A	N/A	0.00010	B178520
Dissolved Sodium (Na)	mg/L	190	+/- 19	N/A	N/A	0.50	B183032
Dissolved Strontium (Sr)	mg/L	0.48	+/- 0.047	N/A	N/A	0.020	B183032
Dissolved Sulphur (S)	mg/L	23	+/- 1.6	N/A	N/A	0.20	B183032
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B178520
Dissolved Tin (Sn)	mg/L	0.0016	+/- <RDL	N/A	N/A	0.0010	B178520
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B178520
Dissolved Uranium (U)	mg/L	0.0090	+/- 0.00082	N/A	N/A	0.00010	B178520
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B178520
Dissolved Zinc (Zn)	mg/L	0.0045	+/- <RDL	N/A	N/A	0.0030	B178520

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB054				CDB055			
Sampling Date		2023/10/27 12:56				2023/10/27 14:12			
COC Number		1/1				1/1			
	UNITS	RMW16-18-13	MU	RDL	QC Batch	MW16-1-15	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	11	N/A	N/A	B174716	28	N/A	N/A	B174716
Cation Sum	meq/L	13	N/A	N/A	B174716	30	N/A	N/A	B174716
Hardness (CaCO3)	mg/L	130	N/A	0.50	B174712	1100	N/A	0.50	B174712
Ion Balance (% Difference)	%	7.6	N/A	N/A	B174714	3.7	N/A	N/A	B174714
Nitrate (N)	mg/L	0.28	N/A	0.010	B180726	<0.010	N/A	0.010	B180726
Nitrate (NO3)	mg/L	1.3	N/A	0.044	B174717	<0.044	N/A	0.044	B174717
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B174717	<0.033	N/A	0.033	B174717
Calculated Total Dissolved Solids	mg/L	680	N/A	10	B174718	1800	N/A	25	B174718
Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	B174704	0.093	+/- 0.040	0.020	B174704
Misc. Inorganics									
Conductivity	uS/cm	1100	+/- 30	2.0	B184591	2100	+/- 56	2.0	B180852
pH	pH	8.40	+/- 0.0832	N/A	B184589	7.89	+/- 0.0782	N/A	B180854
Anions									
Alkalinity (PP as CaCO3)	mg/L	3.3	+/- <RDL	1.0	B184587	<1.0	N/A	1.0	B180851
Alkalinity (Total as CaCO3)	mg/L	360	+/- 27	1.0	B184587	330	+/- 24	1.0	B180851
Bicarbonate (HCO3)	mg/L	430	+/- 6.7	1.0	B184587	400	+/- 6.2	1.0	B180851
Carbonate (CO3)	mg/L	4.0	N/A	1.0	B184587	<1.0	N/A	1.0	B180851
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B184587	<1.0	N/A	1.0	B180851
Chloride (Cl)	mg/L	96	+/- 7.3	1.0	B182898	11	+/- 1.5	1.0	B182898
Sulphate (SO4)	mg/L	73	+/- 5.0	1.0	B182898	1000	+/- 65	25	B182898
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B177173	<0.010	N/A	0.010	B177173
Nitrate plus Nitrite (N)	mg/L	0.28	+/- 0.030	0.010	B177173	<0.010	N/A	0.010	B177173
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	0.0037	+/- <RDL	0.0030	B178520	<0.0030	N/A	0.0030	B178520
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B178520	<0.00060	N/A	0.00060	B178520
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	0.00020	B178520	0.00033	+/- <RDL	0.00020	B178520
Dissolved Barium (Ba)	mg/L	0.033	+/- <RDL	0.010	B183032	0.012	+/- <RDL	0.010	B183032
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520

RDL = Reportable Detection Limit
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB054				CDB055			
Sampling Date		2023/10/27 12:56				2023/10/27 14:12			
COC Number		1/1				1/1			
	UNITS	RMW16-18-13	MU	RDL	QC Batch	MW16-1-15	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.14	+/- <RDL	0.020	B183032	0.098	+/- <RDL	0.020	B183032
Dissolved Calcium (Ca)	mg/L	30	+/- 3.0	0.30	B183032	260	+/- 26	0.30	B183032
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	B178520	0.0010	+/- <RDL	0.00030	B178520
Dissolved Copper (Cu)	mg/L	0.0011	+/- <RDL	0.0010	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B183032	<0.060	N/A	0.060	B183032
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B178520	<0.00020	N/A	0.00020	B178520
Dissolved Lithium (Li)	mg/L	0.020	+/- <RDL	0.020	B183032	<0.020	N/A	0.020	B183032
Dissolved Magnesium (Mg)	mg/L	13	+/- 0.87	0.20	B183032	120	+/- 7.8	0.20	B183032
Dissolved Manganese (Mn)	mg/L	0.10	+/- 0.0069	0.0040	B183032	0.93	+/- 0.062	0.0040	B183032
Dissolved Molybdenum (Mo)	mg/L	0.0038	+/- 0.00097	0.00020	B178520	0.0022	+/- 0.00060	0.00020	B178520
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	0.00050	B178520	0.0011	+/- <RDL	0.00050	B178520
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B183032	<0.10	N/A	0.10	B183032
Dissolved Potassium (K)	mg/L	1.2	+/- <RDL	0.30	B183032	4.2	+/- <RDL	0.30	B183032
Dissolved Selenium (Se)	mg/L	0.0010	+/- <RDL	0.00020	B178520	<0.00020	N/A	0.00020	B178520
Dissolved Silicon (Si)	mg/L	3.1	+/- 0.58	0.50	B183032	5.3	+/- 1.0	0.50	B183032
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B178520	<0.00010	N/A	0.00010	B178520
Dissolved Sodium (Na)	mg/L	250	+/- 24	0.50	B183032	170	+/- 17	0.50	B183032
Dissolved Strontium (Sr)	mg/L	0.21	+/- 0.021	0.020	B183032	1.7	+/- 0.16	0.020	B183032
Dissolved Sulphur (S)	mg/L	26	+/- 1.8	0.20	B183032	390	+/- 26	0.20	B183032
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B178520	<0.00020	N/A	0.00020	B178520
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Uranium (U)	mg/L	0.0048	+/- 0.00044	0.00010	B178520	0.0050	+/- 0.00045	0.00010	B178520
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B178520	<0.0030	N/A	0.0030	B178520

RDL = Reportable Detection Limit
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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB056				CDB057			
Sampling Date		2023/10/27 14:30				2023/10/27 14:41			
COC Number		1/1				1/1			
	UNITS	23-12	MU	RDL	QC Batch	23-13	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	14	N/A	N/A	B174716	23	N/A	N/A	B174716
Cation Sum	meq/L	15	N/A	N/A	B174716	26	N/A	N/A	B174716
Hardness (CaCO3)	mg/L	640	N/A	0.50	B174712	220	N/A	0.50	B174712
Ion Balance (% Difference)	%	3.6	N/A	N/A	B174714	5.7	N/A	N/A	B174714
Nitrate (N)	mg/L	0.59	N/A	0.010	B180726	<0.010	N/A	0.010	B180726
Nitrate (NO3)	mg/L	2.6	N/A	0.044	B174717	<0.044	N/A	0.044	B174717
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B174717	<0.033	N/A	0.033	B174717
Calculated Total Dissolved Solids	mg/L	760	N/A	10	B174718	1600	N/A	10	B174718
Elements									
Dissolved Cadmium (Cd)	ug/L	0.024	+/- <RDL	0.020	B174704	<0.020	N/A	0.020	B174704
Misc. Inorganics									
Conductivity	uS/cm	1300	+/- 33	2.0	B180852	2200	+/- 58	2.0	B184246
pH	pH	7.82	+/- 0.0775	N/A	B180854	8.41	+/- 0.0833	N/A	B184244
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B180851	5.7	+/- <RDL	1.0	B184243
Alkalinity (Total as CaCO3)	mg/L	460	+/- 34	1.0	B180851	310	+/- 23	1.0	B184243
Bicarbonate (HCO3)	mg/L	560	+/- 8.6	1.0	B180851	360	+/- 5.6	1.0	B184243
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B180851	6.8	N/A	1.0	B184243
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B180851	<1.0	N/A	1.0	B184243
Chloride (Cl)	mg/L	110	+/- 8.6	1.0	B182898	1.1	+/- 1.2	1.0	B182253
Sulphate (SO4)	mg/L	89	+/- 6.0	1.0	B182898	820	+/- 52	10	B182253
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B177173	<0.010	N/A	0.010	B177186
Nitrate plus Nitrite (N)	mg/L	0.59	+/- 0.056	0.010	B177173	<0.010	N/A	0.010	B177186
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B178520	<0.0030	N/A	0.0030	B178520
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B178520	<0.00060	N/A	0.00060	B178520
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	0.00020	B178520	<0.00020	N/A	0.00020	B178520
Dissolved Barium (Ba)	mg/L	0.062	+/- <RDL	0.010	B180623	0.011	+/- <RDL	0.010	B180623
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520

RDL = Reportable Detection Limit
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB056				CDB057			
Sampling Date		2023/10/27 14:30				2023/10/27 14:41			
COC Number		1/1				1/1			
	UNITS	23-12	MU	RDL	QC Batch	23-13	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.033	+/- <RDL	0.020	B180623	0.10	+/- <RDL	0.020	B180623
Dissolved Calcium (Ca)	mg/L	150	+/- 15	0.30	B180623	59	+/- 5.9	0.30	B180623
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	B178520	<0.00030	N/A	0.00030	B178520
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B178520	0.0030	+/- <RDL	0.0010	B178520
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B180623	<0.060	N/A	0.060	B180623
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B178520	<0.00020	N/A	0.00020	B178520
Dissolved Lithium (Li)	mg/L	<0.020	N/A	0.020	B180623	0.070	+/- <RDL	0.020	B180623
Dissolved Magnesium (Mg)	mg/L	66	+/- 4.2	0.20	B180623	17	+/- 1.1	0.20	B180623
Dissolved Manganese (Mn)	mg/L	<0.0040	N/A	0.0040	B180623	0.097	+/- 0.0067	0.0040	B180623
Dissolved Molybdenum (Mo)	mg/L	0.00063	+/- 0.00028	0.00020	B178520	0.0023	+/- 0.00061	0.00020	B178520
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	0.00050	B178520	<0.00050	N/A	0.00050	B178520
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B180623	<0.10	N/A	0.10	B180623
Dissolved Potassium (K)	mg/L	6.2	+/- 0.33	0.30	B180623	4.9	+/- <RDL	0.30	B180623
Dissolved Selenium (Se)	mg/L	0.0073	+/- 0.00066	0.00020	B178520	<0.00020	N/A	0.00020	B178520
Dissolved Silicon (Si)	mg/L	4.1	+/- 0.79	0.50	B180623	3.4	+/- 0.64	0.50	B180623
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B178520	<0.00010	N/A	0.00010	B178520
Dissolved Sodium (Na)	mg/L	54	+/- 5.3	0.50	B180623	490	+/- 48	0.50	B180623
Dissolved Strontium (Sr)	mg/L	1.5	+/- 0.15	0.020	B180623	1.1	+/- 0.11	0.020	B180623
Dissolved Sulphur (S)	mg/L	30	+/- 2.0	0.20	B180623	250	+/- 16	0.20	B180623
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B178520	<0.00020	N/A	0.00020	B178520
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Uranium (U)	mg/L	0.0056	+/- 0.00052	0.00010	B178520	<0.00010	N/A	0.00010	B178520
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B178520	<0.0010	N/A	0.0010	B178520
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B178520	<0.0030	N/A	0.0030	B178520

RDL = Reportable Detection Limit
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB058			CDB059		CDB059			
Sampling Date		2023/10/27 14:58			2023/10/27 15:30		2023/10/27 15:30			
COC Number		1/1			1/1		1/1			
	UNITS	23-14	MU	QC Batch	23-15	MU	23-15 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	0.0000	N/A	B174716	0.068	N/A	N/A	N/A	N/A	B174716
Cation Sum	meq/L	0.0010	N/A	B174716	0.0030	N/A	N/A	N/A	N/A	B174716
Hardness (CaCO3)	mg/L	<0.50	N/A	B174712	<0.50	N/A	N/A	N/A	0.50	B174712
Ion Balance (% Difference)	%	NC	N/A	B174714	NC	N/A	N/A	N/A	N/A	B174714
Nitrate (N)	mg/L	<0.010	N/A	B180726	<0.010	N/A	N/A	N/A	0.010	B180726
Nitrate (NO3)	mg/L	<0.044	N/A	B174717	<0.044	N/A	N/A	N/A	0.044	B174717
Nitrite (NO2)	mg/L	<0.033	N/A	B174717	<0.033	N/A	N/A	N/A	0.033	B174717
Calculated Total Dissolved Solids	mg/L	<10	N/A	B174718	<10	N/A	N/A	N/A	10	B174718
Elements										
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	B174704	<0.020	N/A	N/A	N/A	0.020	B174704
Misc. Inorganics										
Conductivity	uS/cm	<2.0	N/A	B187624	<2.0	N/A	N/A	N/A	2.0	B184246
pH	pH	5.95	+/- 0.0590	B184522	5.59	+/- 0.0554	N/A	N/A	N/A	B184244
Anions										
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	B187587	<1.0	N/A	N/A	N/A	1.0	B184243
Alkalinity (Total as CaCO3)	mg/L	<1.0	N/A	B187587	1.6	+/- <RDL	N/A	N/A	1.0	B184243
Bicarbonate (HCO3)	mg/L	<1.0	N/A	B187587	2.0	+/- 1.0	N/A	N/A	1.0	B184243
Carbonate (CO3)	mg/L	<1.0	N/A	B187587	<1.0	N/A	N/A	N/A	1.0	B184243
Hydroxide (OH)	mg/L	<1.0	N/A	B187587	<1.0	N/A	N/A	N/A	1.0	B184243
Chloride (Cl)	mg/L	<1.0	N/A	B182898	<1.0	N/A	N/A	N/A	1.0	B182253
Sulphate (SO4)	mg/L	<1.0	N/A	B182898	1.7	+/- 1.0	N/A	N/A	1.0	B182253
Nutrients										
Nitrite (N)	mg/L	<0.010	N/A	B177173	<0.010	N/A	<0.010	N/A	0.010	B177186
Nitrate plus Nitrite (N)	mg/L	<0.010	N/A	B177173	<0.010	N/A	<0.010	N/A	0.010	B177186
Lab Filtered Elements										
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	B178520	<0.0030	N/A	N/A	N/A	0.0030	B178525
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	B178520	<0.00060	N/A	N/A	N/A	0.00060	B178525
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	B178520	<0.00020	N/A	N/A	N/A	0.00020	B178525
Dissolved Barium (Ba)	mg/L	<0.010	N/A	B183032	<0.010	N/A	N/A	N/A	0.010	B180614

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CDB058			CDB059		CDB059			
Sampling Date		2023/10/27 14:58			2023/10/27 15:30		2023/10/27 15:30			
COC Number		1/1			1/1		1/1			
	UNITS	23-14	MU	QC Batch	23-15	MU	23-15 Lab-Dup	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	B178520	<0.0010	N/A	N/A	N/A	0.0010	B178525
Dissolved Boron (B)	mg/L	<0.020	N/A	B183032	<0.020	N/A	N/A	N/A	0.020	B180614
Dissolved Calcium (Ca)	mg/L	<0.30	N/A	B183032	<0.30	N/A	N/A	N/A	0.30	B180614
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	B178520	<0.0010	N/A	N/A	N/A	0.0010	B178525
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	B178520	<0.00030	N/A	N/A	N/A	0.00030	B178525
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	B178520	<0.0010	N/A	N/A	N/A	0.0010	B178525
Dissolved Iron (Fe)	mg/L	<0.060	N/A	B183032	<0.060	N/A	N/A	N/A	0.060	B180614
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	B178520	<0.00020	N/A	N/A	N/A	0.00020	B178525
Dissolved Lithium (Li)	mg/L	<0.020	N/A	B183032	<0.020	N/A	N/A	N/A	0.020	B180614
Dissolved Magnesium (Mg)	mg/L	<0.20	N/A	B183032	<0.20	N/A	N/A	N/A	0.20	B180614
Dissolved Manganese (Mn)	mg/L	<0.0040	N/A	B183032	<0.0040	N/A	N/A	N/A	0.0040	B180614
Dissolved Molybdenum (Mo)	mg/L	0.00092	+/- 0.00033	B186979	<0.00020	N/A	N/A	N/A	0.00020	B178525
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	B178520	<0.00050	N/A	N/A	N/A	0.00050	B178525
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	B183032	<0.10	N/A	N/A	N/A	0.10	B180614
Dissolved Potassium (K)	mg/L	<0.30	N/A	B183032	<0.30	N/A	N/A	N/A	0.30	B180614
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	B178520	<0.00020	N/A	N/A	N/A	0.00020	B178525
Dissolved Silicon (Si)	mg/L	<0.50	N/A	B183032	<0.50	N/A	N/A	N/A	0.50	B180614
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	B178520	<0.00010	N/A	N/A	N/A	0.00010	B178525
Dissolved Sodium (Na)	mg/L	<0.50	N/A	B183032	<0.50	N/A	N/A	N/A	0.50	B180614
Dissolved Strontium (Sr)	mg/L	<0.020	N/A	B183032	<0.020	N/A	N/A	N/A	0.020	B180614
Dissolved Sulphur (S)	mg/L	<0.20	N/A	B183032	<0.20	N/A	N/A	N/A	0.20	B180614
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	B178520	<0.00020	N/A	N/A	N/A	0.00020	B178525
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	B178520	<0.0010	N/A	N/A	N/A	0.0010	B178525
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	B178520	<0.0010	N/A	N/A	N/A	0.0010	B178525
Dissolved Uranium (U)	mg/L	<0.00010	N/A	B178520	<0.00010	N/A	N/A	N/A	0.00010	B178525
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	B178520	<0.0010	N/A	N/A	N/A	0.0010	B178525
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	B178520	<0.0030	N/A	N/A	N/A	0.0030	B178525

RDL = Reportable Detection Limit
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N/A = Not Applicable

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TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CDB047				CDB048			
Sampling Date		2023/10/27 09:12				2023/10/27 08:55			
COC Number		1/1				1/1			
	UNITS	MW16-8-19	MU	RDL	QC Batch	MW16-8-8	MU	RDL	QC Batch
Calculated Parameters									
Total Kjeldahl Nitrogen (Calc)	mg/L	0.118	N/A	0.020	B182134	2.8	N/A	2.0	B182134
Nutrients									
Total Nitrogen (N)	mg/L	0.71	+/- 0.11	0.020	B181739	3.1 (1)	+/- <RDL	2.0	B181736

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CDB049				CDB050			CDB051			
Sampling Date		2023/10/27 10:21				2023/10/27 10:30			2023/10/27 11:40			
COC Number		1/1				1/1			1/1			
	UNITS	MW16-6-11	MU	RDL	QC Batch	MW16-6-20	MU	RDL	RMW16-19-10	MU	RDL	QC Batch
Calculated Parameters												
Total Kjeldahl Nitrogen (Calc)	mg/L	19	N/A	10	B182134	1.31	N/A	0.020	1.65	N/A	0.40	B182134
Nutrients												
Total Nitrogen (N)	mg/L	19 (1)	+/- <RDL	10	B181739	1.3	+/- 0.20	0.020	1.6 (1)	+/- <RDL	0.40	B181736

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CDB052				CDB053			
Sampling Date		2023/10/27 11:45				2023/10/27 12:45			
COC Number		1/1				1/1			
	UNITS	RMW16-19-19	MU	RDL	QC Batch	RMW16-18-5	MU	RDL	QC Batch
Calculated Parameters									
Total Kjeldahl Nitrogen (Calc)	mg/L	1.52	N/A	0.020	B182134	5.1	N/A	2.0	B182134
Nutrients									
Total Nitrogen (N)	mg/L	1.5	+/- 0.23	0.020	B181736	5.3 (1)	+/- <RDL	2.0	B181739

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C387774
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Location: SR1
Sampler Initials: WT

TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CDB054			CDB055			CDB056			
Sampling Date		2023/10/27 12:56			2023/10/27 14:12			2023/10/27 14:30			
COC Number		1/1			1/1			1/1			
	UNITS	RMW16-18-13	MU	RDL	MW16-1-15	MU	RDL	23-12	MU	RDL	QC Batch
Calculated Parameters											
Total Kjeldahl Nitrogen (Calc)	mg/L	0.142	N/A	0.020	0.36	N/A	0.20	<0.020	N/A	0.020	B182134
Nutrients											
Total Nitrogen (N)	mg/L	0.43	+/- 0.074	0.020	0.36 (1)	+/- <RDL	0.20	0.60	+/- 0.097	0.020	B181736

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CDB056			CDB057		CDB058			
Sampling Date		2023/10/27 14:30			2023/10/27 14:41		2023/10/27 14:58			
COC Number		1/1			1/1		1/1			
	UNITS	23-12 Lab-Dup	MU	QC Batch	23-13	MU	23-14	MU	RDL	QC Batch
Calculated Parameters										
Total Kjeldahl Nitrogen (Calc)	mg/L	N/A	N/A	B182134	1.45	N/A	<0.020	N/A	0.020	B182134
Nutrients										
Total Nitrogen (N)	mg/L	0.62	+/- 0.10	B181736	1.5	+/- 0.22	<0.020	N/A	0.020	B181739

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CDB059		CDB059			
Sampling Date		2023/10/27 15:30		2023/10/27 15:30			
COC Number		1/1		1/1			
	UNITS	23-15	MU	23-15 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters							
Total Kjeldahl Nitrogen (Calc)	mg/L	<0.020	N/A	N/A	N/A	0.020	B182134
Nutrients							
Total Nitrogen (N)	mg/L	<0.020	N/A	<0.020	N/A	0.020	B181746

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C387774
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CDB047		CDB047				CDB048			
Sampling Date		2023/10/27 09:12		2023/10/27 09:12				2023/10/27 08:55			
COC Number		1/1		1/1				1/1			
	UNITS	MW16-8-19	MU	MW16-8-19 Lab-Dup	MU	RDL	QC Batch	MW16-8-8	MU	RDL	QC Batch
Lab Filtered Inorganics											
Dissolved Organic Carbon (C)	mg/L	1.4	+/- <RDL	N/A	N/A	0.50	B179338	2.5	+/- <RDL	0.50	B179338
Microbiological Param.											
E.Coli DST	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B175271	<100 (1)	N/A	100	B175271
Fecal Coliforms	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B175274	<100 (1)	N/A	100	B175274
Heterotrophic Plate Count	CFU/mL	13 (2)	N/A	N/A	N/A	1.0	B174903	900 (3)	N/A	100	B174903
Total Coliforms DST	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B175271	6300 (1)	N/A	100	B175271
Nutrients											
Total Ammonia (N)	mg/L	<0.015	N/A	<0.015	N/A	0.015	B179715	<0.015	N/A	0.015	B179704
Orthophosphate (P)	mg/L	0.0040	+/- 0.0035	N/A	N/A	0.0030	B178203	<0.0030	N/A	0.0030	B178203
Lab Filtered Nutrients											
Dissolved Phosphorus (P)	mg/L	<0.0030 (4)	N/A	N/A	N/A	0.0030	B179556	<0.0030	N/A	0.0030	B179556

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.
(2) Sample analyzed over hold time. Sample analysis is recommended within 24 hours of sampling.
(3) Detection limit raised due to matrix interference.
Sample analyzed over hold time. Sample analysis is recommended within 24 hours of sampling.
(4) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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Bureau Veritas Job #: C387774
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CDB049				CDB050			
Sampling Date		2023/10/27 10:21				2023/10/27 10:30			
COC Number		1/1				1/1			
	UNITS	MW16-6-11	MU	RDL	QC Batch	MW16-6-20	MU	RDL	QC Batch
Lab Filtered Inorganics									
Dissolved Organic Carbon (C)	mg/L	2.2	+/- <RDL	0.50	B179338	2.1	+/- <RDL	0.50	B179338
Microbiological Param.									
E.Coli DST	MPN/100mL	<100 (1)	N/A	100	B175271	<1.0	N/A	1.0	B175271
Fecal Coliforms	MPN/100mL	<100 (1)	N/A	100	B175274	<1.0	N/A	1.0	B175274
Heterotrophic Plate Count	CFU/mL	2900 (1)	N/A	100	B174903	97 (2)	N/A	1.0	B174903
Total Coliforms DST	MPN/100mL	2000 (1)	N/A	100	B175271	1600	N/A	1.0	B175271
Nutrients									
Total Ammonia (N)	mg/L	0.35	+/- 0.039	0.015	B179678	1.1	+/- 0.12	0.015	B179708
Orthophosphate (P)	mg/L	0.0040	+/- 0.0035	0.0030	B178203	0.0032	+/- 0.0034	0.0030	B178203
Lab Filtered Nutrients									
Dissolved Phosphorus (P)	mg/L	<0.0030 (3)	N/A	0.0030	B179556	<0.0030 (3)	N/A	0.0030	B179556

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.
(2) Spreader colony present. Quantitative colony reporting is not possible due to bacterial density.
(3) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C387774
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CDB050				CDB051			
Sampling Date		2023/10/27 10:30				2023/10/27 11:40			
COC Number		1/1				1/1			
	UNITS	MW16-6-20 Lab-Dup	MU	RDL	QC Batch	RMW16-19-10	MU	RDL	QC Batch
Lab Filtered Inorganics									
Dissolved Organic Carbon (C)	mg/L	N/A	N/A	0.50	B179338	3.2	+/- 0.54	0.50	B179338
Microbiological Param.									
E.Coli DST	MPN/100mL	N/A	N/A	1.0	B175271	<100 (1)	N/A	100	B175271
Fecal Coliforms	MPN/100mL	N/A	N/A	1.0	B175274	<100 (1)	N/A	100	B175274
Heterotrophic Plate Count	CFU/mL	N/A	N/A	1.0	B174903	3000 (1)	N/A	20	B174903
Total Coliforms DST	MPN/100mL	N/A	N/A	1.0	B175271	<100 (1)	N/A	100	B175271
Nutrients									
Total Ammonia (N)	mg/L	1.2	+/- 0.13	0.015	B179708	0.14	+/- 0.019	0.015	B179704
Orthophosphate (P)	mg/L	N/A	N/A	0.0030	B178203	<0.0030	N/A	0.0030	B178203
Lab Filtered Nutrients									
Dissolved Phosphorus (P)	mg/L	N/A	N/A	0.0030	B179556	<0.0030	N/A	0.0030	B179556

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.

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Bureau Veritas Job #: C387774
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CDB052				CDB053			
Sampling Date		2023/10/27 11:45				2023/10/27 12:45			
COC Number		1/1				1/1			
	UNITS	RMW16-19-19	MU	RDL	QC Batch	RMW16-18-5	MU	RDL	QC Batch
Lab Filtered Inorganics									
Dissolved Organic Carbon (C)	mg/L	3.3	+/- 0.55	0.50	B179365	1.5	+/- <RDL	0.50	B179338
Microbiological Param.									
E.Coli DST	MPN/100mL	<1.0	N/A	1.0	B175271	<100 (1)	N/A	100	B175271
Fecal Coliforms	MPN/100mL	<1.0	N/A	1.0	B175274	<100 (1)	N/A	100	B175274
Heterotrophic Plate Count	CFU/mL	16	N/A	1.0	B174903	2800 (1)	N/A	20	B174903
Total Coliforms DST	MPN/100mL	<1.0	N/A	1.0	B175271	<100 (1)	N/A	100	B175271
Nutrients									
Total Ammonia (N)	mg/L	1.1	+/- 0.12	0.015	B179678	0.018	+/- <RDL	0.015	B179704
Orthophosphate (P)	mg/L	0.0036	+/- 0.0034	0.0030	B178203	<0.0030	N/A	0.0030	B178203
Lab Filtered Nutrients									
Dissolved Phosphorus (P)	mg/L	<0.0030 (2)	N/A	0.0030	B179556	<0.0030	N/A	0.0030	B179556

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.
(2) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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Bureau Veritas Job #: C387774
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STANTEC CONSULTING LTD
Client Project #: 11077396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CDB053				CDB054		CDB055			
Sampling Date		2023/10/27 12:45				2023/10/27 12:56		2023/10/27 14:12			
COC Number		1/1				1/1		1/1			
	UNITS	RMW16-18-5 Lab-Dup	MU	RDL	QC Batch	RMW16-18-13	MU	MW16-1-15	MU	RDL	QC Batch
Lab Filtered Inorganics											
Dissolved Organic Carbon (C)	mg/L	N/A	N/A	0.50	B179338	1.5	+/- <RDL	2.4	+/- <RDL	0.50	B179365
Microbiological Param.											
E.Coli DST	MPN/100mL	N/A	N/A	100	B175271	<1.0	N/A	<1.0	N/A	1.0	B175271
Fecal Coliforms	MPN/100mL	N/A	N/A	100	B175274	<1.0	N/A	<1.0	N/A	1.0	B175274
Heterotrophic Plate Count	CFU/mL	N/A	N/A	20	B174903	49	N/A	300	N/A	1.0	B174903
Total Coliforms DST	MPN/100mL	N/A	N/A	100	B175271	<1.0	N/A	1.0	N/A	1.0	B175271
Nutrients											
Total Ammonia (N)	mg/L	N/A	N/A	0.015	B179704	<0.015	N/A	0.037	+/- <RDL	0.015	B179678
Orthophosphate (P)	mg/L	N/A	N/A	0.0030	B178203	<0.0030	N/A	<0.0030	N/A	0.0030	B178203
Lab Filtered Nutrients											
Dissolved Phosphorus (P)	mg/L	<0.0030	N/A	0.0030	B179556	<0.0030	N/A	<0.0030	N/A	0.0030	B179556

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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Bureau Veritas Job #: C387774
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CDB056		CDB056				CDB057			
Sampling Date		2023/10/27 14:30		2023/10/27 14:30				2023/10/27 14:41			
COC Number		1/1		1/1				1/1			
	UNITS	23-12	MU	23-12 Lab-Dup	MU	RDL	QC Batch	23-13	MU	RDL	QC Batch
Lab Filtered Inorganics											
Dissolved Organic Carbon (C)	mg/L	1.4	+/- <RDL	N/A	N/A	0.50	B179365	3.1 (1)	+/- <RDL	2.5	B179365
Microbiological Param.											
E.Coli DST	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B175271	<1.0	N/A	1.0	B175271
Fecal Coliforms	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B175274	<1.0	N/A	1.0	B175274
Heterotrophic Plate Count	CFU/mL	18	N/A	N/A	N/A	1.0	B174903	120	N/A	1.0	B174903
Total Coliforms DST	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B175271	770	N/A	1.0	B175271
Nutrients											
Total Ammonia (N)	mg/L	<0.015	N/A	<0.015	N/A	0.015	B179704	1.1	+/- 0.12	0.015	B179704
Orthophosphate (P)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B178203	0.0030	+/- 0.0034	0.0030	B178711
Lab Filtered Nutrients											
Dissolved Phosphorus (P)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B179677	<0.0030 (2)	N/A	0.0030	B179677

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to sample matrix.
(2) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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Bureau Veritas Job #: C387774
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STANTEC CONSULTING LTD
Client Project #: 11077396
Site Location: SR1
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CDB058		CDB058			CDB059			
Sampling Date		2023/10/27 14:58		2023/10/27 14:58			2023/10/27 15:30			
COC Number		1/1		1/1			1/1			
	UNITS	23-14	MU	23-14 Lab-Dup	MU	QC Batch	23-15	MU	RDL	QC Batch
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	<0.50	N/A	N/A	N/A	B179365	<0.50	N/A	0.50	B179338
Microbiological Param.										
E.Coli DST	MPN/100mL	<1.0	N/A	<1.0	N/A	B175271	<1.0	N/A	1.0	B175271
Fecal Coliforms	MPN/100mL	<1.0	N/A	<1.0	N/A	B175274	<1.0	N/A	1.0	B175274
Heterotrophic Plate Count	CFU/mL	1.0	N/A	1.0	N/A	B174903	<1.0	N/A	1.0	B174903
Total Coliforms DST	MPN/100mL	<1.0	N/A	<1.0	N/A	B175271	<1.0	N/A	1.0	B175271
Nutrients										
Total Ammonia (N)	mg/L	<0.015	N/A	N/A	N/A	B176965	<0.015	N/A	0.015	B179715
Orthophosphate (P)	mg/L	<0.0030	N/A	N/A	N/A	B178203	<0.0030	N/A	0.0030	B178711
Lab Filtered Nutrients										
Dissolved Phosphorus (P)	mg/L	<0.0030	N/A	N/A	N/A	B179556	<0.0030	N/A	0.0030	B179556

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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Bureau Veritas Job #: C387774
Report Date: 2023/11/08

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Location: SR1
Sampler Initials: WT

MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID		CDB047			CDB048			CDB049			
Sampling Date		2023/10/27 09:12			2023/10/27 08:55			2023/10/27 10:21			
COC Number		1/1			1/1			1/1			
	UNITS	MW16-8-19	MU	RDL	MW16-8-8	MU	QC Batch	MW16-6-11	MU	RDL	QC Batch
Elements											
Total Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	0.123	+/- 0.021	B181911	0.111	+/- 0.019	0.019	B181911
Lab Filtered Elements											
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	0.0025	+/- 1.17	B179471	<0.0019	N/A	0.0019	B177507

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CDB050				CDB051			
Sampling Date		2023/10/27 10:30				2023/10/27 11:40			
COC Number		1/1				1/1			
	UNITS	MW16-6-20	MU	RDL	QC Batch	RMW16-19-10	MU	RDL	QC Batch
Elements									
Total Mercury (Hg)	ug/L	0.0030	+/- 0.0019	0.0019	B181911	0.132	+/- 0.023	0.019	B181911
Lab Filtered Elements									
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	B179471	0.0020	+/- 1.17	0.0019	B177507

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CDB052				CDB053			
Sampling Date		2023/10/27 11:45				2023/10/27 12:45			
COC Number		1/1				1/1			
	UNITS	RMW16-19-19	MU	RDL	QC Batch	RMW16-18-5	MU	RDL	QC Batch
Elements									
Total Mercury (Hg)	ug/L	0.0028	+/- 0.0019	0.0019	B181911	0.129	+/- 0.022	0.019	B181911
Lab Filtered Elements									
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	B179471	<0.0019	N/A	0.0019	B177507

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID		CDB054		CDB055			CDB056			
Sampling Date		2023/10/27 12:56		2023/10/27 14:12			2023/10/27 14:30			
COC Number		1/1		1/1			1/1			
	UNITS	RMW16-18-13	MU	MW16-1-15	MU	QC Batch	23-12	MU	RDL	QC Batch
Elements										
Total Mercury (Hg)	ug/L	0.0071	+/- 0.0022	0.0241	+/- 0.0045	B181947	<0.0019	N/A	0.0019	B181911
Lab Filtered Elements										
Dissolved Mercury (Hg)	ug/L	0.0020	+/- 1.17	<0.0019	N/A	B179471	<0.0019	N/A	0.0019	B179471

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CDB056			CDB057			CDB058			
Sampling Date		2023/10/27 14:30			2023/10/27 14:41			2023/10/27 14:58			
COC Number		1/1			1/1			1/1			
	UNITS	23-12 Lab-Dup	MU	QC Batch	23-13	MU	QC Batch	23-14	MU	RDL	QC Batch
Elements											
Total Mercury (Hg)	ug/L	<0.0019	N/A	B181911	0.0033	+/- 0.0019	B181947	<0.0019	N/A	0.0019	B181911
Lab Filtered Elements											
Dissolved Mercury (Hg)	ug/L	N/A	N/A	B179471	<0.0019	N/A	B179471	<0.0019	N/A	0.0019	B179471

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CDB059			
Sampling Date		2023/10/27 15:30			
COC Number		1/1			
	UNITS	23-15	MU	RDL	QC Batch
Elements					
Total Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	B181947
Lab Filtered Elements					
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	B179471

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	1.7°C
Package 2	0.7°C

Sample CDB047 [MW16-8-19] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CDB048 [MW16-8-8] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CDB049 [MW16-6-11] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CDB050 [MW16-6-20] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CDB051 [RMW16-19-10] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CDB052 [RMW16-19-19] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CDB053 [RMW16-18-5] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CDB054 [RMW16-18-13] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CDB055 [MW16-1-15] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CDB056 [23-12] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CDB057 [23-13] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CDB058 [23-14] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CDB059 [23-15] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

MERCURY BY COLD VAPOR (WATER) Comments

Sample CDB048 [MW16-8-8] Mercury (Total) by CV: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
Sample CDB049 [MW16-6-11] Mercury (Total) by CV: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
Sample CDB051 [RMW16-19-10] Mercury (Total) by CV: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
Sample CDB053 [RMW16-18-5] Mercury (Total) by CV: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Sample CDB058, Elements by ICPMS-Dissolved-Lab Filtered: Test repeated.

Results relate only to the items tested.

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Client Project #: 11077396
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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B174903	AP1	Method Blank	Heterotrophic Plate Count	2023/10/30	<1.0		CFU/mL	
B174903	AP1	RPD [CDB058-05]	Heterotrophic Plate Count	2023/10/30	0		%	N/A
B175271	SOG	Method Blank	E.Coli DST	2023/10/29	<1.0		mpn/100mL	
			Total Coliforms DST	2023/10/29	<1.0		mpn/100mL	
B175271	SOG	RPD [CDB058-05]	E.Coli DST	2023/10/29	NC		%	N/A
			Total Coliforms DST	2023/10/29	NC		%	N/A
B175274	SOG	Method Blank	Fecal Coliforms	2023/10/29	<1.0		MPN/100mL	
B175274	SOG	RPD [CDB058-05]	Fecal Coliforms	2023/10/29	NC		%	N/A
B175281	CHA	Spiked Blank	O-TERPHENYL (sur.)	2023/11/02		100	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2023/11/02		104	%	60 - 140
B175281	CHA	Method Blank	O-TERPHENYL (sur.)	2023/11/02		99	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2023/11/02	<0.10		mg/L	
B175388	AJG	Matrix Spike [CDB048-07]	1,4-Difluorobenzene (sur.)	2023/11/03		92	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/11/03		94	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/11/03		77	%	50 - 140
			Benzene	2023/11/03		78	%	50 - 140
			Toluene	2023/11/03		77	%	50 - 140
			Ethylbenzene	2023/11/03		85	%	50 - 140
			m & p-Xylene	2023/11/03		87	%	50 - 140
			o-Xylene	2023/11/03		87	%	50 - 140
			F1 (C6-C10)	2023/11/03		82	%	60 - 140
B175388	AJG	Spiked Blank	1,4-Difluorobenzene (sur.)	2023/11/03		93	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/11/03		95	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/11/03		75	%	50 - 140
			Benzene	2023/11/03		78	%	60 - 130
			Toluene	2023/11/03		81	%	60 - 130
			Ethylbenzene	2023/11/03		86	%	60 - 130
			m & p-Xylene	2023/11/03		89	%	60 - 130
			o-Xylene	2023/11/03		88	%	60 - 130
			F1 (C6-C10)	2023/11/03		97	%	60 - 140
B175388	AJG	Method Blank	1,4-Difluorobenzene (sur.)	2023/11/03		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/11/03		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/11/03		80	%	50 - 140
			Benzene	2023/11/03	<0.00040		mg/L	
			Toluene	2023/11/03	<0.00040		mg/L	
			Ethylbenzene	2023/11/03	<0.00040		mg/L	
			m & p-Xylene	2023/11/03	<0.00080		mg/L	
			o-Xylene	2023/11/03	<0.00040		mg/L	
			F1 (C6-C10)	2023/11/03	<0.10		mg/L	
B175388	AJG	RPD [CDB047-07]	Benzene	2023/11/03	NC		%	30
			Toluene	2023/11/03	NC		%	30
			Ethylbenzene	2023/11/03	NC		%	30
			m & p-Xylene	2023/11/03	NC		%	30
			o-Xylene	2023/11/03	NC		%	30
			F1 (C6-C10)	2023/11/03	NC		%	30
B176965	AFI	Matrix Spike	Total Ammonia (N)	2023/10/30		NC	%	80 - 120
B176965	AFI	Spiked Blank	Total Ammonia (N)	2023/10/30		104	%	80 - 120
B176965	AFI	Method Blank	Total Ammonia (N)	2023/10/30	<0.015		mg/L	
B177173	ISW	Matrix Spike [CDB053-01]	Nitrite (N)	2023/10/30		103	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/30		118	%	80 - 120
B177173	ISW	Spiked Blank	Nitrite (N)	2023/10/30		103	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/30		100	%	80 - 120
B177173	ISW	Method Blank	Nitrite (N)	2023/10/30	<0.010		mg/L	

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			Nitrate plus Nitrite (N)	2023/10/30	<0.010		mg/L	
B177173	ISW	RPD [CDB053-01]	Nitrite (N)	2023/10/30	NC		%	20
			Nitrate plus Nitrite (N)	2023/10/30	5.5		%	20
B177186	ISW	Matrix Spike [CDB059-01]	Nitrite (N)	2023/10/30		102	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/30		96	%	80 - 120
B177186	ISW	Spiked Blank	Nitrite (N)	2023/10/30		103	%	80 - 120
			Nitrate plus Nitrite (N)	2023/10/30		99	%	80 - 120
B177186	ISW	Method Blank	Nitrite (N)	2023/10/30	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2023/10/30	<0.010		mg/L	
B177186	ISW	RPD [CDB059-01]	Nitrite (N)	2023/10/30	NC		%	20
			Nitrate plus Nitrite (N)	2023/10/30	NC		%	20
B177507	KKM	Matrix Spike	Dissolved Mercury (Hg)	2023/10/31		94	%	80 - 120
B177507	KKM	Spiked Blank	Dissolved Mercury (Hg)	2023/10/31		101	%	80 - 120
B177507	KKM	Method Blank	Dissolved Mercury (Hg)	2023/10/31	<0.0019		ug/L	
B177507	KKM	RPD	Dissolved Mercury (Hg)	2023/10/31	NC		%	20
B178203	CTU	Matrix Spike	Orthophosphate (P)	2023/10/31		90	%	80 - 120
B178203	CTU	Spiked Blank	Orthophosphate (P)	2023/10/31		99	%	80 - 120
B178203	CTU	Method Blank	Orthophosphate (P)	2023/10/31	<0.0030		mg/L	
B178203	CTU	RPD	Orthophosphate (P)	2023/10/31	4.0		%	20
B178520	KH2	Matrix Spike	Dissolved Aluminum (Al)	2023/11/01		101	%	80 - 120
			Dissolved Antimony (Sb)	2023/11/01		109	%	80 - 120
			Dissolved Arsenic (As)	2023/11/01		105	%	80 - 120
			Dissolved Beryllium (Be)	2023/11/01		98	%	80 - 120
			Dissolved Chromium (Cr)	2023/11/01		98	%	80 - 120
			Dissolved Cobalt (Co)	2023/11/01		96	%	80 - 120
			Dissolved Copper (Cu)	2023/11/01		95	%	80 - 120
			Dissolved Lead (Pb)	2023/11/01		94	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/11/01		104	%	80 - 120
			Dissolved Nickel (Ni)	2023/11/01		95	%	80 - 120
			Dissolved Selenium (Se)	2023/11/01		104	%	80 - 120
			Dissolved Silver (Ag)	2023/11/01		95	%	80 - 120
			Dissolved Thallium (Tl)	2023/11/01		93	%	80 - 120
			Dissolved Tin (Sn)	2023/11/01		102	%	80 - 120
			Dissolved Titanium (Ti)	2023/11/01		100	%	80 - 120
			Dissolved Uranium (U)	2023/11/01		97	%	80 - 120
			Dissolved Vanadium (V)	2023/11/01		101	%	80 - 120
			Dissolved Zinc (Zn)	2023/11/01		101	%	80 - 120
B178520	KH2	Spiked Blank	Dissolved Aluminum (Al)	2023/10/31		116	%	80 - 120
			Dissolved Antimony (Sb)	2023/10/31		109	%	80 - 120
			Dissolved Arsenic (As)	2023/10/31		103	%	80 - 120
			Dissolved Beryllium (Be)	2023/10/31		98	%	80 - 120
			Dissolved Chromium (Cr)	2023/10/31		100	%	80 - 120
			Dissolved Cobalt (Co)	2023/10/31		99	%	80 - 120
			Dissolved Copper (Cu)	2023/10/31		99	%	80 - 120
			Dissolved Lead (Pb)	2023/10/31		98	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/10/31		100	%	80 - 120
			Dissolved Nickel (Ni)	2023/10/31		97	%	80 - 120
			Dissolved Selenium (Se)	2023/10/31		103	%	80 - 120
			Dissolved Silver (Ag)	2023/10/31		96	%	80 - 120
			Dissolved Thallium (Tl)	2023/10/31		96	%	80 - 120
			Dissolved Tin (Sn)	2023/10/31		99	%	80 - 120
			Dissolved Titanium (Ti)	2023/10/31		102	%	80 - 120
			Dissolved Uranium (U)	2023/10/31		97	%	80 - 120

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			Dissolved Vanadium (V)	2023/10/31		101	%	80 - 120
			Dissolved Zinc (Zn)	2023/10/31		104	%	80 - 120
B178520	KH2	Method Blank	Dissolved Aluminum (Al)	2023/10/31	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2023/10/31	<0.00060		mg/L	
			Dissolved Arsenic (As)	2023/10/31	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2023/10/31	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2023/10/31	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2023/10/31	<0.00030		mg/L	
			Dissolved Copper (Cu)	2023/10/31	<0.0010		mg/L	
			Dissolved Lead (Pb)	2023/10/31	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2023/10/31	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2023/10/31	<0.00050		mg/L	
			Dissolved Selenium (Se)	2023/10/31	<0.00020		mg/L	
			Dissolved Silver (Ag)	2023/10/31	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2023/10/31	<0.00020		mg/L	
			Dissolved Tin (Sn)	2023/10/31	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2023/10/31	<0.0010		mg/L	
			Dissolved Uranium (U)	2023/10/31	<0.00010		mg/L	
			Dissolved Vanadium (V)	2023/10/31	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2023/10/31	<0.0030		mg/L	
B178520	KH2	RPD	Dissolved Aluminum (Al)	2023/10/31	NC		%	20
			Dissolved Antimony (Sb)	2023/10/31	NC		%	20
			Dissolved Arsenic (As)	2023/10/31	10		%	20
			Dissolved Beryllium (Be)	2023/10/31	NC		%	20
			Dissolved Chromium (Cr)	2023/10/31	NC		%	20
			Dissolved Cobalt (Co)	2023/10/31	NC		%	20
			Dissolved Copper (Cu)	2023/10/31	1.3		%	20
			Dissolved Lead (Pb)	2023/10/31	NC		%	20
			Dissolved Molybdenum (Mo)	2023/10/31	1.5		%	20
			Dissolved Nickel (Ni)	2023/10/31	NC		%	20
			Dissolved Selenium (Se)	2023/10/31	1.9		%	20
			Dissolved Silver (Ag)	2023/10/31	NC		%	20
			Dissolved Thallium (Tl)	2023/10/31	NC		%	20
			Dissolved Tin (Sn)	2023/10/31	NC		%	20
			Dissolved Titanium (Ti)	2023/10/31	NC		%	20
			Dissolved Uranium (U)	2023/10/31	1.9		%	20
			Dissolved Vanadium (V)	2023/10/31	NC		%	20
			Dissolved Zinc (Zn)	2023/10/31	3.2		%	20
B178525	KH2	Matrix Spike	Dissolved Aluminum (Al)	2023/11/01		117	%	80 - 120
			Dissolved Antimony (Sb)	2023/11/01		110	%	80 - 120
			Dissolved Arsenic (As)	2023/11/01		106	%	80 - 120
			Dissolved Beryllium (Be)	2023/11/01		112	%	80 - 120
			Dissolved Chromium (Cr)	2023/11/01		116	%	80 - 120
			Dissolved Cobalt (Co)	2023/11/01		117	%	80 - 120
			Dissolved Copper (Cu)	2023/11/01		106	%	80 - 120
			Dissolved Lead (Pb)	2023/11/01		102	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/11/01		111	%	80 - 120
			Dissolved Nickel (Ni)	2023/11/01		119	%	80 - 120
			Dissolved Selenium (Se)	2023/11/01		116	%	80 - 120
			Dissolved Silver (Ag)	2023/11/01		103	%	80 - 120
			Dissolved Thallium (Tl)	2023/11/01		101	%	80 - 120
			Dissolved Tin (Sn)	2023/11/01		105	%	80 - 120
			Dissolved Titanium (Ti)	2023/11/01		103	%	80 - 120

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			Dissolved Uranium (U)	2023/11/01		116	%	80 - 120
			Dissolved Vanadium (V)	2023/11/01		107	%	80 - 120
			Dissolved Zinc (Zn)	2023/11/01		107	%	80 - 120
B178525	KH2	Spiked Blank	Dissolved Aluminum (Al)	2023/10/31		107	%	80 - 120
			Dissolved Antimony (Sb)	2023/10/31		110	%	80 - 120
			Dissolved Arsenic (As)	2023/10/31		106	%	80 - 120
			Dissolved Beryllium (Be)	2023/10/31		98	%	80 - 120
			Dissolved Chromium (Cr)	2023/10/31		101	%	80 - 120
			Dissolved Cobalt (Co)	2023/10/31		100	%	80 - 120
			Dissolved Copper (Cu)	2023/10/31		101	%	80 - 120
			Dissolved Lead (Pb)	2023/10/31		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/10/31		102	%	80 - 120
			Dissolved Nickel (Ni)	2023/10/31		98	%	80 - 120
			Dissolved Selenium (Se)	2023/10/31		105	%	80 - 120
			Dissolved Silver (Ag)	2023/10/31		97	%	80 - 120
			Dissolved Thallium (Tl)	2023/10/31		98	%	80 - 120
			Dissolved Tin (Sn)	2023/10/31		103	%	80 - 120
			Dissolved Titanium (Ti)	2023/10/31		102	%	80 - 120
			Dissolved Uranium (U)	2023/10/31		98	%	80 - 120
			Dissolved Vanadium (V)	2023/10/31		101	%	80 - 120
			Dissolved Zinc (Zn)	2023/10/31		103	%	80 - 120
B178525	KH2	Method Blank	Dissolved Aluminum (Al)	2023/10/31	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2023/10/31	<0.00060		mg/L	
			Dissolved Arsenic (As)	2023/10/31	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2023/10/31	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2023/10/31	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2023/10/31	<0.00030		mg/L	
			Dissolved Copper (Cu)	2023/10/31	<0.0010		mg/L	
			Dissolved Lead (Pb)	2023/10/31	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2023/10/31	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2023/10/31	<0.00050		mg/L	
			Dissolved Selenium (Se)	2023/10/31	<0.00020		mg/L	
			Dissolved Silver (Ag)	2023/10/31	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2023/10/31	<0.00020		mg/L	
			Dissolved Tin (Sn)	2023/10/31	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2023/10/31	<0.0010		mg/L	
			Dissolved Uranium (U)	2023/10/31	<0.00010		mg/L	
			Dissolved Vanadium (V)	2023/10/31	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2023/10/31	<0.0030		mg/L	
B178525	KH2	RPD	Dissolved Aluminum (Al)	2023/10/31	NC		%	20
			Dissolved Antimony (Sb)	2023/10/31	NC		%	20
			Dissolved Arsenic (As)	2023/10/31	12		%	20
			Dissolved Beryllium (Be)	2023/10/31	NC		%	20
			Dissolved Chromium (Cr)	2023/10/31	NC		%	20
			Dissolved Cobalt (Co)	2023/10/31	1.5		%	20
			Dissolved Copper (Cu)	2023/10/31	NC		%	20
			Dissolved Lead (Pb)	2023/10/31	NC		%	20
			Dissolved Molybdenum (Mo)	2023/10/31	0.26		%	20
			Dissolved Nickel (Ni)	2023/10/31	3.4		%	20
			Dissolved Selenium (Se)	2023/10/31	6.3		%	20
			Dissolved Silver (Ag)	2023/10/31	NC		%	20
			Dissolved Thallium (Tl)	2023/10/31	NC		%	20
			Dissolved Tin (Sn)	2023/10/31	NC		%	20

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			Dissolved Titanium (Ti)	2023/10/31	NC		%	20
			Dissolved Uranium (U)	2023/10/31	2.7		%	20
			Dissolved Vanadium (V)	2023/10/31	NC		%	20
			Dissolved Zinc (Zn)	2023/10/31	18		%	20
B178711	CTU	Matrix Spike	Orthophosphate (P)	2023/10/31		96	%	80 - 120
B178711	CTU	Spiked Blank	Orthophosphate (P)	2023/10/31		95	%	80 - 120
B178711	CTU	Method Blank	Orthophosphate (P)	2023/10/31	<0.0030		mg/L	
B178711	CTU	RPD	Orthophosphate (P)	2023/10/31	7.7		%	20
B179338	YHK	Matrix Spike	Dissolved Organic Carbon (C)	2023/11/01		91	%	80 - 120
B179338	YHK	Spiked Blank	Dissolved Organic Carbon (C)	2023/11/01		104	%	80 - 120
B179338	YHK	Method Blank	Dissolved Organic Carbon (C)	2023/11/01	<0.50		mg/L	
B179338	YHK	RPD	Dissolved Organic Carbon (C)	2023/11/01	2.0		%	20
B179365	YHK	Matrix Spike	Dissolved Organic Carbon (C)	2023/11/01		84	%	80 - 120
B179365	YHK	Spiked Blank	Dissolved Organic Carbon (C)	2023/11/01		110	%	80 - 120
B179365	YHK	Method Blank	Dissolved Organic Carbon (C)	2023/11/01	<0.50		mg/L	
B179365	YHK	RPD	Dissolved Organic Carbon (C)	2023/11/01	4.7		%	20
B179471	KKM	Matrix Spike	Dissolved Mercury (Hg)	2023/11/02		95	%	80 - 120
B179471	KKM	Spiked Blank	Dissolved Mercury (Hg)	2023/11/02		97	%	80 - 120
B179471	KKM	Method Blank	Dissolved Mercury (Hg)	2023/11/02	<0.0019		ug/L	
B179471	KKM	RPD	Dissolved Mercury (Hg)	2023/11/02	11		%	20
B179556	MAP	Matrix Spike [CDB053-01]	Dissolved Phosphorus (P)	2023/11/01		100	%	80 - 120
B179556	MAP	QC Standard	Dissolved Phosphorus (P)	2023/11/01		96	%	80 - 120
B179556	MAP	Spiked Blank	Dissolved Phosphorus (P)	2023/11/01		100	%	80 - 120
B179556	MAP	Method Blank	Dissolved Phosphorus (P)	2023/11/01	<0.0030		mg/L	
B179556	MAP	RPD [CDB053-01]	Dissolved Phosphorus (P)	2023/11/01	NC		%	20
B179677	MAP	Matrix Spike	Dissolved Phosphorus (P)	2023/11/02		117	%	80 - 120
B179677	MAP	QC Standard	Dissolved Phosphorus (P)	2023/11/02		91	%	80 - 120
B179677	MAP	Spiked Blank	Dissolved Phosphorus (P)	2023/11/02		101	%	80 - 120
B179677	MAP	Method Blank	Dissolved Phosphorus (P)	2023/11/02	<0.0030		mg/L	
B179677	MAP	RPD	Dissolved Phosphorus (P)	2023/11/02	NC		%	20
B179678	AFI	Matrix Spike	Total Ammonia (N)	2023/11/01		102	%	80 - 120
B179678	AFI	Spiked Blank	Total Ammonia (N)	2023/11/01		102	%	80 - 120
B179678	AFI	Method Blank	Total Ammonia (N)	2023/11/01	<0.015		mg/L	
B179678	AFI	RPD	Total Ammonia (N)	2023/11/01	1.1		%	20
B179704	AFI	Matrix Spike [CDB056-08]	Total Ammonia (N)	2023/11/01		106	%	80 - 120
B179704	AFI	Spiked Blank	Total Ammonia (N)	2023/11/01		104	%	80 - 120
B179704	AFI	Method Blank	Total Ammonia (N)	2023/11/01	<0.015		mg/L	
B179704	AFI	RPD [CDB056-08]	Total Ammonia (N)	2023/11/01	NC		%	20
B179708	AFI	Matrix Spike [CDB050-08]	Total Ammonia (N)	2023/11/01		NC	%	80 - 120
B179708	AFI	Spiked Blank	Total Ammonia (N)	2023/11/01		102	%	80 - 120
B179708	AFI	Method Blank	Total Ammonia (N)	2023/11/01	<0.015		mg/L	
B179708	AFI	RPD [CDB050-08]	Total Ammonia (N)	2023/11/02	2.1		%	20
B179715	AFI	Matrix Spike [CDB047-08]	Total Ammonia (N)	2023/11/01		102	%	80 - 120
B179715	AFI	Spiked Blank	Total Ammonia (N)	2023/11/01		103	%	80 - 120
B179715	AFI	Method Blank	Total Ammonia (N)	2023/11/01	<0.015		mg/L	
B179715	AFI	RPD [CDB047-08]	Total Ammonia (N)	2023/11/01	NC		%	20
B179764	MB5	Matrix Spike [CDB052-01]	Chloride (Cl)	2023/11/01		103	%	80 - 120
			Sulphate (SO4)	2023/11/01		NC	%	80 - 120
B179764	MB5	Spiked Blank	Chloride (Cl)	2023/11/01		101	%	80 - 120
			Sulphate (SO4)	2023/11/01		98	%	80 - 120
B179764	MB5	Method Blank	Chloride (Cl)	2023/11/01	<1.0		mg/L	
			Sulphate (SO4)	2023/11/01	<1.0		mg/L	
B179764	MB5	RPD [CDB052-01]	Chloride (Cl)	2023/11/01	NC		%	20

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			Sulphate (SO4)	2023/11/01	0.36		%	20
B180614	IK0	Matrix Spike	Dissolved Barium (Ba)	2023/11/01		100	%	80 - 120
			Dissolved Boron (B)	2023/11/01		99	%	80 - 120
			Dissolved Calcium (Ca)	2023/11/01		102	%	80 - 120
			Dissolved Iron (Fe)	2023/11/01		101	%	80 - 120
			Dissolved Lithium (Li)	2023/11/01		100	%	80 - 120
			Dissolved Magnesium (Mg)	2023/11/01		94	%	80 - 120
			Dissolved Manganese (Mn)	2023/11/01		99	%	80 - 120
			Dissolved Phosphorus (P)	2023/11/01		93	%	80 - 120
			Dissolved Potassium (K)	2023/11/01		108	%	80 - 120
			Dissolved Silicon (Si)	2023/11/01		95	%	80 - 120
			Dissolved Sodium (Na)	2023/11/01		102	%	80 - 120
			Dissolved Strontium (Sr)	2023/11/01		100	%	80 - 120
			Dissolved Sulphur (S)	2023/11/01		100	%	80 - 120
B180614	IK0	Spiked Blank	Dissolved Barium (Ba)	2023/11/01		104	%	80 - 120
			Dissolved Boron (B)	2023/11/01		100	%	80 - 120
			Dissolved Calcium (Ca)	2023/11/01		105	%	80 - 120
			Dissolved Iron (Fe)	2023/11/01		107	%	80 - 120
			Dissolved Lithium (Li)	2023/11/01		104	%	80 - 120
			Dissolved Magnesium (Mg)	2023/11/01		99	%	80 - 120
			Dissolved Manganese (Mn)	2023/11/01		105	%	80 - 120
			Dissolved Phosphorus (P)	2023/11/01		97	%	80 - 120
			Dissolved Potassium (K)	2023/11/01		109	%	80 - 120
			Dissolved Silicon (Si)	2023/11/01		102	%	80 - 120
			Dissolved Sodium (Na)	2023/11/01		105	%	80 - 120
			Dissolved Strontium (Sr)	2023/11/01		102	%	80 - 120
			Dissolved Sulphur (S)	2023/11/01		99	%	80 - 120
B180614	IK0	Method Blank	Dissolved Barium (Ba)	2023/11/01	<0.010		mg/L	
			Dissolved Boron (B)	2023/11/01	<0.020		mg/L	
			Dissolved Calcium (Ca)	2023/11/01	<0.30		mg/L	
			Dissolved Iron (Fe)	2023/11/01	<0.060		mg/L	
			Dissolved Lithium (Li)	2023/11/01	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2023/11/01	<0.20		mg/L	
			Dissolved Manganese (Mn)	2023/11/01	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2023/11/01	<0.10		mg/L	
			Dissolved Potassium (K)	2023/11/01	<0.30		mg/L	
			Dissolved Silicon (Si)	2023/11/01	<0.50		mg/L	
			Dissolved Sodium (Na)	2023/11/01	<0.50		mg/L	
			Dissolved Strontium (Sr)	2023/11/01	<0.020		mg/L	
			Dissolved Sulphur (S)	2023/11/01	<0.20		mg/L	
B180614	IK0	RPD	Dissolved Calcium (Ca)	2023/11/01	NC		%	20
			Dissolved Iron (Fe)	2023/11/01	NC		%	20
			Dissolved Magnesium (Mg)	2023/11/01	NC		%	20
			Dissolved Manganese (Mn)	2023/11/01	NC		%	20
			Dissolved Potassium (K)	2023/11/01	NC		%	20
			Dissolved Sodium (Na)	2023/11/01	NC		%	20
B180623	IK0	Matrix Spike	Dissolved Barium (Ba)	2023/11/01		99	%	80 - 120
			Dissolved Boron (B)	2023/11/01		NC	%	80 - 120
			Dissolved Calcium (Ca)	2023/11/01		98	%	80 - 120
			Dissolved Iron (Fe)	2023/11/01		104	%	80 - 120
			Dissolved Lithium (Li)	2023/11/01		102	%	80 - 120
			Dissolved Magnesium (Mg)	2023/11/01		93	%	80 - 120
			Dissolved Manganese (Mn)	2023/11/01		103	%	80 - 120

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			Dissolved Phosphorus (P)	2023/11/01		97	%	80 - 120
			Dissolved Potassium (K)	2023/11/01		110	%	80 - 120
			Dissolved Silicon (Si)	2023/11/01		98	%	80 - 120
			Dissolved Sodium (Na)	2023/11/01		NC	%	80 - 120
			Dissolved Strontium (Sr)	2023/11/01		96	%	80 - 120
			Dissolved Sulphur (S)	2023/11/01		NC	%	80 - 120
B180623	IK0	Spiked Blank	Dissolved Barium (Ba)	2023/11/01		104	%	80 - 120
			Dissolved Boron (B)	2023/11/01		101	%	80 - 120
			Dissolved Calcium (Ca)	2023/11/01		105	%	80 - 120
			Dissolved Iron (Fe)	2023/11/01		107	%	80 - 120
			Dissolved Lithium (Li)	2023/11/01		103	%	80 - 120
			Dissolved Magnesium (Mg)	2023/11/01		97	%	80 - 120
			Dissolved Manganese (Mn)	2023/11/01		105	%	80 - 120
			Dissolved Phosphorus (P)	2023/11/01		97	%	80 - 120
			Dissolved Potassium (K)	2023/11/01		108	%	80 - 120
			Dissolved Silicon (Si)	2023/11/01		102	%	80 - 120
			Dissolved Sodium (Na)	2023/11/01		104	%	80 - 120
			Dissolved Strontium (Sr)	2023/11/01		103	%	80 - 120
			Dissolved Sulphur (S)	2023/11/01		99	%	80 - 120
B180623	IK0	Method Blank	Dissolved Barium (Ba)	2023/11/01	<0.010		mg/L	
			Dissolved Boron (B)	2023/11/01	<0.020		mg/L	
			Dissolved Calcium (Ca)	2023/11/01	<0.30		mg/L	
			Dissolved Iron (Fe)	2023/11/01	<0.060		mg/L	
			Dissolved Lithium (Li)	2023/11/01	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2023/11/01	<0.20		mg/L	
			Dissolved Manganese (Mn)	2023/11/01	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2023/11/01	<0.10		mg/L	
			Dissolved Potassium (K)	2023/11/01	<0.30		mg/L	
			Dissolved Silicon (Si)	2023/11/01	<0.50		mg/L	
			Dissolved Sodium (Na)	2023/11/01	<0.50		mg/L	
			Dissolved Strontium (Sr)	2023/11/01	<0.020		mg/L	
			Dissolved Sulphur (S)	2023/11/01	<0.20		mg/L	
B180623	IK0	RPD	Dissolved Calcium (Ca)	2023/11/02	3.5		%	20
			Dissolved Iron (Fe)	2023/11/02	NC		%	20
			Dissolved Magnesium (Mg)	2023/11/02	5.8		%	20
			Dissolved Manganese (Mn)	2023/11/02	1.7		%	20
			Dissolved Potassium (K)	2023/11/02	3.4		%	20
			Dissolved Sodium (Na)	2023/11/02	1.8		%	20
B180851	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/04		100	%	80 - 120
B180851	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/11/04	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/04	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/04	<1.0		mg/L	
			Carbonate (CO3)	2023/11/04	<1.0		mg/L	
			Hydroxide (OH)	2023/11/04	<1.0		mg/L	
B180851	JVM	RPD	Alkalinity (PP as CaCO3)	2023/11/04	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/04	0.56		%	20
			Bicarbonate (HCO3)	2023/11/04	0.56		%	20
			Carbonate (CO3)	2023/11/04	NC		%	20
			Hydroxide (OH)	2023/11/04	NC		%	20
B180852	JVM	Spiked Blank	Conductivity	2023/11/04		100	%	90 - 110
B180852	JVM	Method Blank	Conductivity	2023/11/04	<2.0		uS/cm	
B180852	JVM	RPD	Conductivity	2023/11/04	0		%	10
B180854	JVM	Spiked Blank	pH	2023/11/04		100	%	97 - 103

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B180854	JVM	RPD	pH	2023/11/04	2.3		%	N/A
B181736	MAP	Matrix Spike	Total Nitrogen (N)	2023/11/02		NC	%	80 - 120
B181736	MAP	QC Standard	Total Nitrogen (N)	2023/11/02		105	%	80 - 120
B181736	MAP	Spiked Blank	Total Nitrogen (N)	2023/11/02		104	%	80 - 120
B181736	MAP	Method Blank	Total Nitrogen (N)	2023/11/02	<0.020		mg/L	
B181736	MAP	RPD [CDB056-02]	Total Nitrogen (N)	2023/11/02	2.9		%	20
B181739	MAP	Matrix Spike [CDB058-02]	Total Nitrogen (N)	2023/11/02		106	%	80 - 120
B181739	MAP	QC Standard	Total Nitrogen (N)	2023/11/02		105	%	80 - 120
B181739	MAP	Spiked Blank	Total Nitrogen (N)	2023/11/02		107	%	80 - 120
B181739	MAP	Method Blank	Total Nitrogen (N)	2023/11/02	<0.020		mg/L	
B181739	MAP	RPD	Total Nitrogen (N)	2023/11/02	NC		%	20
B181746	MAP	Matrix Spike	Total Nitrogen (N)	2023/11/02		NC	%	80 - 120
B181746	MAP	QC Standard	Total Nitrogen (N)	2023/11/02		108	%	80 - 120
B181746	MAP	Spiked Blank	Total Nitrogen (N)	2023/11/02		106	%	80 - 120
B181746	MAP	Method Blank	Total Nitrogen (N)	2023/11/02	<0.020		mg/L	
B181746	MAP	RPD [CDB059-02]	Total Nitrogen (N)	2023/11/02	NC		%	20
B181911	KKM	Matrix Spike	Total Mercury (Hg)	2023/11/02		101	%	80 - 120
B181911	KKM	Spiked Blank	Total Mercury (Hg)	2023/11/02		92	%	80 - 120
B181911	KKM	Method Blank	Total Mercury (Hg)	2023/11/02	<0.0019		ug/L	
B181911	KKM	RPD [CDB056-09]	Total Mercury (Hg)	2023/11/02	NC		%	20
B181947	KKM	Matrix Spike	Total Mercury (Hg)	2023/11/02		83	%	80 - 120
B181947	KKM	Spiked Blank	Total Mercury (Hg)	2023/11/02		93	%	80 - 120
B181947	KKM	Method Blank	Total Mercury (Hg)	2023/11/02	<0.0019		ug/L	
B181947	KKM	RPD	Total Mercury (Hg)	2023/11/02	NC		%	20
B182253	MB5	Matrix Spike	Chloride (Cl)	2023/11/02		NC	%	80 - 120
			Sulphate (SO4)	2023/11/02		NC	%	80 - 120
B182253	MB5	Spiked Blank	Chloride (Cl)	2023/11/02		110	%	80 - 120
			Sulphate (SO4)	2023/11/02		97	%	80 - 120
B182253	MB5	Method Blank	Chloride (Cl)	2023/11/02	<1.0		mg/L	
			Sulphate (SO4)	2023/11/02	<1.0		mg/L	
B182253	MB5	RPD	Chloride (Cl)	2023/11/02	0.85		%	20
			Sulphate (SO4)	2023/11/02	1.1		%	20
B182898	SKM	Matrix Spike	Chloride (Cl)	2023/11/03		NC	%	80 - 120
			Sulphate (SO4)	2023/11/03		NC	%	80 - 120
B182898	SKM	Spiked Blank	Chloride (Cl)	2023/11/02		103	%	80 - 120
			Sulphate (SO4)	2023/11/02		94	%	80 - 120
B182898	SKM	Method Blank	Chloride (Cl)	2023/11/02	<1.0		mg/L	
			Sulphate (SO4)	2023/11/02	<1.0		mg/L	
B182898	SKM	RPD	Chloride (Cl)	2023/11/03	4.1		%	20
			Sulphate (SO4)	2023/11/03	0.84		%	20
B183032	MKJ	Matrix Spike	Dissolved Barium (Ba)	2023/11/06		90	%	80 - 120
			Dissolved Boron (B)	2023/11/06		88	%	80 - 120
			Dissolved Calcium (Ca)	2023/11/06		NC	%	80 - 120
			Dissolved Iron (Fe)	2023/11/06		101	%	80 - 120
			Dissolved Lithium (Li)	2023/11/06		94	%	80 - 120
			Dissolved Magnesium (Mg)	2023/11/06		NC	%	80 - 120
			Dissolved Manganese (Mn)	2023/11/06		NC	%	80 - 120
			Dissolved Phosphorus (P)	2023/11/06		104	%	80 - 120
			Dissolved Potassium (K)	2023/11/06		106	%	80 - 120
			Dissolved Silicon (Si)	2023/11/06		97	%	80 - 120
			Dissolved Sodium (Na)	2023/11/06		NC	%	80 - 120
			Dissolved Strontium (Sr)	2023/11/06		NC	%	80 - 120
			Dissolved Sulphur (S)	2023/11/06		NC	%	80 - 120

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B183032	MKJ	Spiked Blank	Dissolved Barium (Ba)	2023/11/02		101	%	80 - 120
			Dissolved Boron (B)	2023/11/02		102	%	80 - 120
			Dissolved Calcium (Ca)	2023/11/02		102	%	80 - 120
			Dissolved Iron (Fe)	2023/11/02		103	%	80 - 120
			Dissolved Lithium (Li)	2023/11/02		102	%	80 - 120
			Dissolved Magnesium (Mg)	2023/11/02		98	%	80 - 120
			Dissolved Manganese (Mn)	2023/11/02		105	%	80 - 120
			Dissolved Phosphorus (P)	2023/11/02		99	%	80 - 120
			Dissolved Potassium (K)	2023/11/02		104	%	80 - 120
			Dissolved Silicon (Si)	2023/11/02		107	%	80 - 120
			Dissolved Sodium (Na)	2023/11/02		106	%	80 - 120
			Dissolved Strontium (Sr)	2023/11/02		101	%	80 - 120
			Dissolved Sulphur (S)	2023/11/02		105	%	80 - 120
B183032	MKJ	Method Blank	Dissolved Barium (Ba)	2023/11/02	<0.010		mg/L	
			Dissolved Boron (B)	2023/11/02	<0.020		mg/L	
			Dissolved Calcium (Ca)	2023/11/02	<0.30		mg/L	
			Dissolved Iron (Fe)	2023/11/02	<0.060		mg/L	
			Dissolved Lithium (Li)	2023/11/02	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2023/11/02	<0.20		mg/L	
			Dissolved Manganese (Mn)	2023/11/02	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2023/11/02	<0.10		mg/L	
			Dissolved Potassium (K)	2023/11/02	<0.30		mg/L	
			Dissolved Silicon (Si)	2023/11/02	<0.50		mg/L	
			Dissolved Sodium (Na)	2023/11/02	<0.50		mg/L	
			Dissolved Strontium (Sr)	2023/11/02	<0.020		mg/L	
			Dissolved Sulphur (S)	2023/11/02	<0.20		mg/L	
B183032	MKJ	RPD	Dissolved Barium (Ba)	2023/11/03	NC		%	20
			Dissolved Boron (B)	2023/11/03	4.6		%	20
			Dissolved Calcium (Ca)	2023/11/03	6.5		%	20
			Dissolved Iron (Fe)	2023/11/03	NC		%	20
			Dissolved Lithium (Li)	2023/11/03	6.5		%	20
			Dissolved Magnesium (Mg)	2023/11/03	6.5		%	20
			Dissolved Manganese (Mn)	2023/11/03	3.7		%	20
			Dissolved Phosphorus (P)	2023/11/03	NC		%	20
			Dissolved Potassium (K)	2023/11/03	11		%	20
			Dissolved Silicon (Si)	2023/11/03	5.0		%	20
			Dissolved Sodium (Na)	2023/11/03	6.3		%	20
			Dissolved Strontium (Sr)	2023/11/03	6.9		%	20
			Dissolved Sulphur (S)	2023/11/03	3.2		%	20
B184243	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/05		101	%	80 - 120
B184243	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/11/05	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/05	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/05	<1.0		mg/L	
			Carbonate (CO3)	2023/11/05	<1.0		mg/L	
			Hydroxide (OH)	2023/11/05	<1.0		mg/L	
B184243	JVM	RPD	Alkalinity (PP as CaCO3)	2023/11/05	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/05	4.6		%	20
			Bicarbonate (HCO3)	2023/11/05	4.6		%	20
			Carbonate (CO3)	2023/11/05	NC		%	20
			Hydroxide (OH)	2023/11/05	NC		%	20
B184244	JVM	Spiked Blank	pH	2023/11/05		100	%	97 - 103
B184244	JVM	RPD	pH	2023/11/05	0.18		%	N/A
B184246	JVM	Spiked Blank	Conductivity	2023/11/05		101	%	90 - 110

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B184246	JVM	Method Blank	Conductivity	2023/11/05	<2.0		uS/cm	
B184246	JVM	RPD	Conductivity	2023/11/05	3.8		%	10
B184520	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/05		102	%	80 - 120
B184520	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/11/05	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/05	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/05	<1.0		mg/L	
			Carbonate (CO3)	2023/11/05	<1.0		mg/L	
			Hydroxide (OH)	2023/11/05	<1.0		mg/L	
B184520	JVM	RPD [CDB048-01]	Alkalinity (PP as CaCO3)	2023/11/05	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/05	0.58		%	20
			Bicarbonate (HCO3)	2023/11/05	0.58		%	20
			Carbonate (CO3)	2023/11/05	NC		%	20
			Hydroxide (OH)	2023/11/05	NC		%	20
B184522	JVM	Spiked Blank	pH	2023/11/05		100	%	97 - 103
B184522	JVM	RPD [CDB048-01]	pH	2023/11/05	1.3		%	N/A
B184523	JVM	Spiked Blank	Conductivity	2023/11/05		100	%	90 - 110
B184523	JVM	Method Blank	Conductivity	2023/11/05	<2.0		uS/cm	
B184523	JVM	RPD [CDB048-01]	Conductivity	2023/11/05	0.19		%	10
B184550	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/04		100	%	80 - 120
B184550	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/11/04	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/04	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/04	<1.0		mg/L	
			Carbonate (CO3)	2023/11/04	<1.0		mg/L	
			Hydroxide (OH)	2023/11/04	<1.0		mg/L	
B184550	JVM	RPD	Alkalinity (PP as CaCO3)	2023/11/04	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/04	14		%	20
			Bicarbonate (HCO3)	2023/11/04	14		%	20
			Carbonate (CO3)	2023/11/04	NC		%	20
			Hydroxide (OH)	2023/11/04	NC		%	20
B184552	JVM	Spiked Blank	pH	2023/11/04		100	%	97 - 103
B184552	JVM	RPD	pH	2023/11/04	0.65		%	N/A
B184554	JVM	Spiked Blank	Conductivity	2023/11/04		100	%	90 - 110
B184554	JVM	Method Blank	Conductivity	2023/11/04	<2.0		uS/cm	
B184554	JVM	RPD	Conductivity	2023/11/04	5.6		%	10
B184587	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/04		99	%	80 - 120
B184587	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/11/04	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/04	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/04	<1.0		mg/L	
			Carbonate (CO3)	2023/11/04	<1.0		mg/L	
			Hydroxide (OH)	2023/11/04	<1.0		mg/L	
B184587	JVM	RPD	Alkalinity (PP as CaCO3)	2023/11/04	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/04	0.41		%	20
			Bicarbonate (HCO3)	2023/11/04	0.41		%	20
			Carbonate (CO3)	2023/11/04	NC		%	20
			Hydroxide (OH)	2023/11/04	NC		%	20
B184589	JVM	Spiked Blank	pH	2023/11/04		100	%	97 - 103
B184589	JVM	RPD	pH	2023/11/04	0.34		%	N/A
B184591	JVM	Spiked Blank	Conductivity	2023/11/04		100	%	90 - 110
B184591	JVM	Method Blank	Conductivity	2023/11/04	<2.0		uS/cm	
B184591	JVM	RPD	Conductivity	2023/11/04	1.2		%	10
B186979	KH2	Matrix Spike	Dissolved Molybdenum (Mo)	2023/11/06		106	%	80 - 120
B186979	KH2	Spiked Blank	Dissolved Molybdenum (Mo)	2023/11/06		100	%	80 - 120
B186979	KH2	Method Blank	Dissolved Molybdenum (Mo)	2023/11/06	<0.00020		mg/L	

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B186979	KH2	RPD	Dissolved Molybdenum (Mo)	2023/11/06	0.87		%	20
B187587	LQ1	Spiked Blank	Alkalinity (Total as CaCO3)	2023/11/07		97	%	80 - 120
B187587	LQ1	Method Blank	Alkalinity (PP as CaCO3)	2023/11/07	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/11/07	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/11/07	<1.0		mg/L	
			Carbonate (CO3)	2023/11/07	<1.0		mg/L	
			Hydroxide (OH)	2023/11/07	<1.0		mg/L	
B187587	LQ1	RPD	Alkalinity (PP as CaCO3)	2023/11/07	NC		%	20
			Alkalinity (Total as CaCO3)	2023/11/07	2.3		%	20
			Bicarbonate (HCO3)	2023/11/07	1.5		%	20
			Carbonate (CO3)	2023/11/07	108 (1)		%	20
			Hydroxide (OH)	2023/11/07	NC		%	20
B187624	LQ1	Spiked Blank	Conductivity	2023/11/07		102	%	90 - 110
B187624	LQ1	Method Blank	Conductivity	2023/11/07	<2.0		uS/cm	
B187624	LQ1	RPD	Conductivity	2023/11/07	0.22		%	10

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Sandy Yuan, M.Sc., QP, Scientific Specialist

Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

www.BVNA.com

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- ☐ Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

CHAIN OF CUSTODY RECORD
ENV COC - 00013v3

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Project Information	
Company:	Stantec	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	10220 103 Ave Suite #320	Street Address:		Project #:	110977396
City: Edmonton Prov: AB Postal Code: T5J 3W7		City: Prov: Postal Code:		Site #:	
Phone:	780 969 2223	Phone:		Site Location:	SR1
Email:	dylan.king@stantec.com	Email:		Site Location Province:	
Copies:		Copies:		Sampled By:	WT/TH

mcal-10-2274

CB7774

Regulatory Criteria

☑ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba
☐ Saskatchewan ☐ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)
☑ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply
☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

Comments

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F1-F2	7 BTEX F1-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 Sample TKN	14 Sample DOC	15 Texture (% sand, silt, clay)	16 Basic class II landfill	17 Dissolved Phosphorus	18 Phosphate	19 Ammonia	20 Bacteriological	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE
1	MW16-8-19	23	10	27	09	12	Water			X			X		X		X	X	X	X	X			X	X	X	X	11	
2	MW16-8-8	23	10	27	08	55				X			X		X		X	X	X	√	X			X	X	X	X	11	
3	MW16-6-11	23	10	27	10	21				X			X		X		X	X	X	X	X			X	X	X	X	11	
4	MW16-6-20	23	10	27	10	30				X			X		X		X	X	X	X	X			X	X	X	X	11	
5	R MW16-19-10	23	10	27	11	40				X			X		X		X	X	X	√	X			X	X	X	X	11	
6	R MW16-19-19	23	10	27	11	45				X			X		X		X	X	X	X	X			X	X	X	X	11	
7	R MW16-18-5	23	10	27	12	45				X			X		X		X	X	X	X	X			X	X	X	X	11	
8	R MW16-18-13	23	10	27	12	56				X			X		X		X	X	X	X	X			X	X	X	X	11	
9	MW16-1-15	23	10	27	14	12				X			X		X		X	X	X	X	X			X	X	X	X	11	
10	23-12	23	10	27	14	30				X			X		X		X	X	X	X	X			X	X	X	X	11	
11	23-13	23	10	27	14	41				X			X		X		X	X	X	X	X			X	X	X	X	11	
12	23-14	23	10	27	14	58	↓			X			X		X		X	X	X	X	X			X	X	X	X	11	

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		✓				
Seal intact		✓				
Cooling media present	✓			4	0	1

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		✓				
Seal intact		✓				
Cooling media present	✓			2	1	-1

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present						
Seal intact						
Cooling media present						

Temperature reading by: 1 2 3

Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM
1 [signature] Nicole Tam	23	10	27	17	59	1 [signature] Nirkamal Soni	23	10	27	18	02
2						2					

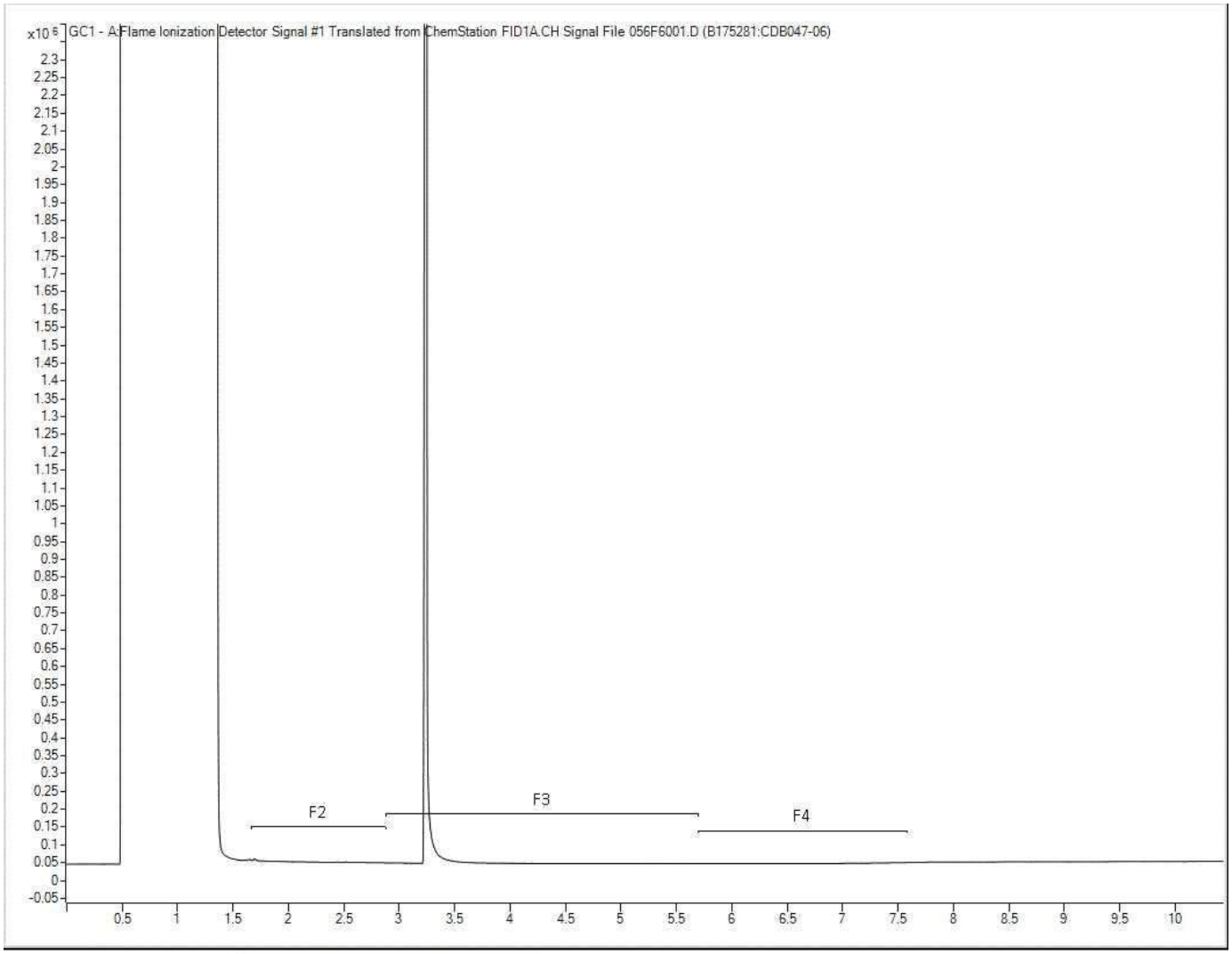
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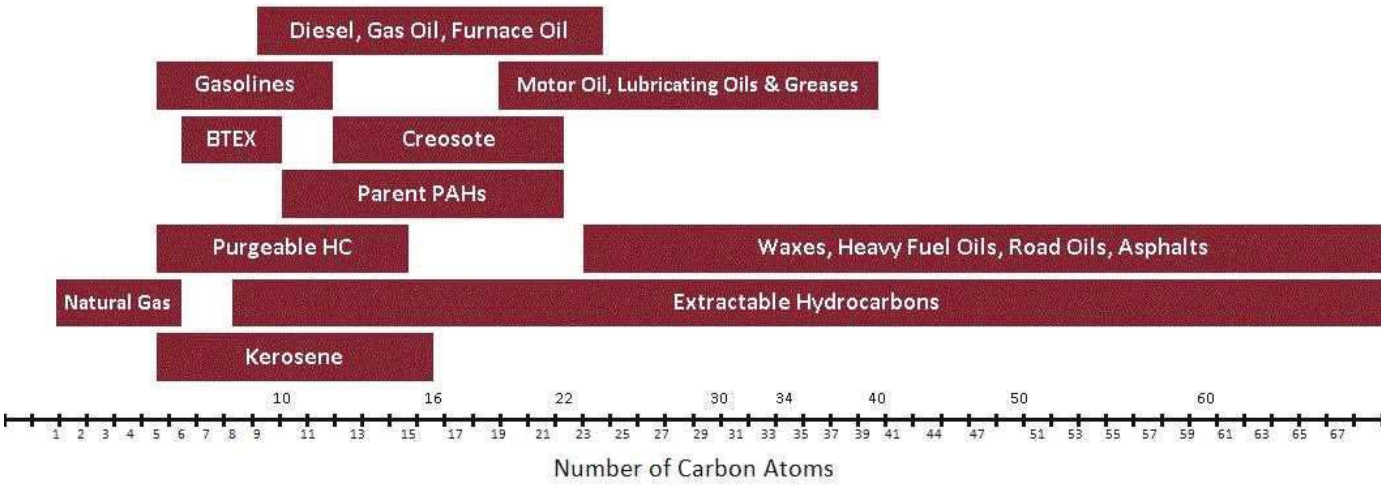
Dissolved parameters not field filtered or preserved - please lab filter

Bureau Veritas Job #: C387774
Report Date: 2023/11/08
Bureau Veritas Sample: CDB047

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Reference: SR1
Client ID: MW16-8-19

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





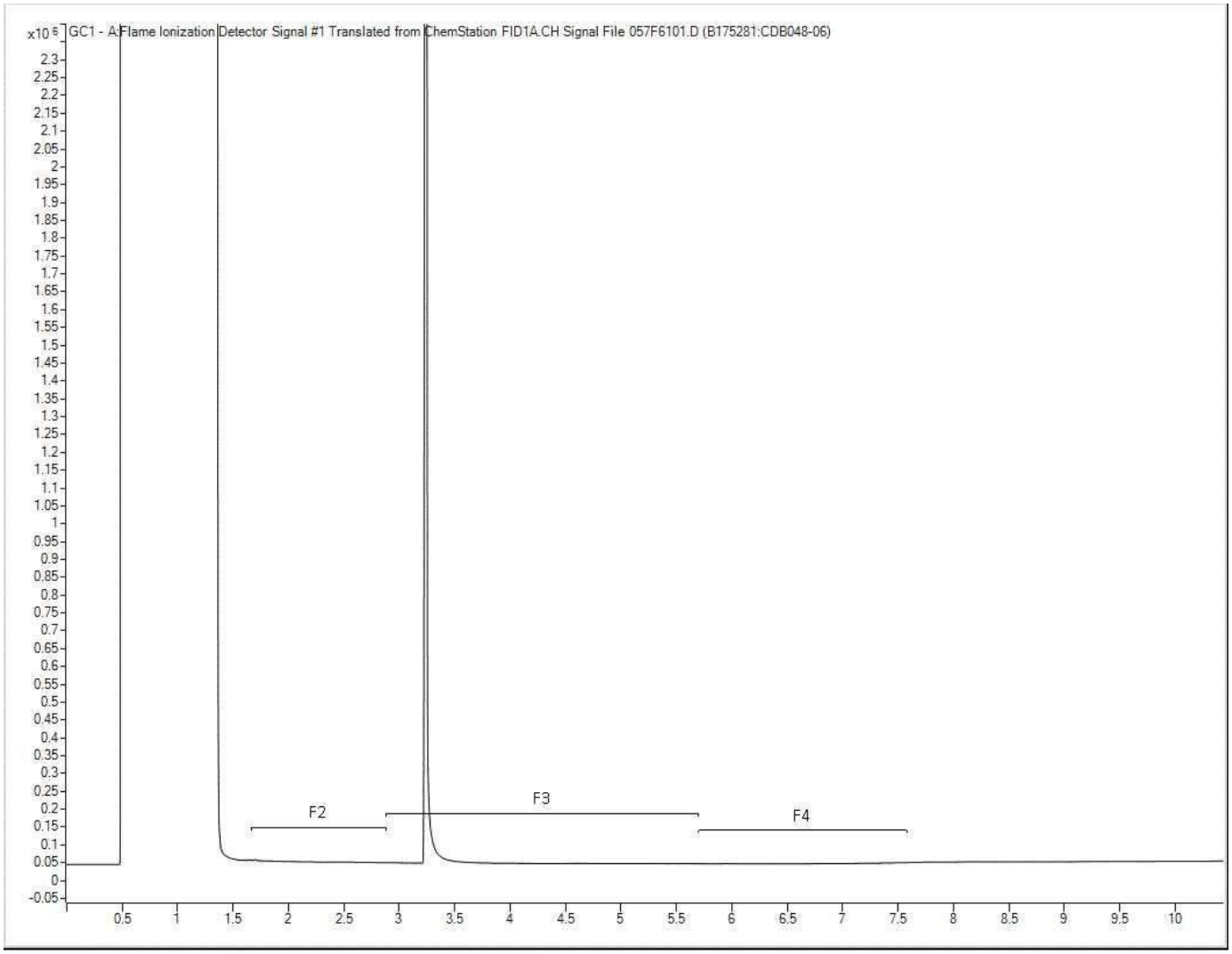
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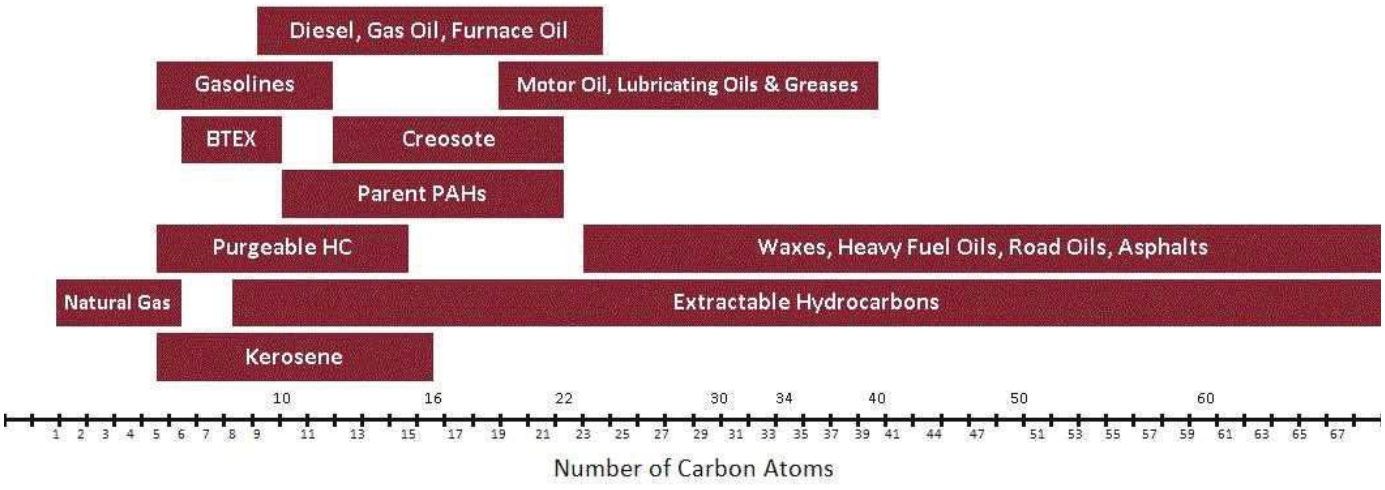
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C387774
Report Date: 2023/11/08
Bureau Veritas Sample: CDB048

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Reference: SR1
Client ID: MW16-8-8

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





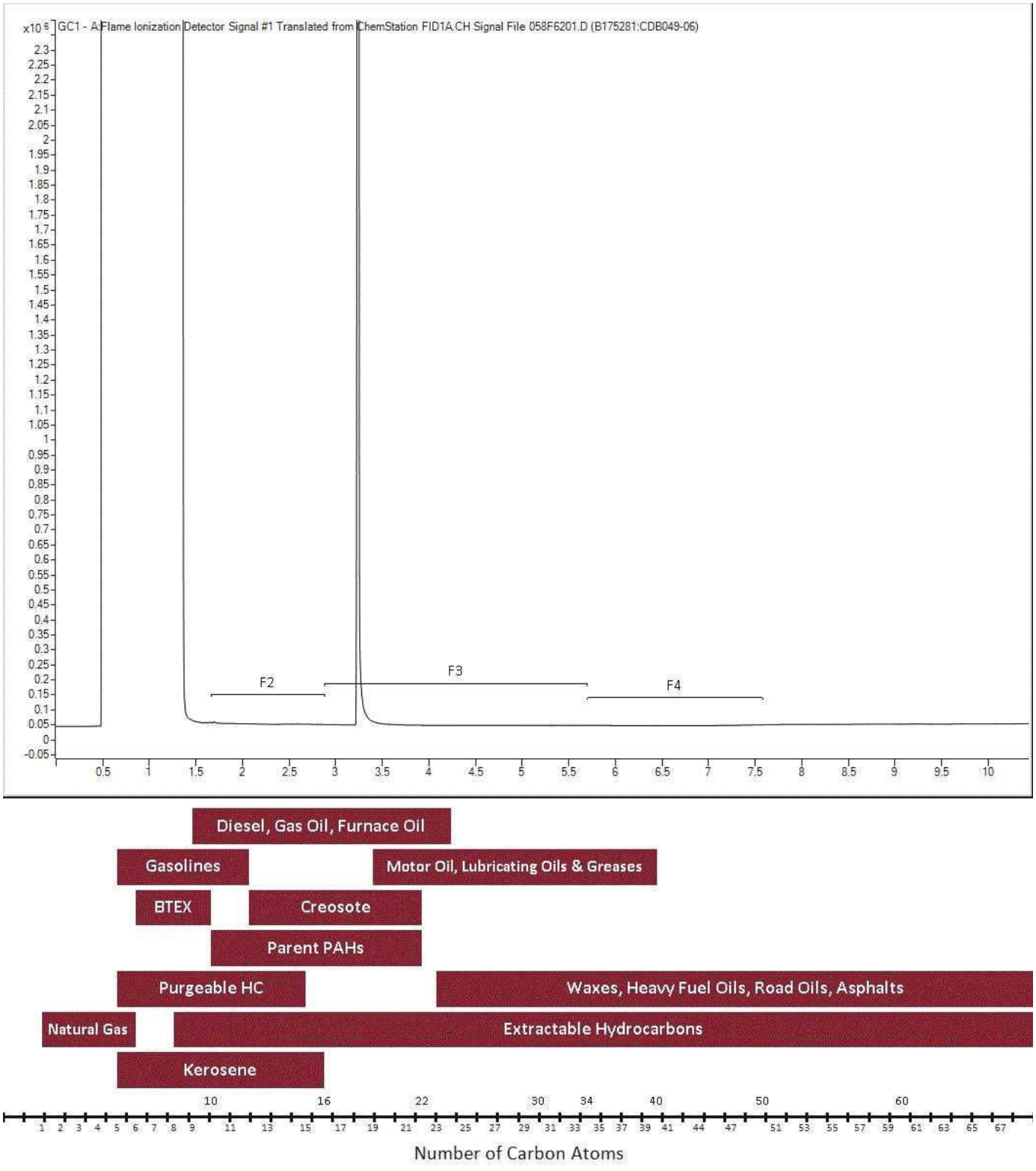
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Bureau Veritas Job #: C387774
Report Date: 2023/11/08
Bureau Veritas Sample: CDB049

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Reference: SR1
Client ID: MW16-6-11

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

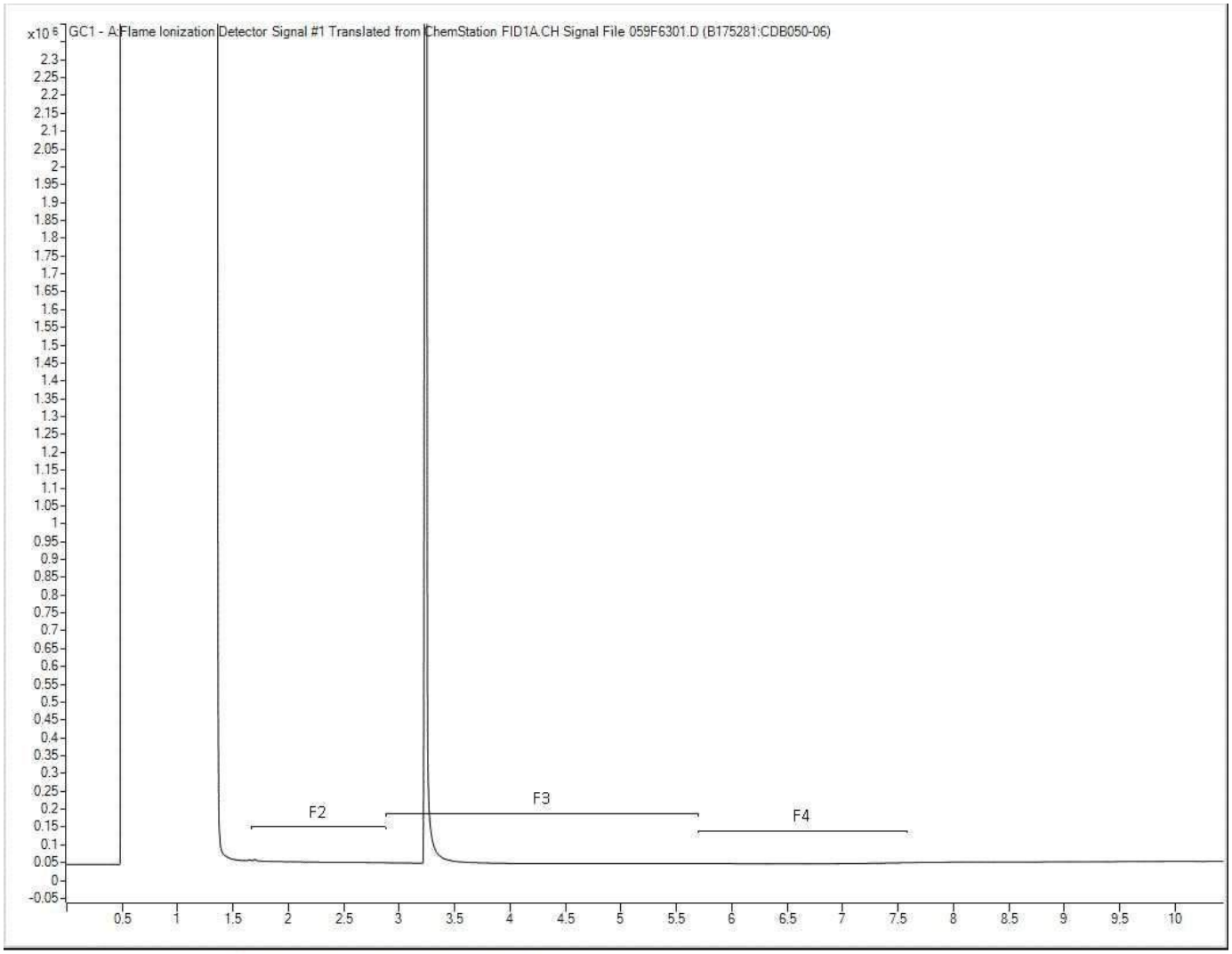


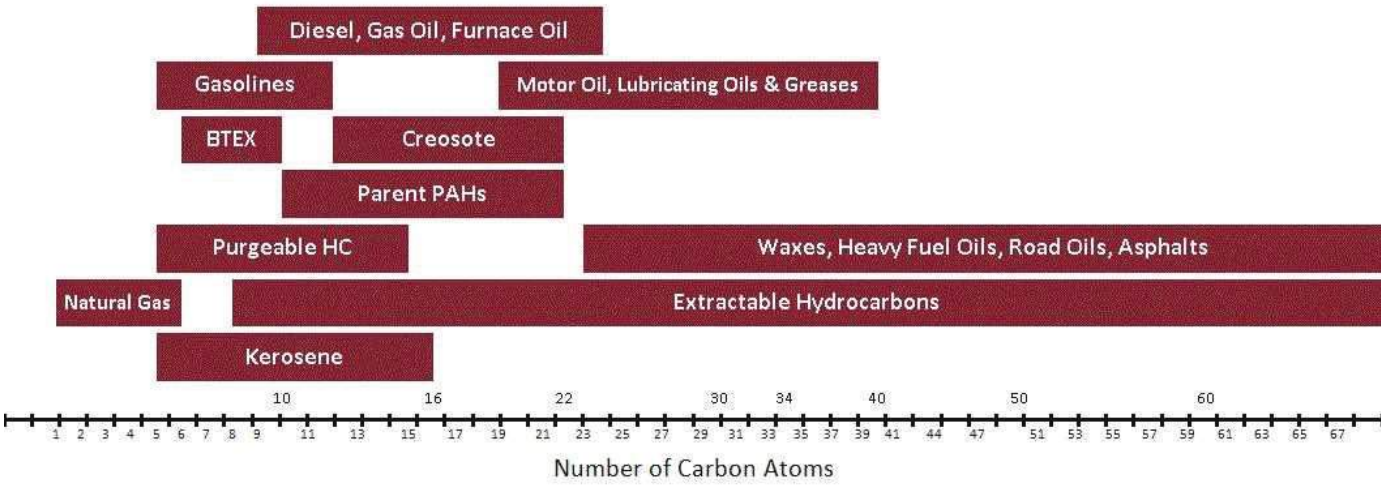
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Bureau Veritas Job #: C387774
Report Date: 2023/11/08
Bureau Veritas Sample: CDB050

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Reference: SR1
Client ID: MW16-6-20

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





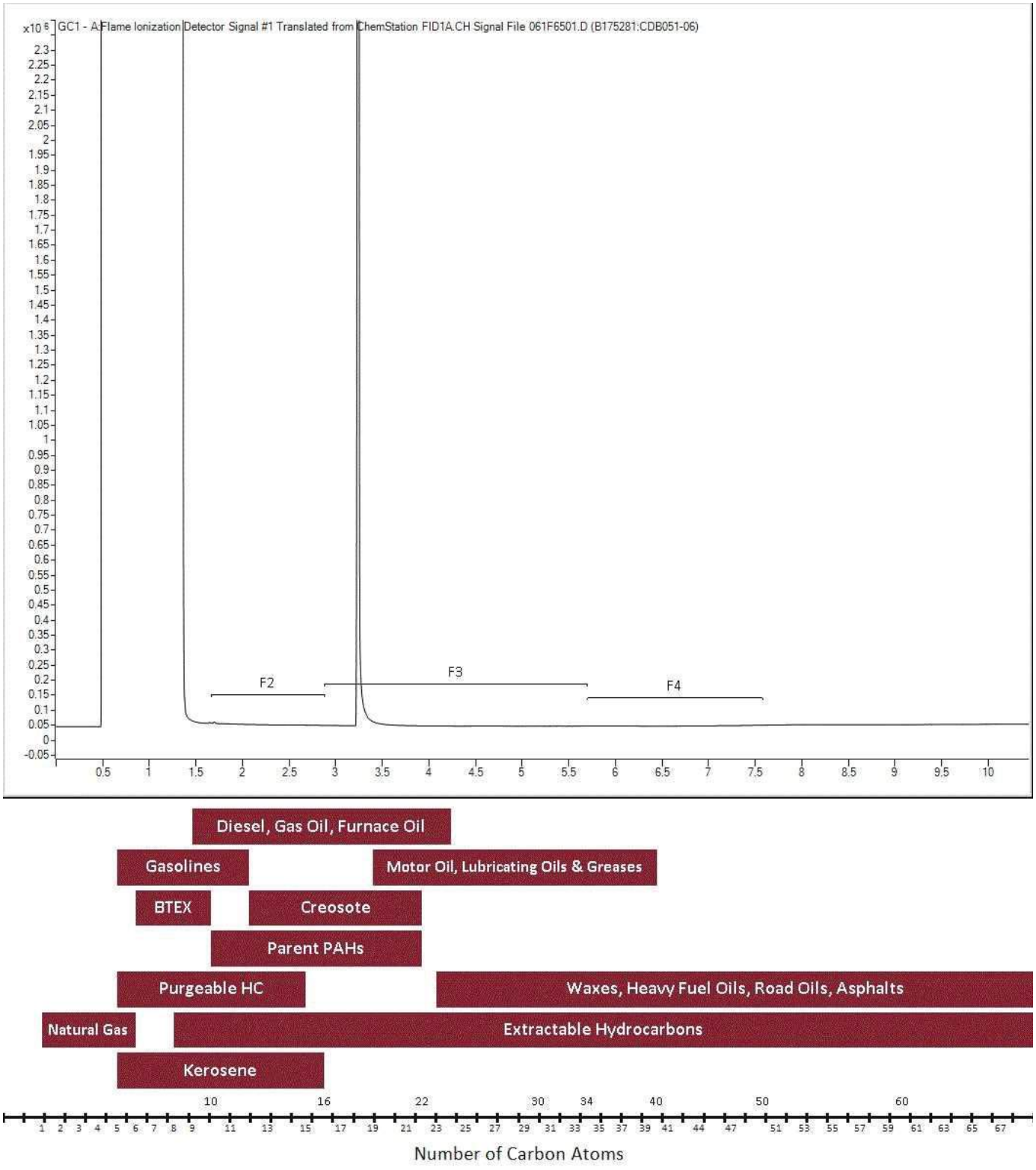
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Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C387774
Report Date: 2023/11/08
Bureau Veritas Sample: CDB051

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Reference: SR1
Client ID: RMW16-19-10

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

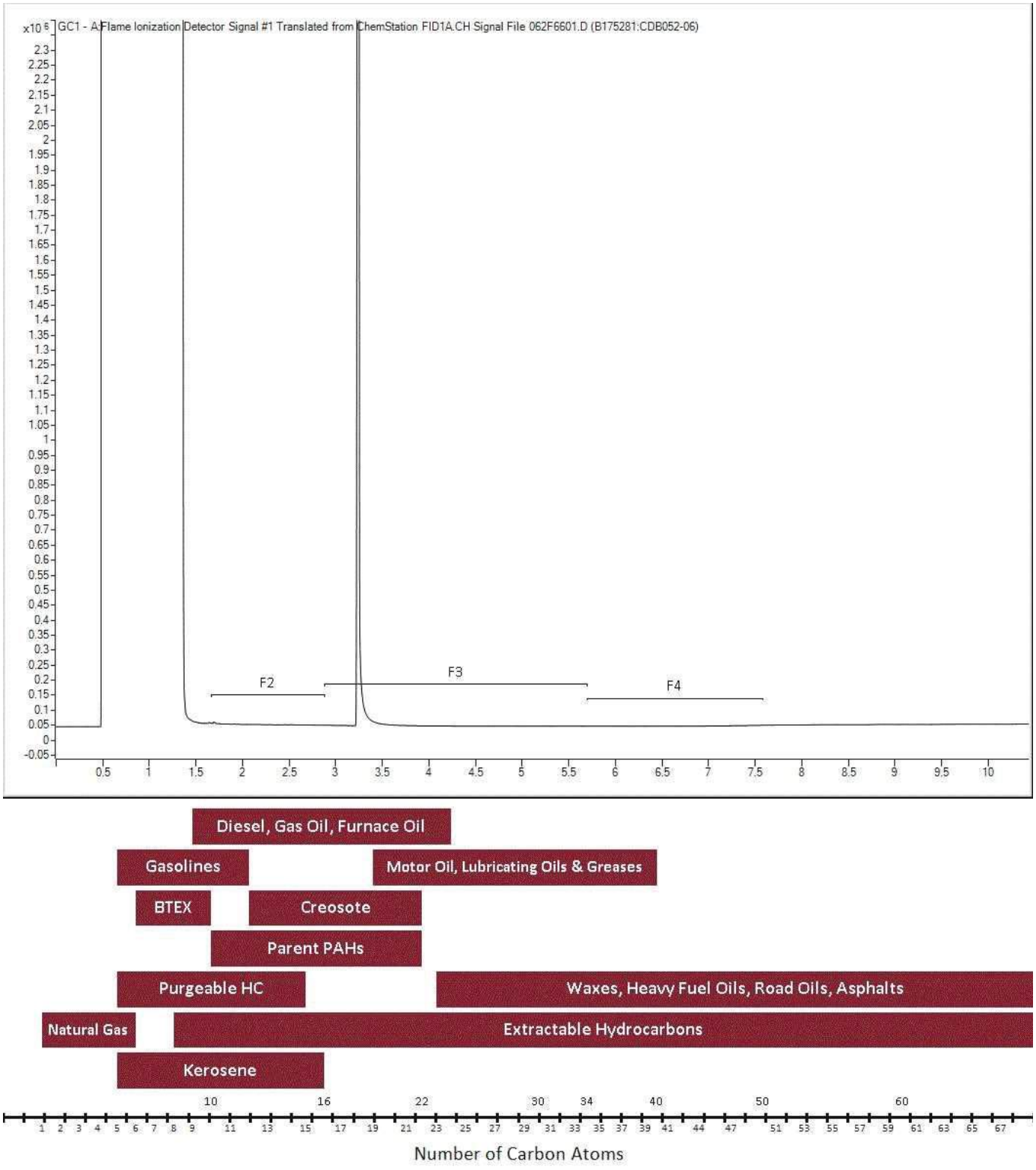


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Bureau Veritas Job #: C387774
Report Date: 2023/11/08
Bureau Veritas Sample: CDB052

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Reference: SR1
Client ID: RMW16-19-19

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

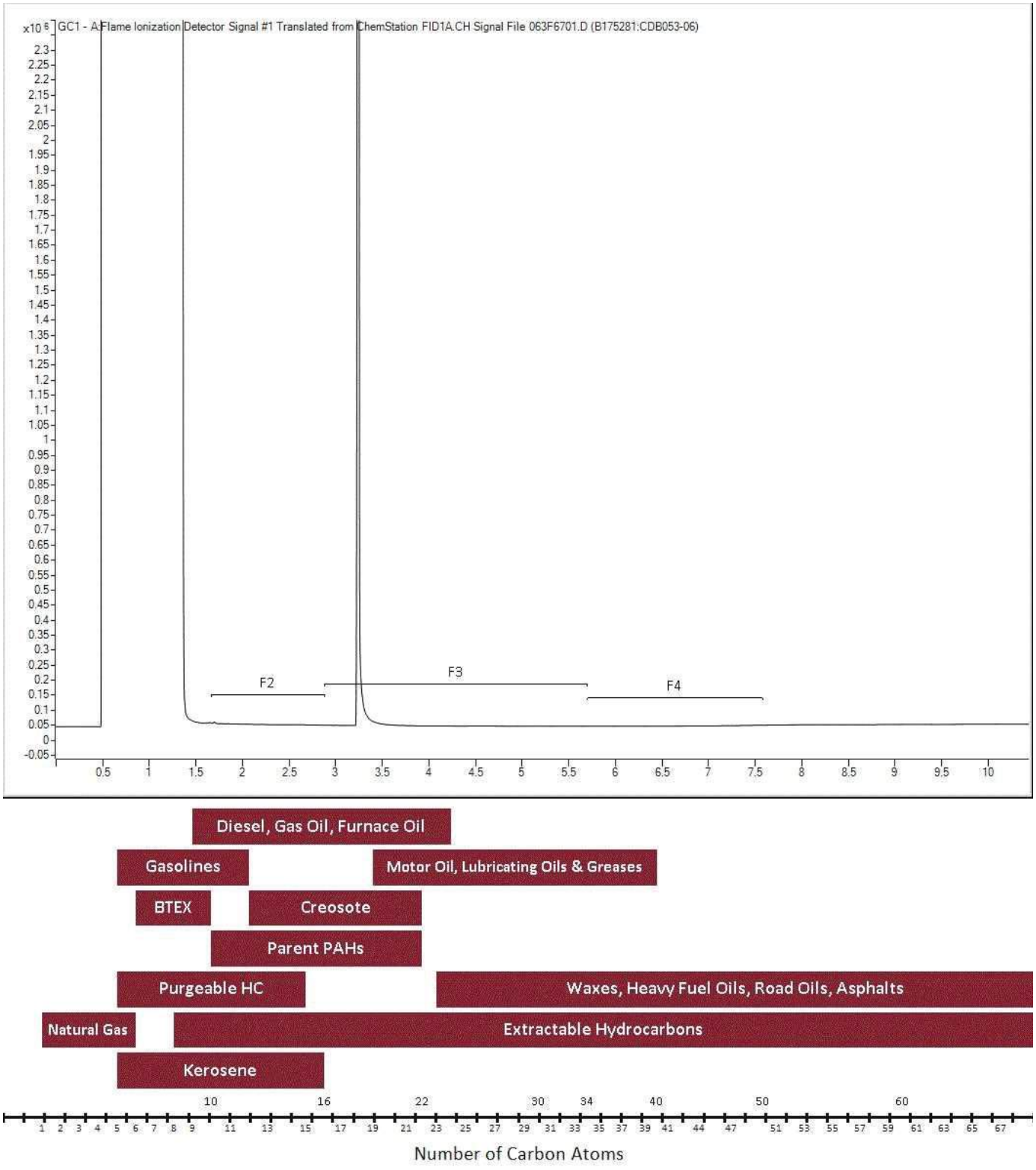


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C387774
Report Date: 2023/11/08
Bureau Veritas Sample: CDB053

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Reference: SR1
Client ID: RMW16-18-5

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

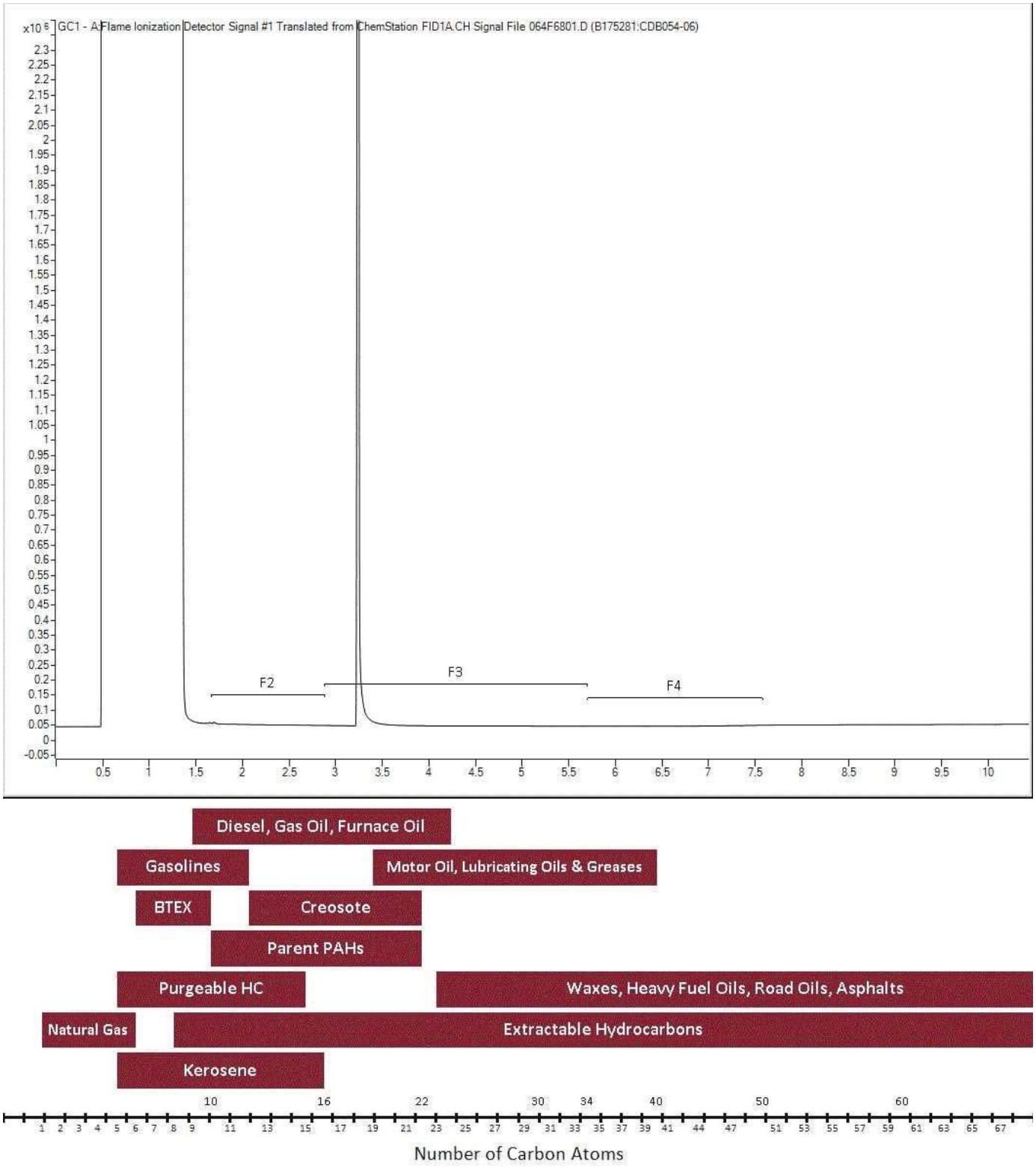


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C387774
Report Date: 2023/11/08
Bureau Veritas Sample: CDB054

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Reference: SR1
Client ID: RMW16-18-13

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

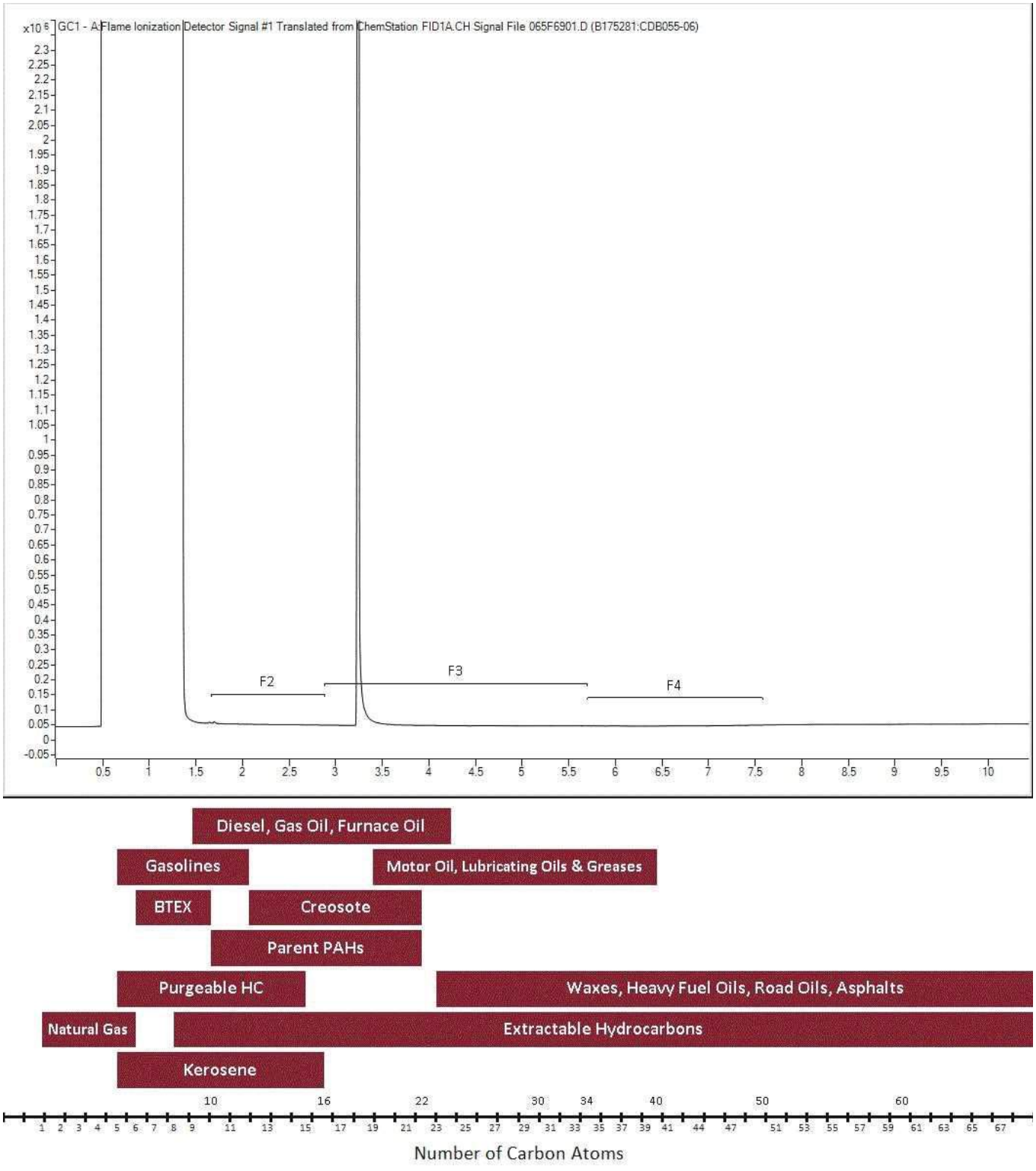


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Bureau Veritas Job #: C387774
Report Date: 2023/11/08
Bureau Veritas Sample: CDB055

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Reference: SR1
Client ID: MW16-1-15

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

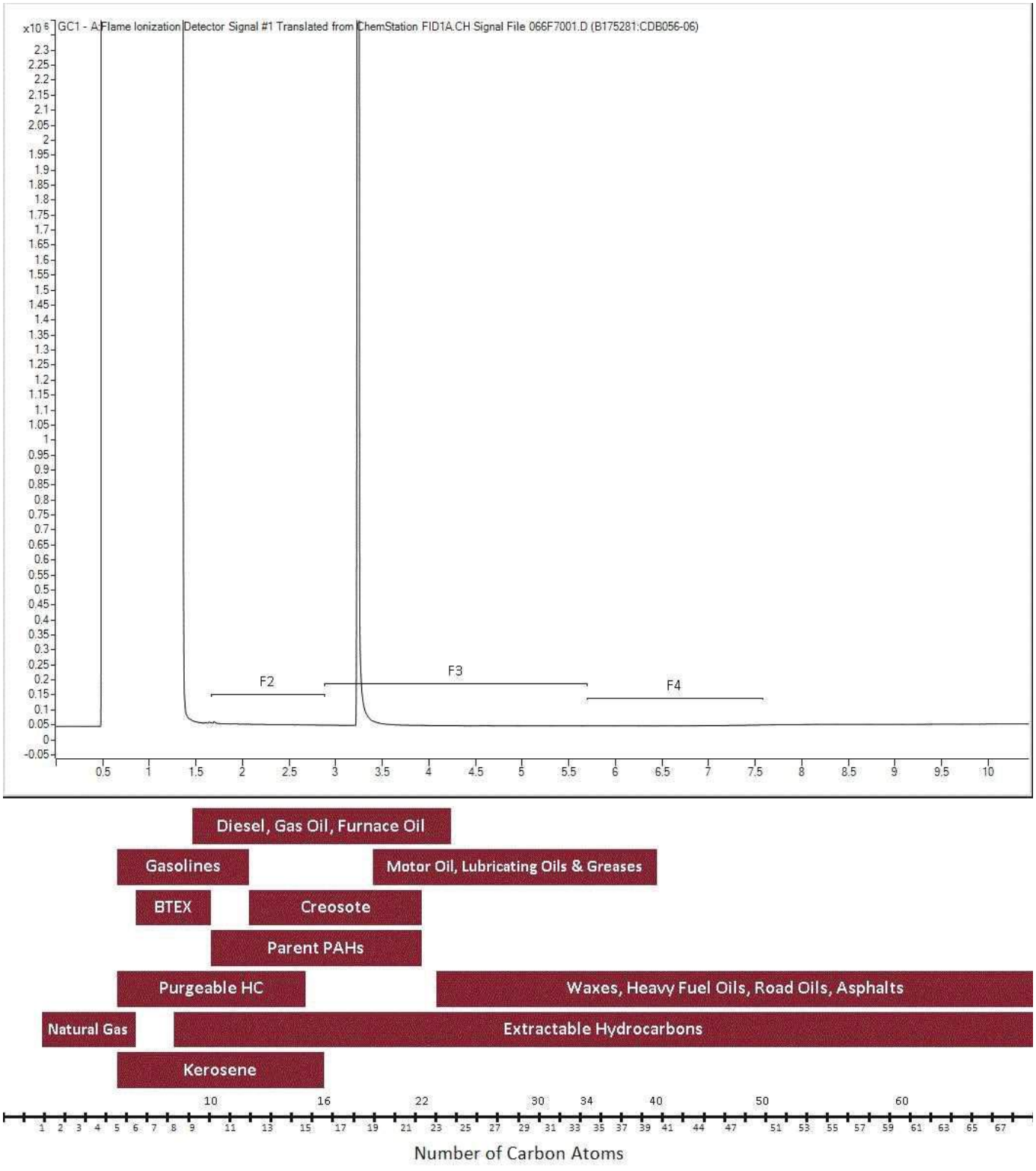


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C387774
Report Date: 2023/11/08
Bureau Veritas Sample: CDB056

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Reference: SR1
Client ID: 23-12

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

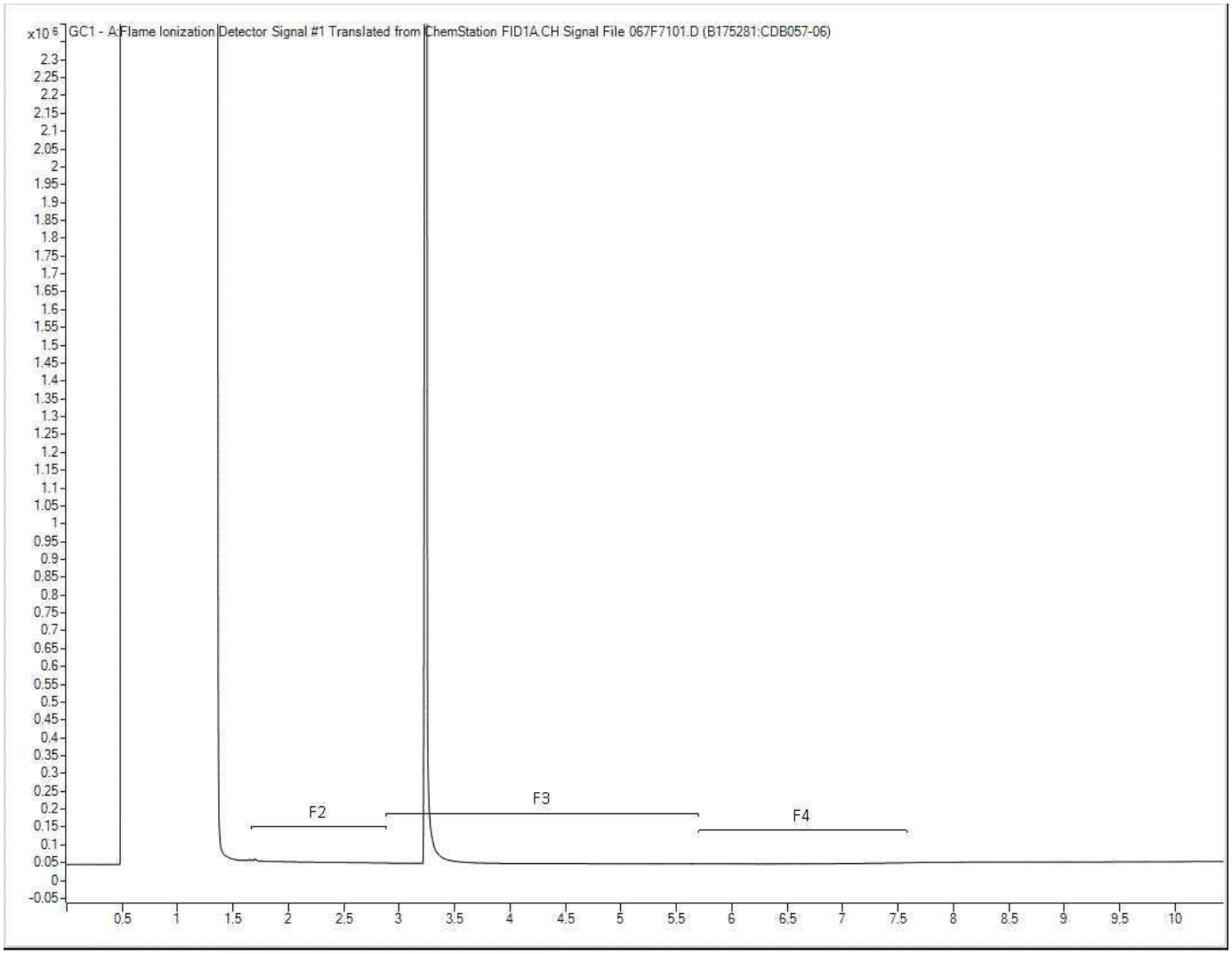


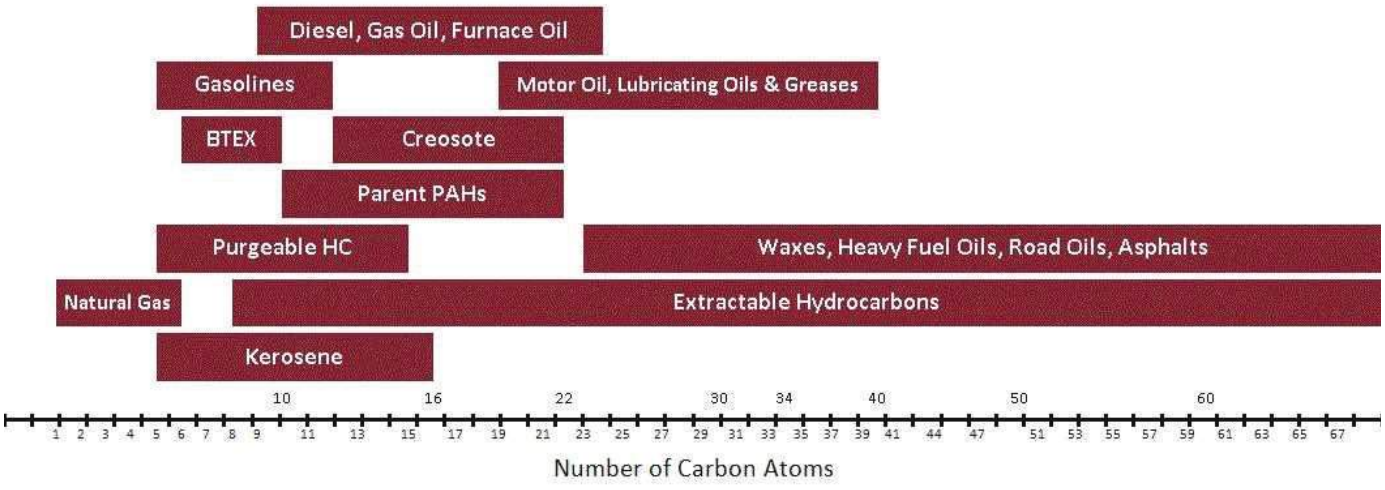
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Bureau Veritas Job #: C387774
Report Date: 2023/11/08
Bureau Veritas Sample: CDB057

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Reference: SR1
Client ID: 23-13

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





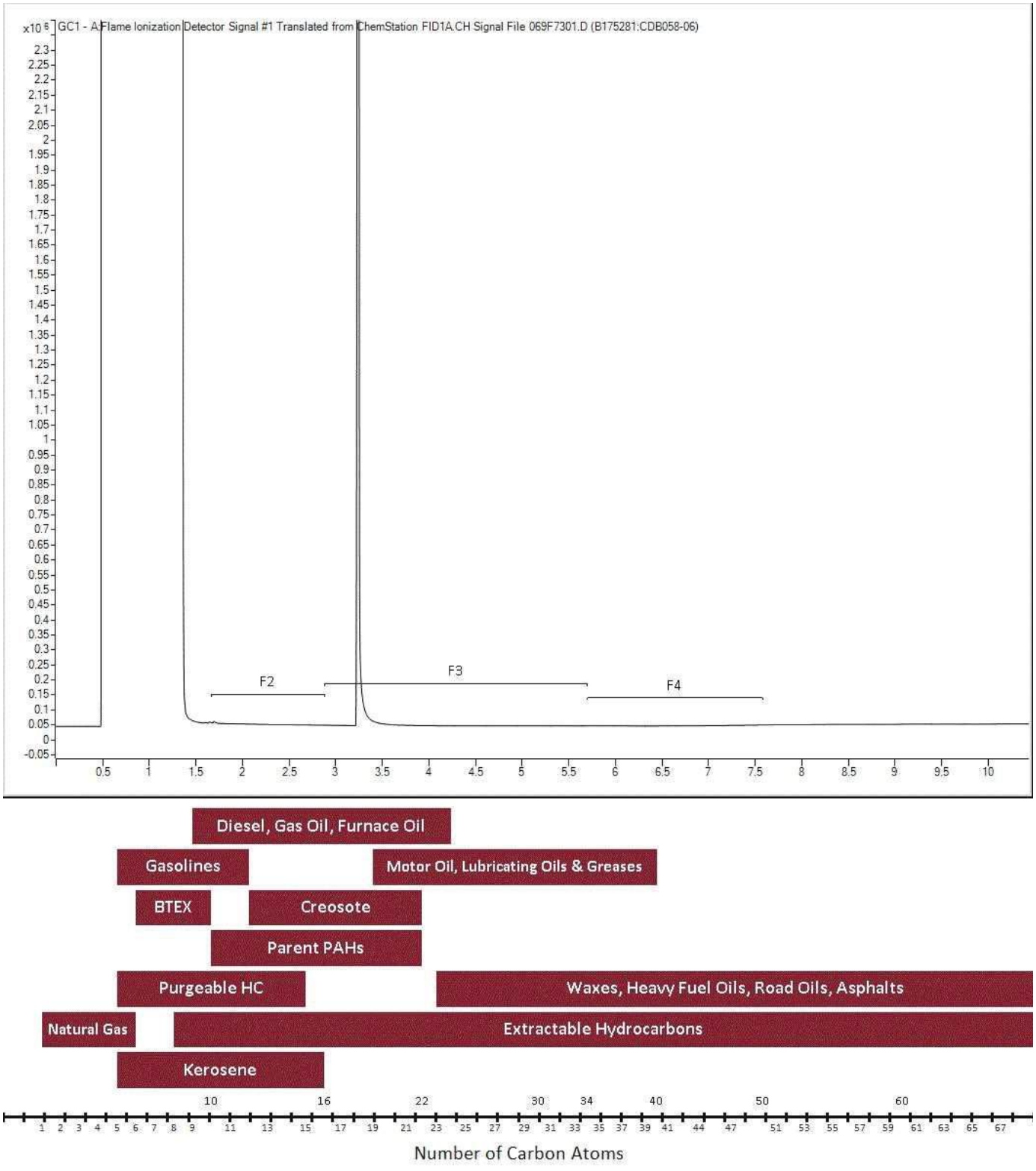
hpchem13\HPchem\1\DATA\2023\11\RUN1102

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C387774
Report Date: 2023/11/08
Bureau Veritas Sample: CDB058

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Reference: SR1
Client ID: 23-14

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

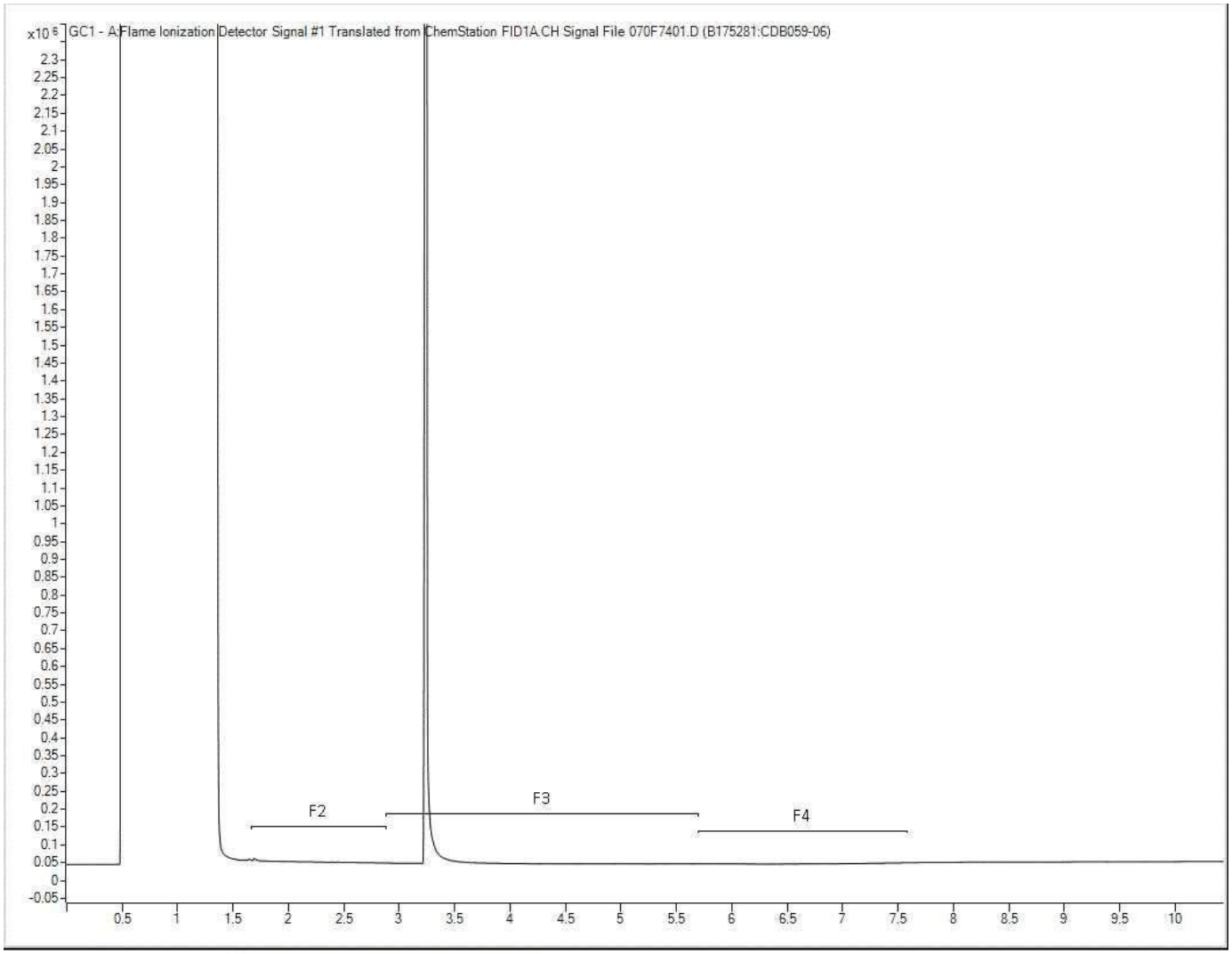


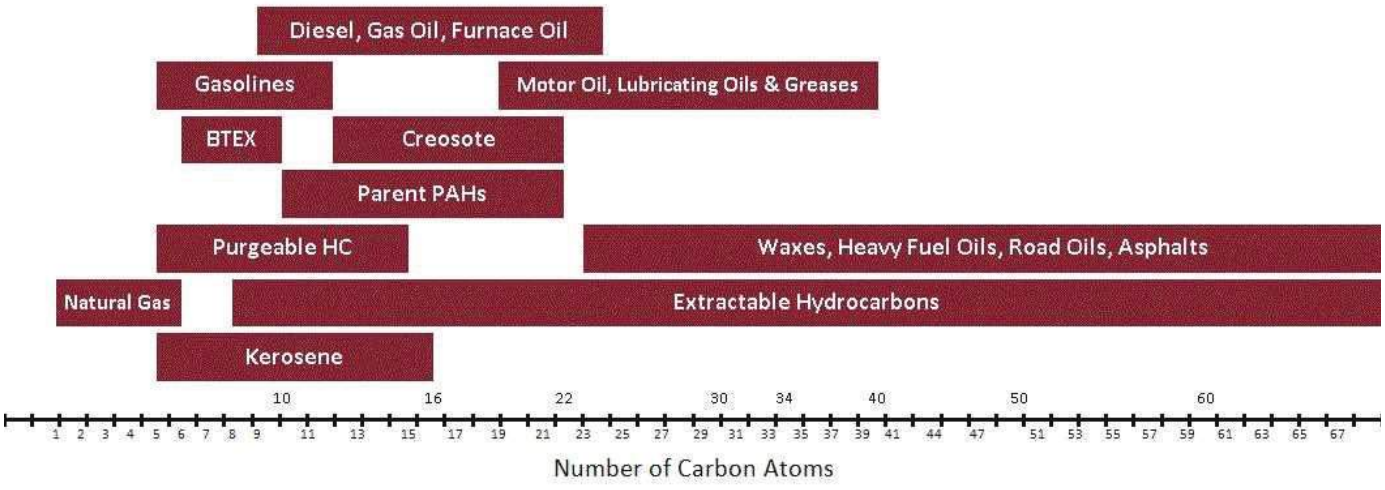
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C387774
Report Date: 2023/11/08
Bureau Veritas Sample: CDB059

STANTEC CONSULTING LTD
Client Project #: 11077396
Site Reference: SR1
Client ID: 23-15

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





hpchem13\HPchem\1\DATA\2023\11\RUN1102

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 110773376
Your C.O.C. #: 1OF1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/21
Report #: R3502639
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C433947
Received: 2024/05/14, 07:00

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	3	N/A	2024/05/18	AB SOP-00005	SM 24 2320 B m
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2024/05/19	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	4	N/A	2024/05/17	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	4	N/A	2024/05/17		Auto Calc
Cadmium - low level CCME - Dissolved	4	N/A	2024/05/16		Auto Calc
Chloride/Sulphate by Auto Colourimetry	4	N/A	2024/05/16	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	4	2024/05/14	2024/05/15	AB SOP-00089	SM 24 9223 A,B m
Heterotrophic Plate Count Quant	4	2024/05/14	2024/05/16	CAL SOP-00012	SM 24 9215 A, E m
Total Coliforms and E.Coli	4	2024/05/15	2024/05/16	AB SOP-00089	SM 24 9223 A,B m
Carbon (DOC) -Lab Filtered (1)	4	N/A	2024/05/21	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	3	N/A	2024/05/18	AB SOP-00005	SM 24 2510 B m
Conductivity @25C	1	N/A	2024/05/19	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	4	2024/05/15	2024/05/15	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	4	N/A	2024/05/17		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	4	2024/05/16	2024/05/16	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	4	2024/05/15	2024/05/16	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (3)	4	N/A	2024/05/16	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	4	N/A	2024/05/16	AB SOP-00043	EPA 6020b R2 m
Ion Balance	1	N/A	2024/05/18		Auto Calc
Ion Balance	3	N/A	2024/05/21		Auto Calc
Sum of cations, anions	4	N/A	2024/05/17		Auto Calc
Ammonia-N (Total)	4	N/A	2024/05/15	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	4	N/A	2024/05/16		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	2	N/A	2024/05/15	AB SOP-00091	SM 24 4500 NO3m
NO2 (N); NO2 (N) + NO3 (N) in Water	2	N/A	2024/05/16	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	4	2024/05/14	2024/05/16		Auto Calc
pH @25°C (5)	3	N/A	2024/05/18	AB SOP-00005	SM 24 4500-H+B m
pH @25°C (5)	1	N/A	2024/05/19	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (6)	4	N/A	2024/05/15	AB SOP-00025	SM 24 4500-P A,F m
Total Dissolved Solids (Calculated)	1	N/A	2024/05/18		Auto Calc
Total Dissolved Solids (Calculated)	3	N/A	2024/05/21		Auto Calc

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773376
Your C.O.C. #: 1OF1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/21
Report #: R3502639
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C433947
Received: 2024/05/14, 07:00

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Kjeldahl Nitrogen (Total)	4	N/A	2024/05/17	BBY WI-00033	Auto Calc
Nitrogen (Total)	4	2024/05/16	2024/05/16	AB SOP-00093	SM 24 4500-N C m
Total Phosphorus-Dissolved-Lab Filtered (7)	4	2024/05/17	2024/05/17	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(7) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773376
Your C.O.C. #: 1OF1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/21
Report #: R3502639
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C433947
Received: 2024/05/14, 07:00

levels unless otherwise noted.

Encryption Key



Bureau Veritas
21 May 2024 18:55:14

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (403) 291-3077

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CNL869		CNL870		CNL871		CNL872			
Sampling Date		2024/05/13 12:01		2024/05/13 12:41		2024/05/13 15:04		2024/05/13 16:18			
COC Number		1OF1		1OF1		1OF1		1OF1			
	UNITS	RRMW16-17-8	MU	RRMW16-16-17	MU	RRMW16-15-39	MU	RRMW16-13-37	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B369377
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B369730
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B369730
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B369730
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B369730
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B369730
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B368906
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B368906
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B369730
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	104	N/A	99	N/A	98	N/A	99	N/A	N/A	B369730
4-Bromofluorobenzene (sur.)	%	101	N/A	104	N/A	100	N/A	104	N/A	N/A	B369730
D4-1,2-Dichloroethane (sur.)	%	105	N/A	112	N/A	104	N/A	108	N/A	N/A	B369730
O-TERPHENYL (sur.)	%	99	N/A	99	N/A	99	N/A	99	N/A	N/A	B369377

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNL869				CNL870			
Sampling Date		2024/05/13 12:01				2024/05/13 12:41			
COC Number		1OF1				1OF1			
	UNITS	RRMW16-17-8	MU	RDL	QC Batch	RRMW16-16-17	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	210	N/A	N/A	B368457	77	N/A	N/A	B368924
Cation Sum	meq/L	190	N/A	N/A	B368457	66	N/A	N/A	B368924
Hardness (CaCO3)	mg/L	5200	N/A	0.50	B368454	1300	N/A	0.50	B368454
Ion Balance (% Difference)	%	4.6	N/A	N/A	B368455	7.8	N/A	N/A	B368920
Nitrate (N)	mg/L	<0.050	N/A	0.050	B368458	<0.050	N/A	0.050	B368458
Nitrate (NO3)	mg/L	<0.22	N/A	0.22	B370766	<0.22	N/A	0.22	B370766
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B370766	<0.033	N/A	0.033	B370766
Calculated Total Dissolved Solids	mg/L	13000	N/A	200	B368471	4800	N/A	25	B368929
Elements									
Dissolved Cadmium (Cd)	ug/L	0.13	+/- 0.056	0.020	B368626	<0.020	N/A	0.020	B368626
Misc. Inorganics									
Conductivity	uS/cm	12000	+/- 310	2.0	B373867	5300	+/- 140	2.0	B373045
pH	pH	7.26	+/- 0.0719	N/A	B373866	7.94	+/- 0.0787	N/A	B373044
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B373863	<1.0	N/A	1.0	B373042
Alkalinity (Total as CaCO3)	mg/L	940	+/- 70	1.0	B373863	720	+/- 54	1.0	B373042
Bicarbonate (HCO3)	mg/L	1200	+/- 17	1.0	B373863	880	+/- 13	1.0	B373042
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B373863	<1.0	N/A	1.0	B373042
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B373863	<1.0	N/A	1.0	B373042
Chloride (Cl)	mg/L	6.9	+/- 1.3	1.0	B370718	5.1	+/- 1.2	1.0	B370718
Sulphate (SO4)	mg/L	9100	+/- 570	200	B370718	3000	+/- 190	25	B370718
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B370520	<0.010	N/A	0.010	B370518
Nitrate plus Nitrite (N)	mg/L	<0.050 (1)	N/A	0.050	B370520	<0.050 (1)	N/A	0.050	B370518
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B371107	<0.0030	N/A	0.0030	B371077
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B371107	<0.00060	N/A	0.00060	B371077
Dissolved Arsenic (As)	mg/L	0.00072	+/- <RDL	0.00020	B371107	0.0022	+/- 0.00024	0.00020	B371077
Dissolved Barium (Ba)	mg/L	0.015	+/- <RDL	0.010	B371085	<0.010	N/A	0.010	B371085
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371077

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNL869				CNL870			
Sampling Date		2024/05/13 12:01				2024/05/13 12:41			
COC Number		1OF1				1OF1			
	UNITS	RRMW16-17-8	MU	RDL	QC Batch	RRMW16-16-17	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.16	+/- <RDL	0.020	B371085	0.22	+/- 0.023	0.020	B371085
Dissolved Calcium (Ca)	mg/L	390	+/- 40	0.30	B371085	280	+/- 28	0.30	B371085
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371077
Dissolved Cobalt (Co)	mg/L	0.0064	+/- 0.00058	0.00030	B371107	0.0019	+/- <RDL	0.00030	B371077
Dissolved Copper (Cu)	mg/L	0.0019	+/- <RDL	0.0010	B371107	<0.0010	N/A	0.0010	B371077
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B371085	<0.060	N/A	0.060	B371085
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B371107	<0.00020	N/A	0.00020	B371077
Dissolved Lithium (Li)	mg/L	0.11	+/- <RDL	0.020	B371085	0.26	+/- 0.022	0.020	B371085
Dissolved Magnesium (Mg)	mg/L	1000	+/- 66	2.0	B371085	150	+/- 9.7	0.20	B371085
Dissolved Manganese (Mn)	mg/L	2.5	+/- 0.16	0.0040	B371085	0.40	+/- 0.027	0.0040	B371085
Dissolved Molybdenum (Mo)	mg/L	0.0016	+/- 0.00048	0.00020	B371107	0.00062	+/- 0.00028	0.00020	B371077
Dissolved Nickel (Ni)	mg/L	0.0093	+/- 0.00079	0.00050	B371107	0.0049	+/- <RDL	0.00050	B371077
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B371085	<0.10	N/A	0.10	B371085
Dissolved Potassium (K)	mg/L	13	+/- 0.66	0.30	B371085	7.9	+/- 0.41	0.30	B371085
Dissolved Selenium (Se)	mg/L	0.00057	+/- <RDL	0.00020	B371107	<0.00080 (1)	N/A	0.00080	B371077
Dissolved Silicon (Si)	mg/L	5.2	+/- 0.98	0.50	B371085	4.6	+/- 0.88	0.50	B371085
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B371107	<0.00010	N/A	0.00010	B371077
Dissolved Sodium (Na)	mg/L	2000	+/- 190	5.0	B371085	900	+/- 88	2.5	B371085
Dissolved Strontium (Sr)	mg/L	9.4	+/- 0.91	0.20	B371085	7.2	+/- 0.70	0.10	B371085
Dissolved Sulphur (S)	mg/L	2700	+/- 180	2.0	B371085	780	+/- 52	1.0	B371085
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B371107	<0.00020	N/A	0.00020	B371077
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371077
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371077
Dissolved Uranium (U)	mg/L	0.043	+/- 0.0038	0.00010	B371107	0.00030	+/- <RDL	0.00010	B371077
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371077
Dissolved Zinc (Zn)	mg/L	0.0048	+/- <RDL	0.0030	B371107	<0.0030	N/A	0.0030	B371077

RDL = Reportable Detection Limit
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N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNL870				CNL871			
Sampling Date		2024/05/13 12:41				2024/05/13 15:04			
COC Number		1OF1				1OF1			
	UNITS	RRMW16-16-17 Lab-Dup	MU	RDL	QC Batch	RRMW16-15-39	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	N/A	N/A	N/A	B368924	11	N/A	N/A	B368924
Cation Sum	meq/L	N/A	N/A	N/A	B368924	11	N/A	N/A	B368924
Hardness (CaCO3)	mg/L	N/A	N/A	0.50	B368454	28	N/A	0.50	B368454
Ion Balance (% Difference)	%	N/A	N/A	N/A	B368920	1.4	N/A	N/A	B368920
Nitrate (N)	mg/L	N/A	N/A	0.050	B368458	0.022	N/A	0.010	B368458
Nitrate (NO3)	mg/L	N/A	N/A	0.22	B370766	0.096	N/A	0.044	B370766
Nitrite (NO2)	mg/L	N/A	N/A	0.033	B370766	<0.033	N/A	0.033	B370766
Calculated Total Dissolved Solids	mg/L	N/A	N/A	25	B368929	650	N/A	10	B368929
Elements									
Dissolved Cadmium (Cd)	ug/L	N/A	N/A	0.020	B368626	<0.020	N/A	0.020	B368626
Misc. Inorganics									
Conductivity	uS/cm	N/A	N/A	2.0	B373045	1000	+/- 27	2.0	B373064
pH	pH	N/A	N/A	N/A	B373044	8.61	+/- 0.0853	N/A	B373063
Anions									
Alkalinity (PP as CaCO3)	mg/L	N/A	N/A	1.0	B373042	9.5	+/- <RDL	1.0	B373048
Alkalinity (Total as CaCO3)	mg/L	N/A	N/A	1.0	B373042	400	+/- 30	1.0	B373048
Bicarbonate (HCO3)	mg/L	N/A	N/A	1.0	B373042	470	+/- 7.3	1.0	B373048
Carbonate (CO3)	mg/L	N/A	N/A	1.0	B373042	11	N/A	1.0	B373048
Hydroxide (OH)	mg/L	N/A	N/A	1.0	B373042	<1.0	N/A	1.0	B373048
Chloride (Cl)	mg/L	N/A	N/A	1.0	B370718	22	+/- 2.1	1.0	B370718
Sulphate (SO4)	mg/L	N/A	N/A	25	B370718	130	+/- 8.5	5.0	B370718
Nutrients									
Nitrite (N)	mg/L	N/A	N/A	0.010	B370518	<0.010	N/A	0.010	B370520
Nitrate plus Nitrite (N)	mg/L	N/A	N/A	0.050	B370518	0.022	+/- 0.012	0.010	B370520
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B371077	0.45	+/- 0.10	0.0030	B371107
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B371077	0.0017	+/- <RDL	0.00060	B371107
Dissolved Arsenic (As)	mg/L	0.0019	+/- 0.00022	0.00020	B371077	0.0015	+/- 0.00020	0.00020	B371107
Dissolved Barium (Ba)	mg/L	N/A	N/A	0.010	B371085	0.035	+/- <RDL	0.010	B371085
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B371077	<0.0010	N/A	0.0010	B371107

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNL870				CNL871			
Sampling Date		2024/05/13 12:41				2024/05/13 15:04			
COC Number		1OF1				1OF1			
	UNITS	RRMW16-16-17 Lab-Dup	MU	RDL	QC Batch	RRMW16-15-39	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	N/A	N/A	0.020	B371085	0.053	+/- <RDL	0.020	B371085
Dissolved Calcium (Ca)	mg/L	N/A	N/A	0.30	B371085	6.9	+/- 0.72	0.30	B371085
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B371077	<0.0010	N/A	0.0010	B371107
Dissolved Cobalt (Co)	mg/L	0.0017	+/- <RDL	0.00030	B371077	<0.00030	N/A	0.00030	B371107
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B371077	<0.0010	N/A	0.0010	B371107
Dissolved Iron (Fe)	mg/L	N/A	N/A	0.060	B371085	0.26	+/- <RDL	0.060	B371085
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B371077	<0.00020	N/A	0.00020	B371107
Dissolved Lithium (Li)	mg/L	N/A	N/A	0.020	B371085	0.044	+/- <RDL	0.020	B371085
Dissolved Magnesium (Mg)	mg/L	N/A	N/A	0.20	B371085	2.6	+/- <RDL	0.20	B371085
Dissolved Manganese (Mn)	mg/L	N/A	N/A	0.0040	B371085	0.0071	+/- <RDL	0.0040	B371085
Dissolved Molybdenum (Mo)	mg/L	0.00088	+/- 0.00032	0.00020	B371077	0.026	+/- 0.0060	0.00020	B371107
Dissolved Nickel (Ni)	mg/L	0.0049	+/- <RDL	0.00050	B371077	0.00056	+/- <RDL	0.00050	B371107
Dissolved Phosphorus (P)	mg/L	N/A	N/A	0.10	B371085	<0.10	N/A	0.10	B371085
Dissolved Potassium (K)	mg/L	N/A	N/A	0.30	B371085	4.3	+/- <RDL	0.30	B371085
Dissolved Selenium (Se)	mg/L	<0.00080	N/A	0.00080	B371077	0.0012	+/- <RDL	0.00020	B371107
Dissolved Silicon (Si)	mg/L	N/A	N/A	0.50	B371085	4.2	+/- 0.80	0.50	B371085
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B371077	<0.00010	N/A	0.00010	B371107
Dissolved Sodium (Na)	mg/L	N/A	N/A	2.5	B371085	240	+/- 23	0.50	B371085
Dissolved Strontium (Sr)	mg/L	N/A	N/A	0.10	B371085	0.11	+/- <RDL	0.020	B371085
Dissolved Sulphur (S)	mg/L	N/A	N/A	1.0	B371085	37	+/- 2.5	0.20	B371085
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B371077	<0.00020	N/A	0.00020	B371107
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B371077	<0.0010	N/A	0.0010	B371107
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B371077	0.0084	+/- 0.0023	0.0010	B371107
Dissolved Uranium (U)	mg/L	0.00029	+/- <RDL	0.00010	B371077	0.0020	+/- 0.00019	0.00010	B371107
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B371077	0.0075	+/- <RDL	0.0010	B371107
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B371077	<0.0030	N/A	0.0030	B371107

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNL872			
Sampling Date		2024/05/13 16:18			
COC Number		1OF1			
	UNITS	RRMW16-13-37	MU	RDL	QC Batch
Calculated Parameters					
Anion Sum	meq/L	17	N/A	N/A	B368924
Cation Sum	meq/L	18	N/A	N/A	B368924
Hardness (CaCO3)	mg/L	98	N/A	0.50	B368454
Ion Balance (% Difference)	%	2.0	N/A	N/A	B368920
Nitrate (N)	mg/L	0.026	N/A	0.010	B368458
Nitrate (NO3)	mg/L	0.11	N/A	0.044	B370766
Nitrite (NO2)	mg/L	0.061	N/A	0.033	B370766
Calculated Total Dissolved Solids	mg/L	990	N/A	10	B368929
Elements					
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	B368626
Misc. Inorganics					
Conductivity	uS/cm	1700	+/- 44	2.0	B373867
pH	pH	8.18	+/- 0.0810	N/A	B373866
Anions					
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B373863
Alkalinity (Total as CaCO3)	mg/L	510	+/- 38	1.0	B373863
Bicarbonate (HCO3)	mg/L	620	+/- 9.5	1.0	B373863
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B373863
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B373863
Chloride (Cl)	mg/L	220	+/- 16	5.0	B370718
Sulphate (SO4)	mg/L	49	+/- 3.5	1.0	B370718
Nutrients					
Nitrite (N)	mg/L	0.019	+/- <RDL	0.010	B370518
Nitrate plus Nitrite (N)	mg/L	0.044	+/- 0.013	0.010	B370518
Lab Filtered Elements					
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B371107
Dissolved Antimony (Sb)	mg/L	0.0012	+/- <RDL	0.00060	B371107
Dissolved Arsenic (As)	mg/L	0.00077	+/- <RDL	0.00020	B371107
Dissolved Barium (Ba)	mg/L	0.21	+/- 0.019	0.010	B371085
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B371107
Dissolved Boron (B)	mg/L	0.092	+/- <RDL	0.020	B371085

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNL872			
Sampling Date		2024/05/13 16:18			
COC Number		1OF1			
	UNITS	RRMW16-13-37	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	29	+/- 3.0	0.30	B371085
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B371107
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	B371107
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B371107
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B371085
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B371107
Dissolved Lithium (Li)	mg/L	0.052	+/- <RDL	0.020	B371085
Dissolved Magnesium (Mg)	mg/L	5.9	+/- 0.38	0.20	B371085
Dissolved Manganese (Mn)	mg/L	0.021	+/- <RDL	0.0040	B371085
Dissolved Molybdenum (Mo)	mg/L	0.027	+/- 0.0063	0.00020	B371107
Dissolved Nickel (Ni)	mg/L	0.00077	+/- <RDL	0.00050	B371107
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B371085
Dissolved Potassium (K)	mg/L	3.5	+/- <RDL	0.30	B371085
Dissolved Selenium (Se)	mg/L	0.00042	+/- <RDL	0.00020	B371107
Dissolved Silicon (Si)	mg/L	2.6	+/- 0.51	0.50	B371085
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B371107
Dissolved Sodium (Na)	mg/L	370	+/- 36	0.50	B371085
Dissolved Strontium (Sr)	mg/L	0.44	+/- 0.043	0.020	B371085
Dissolved Sulphur (S)	mg/L	14	+/- 0.96	0.20	B371085
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B371107
Dissolved Tin (Sn)	mg/L	0.0046	+/- 0.0013	0.0010	B371107
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B371107
Dissolved Uranium (U)	mg/L	0.0047	+/- 0.00043	0.00010	B371107
Dissolved Vanadium (V)	mg/L	0.0023	+/- <RDL	0.0010	B371107
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B371107

RDL = Reportable Detection Limit
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TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CNL869		CNL870			CNL871			
Sampling Date		2024/05/13 12:01		2024/05/13 12:41			2024/05/13 15:04			
COC Number		1OF1		1OF1			1OF1			
	UNITS	RRMW16-17-8	MU	RRMW16-16-17	MU	RDL	RRMW16-15-39	MU	RDL	QC Batch
Calculated Parameters										
Total Kjeldahl Nitrogen (Calc)	mg/L	2.74	N/A	2.11	N/A	0.20	3.2	N/A	2.0	B370776
Nutrients										
Total Nitrogen (N)	mg/L	2.7	+/- 0.40	2.1	+/- 0.31	0.20	3.3	+/- <RDL	2.0	B371369

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CNL872			
Sampling Date		2024/05/13 16:18			
COC Number		1OF1			
	UNITS	RRMW16-13-37	MU	RDL	QC Batch
Calculated Parameters					
Total Kjeldahl Nitrogen (Calc)	mg/L	1.28	N/A	0.020	B370776
Nutrients					
Total Nitrogen (N)	mg/L	1.3	+/- 0.20	0.020	B371369

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C433947
Report Date: 2024/05/21

STANTEC CONSULTING LTD
Client Project #: 110773376
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNL869		CNL869			CNL870			
Sampling Date		2024/05/13 12:01		2024/05/13 12:01			2024/05/13 12:41			
COC Number		1OF1		1OF1			1OF1			
	UNITS	RRMW16-17-8	MU	RRMW16-17-8 Lab-Dup	MU	RDL	RRMW16-16-17	MU	RDL	QC Batch
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	23	+/- 2.6	24	+/- 2.7	1.0	2.6	+/- <RDL	0.50	B374849
Microbiological Param.										
E.Coli DST	MPN/100mL	<50 (1)	N/A	N/A	N/A	50	<5.0 (1)	N/A	5.0	B368791
Fecal Coliforms	MPN/100mL	<50 (1)	N/A	N/A	N/A	50	<5.0 (1)	N/A	5.0	B369179
Heterotrophic DST	MPN/100mL	99000 (1)	N/A	N/A	N/A	50	1600 (1)	N/A	5.0	B369053
Total Coliforms DST	MPN/100mL	23000 (1)	N/A	N/A	N/A	50	38 (1)	N/A	5.0	B368791
Nutrients										
Total Ammonia (N)	mg/L	0.56	+/- 0.062	N/A	N/A	0.015	1.6	+/- 0.18	0.015	B370017
Orthophosphate (P)	mg/L	0.0049	+/- 0.0035	N/A	N/A	0.0030	<0.0030	N/A	0.0030	B370747
Lab Filtered Nutrients										
Dissolved Phosphorus (P)	mg/L	0.0057	+/- 0.0048	N/A	N/A	0.0030	<0.0030	N/A	0.0030	B372850

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNL871			CNL872			
Sampling Date		2024/05/13 15:04			2024/05/13 16:18			
COC Number		1OF1			1OF1			
	UNITS	RRMW16-15-39	MU	RDL	RRMW16-13-37	MU	RDL	QC Batch
Lab Filtered Inorganics								
Dissolved Organic Carbon (C)	mg/L	7.1	+/- 0.90	0.50	3.4	+/- 0.56	0.50	B374849
Microbiological Param.								
E.Coli DST	MPN/100mL	<100 (1)	N/A	100	<50 (1)	N/A	50	B368791
Fecal Coliforms	MPN/100mL	<100 (1)	N/A	100	<50 (1)	N/A	50	B369179
Heterotrophic DST	MPN/100mL	>240000 (1)	N/A	100	>120000 (1)	N/A	50	B369053
Total Coliforms DST	MPN/100mL	<100 (1)	N/A	100	6200 (1)	N/A	50	B368791
Nutrients								
Total Ammonia (N)	mg/L	1.3	+/- 0.14	0.015	0.88	+/- 0.097	0.015	B370017
Orthophosphate (P)	mg/L	0.017	+/- 0.0041	0.0030	0.0077	+/- 0.0036	0.0030	B370747
Lab Filtered Nutrients								
Dissolved Phosphorus (P)	mg/L	0.015 (2)	+/- 0.0050	0.0030	0.013	+/- 0.0049	0.0030	B372850

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.
(2) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID		CNL869		CNL870		CNL871			
Sampling Date		2024/05/13 12:01		2024/05/13 12:41		2024/05/13 15:04			
COC Number		1OF1		1OF1		1OF1			
	UNITS	RRMW16-17-8	MU	RRMW16-16-17	MU	RRMW16-15-39	MU	RDL	QC Batch
Elements									
Total Mercury (Hg)	ug/L	0.26 (1)	+/- <RDL	<0.19 (1)	N/A	0.56 (1)	+/- <RDL	0.19	B369609
Lab Filtered Elements									
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	<0.0019	N/A	<0.0019	N/A	0.0019	B369667

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CNL872			
Sampling Date		2024/05/13 16:18			
COC Number		1OF1			
	UNITS	RRMW16-13-37	MU	RDL	QC Batch
Elements					
Total Mercury (Hg)	ug/L	0.232 (1)	+/- 0.040	0.019	B369609
Lab Filtered Elements					
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	B369667

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	3.3°C

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B368791	YYL	Method Blank	E.Coli DST	2024/05/16	<1.0		mpn/100mL	
			Total Coliforms DST	2024/05/16	<1.0		mpn/100mL	
B368791	YYL	RPD	E.Coli DST	2024/05/16	NC		%	N/A
			Total Coliforms DST	2024/05/16	NC		%	N/A
B369053	YYL	Method Blank	Heterotrophic DST	2024/05/16	<1.0		mpn/100mL	
B369053	YYL	RPD	Heterotrophic DST	2024/05/16	NC		%	N/A
B369179	YYL	Method Blank	Fecal Coliforms	2024/05/15	<1.0		MPN/100mL	
B369179	YYL	RPD	Fecal Coliforms	2024/05/15	200		%	N/A
B369377	CHA	Spiked Blank	O-TERPHENYL (sur.)	2024/05/16		105	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/16		97	%	60 - 140
B369377	CHA	Method Blank	O-TERPHENYL (sur.)	2024/05/15		99	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/15	<0.10		mg/L	
B369609	KHU	Matrix Spike	Total Mercury (Hg)	2024/05/16		93	%	80 - 120
B369609	KHU	Spiked Blank	Total Mercury (Hg)	2024/05/16		95	%	80 - 120
B369609	KHU	Method Blank	Total Mercury (Hg)	2024/05/16	<0.0019		ug/L	
B369609	KHU	RPD	Total Mercury (Hg)	2024/05/16	NC		%	20
B369667	KHU	Matrix Spike	Dissolved Mercury (Hg)	2024/05/16		91	%	80 - 120
B369667	KHU	Spiked Blank	Dissolved Mercury (Hg)	2024/05/16		99	%	80 - 120
B369667	KHU	Method Blank	Dissolved Mercury (Hg)	2024/05/16	<0.0019		ug/L	
B369667	KHU	RPD	Dissolved Mercury (Hg)	2024/05/16	5.4		%	20
B369730	RIL	Matrix Spike	1,4-Difluorobenzene (sur.)	2024/05/16		93	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/16		101	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/16		113	%	50 - 140
			Benzene	2024/05/16		94	%	50 - 140
			Toluene	2024/05/16		92	%	50 - 140
			Ethylbenzene	2024/05/16		92	%	50 - 140
			m & p-Xylene	2024/05/16		90	%	50 - 140
			o-Xylene	2024/05/16		93	%	50 - 140
			F1 (C6-C10)	2024/05/16		106	%	60 - 140
B369730	RIL	Spiked Blank	1,4-Difluorobenzene (sur.)	2024/05/16		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/16		97	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/16		103	%	50 - 140
			Benzene	2024/05/16		95	%	60 - 130
			Toluene	2024/05/16		94	%	60 - 130
			Ethylbenzene	2024/05/16		99	%	60 - 130
			m & p-Xylene	2024/05/16		93	%	60 - 130
			o-Xylene	2024/05/16		95	%	60 - 130
			F1 (C6-C10)	2024/05/16		107	%	60 - 140
B369730	RIL	Method Blank	1,4-Difluorobenzene (sur.)	2024/05/16		105	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/16		102	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/16		104	%	50 - 140
			Benzene	2024/05/16	<0.00040		mg/L	
			Toluene	2024/05/16	<0.00040		mg/L	
			Ethylbenzene	2024/05/16	<0.00040		mg/L	
			m & p-Xylene	2024/05/16	<0.00080		mg/L	
			o-Xylene	2024/05/16	<0.00040		mg/L	
			F1 (C6-C10)	2024/05/16	<0.10		mg/L	
B369730	RIL	RPD	Benzene	2024/05/17	NC		%	30
			Toluene	2024/05/17	NC		%	30
			Ethylbenzene	2024/05/17	NC		%	30
			m & p-Xylene	2024/05/17	NC		%	30
			o-Xylene	2024/05/17	NC		%	30
			F1 (C6-C10)	2024/05/17	NC		%	30
B370017	CTU	Matrix Spike	Total Ammonia (N)	2024/05/15		104	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B370017	CTU	Spiked Blank	Total Ammonia (N)	2024/05/15		103	%	80 - 120
B370017	CTU	Method Blank	Total Ammonia (N)	2024/05/15	<0.015		mg/L	
B370017	CTU	RPD	Total Ammonia (N)	2024/05/15	4.7		%	20
B370518	CTU	Matrix Spike	Nitrite (N)	2024/05/16		98	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/16		NC	%	80 - 120
B370518	CTU	Spiked Blank	Nitrite (N)	2024/05/15		99	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/15		102	%	80 - 120
B370518	CTU	Method Blank	Nitrite (N)	2024/05/15	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/15	<0.010		mg/L	
B370518	CTU	RPD	Nitrite (N)	2024/05/15	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/15	1.9		%	20
B370520	CTU	Matrix Spike	Nitrite (N)	2024/05/15		92	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/15		NC	%	80 - 120
B370520	CTU	Spiked Blank	Nitrite (N)	2024/05/15		100	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/15		105	%	80 - 120
B370520	CTU	Method Blank	Nitrite (N)	2024/05/15	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/15	<0.010		mg/L	
B370520	CTU	RPD	Nitrite (N)	2024/05/15	0.46		%	20
			Nitrate plus Nitrite (N)	2024/05/15	2.8		%	20
B370718	TOR	Matrix Spike	Chloride (Cl)	2024/05/16		NC	%	80 - 120
			Sulphate (SO4)	2024/05/16		NC	%	80 - 120
B370718	TOR	Spiked Blank	Chloride (Cl)	2024/05/16		103	%	80 - 120
			Sulphate (SO4)	2024/05/16		110	%	80 - 120
B370718	TOR	Method Blank	Chloride (Cl)	2024/05/15	<1.0		mg/L	
			Sulphate (SO4)	2024/05/15	<1.0		mg/L	
B370718	TOR	RPD	Chloride (Cl)	2024/05/16	2.5		%	20
			Sulphate (SO4)	2024/05/16	0.73		%	20
B370747	MAP	Matrix Spike	Orthophosphate (P)	2024/05/15		94	%	80 - 120
B370747	MAP	Spiked Blank	Orthophosphate (P)	2024/05/15		97	%	80 - 120
B370747	MAP	Method Blank	Orthophosphate (P)	2024/05/15	<0.0030		mg/L	
B370747	MAP	RPD	Orthophosphate (P)	2024/05/15	0.63		%	20
B371077	JAB	Matrix Spike [CNL870-01]	Dissolved Aluminum (Al)	2024/05/16		97	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/16		99	%	80 - 120
			Dissolved Arsenic (As)	2024/05/16		97	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/16		93	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/16		95	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/16		94	%	80 - 120
			Dissolved Copper (Cu)	2024/05/16		91	%	80 - 120
			Dissolved Lead (Pb)	2024/05/16		89	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/16		102	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/16		91	%	80 - 120
			Dissolved Selenium (Se)	2024/05/16		91	%	80 - 120
			Dissolved Silver (Ag)	2024/05/16		91	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/16		89	%	80 - 120
			Dissolved Tin (Sn)	2024/05/16		98	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/16		94	%	80 - 120
			Dissolved Uranium (U)	2024/05/16		94	%	80 - 120
			Dissolved Vanadium (V)	2024/05/16		97	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/16		91	%	80 - 120
B371077	JAB	Spiked Blank	Dissolved Aluminum (Al)	2024/05/16		107	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/16		104	%	80 - 120
			Dissolved Arsenic (As)	2024/05/16		94	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/16		98	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/16		97	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Cobalt (Co)	2024/05/16		98	%	80 - 120
			Dissolved Copper (Cu)	2024/05/16		100	%	80 - 120
			Dissolved Lead (Pb)	2024/05/16		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/16		99	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/16		97	%	80 - 120
			Dissolved Selenium (Se)	2024/05/16		99	%	80 - 120
			Dissolved Silver (Ag)	2024/05/16		96	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/16		98	%	80 - 120
			Dissolved Tin (Sn)	2024/05/16		96	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/16		92	%	80 - 120
			Dissolved Uranium (U)	2024/05/16		97	%	80 - 120
			Dissolved Vanadium (V)	2024/05/16		98	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/16		95	%	80 - 120
B371077	JAB	Method Blank	Dissolved Aluminum (Al)	2024/05/16	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2024/05/16	<0.00060		mg/L	
			Dissolved Arsenic (As)	2024/05/16	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2024/05/16	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2024/05/16	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2024/05/16	<0.00030		mg/L	
			Dissolved Copper (Cu)	2024/05/16	<0.0010		mg/L	
			Dissolved Lead (Pb)	2024/05/16	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2024/05/16	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2024/05/16	<0.00050		mg/L	
			Dissolved Selenium (Se)	2024/05/16	<0.00020		mg/L	
			Dissolved Silver (Ag)	2024/05/16	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2024/05/16	<0.00020		mg/L	
			Dissolved Tin (Sn)	2024/05/16	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2024/05/16	<0.0010		mg/L	
			Dissolved Uranium (U)	2024/05/16	<0.00010		mg/L	
			Dissolved Vanadium (V)	2024/05/16	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2024/05/16	<0.0030		mg/L	
B371077	JAB	RPD [CNL870-01]	Dissolved Aluminum (Al)	2024/05/16	NC		%	20
			Dissolved Antimony (Sb)	2024/05/16	NC		%	20
			Dissolved Arsenic (As)	2024/05/16	13		%	20
			Dissolved Beryllium (Be)	2024/05/16	NC		%	20
			Dissolved Chromium (Cr)	2024/05/16	NC		%	20
			Dissolved Cobalt (Co)	2024/05/16	7.5		%	20
			Dissolved Copper (Cu)	2024/05/16	NC		%	20
			Dissolved Lead (Pb)	2024/05/16	NC		%	20
			Dissolved Molybdenum (Mo)	2024/05/16	NC		%	20
			Dissolved Nickel (Ni)	2024/05/16	0.61		%	20
			Dissolved Selenium (Se)	2024/05/16	NC		%	20
			Dissolved Silver (Ag)	2024/05/16	NC		%	20
			Dissolved Thallium (Tl)	2024/05/16	NC		%	20
			Dissolved Tin (Sn)	2024/05/16	NC		%	20
			Dissolved Titanium (Ti)	2024/05/16	NC		%	20
			Dissolved Uranium (U)	2024/05/16	3.0		%	20
			Dissolved Vanadium (V)	2024/05/16	NC		%	20
			Dissolved Zinc (Zn)	2024/05/16	NC		%	20
B371085	S1D	Matrix Spike	Dissolved Barium (Ba)	2024/05/16		95	%	80 - 120
			Dissolved Boron (B)	2024/05/16		99	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/16		NC	%	80 - 120
			Dissolved Iron (Fe)	2024/05/16		96	%	80 - 120
			Dissolved Lithium (Li)	2024/05/16		101	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Magnesium (Mg)	2024/05/16		NC	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/16		NC	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/16		101	%	80 - 120
			Dissolved Potassium (K)	2024/05/16		100	%	80 - 120
			Dissolved Silicon (Si)	2024/05/16		91	%	80 - 120
			Dissolved Sodium (Na)	2024/05/16		NC	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/16		NC	%	80 - 120
			Dissolved Sulphur (S)	2024/05/16		NC	%	80 - 120
B371085	S1D	Spiked Blank	Dissolved Barium (Ba)	2024/05/16		99	%	80 - 120
			Dissolved Boron (B)	2024/05/16		97	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/16		96	%	80 - 120
			Dissolved Iron (Fe)	2024/05/16		97	%	80 - 120
			Dissolved Lithium (Li)	2024/05/16		101	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/16		98	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/16		101	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/16		96	%	80 - 120
			Dissolved Potassium (K)	2024/05/16		101	%	80 - 120
			Dissolved Silicon (Si)	2024/05/16		93	%	80 - 120
			Dissolved Sodium (Na)	2024/05/16		98	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/16		98	%	80 - 120
			Dissolved Sulphur (S)	2024/05/16		95	%	80 - 120
B371085	S1D	Method Blank	Dissolved Barium (Ba)	2024/05/16	<0.010		mg/L	
			Dissolved Boron (B)	2024/05/16	<0.020		mg/L	
			Dissolved Calcium (Ca)	2024/05/16	<0.30		mg/L	
			Dissolved Iron (Fe)	2024/05/16	<0.060		mg/L	
			Dissolved Lithium (Li)	2024/05/16	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2024/05/16	<0.20		mg/L	
			Dissolved Manganese (Mn)	2024/05/16	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2024/05/16	<0.10		mg/L	
			Dissolved Potassium (K)	2024/05/16	<0.30		mg/L	
			Dissolved Silicon (Si)	2024/05/16	<0.50		mg/L	
			Dissolved Sodium (Na)	2024/05/16	<0.50		mg/L	
			Dissolved Strontium (Sr)	2024/05/16	<0.020		mg/L	
			Dissolved Sulphur (S)	2024/05/16	<0.20		mg/L	
B371085	S1D	RPD	Dissolved Calcium (Ca)	2024/05/16	0.53		%	20
			Dissolved Magnesium (Mg)	2024/05/16	0.68		%	20
			Dissolved Sodium (Na)	2024/05/16	0.38		%	20
B371107	JAB	Matrix Spike	Dissolved Aluminum (Al)	2024/05/16		97	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/16		101	%	80 - 120
			Dissolved Arsenic (As)	2024/05/16		99	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/16		92	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/16		95	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/16		93	%	80 - 120
			Dissolved Copper (Cu)	2024/05/16		91	%	80 - 120
			Dissolved Lead (Pb)	2024/05/16		93	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/16		99	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/16		93	%	80 - 120
			Dissolved Selenium (Se)	2024/05/16		102	%	80 - 120
			Dissolved Silver (Ag)	2024/05/16		95	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/16		92	%	80 - 120
			Dissolved Tin (Sn)	2024/05/16		97	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/16		93	%	80 - 120
			Dissolved Uranium (U)	2024/05/16		90	%	80 - 120
			Dissolved Vanadium (V)	2024/05/16		98	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Zinc (Zn)	2024/05/16		93	%	80 - 120
B371107	JAB	Spiked Blank	Dissolved Aluminum (Al)	2024/05/16		100	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/16		100	%	80 - 120
			Dissolved Arsenic (As)	2024/05/16		92	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/16		92	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/16		96	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/16		97	%	80 - 120
			Dissolved Copper (Cu)	2024/05/16		96	%	80 - 120
			Dissolved Lead (Pb)	2024/05/16		95	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/16		98	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/16		94	%	80 - 120
			Dissolved Selenium (Se)	2024/05/16		95	%	80 - 120
			Dissolved Silver (Ag)	2024/05/16		95	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/16		93	%	80 - 120
			Dissolved Tin (Sn)	2024/05/16		93	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/16		101	%	80 - 120
			Dissolved Uranium (U)	2024/05/16		88	%	80 - 120
			Dissolved Vanadium (V)	2024/05/16		97	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/16		93	%	80 - 120
B371107	JAB	Method Blank	Dissolved Aluminum (Al)	2024/05/16	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2024/05/16	<0.00060		mg/L	
			Dissolved Arsenic (As)	2024/05/16	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2024/05/16	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2024/05/16	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2024/05/16	<0.00030		mg/L	
			Dissolved Copper (Cu)	2024/05/16	<0.0010		mg/L	
			Dissolved Lead (Pb)	2024/05/16	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2024/05/16	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2024/05/16	<0.00050		mg/L	
			Dissolved Selenium (Se)	2024/05/16	<0.00020		mg/L	
			Dissolved Silver (Ag)	2024/05/16	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2024/05/16	<0.00020		mg/L	
			Dissolved Tin (Sn)	2024/05/16	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2024/05/16	<0.0010		mg/L	
			Dissolved Uranium (U)	2024/05/16	<0.00010		mg/L	
			Dissolved Vanadium (V)	2024/05/16	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2024/05/16	<0.0030		mg/L	
B371107	JAB	RPD	Dissolved Aluminum (Al)	2024/05/16	NC		%	20
			Dissolved Antimony (Sb)	2024/05/16	NC		%	20
			Dissolved Arsenic (As)	2024/05/16	8.7		%	20
			Dissolved Beryllium (Be)	2024/05/16	NC		%	20
			Dissolved Chromium (Cr)	2024/05/16	NC		%	20
			Dissolved Cobalt (Co)	2024/05/16	NC		%	20
			Dissolved Copper (Cu)	2024/05/16	NC		%	20
			Dissolved Lead (Pb)	2024/05/16	NC		%	20
			Dissolved Molybdenum (Mo)	2024/05/16	113 (1)		%	20
			Dissolved Nickel (Ni)	2024/05/16	4.0		%	20
			Dissolved Selenium (Se)	2024/05/16	NC		%	20
			Dissolved Silver (Ag)	2024/05/16	NC		%	20
			Dissolved Thallium (Tl)	2024/05/16	NC		%	20
			Dissolved Tin (Sn)	2024/05/16	NC		%	20
			Dissolved Titanium (Ti)	2024/05/16	NC		%	20
			Dissolved Uranium (U)	2024/05/16	3.4		%	20
			Dissolved Vanadium (V)	2024/05/16	NC		%	20

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Zinc (Zn)	2024/05/16	6.5		%	20
B371369	TOR	Matrix Spike	Total Nitrogen (N)	2024/05/16		101	%	80 - 120
B371369	TOR	QC Standard	Total Nitrogen (N)	2024/05/16		104	%	80 - 120
B371369	TOR	Spiked Blank	Total Nitrogen (N)	2024/05/16		102	%	80 - 120
B371369	TOR	Method Blank	Total Nitrogen (N)	2024/05/16	<0.020		mg/L	
B371369	TOR	RPD	Total Nitrogen (N)	2024/05/16	2.8		%	20
B372850	MAP	Matrix Spike	Dissolved Phosphorus (P)	2024/05/17		99	%	80 - 120
B372850	MAP	QC Standard	Dissolved Phosphorus (P)	2024/05/17		90	%	80 - 120
B372850	MAP	Spiked Blank	Dissolved Phosphorus (P)	2024/05/17		97	%	80 - 120
B372850	MAP	Method Blank	Dissolved Phosphorus (P)	2024/05/17	<0.0030		mg/L	
B372850	MAP	RPD	Dissolved Phosphorus (P)	2024/05/17	NC		%	20
B373042	A5S	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/18		100	%	80 - 120
B373042	A5S	Method Blank	Alkalinity (PP as CaCO3)	2024/05/18	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/18	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/18	<1.0		mg/L	
			Carbonate (CO3)	2024/05/18	<1.0		mg/L	
			Hydroxide (OH)	2024/05/18	<1.0		mg/L	
B373042	A5S	RPD	Alkalinity (PP as CaCO3)	2024/05/18	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/18	0.73		%	20
			Bicarbonate (HCO3)	2024/05/18	0.73		%	20
			Carbonate (CO3)	2024/05/18	NC		%	20
			Hydroxide (OH)	2024/05/18	NC		%	20
B373044	A5S	Spiked Blank	pH	2024/05/18		100	%	97 - 103
B373044	A5S	RPD	pH	2024/05/18	0.76		%	N/A
B373045	A5S	Spiked Blank	Conductivity	2024/05/18		102	%	90 - 110
B373045	A5S	Method Blank	Conductivity	2024/05/18	<2.0		uS/cm	
B373045	A5S	RPD	Conductivity	2024/05/18	0.21		%	10
B373048	A5S	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/19		99	%	80 - 120
B373048	A5S	Method Blank	Alkalinity (PP as CaCO3)	2024/05/19	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/19	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/19	<1.0		mg/L	
			Carbonate (CO3)	2024/05/19	<1.0		mg/L	
			Hydroxide (OH)	2024/05/19	<1.0		mg/L	
B373048	A5S	RPD	Alkalinity (PP as CaCO3)	2024/05/19	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/19	2.3		%	20
			Bicarbonate (HCO3)	2024/05/19	2.3		%	20
			Carbonate (CO3)	2024/05/19	NC		%	20
			Hydroxide (OH)	2024/05/19	NC		%	20
B373063	A5S	Spiked Blank	pH	2024/05/19		99	%	97 - 103
B373063	A5S	RPD	pH	2024/05/19	0.027		%	N/A
B373064	A5S	Spiked Blank	Conductivity	2024/05/19		102	%	90 - 110
B373064	A5S	Method Blank	Conductivity	2024/05/19	<2.0		uS/cm	
B373064	A5S	RPD	Conductivity	2024/05/19	0.26		%	10
B373863	A5S	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/18		98	%	80 - 120
B373863	A5S	Method Blank	Alkalinity (PP as CaCO3)	2024/05/18	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/18	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/18	<1.0		mg/L	
			Carbonate (CO3)	2024/05/18	<1.0		mg/L	
			Hydroxide (OH)	2024/05/18	<1.0		mg/L	
B373863	A5S	RPD	Alkalinity (PP as CaCO3)	2024/05/18	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/18	0.043		%	20
			Bicarbonate (HCO3)	2024/05/18	0.043		%	20
			Carbonate (CO3)	2024/05/18	NC		%	20
			Hydroxide (OH)	2024/05/18	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B373866	JVM	Spiked Blank	pH	2024/05/18		99	%	97 - 103
B373866	JVM	RPD	pH	2024/05/18	0.11		%	N/A
B373867	A5S	Spiked Blank	Conductivity	2024/05/18		102	%	90 - 110
B373867	A5S	Method Blank	Conductivity	2024/05/18	<2.0		uS/cm	
B373867	A5S	RPD	Conductivity	2024/05/18	0.40		%	10
B374849	JFE	Matrix Spike [CNL869-01]	Dissolved Organic Carbon (C)	2024/05/21		NC	%	80 - 120
B374849	JFE	Spiked Blank	Dissolved Organic Carbon (C)	2024/05/21		103	%	80 - 120
B374849	JFE	Method Blank	Dissolved Organic Carbon (C)	2024/05/21	<0.50		mg/L	
B374849	JFE	RPD [CNL869-01]	Dissolved Organic Carbon (C)	2024/05/21	3.6		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

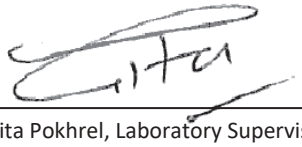
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Gita Pokhrel, Laboratory Supervisor



Janet Gao, B.Sc., QP, Supervisor, Organics



Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist



Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

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- [x] Calgary, AB: 4000 - 19th St. NE, T2E 6P8 Toll Free (800) 386-7247
- [ ] Edmonton, AB: 4326 - 76 Avenue NW, T6B 2T8 Toll Free (800) 386-7247
- [ ] Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

CHAIN OF CUSTODY RECORD

ENV COC - 00013v5

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Project Information	
Company:	Stantec	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	10220 103 Ave NW	Street Address:		Project #:	110773396
City:	Edmonton Prov: AB Postal Code: T5J 3N4	City: Prov: Postal Code:		Site #:	
Phone:	780 969 2223	Phone:		Site Location:	
Email:	dylan.king@stantec.com	Email:		Site Location Province:	AB
Copies:		Copies:		Sampled By:	WT/TH

LAB USE ONLY - PLACE STICKER HERE

Rush Confirmation #:

Regulatory Criteria

☑ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba ☐ Saskatchewan ☐ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)

☑ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply

☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

Comments

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	FIELD FILTERED	FIELD PRESERVED	LAB FILTRATION REQUIRED	BTEX F1	VOCs	BTEX F1-F2	BTEX F1	Routine water	Regulated metals - total	Regulated metals - dissolved	Mercury - total	Mercury - dissolved	Salinity 4	Sieve (75 micron)	Toxicity (Report 28 days) DOC	Biochemistry 4 TKN	Dissolved Phosphorus	Phosphate	Ammonia	Bacteriological *	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE
1	RRMW16-17-8	24	05	13	12	31	Water						X		X		X	X	X			X	X	X	X	X	X	11	
2	RMW16-16-17	24	05	13	12	41	Water						X		X		X	X	X			X	X	X	X	X	X	11	
3	RMW16-15-39	24	05	13	15	04	Water						X		X		X	X	X			X	X	X	X	X	X	11	
4	RMW16-13-37	24	05	13	16	18	Water						X		X		X	X	X			X	X	X	X	X	X	11	
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

MCAL-2024-05-734

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C			
Seal present						
Seal intact						
Cooling media present				1	2	3

LAB USE ONLY	Yes	No	°C			
Seal present	X					
Seal intact	X					
Cooling media present	X			1	2	3
				4	5	1

LAB USE ONLY	Yes	No	°C			
Seal present						
Seal intact						
Cooling media present				1	2	3

Temperature reading by:

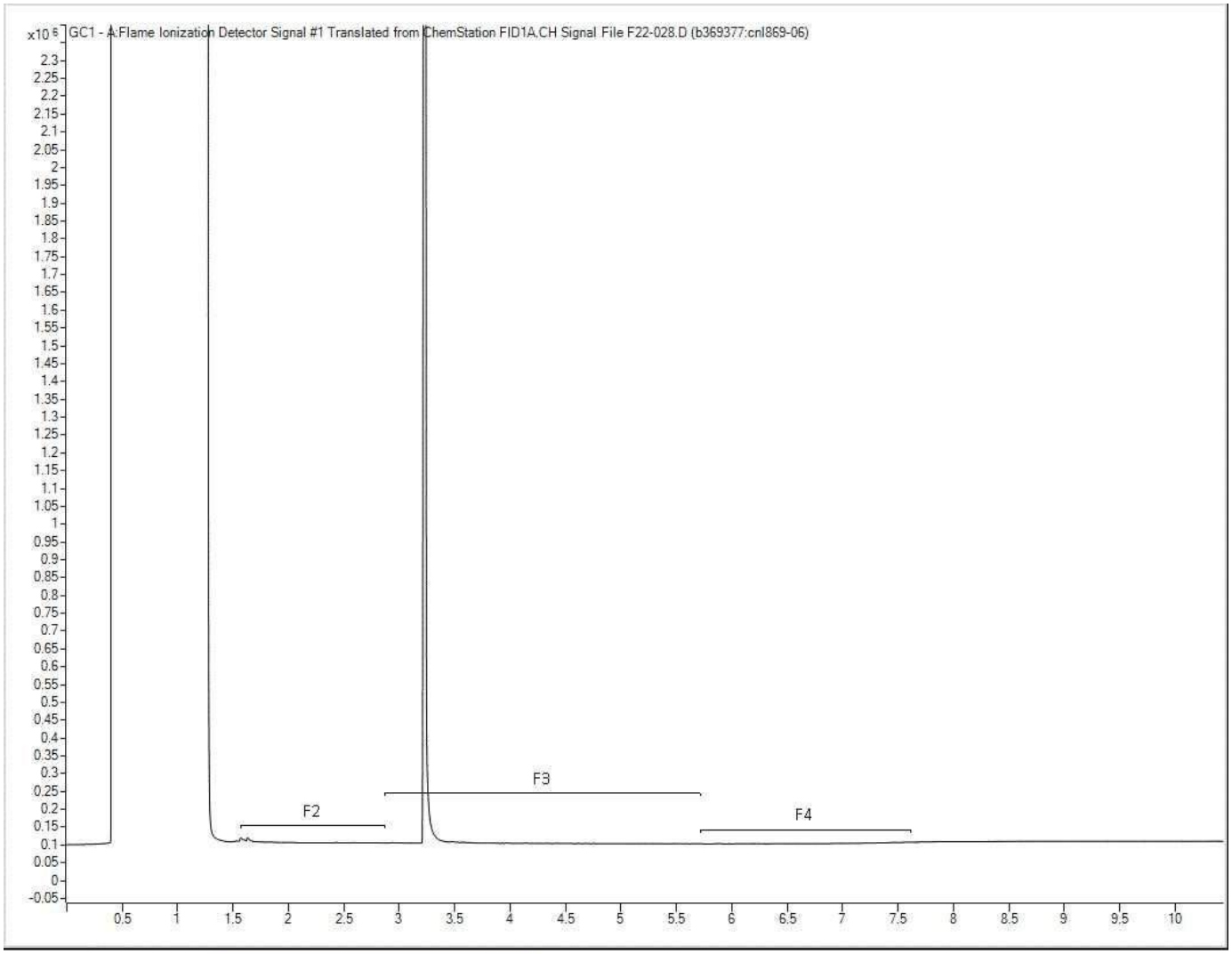
Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM
1 Taylor Herms	2024	05	13	18	10	1 Sidjun Sousa	2024	05	14	07	00
2						2					

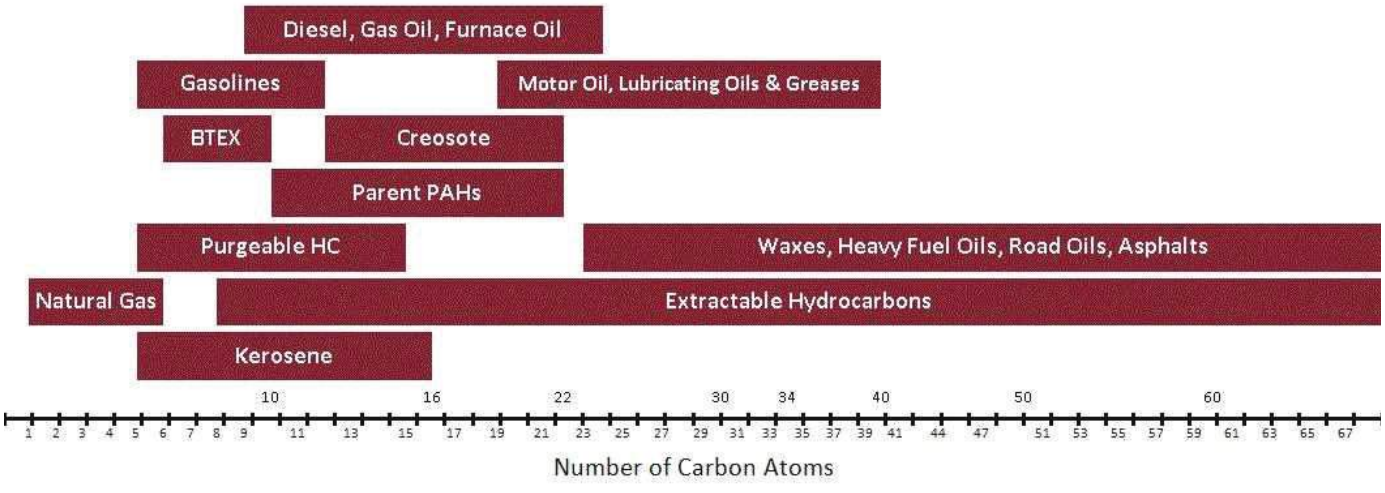
Special instructions

* Total coliforms, ecoli fecal coliforms, heterotrophic plate count

Dissolved parameters not field filtered — please lab filter

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

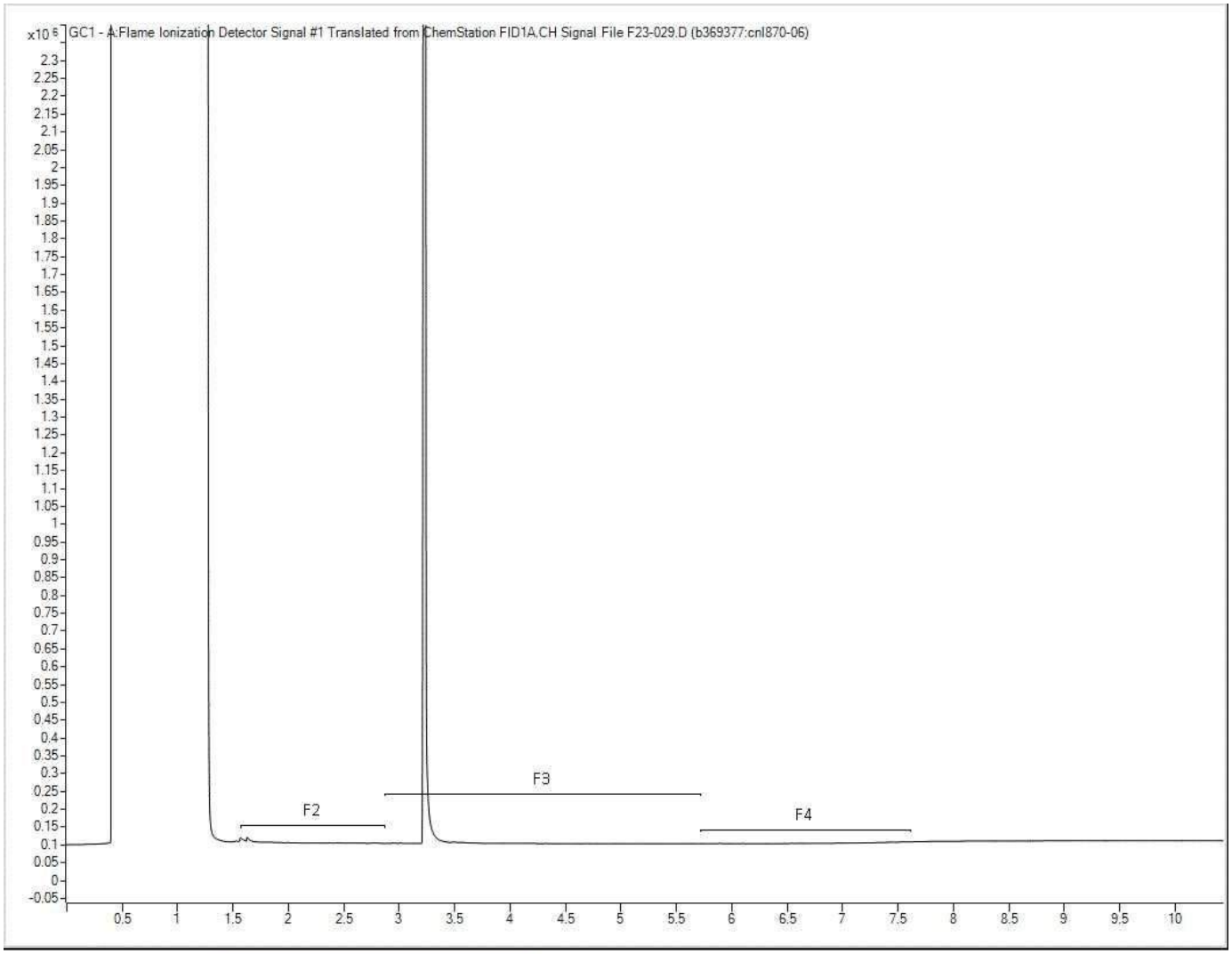


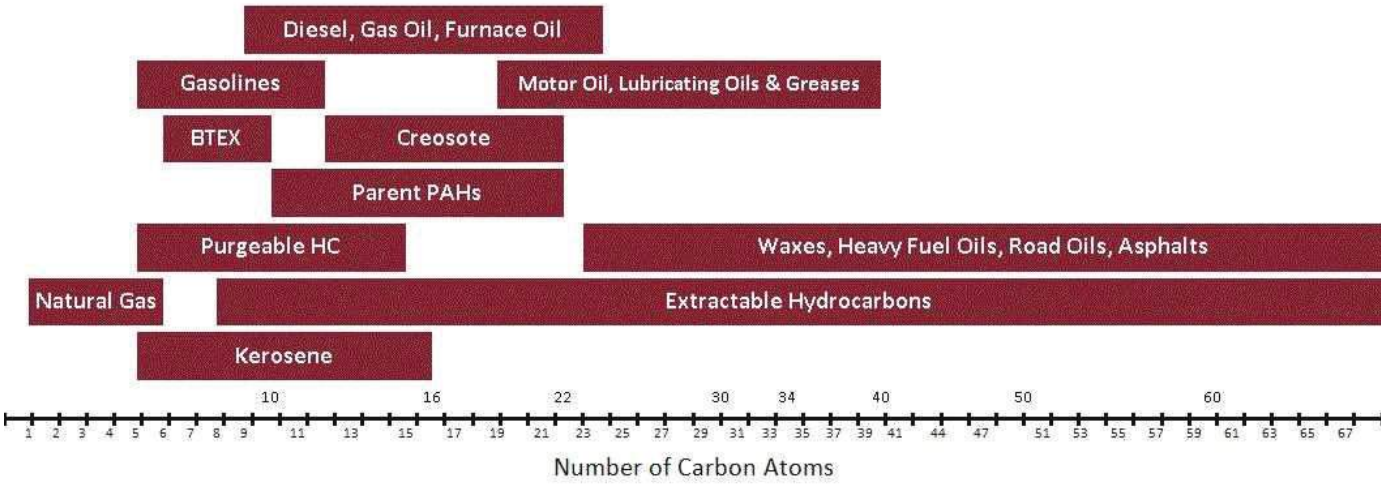


hpchem23\HPchem\1\DATA\2024\05\0515

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

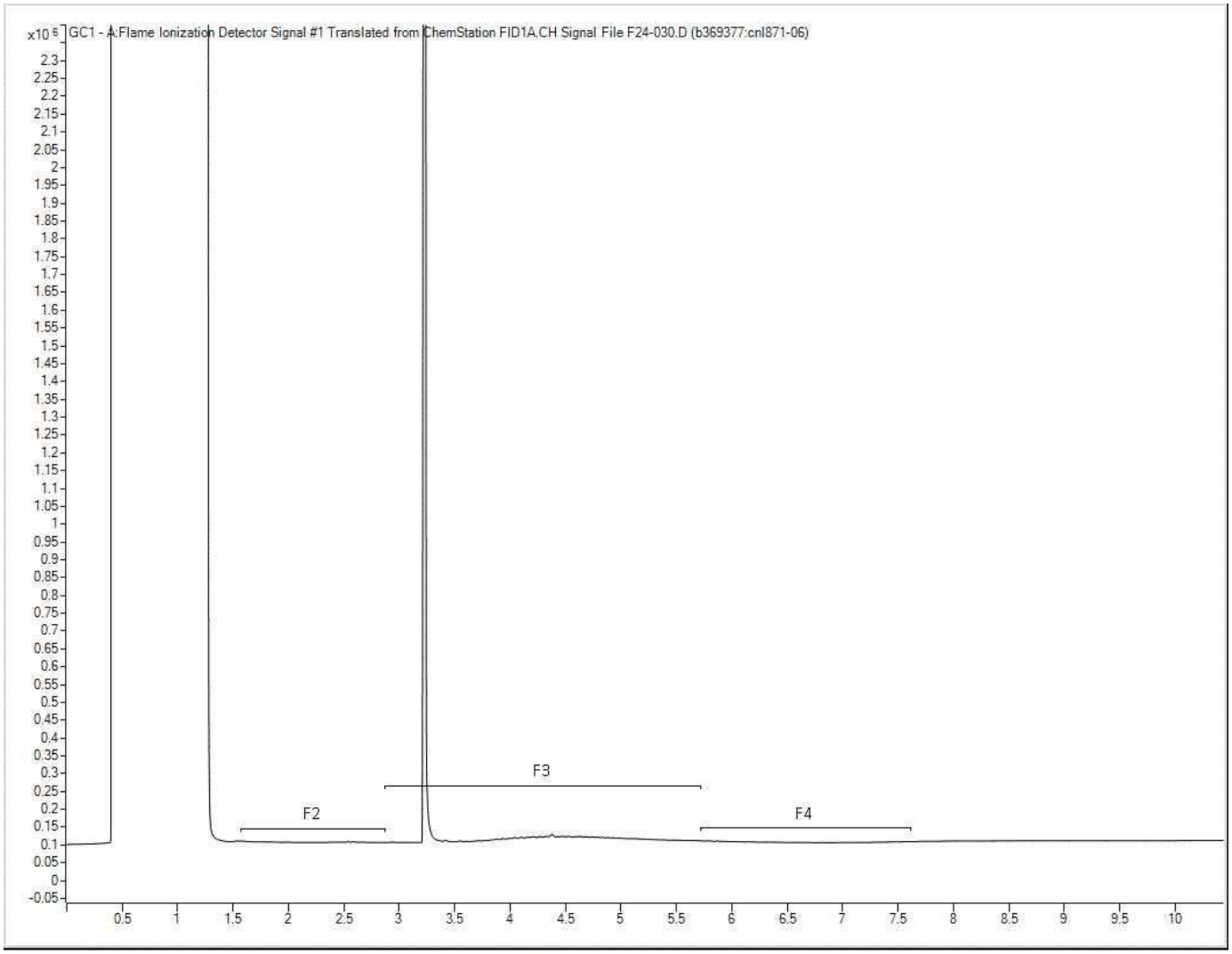


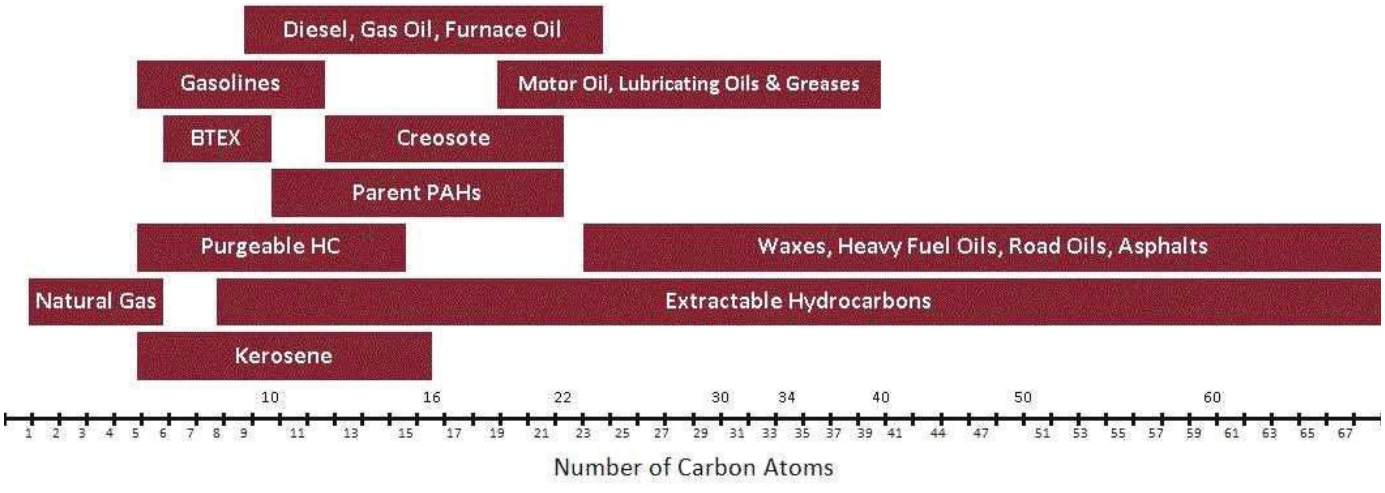


hpchem23\HPchem\1\DATA\2024\05\0515

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

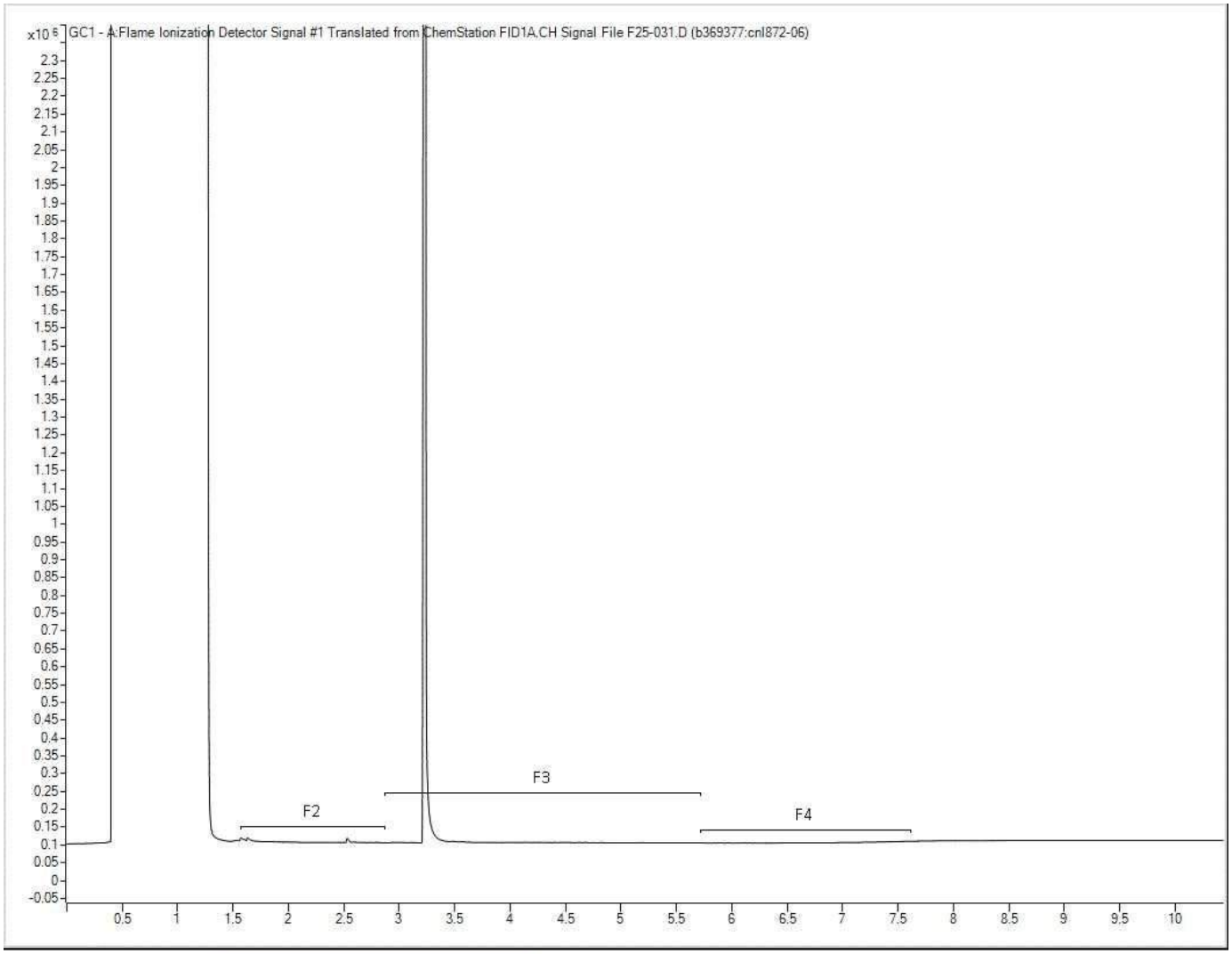


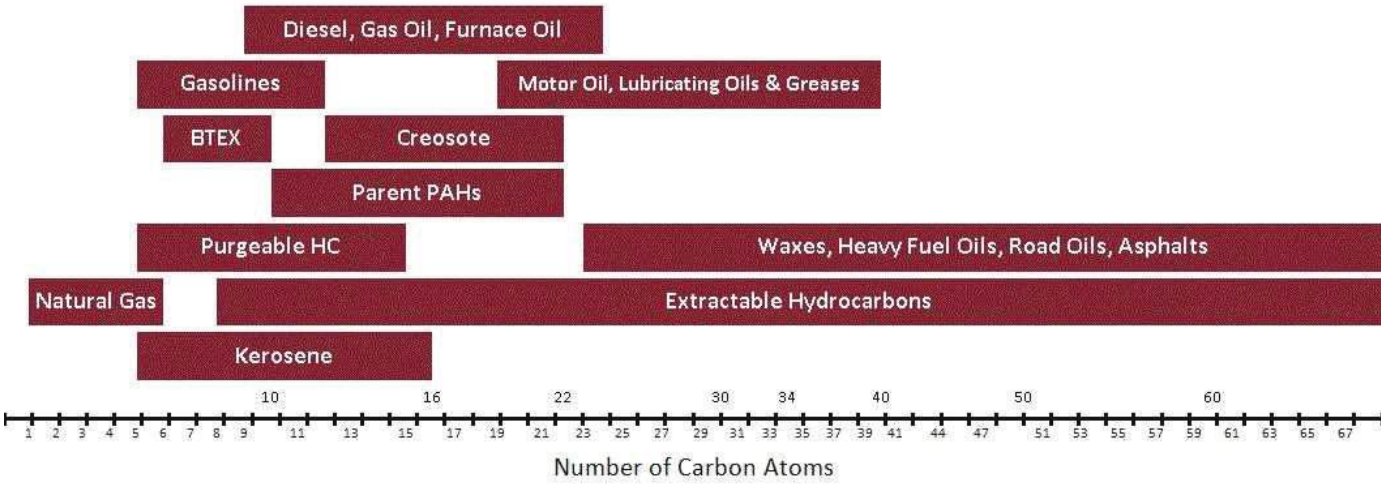


hpchem23\HPchem\1\DATA\2024\05\0515

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





hpchem23\HPchem\1\DATA\2024\05\0515

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 110773396
Your C.O.C. #: 1OF1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/23
Report #: R3503607
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C433976
Received: 2024/05/14, 07:00

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2024/05/18	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2024/05/16	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	1	N/A	2024/05/17		Auto Calc
Cadmium - low level CCME - Dissolved	1	N/A	2024/05/15		Auto Calc
Chloride/Sulphate by Auto Colourimetry	1	N/A	2024/05/15	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	1	2024/05/14	2024/05/15	AB SOP-00089	SM 24 9223 A,B m
Heterotrophic Plate Count Quant	1	2024/05/14	2024/05/16	CAL SOP-00012	SM 24 9215 A, E m
Total Coliforms and E.Coli	1	2024/05/15	2024/05/16	AB SOP-00089	SM 24 9223 A,B m
Carbon (DOC) -Lab Filtered (1)	1	N/A	2024/05/17	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	1	N/A	2024/05/18	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	1	2024/05/15	2024/05/16	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	1	N/A	2024/05/16		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	1	2024/05/16	2024/05/16	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	1	2024/05/15	2024/05/16	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (3)	1	N/A	2024/05/16	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	1	N/A	2024/05/15	AB SOP-00043	EPA 6020b R2 m
Ion Balance	1	N/A	2024/05/18		Auto Calc
Sum of cations, anions	1	N/A	2024/05/16		Auto Calc
Ammonia-N (Total)	1	N/A	2024/05/15	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	1	N/A	2024/05/16		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	1	N/A	2024/05/15	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	1	2024/05/14	2024/05/15		Auto Calc
pH @25°C (5)	1	N/A	2024/05/18	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (6)	1	N/A	2024/05/15	AB SOP-00025	SM 24 4500-P A,F m
Total Dissolved Solids (Calculated)	1	N/A	2024/05/18		Auto Calc
Total Kjeldahl Nitrogen (Total)	1	N/A	2024/05/17	BBY WI-00033	Auto Calc
Nitrogen (Total)	1	2024/05/16	2024/05/16	AB SOP-00093	SM 24 4500-N C m
Total Phosphorus-Dissolved-Lab Filtered (7)	1	2024/05/15	2024/05/16	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau

Your Project #: 110773396
Your C.O.C. #: 1OF1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/23
Report #: R3503607
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C433976
Received: 2024/05/14, 07:00

Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(7) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Your Project #: 110773396
Your C.O.C. #: 1OF1

Attention: DYLAN KING

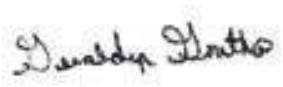
STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/23
Report #: R3503607
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C433976
Received: 2024/05/14, 07:00

Encryption Key



Geraldlyn Gouthro
Key Account Specialist
23 May 2024 13:01:18

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (403) 291-3077
==========

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Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID				CNL997		CNL997			
Sampling Date				2024/05/13 14:06		2024/05/13 14:06			
COC Number				1OF1		1OF1			
	UNITS	MAC	AO	NE20-R3-01	MU	NE20-R3-01 Lab-Dup	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	-	-	<0.10	N/A	N/A	N/A	0.10	B369374
Volatiles									
Benzene	mg/L	0.005	-	<0.00040	N/A	<0.00040	N/A	0.00040	B369337
Toluene	mg/L	0.06	0.024	<0.00040	N/A	<0.00040	N/A	0.00040	B369337
Ethylbenzene	mg/L	0.14	0.0016	<0.00040	N/A	<0.00040	N/A	0.00040	B369337
m & p-Xylene	mg/L	-	-	<0.00080	N/A	<0.00080	N/A	0.00080	B369337
o-Xylene	mg/L	-	-	<0.00040	N/A	<0.00040	N/A	0.00040	B369337
Xylenes (Total)	mg/L	0.09	0.02	<0.00089	N/A	N/A	N/A	0.00089	B368495
F1 (C6-C10) - BTEX	mg/L	-	-	<0.10	N/A	N/A	N/A	0.10	B368495
F1 (C6-C10)	mg/L	-	-	<0.10	N/A	<0.10	N/A	0.10	B369337
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	-	-	104	N/A	107	N/A	N/A	B369337
4-Bromofluorobenzene (sur.)	%	-	-	89	N/A	101	N/A	N/A	B369337
D4-1,2-Dichloroethane (sur.)	%	-	-	96	N/A	104	N/A	N/A	B369337
O-TERPHENYL (sur.)	%	-	-	104	N/A	N/A	N/A	N/A	B369374

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID					CNL997			
Sampling Date					2024/05/13 14:06			
COC Number					1OF1			
	UNITS	MAC	AO	OG	NE20-R3-01	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	-	-	-	18	N/A	N/A	B368457
Cation Sum	meq/L	-	-	-	18	N/A	N/A	B368457
Hardness (CaCO3)	mg/L	-	-	-	600	N/A	0.50	B368454
Ion Balance (% Difference)	%	-	-	-	1.5	N/A	N/A	B368455
Nitrate (N)	mg/L	10	-	-	1.1	N/A	0.050	B368458
Nitrate (NO3)	mg/L	45	-	-	5.0	N/A	0.22	B370768
Nitrite (NO2)	mg/L	3	-	-	<0.033	N/A	0.033	B370768
Calculated Total Dissolved Solids	mg/L	-	500	-	**1000**	N/A	10	B368471
Elements								
Dissolved Cadmium (Cd)	ug/L	7	-	-	0.022	+/- <RDL	0.020	B368626
Misc. Inorganics								
Conductivity	uS/cm	-	-	-	1600	+/- 42	2.0	B372994
pH	pH	-	-	7.0:10.5	7.99	+/- 0.0792	N/A	B372993
Anions								
Alkalinity (PP as CaCO3)	mg/L	-	-	-	<1.0	N/A	1.0	B372988
Alkalinity (Total as CaCO3)	mg/L	-	-	-	430	+/- 32	1.0	B372988
Bicarbonate (HCO3)	mg/L	-	-	-	530	+/- 8.1	1.0	B372988
Carbonate (CO3)	mg/L	-	-	-	<1.0	N/A	1.0	B372988
Hydroxide (OH)	mg/L	-	-	-	<1.0	N/A	1.0	B372988
Chloride (Cl)	mg/L	-	250	-	100	+/- 7.9	1.0	B370272
Sulphate (SO4)	mg/L	-	500	-	290	+/- 18	5.0	B370272
Nutrients								
Nitrite (N)	mg/L	1	-	-	<0.010	N/A	0.010	B370138
Nitrate plus Nitrite (N)	mg/L	-	-	-	1.1	+/- 0.10	0.050	B370138
Lab Filtered Elements								
Dissolved Aluminum (Al)	mg/L	2.9	-	0.1	<0.0030	N/A	0.0030	B370048
Dissolved Antimony (Sb)	mg/L	0.006	-	-	<0.00060	N/A	0.00060	B370048
Dissolved Arsenic (As)	mg/L	0.01	-	-	<0.00020	N/A	0.00020	B370048
Dissolved Barium (Ba)	mg/L	2	-	-	0.021	+/- <RDL	0.010	B371062
Dissolved Beryllium (Be)	mg/L	-	-	-	<0.0010	N/A	0.0010	B370048
Dissolved Boron (B)	mg/L	5	-	-	0.049	+/- <RDL	0.020	B371062

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID					CNL997			
Sampling Date					2024/05/13 14:06			
COC Number					1OF1			
	UNITS	MAC	AO	OG	NE20-R3-01	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	-	-	-	130	+/- 13	0.30	B371062
Dissolved Chromium (Cr)	mg/L	0.05	-	-	<0.0010	N/A	0.0010	B370048
Dissolved Cobalt (Co)	mg/L	-	-	-	<0.00030	N/A	0.00030	B370048
Dissolved Copper (Cu)	mg/L	2.0	1.0	-	0.0041	+/- 0.0012	0.0010	B370048
Dissolved Iron (Fe)	mg/L	-	0.3	-	<0.060	N/A	0.060	B371062
Dissolved Lead (Pb)	mg/L	0.005	-	-	0.00022	+/- <RDL	0.00020	B370048
Dissolved Lithium (Li)	mg/L	-	-	-	0.040	+/- <RDL	0.020	B371062
Dissolved Magnesium (Mg)	mg/L	-	-	-	69	+/- 4.4	0.20	B371062
Dissolved Manganese (Mn)	mg/L	0.12	0.02	-	0.0069	+/- <RDL	0.0040	B371062
Dissolved Molybdenum (Mo)	mg/L	-	-	-	0.00077	+/- 0.00030	0.00020	B370048
Dissolved Nickel (Ni)	mg/L	-	-	-	0.0015	+/- <RDL	0.00050	B370048
Dissolved Phosphorus (P)	mg/L	-	-	-	<0.10	N/A	0.10	B371062
Dissolved Potassium (K)	mg/L	-	-	-	6.5	+/- 0.34	0.30	B371062
Dissolved Selenium (Se)	mg/L	0.05	-	-	0.00034	+/- <RDL	0.00020	B370048
Dissolved Silicon (Si)	mg/L	-	-	-	4.0	+/- 0.76	0.50	B371062
Dissolved Silver (Ag)	mg/L	-	-	-	<0.00010	N/A	0.00010	B370048
Dissolved Sodium (Na)	mg/L	-	200	-	140	+/- 13	0.50	B371062
Dissolved Strontium (Sr)	mg/L	7	-	-	1.7	+/- 0.17	0.020	B371062
Dissolved Sulphur (S)	mg/L	-	-	-	98	+/- 6.6	0.20	B371062
Dissolved Thallium (Tl)	mg/L	-	-	-	<0.00020	N/A	0.00020	B370048
Dissolved Tin (Sn)	mg/L	-	-	-	<0.0010	N/A	0.0010	B370048
Dissolved Titanium (Ti)	mg/L	-	-	-	<0.0010	N/A	0.0010	B370048
Dissolved Uranium (U)	mg/L	0.02	-	-	0.0034	+/- 0.00032	0.00010	B370048
Dissolved Vanadium (V)	mg/L	-	-	-	<0.0010	N/A	0.0010	B370048
Dissolved Zinc (Zn)	mg/L	-	5.0	-	0.019	+/- <RDL	0.0030	B370048

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CNL997			
Sampling Date		2024/05/13 14:06			
COC Number		1OF1			
	UNITS	**NE20-R3-01**	**MU**	**RDL**	**QC Batch**
Calculated Parameters					
Total Kjeldahl Nitrogen (Calc)	mg/L	0.208	N/A	0.050	B370776
Nutrients					
Total Nitrogen (N)	mg/L	1.3	+/- 0.20	0.020	B371369

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID			CNL997		CNL997			
Sampling Date			2024/05/13 14:06		2024/05/13 14:06			
COC Number			1OF1		1OF1			
	UNITS	**MAC**	**NE20-R3-01**	**MU**	**NE20-R3-01 Lab-Dup**	**MU**	**RDL**	**QC Batch**
Lab Filtered Inorganics								
Dissolved Organic Carbon (C)	mg/L	-	2.1 (1)	+/- <RDL	2.1	+/- <RDL	0.50	B372567
Microbiological Param.								
E.Coli DST	MPN/100mL	1	<1.0	N/A	N/A	N/A	1.0	B368791
Fecal Coliforms	MPN/100mL	-	<1.0	N/A	N/A	N/A	1.0	B369179
Heterotrophic DST	MPN/100mL	-	>2400	N/A	>2400	N/A	1.0	B369053
Total Coliforms DST	MPN/100mL	1	<1.0	N/A	N/A	N/A	1.0	B368791
Nutrients								
Total Ammonia (N)	mg/L	-	0.12	+/- 0.017	0.12	+/- 0.017	0.015	B370018
Orthophosphate (P)	mg/L	-	<0.0030	N/A	N/A	N/A	0.0030	B370428
Lab Filtered Nutrients								
Dissolved Phosphorus (P)	mg/L	-	<0.0030	N/A	N/A	N/A	0.0030	B370049

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Matrix spike exceeds acceptance limits due to matrix interference.

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MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID			CNL997			
Sampling Date			2024/05/13 14:06			
COC Number			1OF1			
	UNITS	MAC	NE20-R3-01	MU	RDL	QC Batch
Elements						
Total Mercury (Hg)	ug/L	1	<0.0019	N/A	0.0019	B369609
Lab Filtered Elements						
Dissolved Mercury (Hg)	ug/L	1	<0.0019	N/A	0.0019	B369667

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	2.7°C

Version 2: CDWG included on report
MAC,AO,OG: The guidelines that have been included in this report have been taken from the Canadian Drinking Water Quality Summary Table, September 2022.

Criteria A = Maximum Acceptable Concentration (MAC) / Criteria B = Aesthetic Objectives (AO) / Criteria C = Operational Guidance Values (OG)
It is recommended to consult these guidelines when interpreting your data since there are non-numerical guidelines that are not included on this report.

Turbidity Guidelines:
1. Chemically assisted filtration: less than or equal to 0.3 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 1.0 NTU at any time.
2. Slow sand / diatomaceous earth filtration: less than or equal to 1.0 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 3.0 NTU at any time.
3. Membrane filtration: less than or equal to 0.1 NTU in 99% of the measurements made or at least 99% of the time each calendar month. Shall not exceed 0.3 NTU at any time.
4. To ensure effectiveness of disinfection and for good operation of the distribution system, it is recommended that water entering the distribution system have turbidity levels of 1.0 NTU or less.
Measurement of Uncertainty has not been accounted for when stating conformity to the selected criteria, where applicable.
The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B368791	YYL	Method Blank	E.Coli DST	2024/05/16	<1.0		mpn/100mL	
			Total Coliforms DST	2024/05/16	<1.0		mpn/100mL	
B368791	YYL	RPD	E.Coli DST	2024/05/16	NC		%	N/A
			Total Coliforms DST	2024/05/16	NC		%	N/A
B369053	YYL	Method Blank	Heterotrophic DST	2024/05/16	<1.0		mpn/100mL	
B369053	YYL	RPD [CNL997-02]	Heterotrophic DST	2024/05/16	NC		%	N/A
B369179	YYL	Method Blank	Fecal Coliforms	2024/05/15	<1.0		MPN/100mL	
B369179	YYL	RPD	Fecal Coliforms	2024/05/15	200		%	N/A
B369337	WPK	Matrix Spike	1,4-Difluorobenzene (sur.)	2024/05/16		104	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/16		82	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/16		107	%	50 - 140
			Benzene	2024/05/16		100	%	50 - 140
			Toluene	2024/05/16		101	%	50 - 140
			Ethylbenzene	2024/05/16		95	%	50 - 140
			m & p-Xylene	2024/05/16		87	%	50 - 140
			o-Xylene	2024/05/16		98	%	50 - 140
			F1 (C6-C10)	2024/05/16		87	%	60 - 140
B369337	WPK	Spiked Blank	1,4-Difluorobenzene (sur.)	2024/05/16		104	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/16		92	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/16		107	%	50 - 140
			Benzene	2024/05/16		102	%	60 - 130
			Toluene	2024/05/16		104	%	60 - 130
			Ethylbenzene	2024/05/16		105	%	60 - 130
			m & p-Xylene	2024/05/16		98	%	60 - 130
			o-Xylene	2024/05/16		107	%	60 - 130
			F1 (C6-C10)	2024/05/16		106	%	60 - 140
B369337	WPK	Method Blank	1,4-Difluorobenzene (sur.)	2024/05/16		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/16		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/16		96	%	50 - 140
			Benzene	2024/05/16	<0.00040		mg/L	
			Toluene	2024/05/16	<0.00040		mg/L	
			Ethylbenzene	2024/05/16	<0.00040		mg/L	
			m & p-Xylene	2024/05/16	<0.00080		mg/L	
			o-Xylene	2024/05/16	<0.00040		mg/L	
			F1 (C6-C10)	2024/05/16	<0.10		mg/L	
B369337	WPK	RPD [CNL997-07]	Benzene	2024/05/16	NC		%	30
			Toluene	2024/05/16	NC		%	30
			Ethylbenzene	2024/05/16	NC		%	30
			m & p-Xylene	2024/05/16	NC		%	30
			o-Xylene	2024/05/16	NC		%	30
			F1 (C6-C10)	2024/05/16	NC		%	30
B369374	GG3	Spiked Blank	O-TERPHENYL (sur.)	2024/05/16		111	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/16		114	%	60 - 140
B369374	GG3	Method Blank	O-TERPHENYL (sur.)	2024/05/16		101	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/16	<0.10		mg/L	
B369609	KHU	Matrix Spike [CNL997-09]	Total Mercury (Hg)	2024/05/16		93	%	80 - 120
B369609	KHU	Spiked Blank	Total Mercury (Hg)	2024/05/16		95	%	80 - 120
B369609	KHU	Method Blank	Total Mercury (Hg)	2024/05/16	<0.0019		ug/L	
B369609	KHU	RPD	Total Mercury (Hg)	2024/05/16	NC		%	20
B369667	KHU	Matrix Spike	Dissolved Mercury (Hg)	2024/05/16		91	%	80 - 120
B369667	KHU	Spiked Blank	Dissolved Mercury (Hg)	2024/05/16		99	%	80 - 120
B369667	KHU	Method Blank	Dissolved Mercury (Hg)	2024/05/16	<0.0019		ug/L	
B369667	KHU	RPD	Dissolved Mercury (Hg)	2024/05/16	5.4		%	20
B370018	CTU	Matrix Spike [CNL997-08]	Total Ammonia (N)	2024/05/15		108	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B370018	CTU	Spiked Blank	Total Ammonia (N)	2024/05/15		105	%	80 - 120
B370018	CTU	Method Blank	Total Ammonia (N)	2024/05/15	<0.015		mg/L	
B370018	CTU	RPD [CNL997-08]	Total Ammonia (N)	2024/05/15	0.55		%	20
B370048	KH2	Matrix Spike	Dissolved Aluminum (Al)	2024/05/15		100	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/15		106	%	80 - 120
			Dissolved Arsenic (As)	2024/05/15		104	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/15		100	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/15		99	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/15		98	%	80 - 120
			Dissolved Copper (Cu)	2024/05/15		95	%	80 - 120
			Dissolved Lead (Pb)	2024/05/15		93	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/15		109	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/15		97	%	80 - 120
			Dissolved Selenium (Se)	2024/05/15		NC	%	80 - 120
			Dissolved Silver (Ag)	2024/05/15		98	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/15		93	%	80 - 120
			Dissolved Tin (Sn)	2024/05/15		107	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/15		112	%	80 - 120
			Dissolved Uranium (U)	2024/05/15		NC	%	80 - 120
			Dissolved Vanadium (V)	2024/05/15		101	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/15		95	%	80 - 120
B370048	KH2	Spiked Blank	Dissolved Aluminum (Al)	2024/05/15		107	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/15		108	%	80 - 120
			Dissolved Arsenic (As)	2024/05/15		100	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/15		100	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/15		99	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/15		100	%	80 - 120
			Dissolved Copper (Cu)	2024/05/15		100	%	80 - 120
			Dissolved Lead (Pb)	2024/05/15		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/15		102	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/15		98	%	80 - 120
			Dissolved Selenium (Se)	2024/05/15		103	%	80 - 120
			Dissolved Silver (Ag)	2024/05/15		100	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/15		97	%	80 - 120
			Dissolved Tin (Sn)	2024/05/15		101	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/15		96	%	80 - 120
			Dissolved Uranium (U)	2024/05/15		99	%	80 - 120
			Dissolved Vanadium (V)	2024/05/15		99	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/15		99	%	80 - 120
B370048	KH2	Method Blank	Dissolved Aluminum (Al)	2024/05/15	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2024/05/15	<0.00060		mg/L	
			Dissolved Arsenic (As)	2024/05/15	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2024/05/15	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2024/05/15	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2024/05/15	<0.00030		mg/L	
			Dissolved Copper (Cu)	2024/05/15	<0.0010		mg/L	
			Dissolved Lead (Pb)	2024/05/15	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2024/05/15	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2024/05/15	<0.00050		mg/L	
			Dissolved Selenium (Se)	2024/05/15	<0.00020		mg/L	
			Dissolved Silver (Ag)	2024/05/15	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2024/05/15	<0.00020		mg/L	
			Dissolved Tin (Sn)	2024/05/15	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2024/05/15	<0.0010		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Uranium (U)	2024/05/15	<0.00010		mg/L	
			Dissolved Vanadium (V)	2024/05/15	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2024/05/15	<0.0030		mg/L	
B370048	KH2	RPD	Dissolved Aluminum (Al)	2024/05/15	NC		%	20
			Dissolved Antimony (Sb)	2024/05/15	NC		%	20
			Dissolved Arsenic (As)	2024/05/15	6.7		%	20
			Dissolved Beryllium (Be)	2024/05/15	NC		%	20
			Dissolved Chromium (Cr)	2024/05/15	NC		%	20
			Dissolved Cobalt (Co)	2024/05/15	NC		%	20
			Dissolved Copper (Cu)	2024/05/15	9.5		%	20
			Dissolved Lead (Pb)	2024/05/15	NC		%	20
			Dissolved Molybdenum (Mo)	2024/05/15	4.9		%	20
			Dissolved Nickel (Ni)	2024/05/15	4.0		%	20
			Dissolved Selenium (Se)	2024/05/15	0.91		%	20
			Dissolved Silver (Ag)	2024/05/15	NC		%	20
			Dissolved Thallium (Tl)	2024/05/15	NC		%	20
			Dissolved Tin (Sn)	2024/05/15	NC		%	20
			Dissolved Titanium (Ti)	2024/05/15	NC		%	20
			Dissolved Uranium (U)	2024/05/15	1.4		%	20
			Dissolved Vanadium (V)	2024/05/15	NC		%	20
			Dissolved Zinc (Zn)	2024/05/15	2.9		%	20
B370049	MAP	Matrix Spike	Dissolved Phosphorus (P)	2024/05/16		96	%	80 - 120
B370049	MAP	QC Standard	Dissolved Phosphorus (P)	2024/05/16		90	%	80 - 120
B370049	MAP	Spiked Blank	Dissolved Phosphorus (P)	2024/05/16		95	%	80 - 120
B370049	MAP	Method Blank	Dissolved Phosphorus (P)	2024/05/16	<0.0030		mg/L	
B370049	MAP	RPD	Dissolved Phosphorus (P)	2024/05/16	20		%	20
B370138	CTU	Matrix Spike	Nitrite (N)	2024/05/15		100	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/15		131 (1)	%	80 - 120
B370138	CTU	Spiked Blank	Nitrite (N)	2024/05/15		99	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/15		101	%	80 - 120
B370138	CTU	Method Blank	Nitrite (N)	2024/05/15	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/15	<0.010		mg/L	
B370138	CTU	RPD	Nitrite (N)	2024/05/15	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/15	8.1		%	20
B370272	TOR	Matrix Spike	Chloride (Cl)	2024/05/15		NC	%	80 - 120
			Sulphate (SO4)	2024/05/15		NC	%	80 - 120
B370272	TOR	Spiked Blank	Chloride (Cl)	2024/05/15		104	%	80 - 120
			Sulphate (SO4)	2024/05/15		103	%	80 - 120
B370272	TOR	Method Blank	Chloride (Cl)	2024/05/15	<1.0		mg/L	
			Sulphate (SO4)	2024/05/15	<1.0		mg/L	
B370272	TOR	RPD	Chloride (Cl)	2024/05/15	0.11		%	20
B370428	MAP	Matrix Spike	Orthophosphate (P)	2024/05/15		92	%	80 - 120
B370428	MAP	Spiked Blank	Orthophosphate (P)	2024/05/15		98	%	80 - 120
B370428	MAP	Method Blank	Orthophosphate (P)	2024/05/15	<0.0030		mg/L	
B370428	MAP	RPD	Orthophosphate (P)	2024/05/15	NC		%	20
B371062	VSC	Matrix Spike	Dissolved Barium (Ba)	2024/05/16		86	%	80 - 120
			Dissolved Boron (B)	2024/05/16		93	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/16		NC	%	80 - 120
			Dissolved Iron (Fe)	2024/05/16		103	%	80 - 120
			Dissolved Lithium (Li)	2024/05/16		88	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/16		NC	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/16		104	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/16		105	%	80 - 120
			Dissolved Potassium (K)	2024/05/16		93	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Silicon (Si)	2024/05/16		NC	%	80 - 120
			Dissolved Sodium (Na)	2024/05/16		NC	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/16		NC	%	80 - 120
			Dissolved Sulphur (S)	2024/05/16		NC	%	80 - 120
B371062	VSC	Spiked Blank	Dissolved Barium (Ba)	2024/05/16		95	%	80 - 120
			Dissolved Boron (B)	2024/05/16		97	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/16		93	%	80 - 120
			Dissolved Iron (Fe)	2024/05/16		100	%	80 - 120
			Dissolved Lithium (Li)	2024/05/16		93	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/16		95	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/16		99	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/16		102	%	80 - 120
			Dissolved Potassium (K)	2024/05/16		95	%	80 - 120
			Dissolved Silicon (Si)	2024/05/16		93	%	80 - 120
			Dissolved Sodium (Na)	2024/05/16		92	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/16		91	%	80 - 120
			Dissolved Sulphur (S)	2024/05/16		98	%	80 - 120
B371062	VSC	Method Blank	Dissolved Barium (Ba)	2024/05/16	<0.010		mg/L	
			Dissolved Boron (B)	2024/05/16	<0.020		mg/L	
			Dissolved Calcium (Ca)	2024/05/16	<0.30		mg/L	
			Dissolved Iron (Fe)	2024/05/16	<0.060		mg/L	
			Dissolved Lithium (Li)	2024/05/16	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2024/05/16	<0.20		mg/L	
			Dissolved Manganese (Mn)	2024/05/16	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2024/05/16	<0.10		mg/L	
			Dissolved Potassium (K)	2024/05/16	<0.30		mg/L	
			Dissolved Silicon (Si)	2024/05/16	<0.50		mg/L	
			Dissolved Sodium (Na)	2024/05/16	<0.50		mg/L	
			Dissolved Strontium (Sr)	2024/05/16	<0.020		mg/L	
			Dissolved Sulphur (S)	2024/05/16	<0.20		mg/L	
B371062	VSC	RPD	Dissolved Barium (Ba)	2024/05/16	5.1		%	20
			Dissolved Boron (B)	2024/05/16	0.80		%	20
			Dissolved Calcium (Ca)	2024/05/16	2.4		%	20
			Dissolved Iron (Fe)	2024/05/16	NC		%	20
			Dissolved Lithium (Li)	2024/05/16	2.7		%	20
			Dissolved Magnesium (Mg)	2024/05/16	3.4		%	20
			Dissolved Manganese (Mn)	2024/05/16	0.25		%	20
			Dissolved Phosphorus (P)	2024/05/16	NC		%	20
			Dissolved Potassium (K)	2024/05/16	2.7		%	20
			Dissolved Silicon (Si)	2024/05/16	0.37		%	20
			Dissolved Sodium (Na)	2024/05/16	2.3		%	20
			Dissolved Strontium (Sr)	2024/05/16	0.087		%	20
			Dissolved Sulphur (S)	2024/05/16	0.043		%	20
B371369	TOR	Matrix Spike	Total Nitrogen (N)	2024/05/16		101	%	80 - 120
B371369	TOR	QC Standard	Total Nitrogen (N)	2024/05/16		104	%	80 - 120
B371369	TOR	Spiked Blank	Total Nitrogen (N)	2024/05/16		102	%	80 - 120
B371369	TOR	Method Blank	Total Nitrogen (N)	2024/05/16	<0.020		mg/L	
B371369	TOR	RPD	Total Nitrogen (N)	2024/05/16	2.8		%	20
B372567	JFE	Matrix Spike [CNL997-01]	Dissolved Organic Carbon (C)	2024/05/17		199 (1)	%	80 - 120
B372567	JFE	Spiked Blank	Dissolved Organic Carbon (C)	2024/05/17		108	%	80 - 120
B372567	JFE	Method Blank	Dissolved Organic Carbon (C)	2024/05/17	<0.50		mg/L	
B372567	JFE	RPD [CNL997-01]	Dissolved Organic Carbon (C)	2024/05/17	1.8		%	20
B372988	A5S	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/18		98	%	80 - 120
B372988	A5S	Method Blank	Alkalinity (PP as CaCO3)	2024/05/18	<1.0		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Alkalinity (Total as CaCO3)	2024/05/18	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/18	<1.0		mg/L	
			Carbonate (CO3)	2024/05/18	<1.0		mg/L	
			Hydroxide (OH)	2024/05/18	<1.0		mg/L	
B372988	A5S	RPD	Alkalinity (PP as CaCO3)	2024/05/18	9.0		%	20
			Alkalinity (Total as CaCO3)	2024/05/18	0.67		%	20
			Bicarbonate (HCO3)	2024/05/18	0.19		%	20
			Carbonate (CO3)	2024/05/18	9.0		%	20
			Hydroxide (OH)	2024/05/18	NC		%	20
B372993	A5S	Spiked Blank	pH	2024/05/18		100	%	97 - 103
B372993	A5S	RPD	pH	2024/05/18	0.24		%	N/A
B372994	A5S	Spiked Blank	Conductivity	2024/05/18		102	%	90 - 110
B372994	A5S	Method Blank	Conductivity	2024/05/18	<2.0		uS/cm	
B372994	A5S	RPD	Conductivity	2024/05/18	0		%	10

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

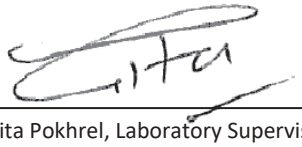
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

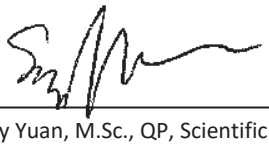
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VALIDATION SIGNATURE PAGE

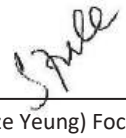
The analytical data and all QC contained in this report were reviewed and validated by:



Gita Pokhrel, Laboratory Supervisor



Sandy Yuan, M.Sc., QP, Scientific Specialist



Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist



Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

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- ☐ Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

Invoice Information	Invoice to (requires report) ☒	Report Information (if differs from invoice)		Project Information	
Company:	Stantec	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	#300, 10220 168 Ave NW	Street Address:		Project #:	110773396
City:	Edmonton Prov: AB Postal Code: T5J0K4	City: Prov: Postal Code:		Site #:	
Phone:	780 969 2225	Phone:		Site Location:	
Email:	dylan.king@stantec.com	Email:		Site Location Province:	AB
Copies:		Copies:		Sampled By:	WT/TH

LAB USE ONLY - PLACE STICKER HERE

Rush Confirmation #:

Regulatory Criteria

☑ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba ☐ Saskatchewan ☐ Drinking Water - Alberta ☐ Other _____

Regular Turnaround Time (TAT)

☑ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply

☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F1-F2	7 BTEX F1-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 Salinity 4	14 Sieve (75 micron)	15 Texture (hydrometer) DOC	16 Bacteria (fecal) TKN	17 Dissolved Phosphorus	18 Phosphate	19 Ammonia	20 Bacteriology (coli)	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE	Comments
1	NE20-R3-01	24	05	13	14	06	water						X		X		X	X	X			X	X	X	X	X	X	11		
2																														
3																														
4																														
5																														
6																														
7																														
8																														
9																														
10																														
11																														
12																														

MCAL-2024-05-738

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present	✓					
Seal intact	✓					
Cooling media present	✓			2	3	3

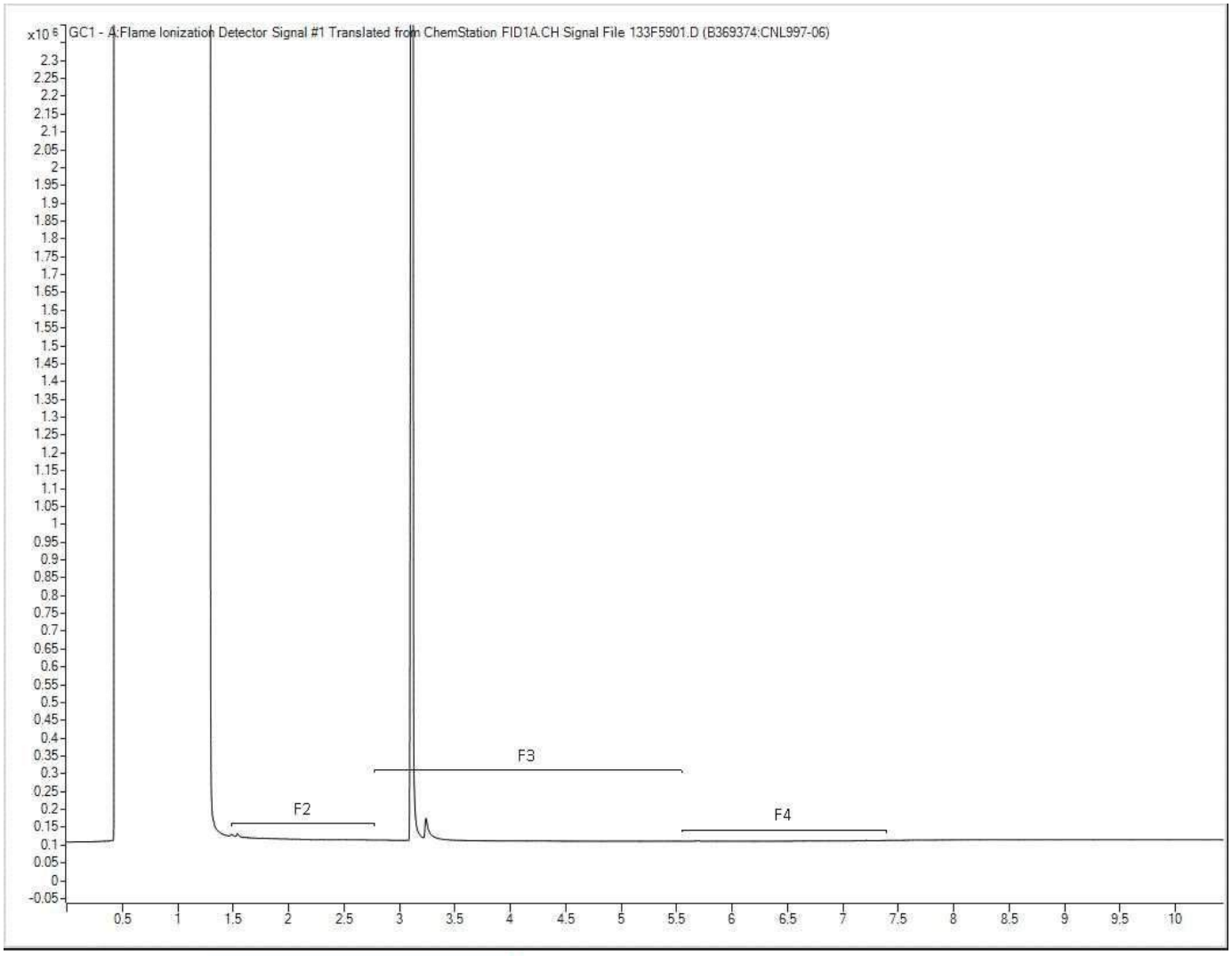
LAB USE ONLY	Yes	No	°C	1	2	3
Seal present						
Seal intact						
Cooling media present						

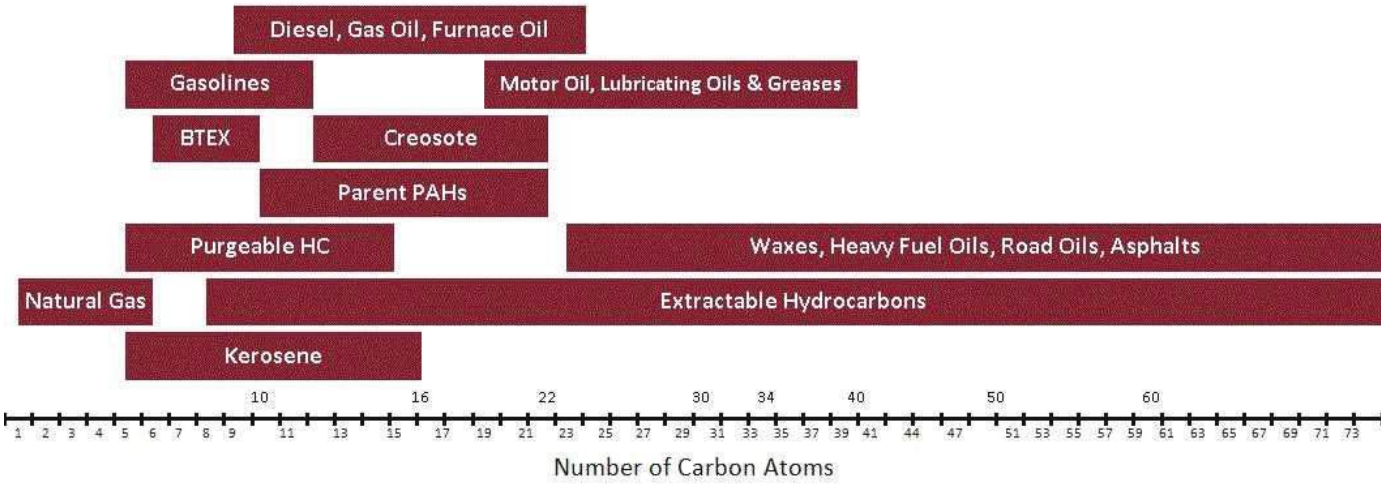
LAB USE ONLY	Yes	No	°C	1	2	3	Temperature reading by:
Seal present							
Seal intact							
Cooling media present							

	Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special instructions
1	Taylor Harris	2024	05	13	18	20	SEAN EM	2024	05	14	07	00	* Total coliforms, e.coli, fecal coliforms, heterotrophic plate count
2							2						

Dissolved parameters not field filtered - pls lab filter

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





hpchem12\HPchem\1\DATA\2024\05\RUN0515

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 110773396
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/23
Report #: R3503817
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C434263
Received: 2024/05/14, 17:16

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	7	N/A	2024/05/18	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	4	N/A	2024/05/17	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 in Water by HS GC/MS/FID	3	N/A	2024/05/18	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	7	N/A	2024/05/18		Auto Calc
Cadmium - low level CCME - Dissolved	7	N/A	2024/05/16		Auto Calc
Chloride/Sulphate by Auto Colourimetry	7	N/A	2024/05/16	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	7	2024/05/15	2024/05/16	AB SOP-00089	SM 24 9223 A,B m
Heterotrophic Plate Count Quant	7	2024/05/15	2024/05/17	CAL SOP-00012	SM 24 9215 A, E m
Total Coliforms and E.Coli	7	2024/05/15	2024/05/16	AB SOP-00089	SM 24 9223 A,B m
Carbon (DOC) -Lab Filtered (1)	7	N/A	2024/05/22	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	7	N/A	2024/05/18	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	7	2024/05/15	2024/05/16	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	7	N/A	2024/05/16		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	7	2024/05/17	2024/05/17	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	7	2024/05/16	2024/05/16	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (3)	7	N/A	2024/05/16	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	7	N/A	2024/05/16	AB SOP-00043	EPA 6020b R2 m
Ion Balance	7	N/A	2024/05/21		Auto Calc
Sum of cations, anions	7	N/A	2024/05/16		Auto Calc
Ammonia-N (Total)	7	N/A	2024/05/15	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	7	N/A	2024/05/16		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	7	N/A	2024/05/16	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	7	2024/05/14	2024/05/16		Auto Calc
pH @25°C (5)	7	N/A	2024/05/18	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (6)	7	N/A	2024/05/17	AB SOP-00025	SM 24 4500-P A,F m
Total Dissolved Solids (Calculated)	7	N/A	2024/05/21		Auto Calc
Total Kjeldahl Nitrogen (Total)	7	N/A	2024/05/22	BBY WI-00033	Auto Calc
Nitrogen (Total)	7	2024/05/21	2024/05/22	AB SOP-00093	SM 24 4500-N C m
Total Phosphorus-Dissolved-Lab Filtered (7)	7	2024/05/17	2024/05/17	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Your Project #: 110773396
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/23
Report #: R3503817
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C434263
Received: 2024/05/14, 17:16

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(7) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Your C.O.C. #: 1/1

Attention: DYLAN KING

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Report Date: 2024/05/23
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23 May 2024 16:32:11

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (403) 291-3077

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AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CNN524		CNN524		CNN525		CNN526			
Sampling Date		2024/05/14 09:51		2024/05/14 09:51		2024/05/14 09:30		2024/05/14 11:33			
COC Number		1/1		1/1		1/1		1/1			
	UNITS	WS11-01	MU	WS11-01 Lab-Dup	MU	MW16-3-7	MU	MW16-7-5	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	N/A	N/A	<0.10	N/A	<0.10	N/A	0.10	B370153
Volatiles											
Benzene	mg/L	0.00065	+/- <RDL	0.00060	+/- <RDL	<0.00040	N/A	<0.00040	N/A	0.00040	B370393
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B370393
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B370393
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B370393
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B370393
Xylenes (Total)	mg/L	<0.00089	N/A	N/A	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B369463
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	N/A	N/A	<0.10	N/A	<0.10	N/A	0.10	B369463
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B370393
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	101	N/A	101	N/A	101	N/A	101	N/A	N/A	B370393
4-Bromofluorobenzene (sur.)	%	96	N/A	99	N/A	99	N/A	98	N/A	N/A	B370393
D4-1,2-Dichloroethane (sur.)	%	111	N/A	105	N/A	105	N/A	104	N/A	N/A	B370393
O-TERPHENYL (sur.)	%	102	N/A	N/A	N/A	101	N/A	106	N/A	N/A	B370153

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CNN527		CNN528		CNN529		CNN530			
Sampling Date		2024/05/14 13:23		2024/05/14 14:18		2024/05/14 15:14		2024/05/14 15:31			
COC Number		1/1		1/1		1/1		1/1			
	UNITS	MW16-1-15	MU	MW16-10-15	MU	MW16-11-15	MU	SR24-01	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B370153
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B370393
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B370393
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B370393
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B370393
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B370393
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B369463
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B369463
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B370393
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	104	N/A	100	N/A	100	N/A	100	N/A	N/A	B370393
4-Bromofluorobenzene (sur.)	%	99	N/A	100	N/A	101	N/A	99	N/A	N/A	B370393
D4-1,2-Dichloroethane (sur.)	%	106	N/A	103	N/A	100	N/A	101	N/A	N/A	B370393
O-TERPHENYL (sur.)	%	105	N/A	139	N/A	100	N/A	103	N/A	N/A	B370153

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNN524				CNN525			
Sampling Date		2024/05/14 09:51				2024/05/14 09:30			
COC Number		1/1				1/1			
	UNITS	WS11-01	MU	RDL	QC Batch	MW16-3-7	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	9.4	N/A	N/A	B369301	16	N/A	N/A	B369301
Cation Sum	meq/L	9.5	N/A	N/A	B369301	18	N/A	N/A	B369301
Hardness (CaCO3)	mg/L	250	N/A	0.50	B369396	490	N/A	0.50	B369396
Ion Balance (% Difference)	%	0.87	N/A	N/A	B369300	5.9	N/A	N/A	B369300
Nitrate (N)	mg/L	<0.010	N/A	0.010	B369498	1.4	N/A	0.050	B369498
Nitrate (NO3)	mg/L	<0.044	N/A	0.044	B370769	6.2	N/A	0.22	B370770
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B370769	<0.033	N/A	0.033	B370770
Calculated Total Dissolved Solids	mg/L	470	N/A	10	B369304	940	N/A	10	B369304
Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	B369358	0.044	+/- 0.023	0.020	B369358
Misc. Inorganics									
Conductivity	uS/cm	810	+/- 22	2.0	B373127	1700	+/- 45	2.0	B373127
pH	pH	8.04	+/- 0.0797	N/A	B373126	7.98	+/- 0.0790	N/A	B373126
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B373124	<1.0	N/A	1.0	B373124
Alkalinity (Total as CaCO3)	mg/L	450	+/- 33	1.0	B373124	190	+/- 14	1.0	B373124
Bicarbonate (HCO3)	mg/L	540	+/- 8.4	1.0	B373124	240	+/- 3.8	1.0	B373124
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B373124	<1.0	N/A	1.0	B373124
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B373124	<1.0	N/A	1.0	B373124
Chloride (Cl)	mg/L	3.8	+/- 1.2	1.0	B371321	290	+/- 21	5.0	B371326
Sulphate (SO4)	mg/L	15	+/- 1.5	1.0	B371321	180	+/- 12	5.0	B371326
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B371461	<0.010	N/A	0.010	B371461
Nitrate plus Nitrite (N)	mg/L	<0.010	N/A	0.010	B371461	1.4	+/- 0.12	0.050	B371461
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B371107	<0.0030	N/A	0.0030	B371107
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B371107	<0.00060	N/A	0.00060	B371107
Dissolved Arsenic (As)	mg/L	0.00028	+/- <RDL	0.00020	B371107	0.00030	+/- <RDL	0.00020	B371107
Dissolved Barium (Ba)	mg/L	0.28	+/- 0.024	0.010	B371207	0.056	+/- <RDL	0.010	B371207
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371107
Dissolved Boron (B)	mg/L	0.31	+/- 0.031	0.020	B371207	0.031	+/- <RDL	0.020	B371207

RDL = Reportable Detection Limit
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNN524				CNN525			
Sampling Date		2024/05/14 09:51				2024/05/14 09:30			
COC Number		1/1				1/1			
	UNITS	WS11-01	MU	RDL	QC Batch	MW16-3-7	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	54	+/- 5.5	0.30	B371207	97	+/- 9.8	0.30	B371207
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371107
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	B371107	<0.00030	N/A	0.00030	B371107
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B371107	0.0012	+/- <RDL	0.0010	B371107
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B371207	<0.060	N/A	0.060	B371207
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B371107	<0.00020	N/A	0.00020	B371107
Dissolved Lithium (Li)	mg/L	<0.020	N/A	0.020	B371207	0.026	+/- <RDL	0.020	B371207
Dissolved Magnesium (Mg)	mg/L	29	+/- 1.8	0.20	B371207	59	+/- 3.8	0.20	B371207
Dissolved Manganese (Mn)	mg/L	0.36	+/- 0.024	0.0040	B371207	0.020	+/- <RDL	0.0040	B371207
Dissolved Molybdenum (Mo)	mg/L	0.0088	+/- 0.0021	0.00020	B371107	0.0018	+/- 0.00050	0.00020	B371107
Dissolved Nickel (Ni)	mg/L	0.00058	+/- <RDL	0.00050	B371107	0.0016	+/- <RDL	0.00050	B371107
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B371207	<0.10	N/A	0.10	B371207
Dissolved Potassium (K)	mg/L	4.8	+/- <RDL	0.30	B371207	3.9	+/- <RDL	0.30	B371207
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	B371107	0.00043	+/- <RDL	0.00020	B371107
Dissolved Silicon (Si)	mg/L	5.4	+/- 1.0	0.50	B371207	2.9	+/- 0.55	0.50	B371207
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B371107	<0.00010	N/A	0.00010	B371107
Dissolved Sodium (Na)	mg/L	99	+/- 9.7	0.50	B371207	190	+/- 18	0.50	B371207
Dissolved Strontium (Sr)	mg/L	2.7	+/- 0.27	0.020	B371207	0.86	+/- 0.084	0.020	B371207
Dissolved Sulphur (S)	mg/L	4.4	+/- 0.32	0.20	B371207	67	+/- 4.4	0.20	B371207
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B371107	<0.00020	N/A	0.00020	B371107
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371107
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371107
Dissolved Uranium (U)	mg/L	0.00012	+/- <RDL	0.00010	B371107	0.0043	+/- 0.00039	0.00010	B371107
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371107
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B371107	<0.0030	N/A	0.0030	B371107

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNN525				CNN526			
Sampling Date		2024/05/14 09:30				2024/05/14 11:33			
COC Number		1/1				1/1			
	UNITS	MW16-3-7 Lab-Dup	MU	RDL	QC Batch	MW16-7-5	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	N/A	N/A	N/A	B369301	35	N/A	N/A	B369301
Cation Sum	meq/L	N/A	N/A	N/A	B369301	35	N/A	N/A	B369301
Hardness (CaCO3)	mg/L	N/A	N/A	0.50	B369396	990	N/A	0.50	B369396
Ion Balance (% Difference)	%	N/A	N/A	N/A	B369300	0.014	N/A	N/A	B369300
Nitrate (N)	mg/L	N/A	N/A	0.050	B369498	<0.010	N/A	0.010	B369498
Nitrate (NO3)	mg/L	N/A	N/A	0.22	B370770	<0.044	N/A	0.044	B370770
Nitrite (NO2)	mg/L	N/A	N/A	0.033	B370770	<0.033	N/A	0.033	B370770
Calculated Total Dissolved Solids	mg/L	N/A	N/A	10	B369304	2200	N/A	25	B369304
Elements									
Dissolved Cadmium (Cd)	ug/L	N/A	N/A	0.020	B369358	0.057	+/- 0.027	0.020	B369358
Misc. Inorganics									
Conductivity	uS/cm	N/A	N/A	2.0	B373127	2800	+/- 73	2.0	B373127
pH	pH	N/A	N/A	N/A	B373126	7.90	+/- 0.0783	N/A	B373126
Anions									
Alkalinity (PP as CaCO3)	mg/L	N/A	N/A	1.0	B373124	<1.0	N/A	1.0	B373124
Alkalinity (Total as CaCO3)	mg/L	N/A	N/A	1.0	B373124	480	+/- 36	1.0	B373124
Bicarbonate (HCO3)	mg/L	N/A	N/A	1.0	B373124	590	+/- 9.0	1.0	B373124
Carbonate (CO3)	mg/L	N/A	N/A	1.0	B373124	<1.0	N/A	1.0	B373124
Hydroxide (OH)	mg/L	N/A	N/A	1.0	B373124	<1.0	N/A	1.0	B373124
Chloride (Cl)	mg/L	300	+/- 22	5.0	B371326	3.5	+/- 1.2	1.0	B371321
Sulphate (SO4)	mg/L	180	+/- 11	5.0	B371326	1200	+/- 77	25	B371321
Nutrients									
Nitrite (N)	mg/L	N/A	N/A	0.010	B371461	<0.010	N/A	0.010	B371461
Nitrate plus Nitrite (N)	mg/L	N/A	N/A	0.050	B371461	<0.010	N/A	0.010	B371461
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	N/A	N/A	0.0030	B371107	<0.0030	N/A	0.0030	B371107
Dissolved Antimony (Sb)	mg/L	N/A	N/A	0.00060	B371107	<0.00060	N/A	0.00060	B371107
Dissolved Arsenic (As)	mg/L	N/A	N/A	0.00020	B371107	0.00023	+/- <RDL	0.00020	B371107
Dissolved Barium (Ba)	mg/L	N/A	N/A	0.010	B371207	0.015	+/- <RDL	0.010	B371207
Dissolved Beryllium (Be)	mg/L	N/A	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371107

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNN525				CNN526			
Sampling Date		2024/05/14 09:30				2024/05/14 11:33			
COC Number		1/1				1/1			
	UNITS	MW16-3-7 Lab-Dup	MU	RDL	QC Batch	MW16-7-5	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	N/A	N/A	0.020	B371207	0.093	+/- <RDL	0.020	B371207
Dissolved Calcium (Ca)	mg/L	N/A	N/A	0.30	B371207	160	+/- 17	0.30	B371207
Dissolved Chromium (Cr)	mg/L	N/A	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371107
Dissolved Cobalt (Co)	mg/L	N/A	N/A	0.00030	B371107	<0.00030	N/A	0.00030	B371107
Dissolved Copper (Cu)	mg/L	N/A	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371107
Dissolved Iron (Fe)	mg/L	N/A	N/A	0.060	B371207	<0.060	N/A	0.060	B371207
Dissolved Lead (Pb)	mg/L	N/A	N/A	0.00020	B371107	<0.00020	N/A	0.00020	B371107
Dissolved Lithium (Li)	mg/L	N/A	N/A	0.020	B371207	0.060	+/- <RDL	0.020	B371207
Dissolved Magnesium (Mg)	mg/L	N/A	N/A	0.20	B371207	140	+/- 9.0	0.20	B371207
Dissolved Manganese (Mn)	mg/L	N/A	N/A	0.0040	B371207	0.15	+/- 0.010	0.0040	B371207
Dissolved Molybdenum (Mo)	mg/L	N/A	N/A	0.00020	B371107	0.0010	+/- 0.00035	0.00020	B371107
Dissolved Nickel (Ni)	mg/L	N/A	N/A	0.00050	B371107	0.0021	+/- <RDL	0.00050	B371107
Dissolved Phosphorus (P)	mg/L	N/A	N/A	0.10	B371207	<0.10	N/A	0.10	B371207
Dissolved Potassium (K)	mg/L	N/A	N/A	0.30	B371207	4.7	+/- <RDL	0.30	B371207
Dissolved Selenium (Se)	mg/L	N/A	N/A	0.00020	B371107	<0.00020	N/A	0.00020	B371107
Dissolved Silicon (Si)	mg/L	N/A	N/A	0.50	B371207	4.4	+/- 0.84	0.50	B371207
Dissolved Silver (Ag)	mg/L	N/A	N/A	0.00010	B371107	<0.00010	N/A	0.00010	B371107
Dissolved Sodium (Na)	mg/L	N/A	N/A	0.50	B371207	350	+/- 34	0.50	B371207
Dissolved Strontium (Sr)	mg/L	N/A	N/A	0.020	B371207	1.6	+/- 0.16	0.020	B371207
Dissolved Sulphur (S)	mg/L	N/A	N/A	0.20	B371207	400	+/- 26	0.20	B371207
Dissolved Thallium (Tl)	mg/L	N/A	N/A	0.00020	B371107	<0.00020	N/A	0.00020	B371107
Dissolved Tin (Sn)	mg/L	N/A	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371107
Dissolved Titanium (Ti)	mg/L	N/A	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371107
Dissolved Uranium (U)	mg/L	N/A	N/A	0.00010	B371107	0.011	+/- 0.0010	0.00010	B371107
Dissolved Vanadium (V)	mg/L	N/A	N/A	0.0010	B371107	<0.0010	N/A	0.0010	B371107
Dissolved Zinc (Zn)	mg/L	N/A	N/A	0.0030	B371107	<0.0030	N/A	0.0030	B371107

RDL = Reportable Detection Limit
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNN527			CNN528			
Sampling Date		2024/05/14 13:23			2024/05/14 14:18			
COC Number		1/1			1/1			
	UNITS	MW16-1-15	MU	RDL	MW16-10-15	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	28	N/A	N/A	59	N/A	N/A	B369301
Cation Sum	meq/L	28	N/A	N/A	65	N/A	N/A	B369301
Hardness (CaCO3)	mg/L	1100	N/A	0.50	2400	N/A	0.50	B369396
Ion Balance (% Difference)	%	1.3	N/A	N/A	4.4	N/A	N/A	B369300
Nitrate (N)	mg/L	<0.10	N/A	0.10	0.050	N/A	0.050	B369498
Nitrate (NO3)	mg/L	<0.44	N/A	0.44	0.22	N/A	0.22	B370770
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	<0.033	N/A	0.033	B370770
Calculated Total Dissolved Solids	mg/L	1700	N/A	25	3800	N/A	25	B369304
Elements								
Dissolved Cadmium (Cd)	ug/L	0.053	+/- 0.026	0.020	0.14	+/- 0.059	0.020	B369358
Misc. Inorganics								
Conductivity	uS/cm	2200	+/- 57	2.0	4600	+/- 120	2.0	B373127
pH	pH	7.84	+/- 0.0777	N/A	7.65	+/- 0.0758	N/A	B373126
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	B373124
Alkalinity (Total as CaCO3)	mg/L	330	+/- 25	1.0	510	+/- 38	1.0	B373124
Bicarbonate (HCO3)	mg/L	400	+/- 6.3	1.0	620	+/- 9.5	1.0	B373124
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	B373124
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	B373124
Chloride (Cl)	mg/L	11	+/- 1.5	1.0	2.9	+/- 1.2	1.0	B371321
Sulphate (SO4)	mg/L	990	+/- 63	25	2400	+/- 150	25	B371321
Nutrients								
Nitrite (N)	mg/L	<0.010	N/A	0.010	<0.010	N/A	0.010	B371461
Nitrate plus Nitrite (N)	mg/L	<0.10 (1)	N/A	0.10	0.050 (1)	+/- <RDL	0.050	B371461
Lab Filtered Elements								
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	<0.0030	N/A	0.0030	B371107
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	<0.00060	N/A	0.00060	B371107
Dissolved Arsenic (As)	mg/L	0.00037	+/- <RDL	0.00020	0.00023	+/- <RDL	0.00020	B371107
Dissolved Barium (Ba)	mg/L	0.013	+/- <RDL	0.010	0.011	+/- <RDL	0.010	B371207
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B371107

RDL = Reportable Detection Limit
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N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNN527			CNN528			
Sampling Date		2024/05/14 13:23			2024/05/14 14:18			
COC Number		1/1			1/1			
	UNITS	MW16-1-15	MU	RDL	MW16-10-15	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.073	+/- <RDL	0.020	0.20	+/- 0.021	0.020	B371207
Dissolved Calcium (Ca)	mg/L	240	+/- 24	0.30	460	+/- 47	0.30	B371207
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B371107
Dissolved Cobalt (Co)	mg/L	0.00084	+/- <RDL	0.00030	0.0038	+/- 0.00035	0.00030	B371107
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B371107
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	<0.060	N/A	0.060	B371207
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	B371107
Dissolved Lithium (Li)	mg/L	0.021	+/- <RDL	0.020	0.064	+/- <RDL	0.020	B371207
Dissolved Magnesium (Mg)	mg/L	110	+/- 7.0	0.20	300	+/- 19	0.20	B371207
Dissolved Manganese (Mn)	mg/L	0.86	+/- 0.058	0.0040	2.7	+/- 0.18	0.0040	B371207
Dissolved Molybdenum (Mo)	mg/L	0.0028	+/- 0.00075	0.00020	0.0014	+/- 0.00043	0.00020	B371107
Dissolved Nickel (Ni)	mg/L	0.0014	+/- <RDL	0.00050	0.0072	+/- 0.00062	0.00050	B371107
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	<0.10	N/A	0.10	B371207
Dissolved Potassium (K)	mg/L	4.0	+/- <RDL	0.30	10	+/- 0.51	0.30	B371207
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	0.00021	+/- <RDL	0.00020	B371107
Dissolved Silicon (Si)	mg/L	4.5	+/- 0.85	0.50	5.1	+/- 0.97	0.50	B371207
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	<0.00010	N/A	0.00010	B371107
Dissolved Sodium (Na)	mg/L	160	+/- 16	0.50	390	+/- 38	0.50	B371207
Dissolved Strontium (Sr)	mg/L	1.6	+/- 0.15	0.020	6.8	+/- 0.67	0.10	B371207
Dissolved Sulphur (S)	mg/L	330	+/- 22	0.20	920	+/- 61	1.0	B371207
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	B371107
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B371107
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B371107
Dissolved Uranium (U)	mg/L	0.0042	+/- 0.00039	0.00010	0.012	+/- 0.0011	0.00010	B371107
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B371107
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	<0.0030	N/A	0.0030	B371107

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNN529			CNN530			
Sampling Date		2024/05/14 15:14			2024/05/14 15:31			
COC Number		1/1			1/1			
	UNITS	MW16-11-15	MU	RDL	SR24-01	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	39	N/A	N/A	37	N/A	N/A	B369301
Cation Sum	meq/L	41	N/A	N/A	41	N/A	N/A	B369301
Hardness (CaCO3)	mg/L	1300	N/A	0.50	1300	N/A	0.50	B369396
Ion Balance (% Difference)	%	2.3	N/A	N/A	4.4	N/A	N/A	B369300
Nitrate (N)	mg/L	<0.10	N/A	0.10	<0.050	N/A	0.050	B369498
Nitrate (NO3)	mg/L	<0.44	N/A	0.44	<0.22	N/A	0.22	B370770
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	<0.033	N/A	0.033	B370770
Calculated Total Dissolved Solids	mg/L	2500	N/A	25	2400	N/A	25	B369304
Elements								
Dissolved Cadmium (Cd)	ug/L	0.023	+/- <RDL	0.020	0.026	+/- <RDL	0.020	B369358
Misc. Inorganics								
Conductivity	uS/cm	3100	+/- 82	2.0	3100	+/- 82	2.0	B373127
pH	pH	7.79	+/- 0.0772	N/A	7.73	+/- 0.0766	N/A	B373126
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	B373124
Alkalinity (Total as CaCO3)	mg/L	410	+/- 30	1.0	410	+/- 30	1.0	B373124
Bicarbonate (HCO3)	mg/L	500	+/- 7.7	1.0	500	+/- 7.6	1.0	B373124
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	B373124
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	B373124
Chloride (Cl)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	B371321
Sulphate (SO4)	mg/L	1500	+/- 94	25	1400	+/- 89	25	B371321
Nutrients								
Nitrite (N)	mg/L	<0.010	N/A	0.010	<0.010	N/A	0.010	B371461
Nitrate plus Nitrite (N)	mg/L	<0.10 (1)	N/A	0.10	<0.050 (1)	N/A	0.050	B371461
Lab Filtered Elements								
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	<0.0030	N/A	0.0030	B371107
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	<0.00060	N/A	0.00060	B371107
Dissolved Arsenic (As)	mg/L	0.00046	+/- <RDL	0.00020	0.00053	+/- <RDL	0.00020	B371107
Dissolved Barium (Ba)	mg/L	0.013	+/- <RDL	0.010	0.012	+/- <RDL	0.010	B371207
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B371107

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNN529			CNN530			
Sampling Date		2024/05/14 15:14			2024/05/14 15:31			
COC Number		1/1			1/1			
	UNITS	MW16-11-15	MU	RDL	SR24-01	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.10	+/- <RDL	0.020	0.10	+/- <RDL	0.020	B371207
Dissolved Calcium (Ca)	mg/L	310	+/- 32	0.30	320	+/- 32	0.30	B371207
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B371107
Dissolved Cobalt (Co)	mg/L	0.0013	+/- <RDL	0.00030	0.0013	+/- <RDL	0.00030	B371107
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B371107
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	<0.060	N/A	0.060	B371207
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	B371107
Dissolved Lithium (Li)	mg/L	0.053	+/- <RDL	0.020	0.058	+/- <RDL	0.020	B371207
Dissolved Magnesium (Mg)	mg/L	130	+/- 8.6	0.20	130	+/- 8.6	0.20	B371207
Dissolved Manganese (Mn)	mg/L	1.1	+/- 0.073	0.0040	1.1	+/- 0.073	0.0040	B371207
Dissolved Molybdenum (Mo)	mg/L	0.00095	+/- 0.00034	0.00020	0.0031	+/- 0.00081	0.00020	B371107
Dissolved Nickel (Ni)	mg/L	0.0021	+/- <RDL	0.00050	0.0020	+/- <RDL	0.00050	B371107
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	<0.10	N/A	0.10	B371207
Dissolved Potassium (K)	mg/L	5.7	+/- 0.31	0.30	5.8	+/- 0.31	0.30	B371207
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	B371107
Dissolved Silicon (Si)	mg/L	4.5	+/- 0.86	0.50	4.5	+/- 0.86	0.50	B371207
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	<0.00010	N/A	0.00010	B371107
Dissolved Sodium (Na)	mg/L	320	+/- 31	0.50	320	+/- 31	0.50	B371207
Dissolved Strontium (Sr)	mg/L	3.0	+/- 0.29	0.020	2.9	+/- 0.29	0.020	B371207
Dissolved Sulphur (S)	mg/L	530	+/- 35	1.0	540	+/- 36	1.0	B371207
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	B371107
Dissolved Tin (Sn)	mg/L	0.0011	+/- <RDL	0.0010	<0.0010	N/A	0.0010	B371107
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B371107
Dissolved Uranium (U)	mg/L	0.0053	+/- 0.00048	0.00010	0.0055	+/- 0.00051	0.00010	B371107
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B371107
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	<0.0030	N/A	0.0030	B371107

RDL = Reportable Detection Limit
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N/A = Not Applicable

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TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CNN524		CNN524				CNN525			
Sampling Date		2024/05/14 09:51		2024/05/14 09:51				2024/05/14 09:30			
COC Number		1/1		1/1				1/1			
	UNITS	WS11-01	MU	WS11-01 Lab-Dup	MU	RDL	QC Batch	MW16-3-7	MU	RDL	QC Batch
Calculated Parameters											
Total Kjeldahl Nitrogen (Calc)	mg/L	0.448	N/A	N/A	N/A	0.020	B370777	0.97	N/A	0.20	B370777
Nutrients											
Total Nitrogen (N)	mg/L	0.45	+/- 0.077	0.37	+/- 0.067	0.020	B374328	2.4	+/- 0.35	0.20	B374322

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CNN526		CNN527		CNN528			
Sampling Date		2024/05/14 11:33		2024/05/14 13:23		2024/05/14 14:18			
COC Number		1/1		1/1		1/1			
	UNITS	MW16-7-5	MU	MW16-1-15	MU	MW16-10-15	MU	RDL	QC Batch
Calculated Parameters									
Total Kjeldahl Nitrogen (Calc)	mg/L	1.01	N/A	1.22	N/A	2.35	N/A	0.20	B370777
Nutrients									
Total Nitrogen (N)	mg/L	1.0 (1)	+/- <RDL	1.2 (1)	+/- <RDL	2.4	+/- 0.35	0.20	B374322

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CNN529			CNN530			
Sampling Date		2024/05/14 15:14			2024/05/14 15:31			
COC Number		1/1			1/1			
	UNITS	MW16-11-15	MU	QC Batch	SR24-01	MU	RDL	QC Batch
Calculated Parameters								
Total Kjeldahl Nitrogen (Calc)	mg/L	1.13	N/A	B370777	1.19	N/A	0.20	B370777
Nutrients								
Total Nitrogen (N)	mg/L	1.1 (1)	+/- <RDL	B374328	1.2 (1)	+/- <RDL	0.20	B374322

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C434263
Report Date: 2024/05/23

STANTEC CONSULTING LTD
Client Project #: 110773396
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNN524		CNN524			CNN525			
Sampling Date		2024/05/14 09:51		2024/05/14 09:51			2024/05/14 09:30			
COC Number		1/1		1/1			1/1			
	UNITS	WS11-01	MU	WS11-01 Lab-Dup	MU	RDL	MW16-3-7	MU	RDL	QC Batch
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	1.8	+/- <RDL	N/A	N/A	0.50	3.0	+/- 0.53	0.50	B375583
Microbiological Param.										
E.Coli DST	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	<10 (1)	N/A	10	B370388
Fecal Coliforms	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	10 (1)	N/A	10	B370045
Heterotrophic DST	MPN/100mL	>2400	N/A	>2400	N/A	1.0	>4800 (1)	N/A	2.0	B369810
Total Coliforms DST	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	<10 (1)	N/A	10	B370388
Nutrients										
Total Ammonia (N)	mg/L	0.25	+/- 0.029	N/A	N/A	0.015	0.019	+/- <RDL	0.015	B370555
Orthophosphate (P)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	0.0086	+/- 0.0036	0.0030	B372092
Lab Filtered Nutrients										
Dissolved Phosphorus (P)	mg/L	0.0082	+/- 0.0049	N/A	N/A	0.0030	0.0081 (2)	+/- 0.0049	0.0030	B372931

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.
(2) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNN525		CNN526		CNN526			
Sampling Date		2024/05/14 09:30		2024/05/14 11:33		2024/05/14 11:33			
COC Number		1/1		1/1		1/1			
	UNITS	MW16-3-7 Lab-Dup	MU	MW16-7-5	MU	MW16-7-5 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Inorganics									
Dissolved Organic Carbon (C)	mg/L	3.2	+/- 0.54	2.6	+/- <RDL	N/A	N/A	0.50	B375583
Microbiological Param.									
E.Coli DST	MPN/100mL	N/A	N/A	<10 (1)	N/A	<10	N/A	10	B370388
Fecal Coliforms	MPN/100mL	<10 (1)	N/A	<10 (1)	N/A	N/A	N/A	10	B370045
Heterotrophic DST	MPN/100mL	N/A	N/A	>4800 (1)	N/A	N/A	N/A	2.0	B369810
Total Coliforms DST	MPN/100mL	N/A	N/A	62 (1)	N/A	63	N/A	10	B370388
Nutrients									
Total Ammonia (N)	mg/L	N/A	N/A	0.035	+/- <RDL	N/A	N/A	0.015	B370555
Orthophosphate (P)	mg/L	N/A	N/A	<0.0030	N/A	N/A	N/A	0.0030	B372092
Lab Filtered Nutrients									
Dissolved Phosphorus (P)	mg/L	N/A	N/A	0.0047	+/- 0.0048	N/A	N/A	0.0030	B372931

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNN527		CNN528			CNN529			
Sampling Date		2024/05/14 13:23		2024/05/14 14:18			2024/05/14 15:14			
COC Number		1/1		1/1			1/1			
	UNITS	MW16-1-15	MU	MW16-10-15	MU	RDL	MW16-11-15	MU	RDL	QC Batch
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	2.5	+/- <RDL	2.7	+/- 0.50	0.50	2.6	+/- 0.50	0.50	B375583
Microbiological Param.										
E.Coli DST	MPN/100mL	<100 (1)	N/A	<100 (1)	N/A	100	10 (1)	N/A	10	B370388
Fecal Coliforms	MPN/100mL	<100 (1)	N/A	<100 (1)	N/A	100	<10 (1)	N/A	10	B370045
Heterotrophic DST	MPN/100mL	>12000 (1)	N/A	>12000 (1)	N/A	5.0	>4800 (1)	N/A	2.0	B369810
Total Coliforms DST	MPN/100mL	<100 (1)	N/A	<100 (1)	N/A	100	52 (1)	N/A	10	B370388
Nutrients										
Total Ammonia (N)	mg/L	0.057	+/- <RDL	0.44	+/- 0.049	0.015	0.46	+/- 0.051	0.015	B370555
Orthophosphate (P)	mg/L	0.0033	+/- 0.0034	<0.0030	N/A	0.0030	<0.0030	N/A	0.0030	B372092
Lab Filtered Nutrients										
Dissolved Phosphorus (P)	mg/L	<0.0030 (2)	N/A	0.0065	+/- 0.0048	0.0030	0.0030	+/- 0.0048	0.0030	B372931

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.
(2) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNN530			
Sampling Date		2024/05/14 15:31			
COC Number		1/1			
	UNITS	**SR24-01**	**MU**	**RDL**	**QC Batch**
Lab Filtered Inorganics					
Dissolved Organic Carbon (C)	mg/L	2.7	+/- 0.50	0.50	B375583
Microbiological Param.					
E.Coli DST	MPN/100mL	<10 (1)	N/A	10	B370388
Fecal Coliforms	MPN/100mL	<10 (1)	N/A	10	B370045
Heterotrophic DST	MPN/100mL	>4800 (1)	N/A	2.0	B369810
Total Coliforms DST	MPN/100mL	52 (1)	N/A	10	B370388
Nutrients					
Total Ammonia (N)	mg/L	0.46	+/- 0.051	0.015	B370555
Orthophosphate (P)	mg/L	<0.0030	N/A	0.0030	B372092
Lab Filtered Nutrients					
Dissolved Phosphorus (P)	mg/L	0.0037	+/- 0.0048	0.0030	B372850

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.

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MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID		CNN524			CNN525		CNN526			
Sampling Date		2024/05/14 09:51			2024/05/14 09:30		2024/05/14 11:33			
COC Number		1/1			1/1		1/1			
	UNITS	WS11-01	MU	RDL	MW16-3-7	MU	MW16-7-5	MU	RDL	QC Batch
Elements										
Total Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	0.047 (1)	+/- <RDL	0.050 (1)	+/- <RDL	0.019	B371002
Lab Filtered Elements										
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	<0.0019	N/A	<0.0019	N/A	0.0019	B372264

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CNN527			CNN528			CNN529			
Sampling Date		2024/05/14 13:23			2024/05/14 14:18			2024/05/14 15:14			
COC Number		1/1			1/1			1/1			
	UNITS	MW16-1-15	MU	RDL	MW16-10-15	MU	RDL	MW16-11-15	MU	RDL	QC Batch
Elements											
Total Mercury (Hg)	ug/L	0.132 (1)	+/- 0.023	0.019	0.21 (1)	+/- <RDL	0.19	0.054 (1)	+/- <RDL	0.019	B371002
Lab Filtered Elements											
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	<0.0019	N/A	0.0019	<0.0019	N/A	0.0019	B372264

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CNN530			
Sampling Date		2024/05/14 15:31			
COC Number		1/1			
	UNITS	SR24-01	MU	RDL	QC Batch
Elements					
Total Mercury (Hg)	ug/L	0.060 (1)	+/- <RDL	0.019	B371002
Lab Filtered Elements					
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	B372264

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	8.7°C
Package 2	9.3°C

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B369810	YYL	Method Blank	Heterotrophic DST	2024/05/17	<1.0		mpn/100mL	
B369810	YYL	RPD [CNN524-05]	Heterotrophic DST	2024/05/17	NC		%	N/A
B370045	YYL	Method Blank	Fecal Coliforms	2024/05/16	<1.0		MPN/100mL	
B370045	YYL	RPD [CNN525-05]	Fecal Coliforms	2024/05/16	0 (1)		%	N/A
B370153	GG3	Spiked Blank	O-TERPHENYL (sur.)	2024/05/16		103	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/16		86	%	60 - 140
B370153	GG3	Method Blank	O-TERPHENYL (sur.)	2024/05/16		105	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/16	<0.10		mg/L	
B370388	YYL	Method Blank	E.Coli DST	2024/05/16	<1.0		mpn/100mL	
			Total Coliforms DST	2024/05/16	<1.0		mpn/100mL	
B370388	YYL	RPD [CNN526-05]	E.Coli DST	2024/05/16	NC		%	N/A
			Total Coliforms DST	2024/05/16	1.6		%	N/A
B370393	SNA	Matrix Spike [CNN525-09]	1,4-Difluorobenzene (sur.)	2024/05/17		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/17		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/17		101	%	50 - 140
			Benzene	2024/05/17		89	%	50 - 140
			Toluene	2024/05/17		90	%	50 - 140
			Ethylbenzene	2024/05/17		90	%	50 - 140
			m & p-Xylene	2024/05/17		89	%	50 - 140
			o-Xylene	2024/05/17		91	%	50 - 140
			F1 (C6-C10)	2024/05/17		68	%	60 - 140
B370393	SNA	Spiked Blank	1,4-Difluorobenzene (sur.)	2024/05/17		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/17		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/17		101	%	50 - 140
			Benzene	2024/05/17		89	%	60 - 130
			Toluene	2024/05/17		89	%	60 - 130
			Ethylbenzene	2024/05/17		88	%	60 - 130
			m & p-Xylene	2024/05/17		86	%	60 - 130
			o-Xylene	2024/05/17		89	%	60 - 130
			F1 (C6-C10)	2024/05/17		114	%	60 - 140
B370393	SNA	Method Blank	1,4-Difluorobenzene (sur.)	2024/05/17		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/17		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/17		98	%	50 - 140
			Benzene	2024/05/17	<0.00040		mg/L	
			Toluene	2024/05/17	<0.00040		mg/L	
			Ethylbenzene	2024/05/17	<0.00040		mg/L	
			m & p-Xylene	2024/05/17	<0.00080		mg/L	
			o-Xylene	2024/05/17	<0.00040		mg/L	
			F1 (C6-C10)	2024/05/17	<0.10		mg/L	
B370393	SNA	RPD [CNN524-09]	Benzene	2024/05/18	8.5		%	30
			Toluene	2024/05/18	NC		%	30
			Ethylbenzene	2024/05/18	NC		%	30
			m & p-Xylene	2024/05/18	NC		%	30
			o-Xylene	2024/05/18	NC		%	30
			F1 (C6-C10)	2024/05/18	NC		%	30
B370555	AFI	Matrix Spike	Total Ammonia (N)	2024/05/15		114	%	80 - 120
B370555	AFI	Spiked Blank	Total Ammonia (N)	2024/05/15		106	%	80 - 120
B370555	AFI	Method Blank	Total Ammonia (N)	2024/05/15	<0.015		mg/L	
B370555	AFI	RPD	Total Ammonia (N)	2024/05/15	2.1		%	20
B371002	KHU	Matrix Spike	Total Mercury (Hg)	2024/05/16		96	%	80 - 120
B371002	KHU	Spiked Blank	Total Mercury (Hg)	2024/05/16		97	%	80 - 120
B371002	KHU	Method Blank	Total Mercury (Hg)	2024/05/16	<0.0019		ug/L	
B371002	KHU	RPD	Total Mercury (Hg)	2024/05/16	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B371107	JAB	Matrix Spike	Dissolved Aluminum (Al)	2024/05/16		97	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/16		101	%	80 - 120
			Dissolved Arsenic (As)	2024/05/16		99	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/16		92	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/16		95	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/16		93	%	80 - 120
			Dissolved Copper (Cu)	2024/05/16		91	%	80 - 120
			Dissolved Lead (Pb)	2024/05/16		93	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/16		99	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/16		93	%	80 - 120
			Dissolved Selenium (Se)	2024/05/16		102	%	80 - 120
			Dissolved Silver (Ag)	2024/05/16		95	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/16		92	%	80 - 120
			Dissolved Tin (Sn)	2024/05/16		97	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/16		93	%	80 - 120
			Dissolved Uranium (U)	2024/05/16		90	%	80 - 120
			Dissolved Vanadium (V)	2024/05/16		98	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/16		93	%	80 - 120
B371107	JAB	Spiked Blank	Dissolved Aluminum (Al)	2024/05/16		100	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/16		100	%	80 - 120
			Dissolved Arsenic (As)	2024/05/16		92	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/16		92	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/16		96	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/16		97	%	80 - 120
			Dissolved Copper (Cu)	2024/05/16		96	%	80 - 120
			Dissolved Lead (Pb)	2024/05/16		95	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/16		98	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/16		94	%	80 - 120
			Dissolved Selenium (Se)	2024/05/16		95	%	80 - 120
			Dissolved Silver (Ag)	2024/05/16		95	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/16		93	%	80 - 120
			Dissolved Tin (Sn)	2024/05/16		93	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/16		101	%	80 - 120
			Dissolved Uranium (U)	2024/05/16		88	%	80 - 120
			Dissolved Vanadium (V)	2024/05/16		97	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/16		93	%	80 - 120
B371107	JAB	Method Blank	Dissolved Aluminum (Al)	2024/05/16	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2024/05/16	<0.00060		mg/L	
			Dissolved Arsenic (As)	2024/05/16	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2024/05/16	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2024/05/16	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2024/05/16	<0.00030		mg/L	
			Dissolved Copper (Cu)	2024/05/16	<0.0010		mg/L	
			Dissolved Lead (Pb)	2024/05/16	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2024/05/16	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2024/05/16	<0.00050		mg/L	
			Dissolved Selenium (Se)	2024/05/16	<0.00020		mg/L	
			Dissolved Silver (Ag)	2024/05/16	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2024/05/16	<0.00020		mg/L	
			Dissolved Tin (Sn)	2024/05/16	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2024/05/16	<0.0010		mg/L	
			Dissolved Uranium (U)	2024/05/16	<0.00010		mg/L	
			Dissolved Vanadium (V)	2024/05/16	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2024/05/16	<0.0030		mg/L	

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B371107	JAB	RPD	Dissolved Aluminum (Al)	2024/05/16	NC		%	20
			Dissolved Antimony (Sb)	2024/05/16	NC		%	20
			Dissolved Arsenic (As)	2024/05/16	8.7		%	20
			Dissolved Beryllium (Be)	2024/05/16	NC		%	20
			Dissolved Chromium (Cr)	2024/05/16	NC		%	20
			Dissolved Cobalt (Co)	2024/05/16	NC		%	20
			Dissolved Copper (Cu)	2024/05/16	NC		%	20
			Dissolved Lead (Pb)	2024/05/16	NC		%	20
			Dissolved Molybdenum (Mo)	2024/05/16	113 (2)		%	20
			Dissolved Nickel (Ni)	2024/05/16	4.0		%	20
			Dissolved Selenium (Se)	2024/05/16	NC		%	20
			Dissolved Silver (Ag)	2024/05/16	NC		%	20
			Dissolved Thallium (Tl)	2024/05/16	NC		%	20
			Dissolved Tin (Sn)	2024/05/16	NC		%	20
			Dissolved Titanium (Ti)	2024/05/16	NC		%	20
			Dissolved Uranium (U)	2024/05/16	3.4		%	20
			Dissolved Vanadium (V)	2024/05/16	NC		%	20
			Dissolved Zinc (Zn)	2024/05/16	6.5		%	20
B371207	S1D	Matrix Spike	Dissolved Barium (Ba)	2024/05/16		99	%	80 - 120
			Dissolved Boron (B)	2024/05/16		98	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/16		99	%	80 - 120
			Dissolved Iron (Fe)	2024/05/16		105	%	80 - 120
			Dissolved Lithium (Li)	2024/05/16		97	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/16		102	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/16		104	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/16		106	%	80 - 120
			Dissolved Potassium (K)	2024/05/16		99	%	80 - 120
			Dissolved Silicon (Si)	2024/05/16		92	%	80 - 120
			Dissolved Sodium (Na)	2024/05/16		NC	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/16		96	%	80 - 120
			Dissolved Sulphur (S)	2024/05/16		105	%	80 - 120
B371207	S1D	Spiked Blank	Dissolved Barium (Ba)	2024/05/16		96	%	80 - 120
			Dissolved Boron (B)	2024/05/16		96	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/16		93	%	80 - 120
			Dissolved Iron (Fe)	2024/05/16		99	%	80 - 120
			Dissolved Lithium (Li)	2024/05/16		93	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/16		95	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/16		98	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/16		100	%	80 - 120
			Dissolved Potassium (K)	2024/05/16		94	%	80 - 120
			Dissolved Silicon (Si)	2024/05/16		91	%	80 - 120
			Dissolved Sodium (Na)	2024/05/16		92	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/16		92	%	80 - 120
			Dissolved Sulphur (S)	2024/05/16		96	%	80 - 120
B371207	S1D	Method Blank	Dissolved Barium (Ba)	2024/05/16	<0.010		mg/L	
			Dissolved Boron (B)	2024/05/16	<0.020		mg/L	
			Dissolved Calcium (Ca)	2024/05/16	<0.30		mg/L	
			Dissolved Iron (Fe)	2024/05/16	<0.060		mg/L	
			Dissolved Lithium (Li)	2024/05/16	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2024/05/16	<0.20		mg/L	
			Dissolved Manganese (Mn)	2024/05/16	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2024/05/16	<0.10		mg/L	
			Dissolved Potassium (K)	2024/05/16	<0.30		mg/L	
			Dissolved Silicon (Si)	2024/05/16	<0.50		mg/L	

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Sodium (Na)	2024/05/16	<0.50		mg/L	
			Dissolved Strontium (Sr)	2024/05/16	<0.020		mg/L	
			Dissolved Sulphur (S)	2024/05/16	<0.20		mg/L	
B371207	S1D	RPD	Dissolved Barium (Ba)	2024/05/16	NC		%	20
			Dissolved Boron (B)	2024/05/16	NC		%	20
			Dissolved Calcium (Ca)	2024/05/16	3.0		%	20
			Dissolved Iron (Fe)	2024/05/16	NC		%	20
			Dissolved Lithium (Li)	2024/05/16	NC		%	20
			Dissolved Magnesium (Mg)	2024/05/16	2.1		%	20
			Dissolved Manganese (Mn)	2024/05/16	NC		%	20
			Dissolved Phosphorus (P)	2024/05/16	NC		%	20
			Dissolved Potassium (K)	2024/05/16	2.8		%	20
			Dissolved Silicon (Si)	2024/05/16	0.54		%	20
			Dissolved Sodium (Na)	2024/05/16	2.6		%	20
			Dissolved Strontium (Sr)	2024/05/16	NC		%	20
			Dissolved Sulphur (S)	2024/05/16	2.6		%	20
B371321	TOR	Matrix Spike	Chloride (Cl)	2024/05/16		114	%	80 - 120
			Sulphate (SO4)	2024/05/16		135 (2)	%	80 - 120
B371321	TOR	Spiked Blank	Chloride (Cl)	2024/05/16		100	%	80 - 120
			Sulphate (SO4)	2024/05/16		95	%	80 - 120
B371321	TOR	Method Blank	Chloride (Cl)	2024/05/16	<1.0		mg/L	
			Sulphate (SO4)	2024/05/16	<1.0		mg/L	
B371321	TOR	RPD	Chloride (Cl)	2024/05/16	1.9		%	20
			Sulphate (SO4)	2024/05/16	NC		%	20
B371326	TOR	Matrix Spike [CNN525-01]	Chloride (Cl)	2024/05/16		NC	%	80 - 120
			Sulphate (SO4)	2024/05/16		NC	%	80 - 120
B371326	TOR	Spiked Blank	Chloride (Cl)	2024/05/16		100	%	80 - 120
			Sulphate (SO4)	2024/05/16		95	%	80 - 120
B371326	TOR	Method Blank	Chloride (Cl)	2024/05/16	<1.0		mg/L	
			Sulphate (SO4)	2024/05/16	<1.0		mg/L	
B371326	TOR	RPD [CNN525-01]	Chloride (Cl)	2024/05/16	3.1		%	20
			Sulphate (SO4)	2024/05/16	2.0		%	20
B371461	ISW	Matrix Spike	Nitrite (N)	2024/05/16		100	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/16		72 (2)	%	80 - 120
B371461	ISW	Spiked Blank	Nitrite (N)	2024/05/16		99	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/16		98	%	80 - 120
B371461	ISW	Method Blank	Nitrite (N)	2024/05/16	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/16	<0.010		mg/L	
B371461	ISW	RPD	Nitrite (N)	2024/05/16	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/16	NC		%	20
B372092	CTU	Matrix Spike	Orthophosphate (P)	2024/05/17		97	%	80 - 120
B372092	CTU	Spiked Blank	Orthophosphate (P)	2024/05/17		103	%	80 - 120
B372092	CTU	Method Blank	Orthophosphate (P)	2024/05/17	<0.0030		mg/L	
B372092	CTU	RPD	Orthophosphate (P)	2024/05/17	NC		%	20
B372264	MPK	Matrix Spike	Dissolved Mercury (Hg)	2024/05/17		94	%	80 - 120
B372264	MPK	Spiked Blank	Dissolved Mercury (Hg)	2024/05/17		99	%	80 - 120
B372264	MPK	Method Blank	Dissolved Mercury (Hg)	2024/05/17	<0.0019		ug/L	
B372264	MPK	RPD	Dissolved Mercury (Hg)	2024/05/17	NC		%	20
B372850	MAP	Matrix Spike	Dissolved Phosphorus (P)	2024/05/17		99	%	80 - 120
B372850	MAP	QC Standard	Dissolved Phosphorus (P)	2024/05/17		90	%	80 - 120
B372850	MAP	Spiked Blank	Dissolved Phosphorus (P)	2024/05/17		97	%	80 - 120
B372850	MAP	Method Blank	Dissolved Phosphorus (P)	2024/05/17	<0.0030		mg/L	
B372850	MAP	RPD	Dissolved Phosphorus (P)	2024/05/17	NC		%	20

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B372931	CTU	Matrix Spike	Dissolved Phosphorus (P)	2024/05/17		98	%	80 - 120
B372931	CTU	QC Standard	Dissolved Phosphorus (P)	2024/05/17		90	%	80 - 120
B372931	CTU	Spiked Blank	Dissolved Phosphorus (P)	2024/05/17		96	%	80 - 120
B372931	CTU	Method Blank	Dissolved Phosphorus (P)	2024/05/17	<0.0030		mg/L	
B372931	CTU	RPD	Dissolved Phosphorus (P)	2024/05/17	NC		%	20
B373124	A5S	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/18		98	%	80 - 120
B373124	A5S	Method Blank	Alkalinity (PP as CaCO3)	2024/05/18	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/18	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/18	<1.0		mg/L	
			Carbonate (CO3)	2024/05/18	<1.0		mg/L	
			Hydroxide (OH)	2024/05/18	<1.0		mg/L	
B373124	A5S	RPD	Alkalinity (PP as CaCO3)	2024/05/18	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/18	0.0077		%	20
			Bicarbonate (HCO3)	2024/05/18	0.0077		%	20
			Carbonate (CO3)	2024/05/18	NC		%	20
			Hydroxide (OH)	2024/05/18	NC		%	20
B373126	A5S	Spiked Blank	pH	2024/05/18		100	%	97 - 103
B373126	A5S	RPD	pH	2024/05/18	0.27		%	N/A
B373127	A5S	Spiked Blank	Conductivity	2024/05/18		100	%	90 - 110
B373127	A5S	Method Blank	Conductivity	2024/05/18	<2.0		uS/cm	
B373127	A5S	RPD	Conductivity	2024/05/18	0.40		%	10
B374322	CTU	Matrix Spike	Total Nitrogen (N)	2024/05/22		104	%	80 - 120
B374322	CTU	QC Standard	Total Nitrogen (N)	2024/05/22		106	%	80 - 120
B374322	CTU	Spiked Blank	Total Nitrogen (N)	2024/05/22		111	%	80 - 120
B374322	CTU	Method Blank	Total Nitrogen (N)	2024/05/22	<0.020		mg/L	
B374322	CTU	RPD	Total Nitrogen (N)	2024/05/22	3.9		%	20
B374328	CTU	Matrix Spike [CNN524-02]	Total Nitrogen (N)	2024/05/22		106	%	80 - 120
B374328	CTU	QC Standard	Total Nitrogen (N)	2024/05/22		111	%	80 - 120
B374328	CTU	Spiked Blank	Total Nitrogen (N)	2024/05/22		112	%	80 - 120
B374328	CTU	Method Blank	Total Nitrogen (N)	2024/05/22	<0.020		mg/L	
B374328	CTU	RPD [CNN524-02]	Total Nitrogen (N)	2024/05/22	19		%	20
B375583	MDO	Matrix Spike [CNN525-01]	Dissolved Organic Carbon (C)	2024/05/22		96	%	80 - 120
B375583	MDO	Spiked Blank	Dissolved Organic Carbon (C)	2024/05/22		103	%	80 - 120
B375583	MDO	Method Blank	Dissolved Organic Carbon (C)	2024/05/22	<0.50		mg/L	
B375583	MDO	RPD [CNN525-01]	Dissolved Organic Carbon (C)	2024/05/22	6.3		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

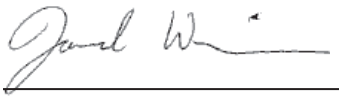
(1) Detection limit raised due to matrix interference.

(2) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

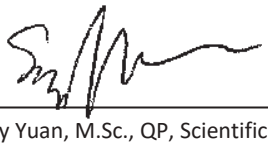
Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Jared Wiseman, B.Sc., P.Chem., QP, Senior Analyst, Organics



Sandy Yuan, M.Sc., QP, Scientific Specialist



Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist



Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

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CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

Page 1 of 1

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Project Information	
Company:	Stantec Consulting	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	#300 10220 103 Ave NW	Street Address:		Project #:	110773396
City:	Edmonton	Prov: AB	Postal Code: T5J0K4	City: Prov: Postal Code:	Site #:
Phone:	780 969 2223	Phone:		Site Location:	
Email:	dylan.king@stantec.com	Email:		Site Location Province:	AB
Copies:		Copies:		Sampled By:	WT/TH

LAB USE ONLY - PLACE STICKER HERE

Rush Confirmation #:

Regulatory Criteria

- [x] AT1
- [ ] CCME
- [ ] Drinking Water - Canada
- [ ] Drinking Water - Manitoba
- [ ] Saskatchewan
- [ ] Drinking Water - Alberta
- [ ] Other

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)

- [x] 5 to 7 Day
- [ ] 10 Day

Rush Turnaround Time (TAT) Surcharges apply

- [ ] Same Day
- [ ] 1 Day
- [ ] 2 Day
- [ ] 3 Day
- [ ] 4 Day

Date Required: YY MM DD

Comments

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F1-F2	7 BTEX F1-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 Salinity 4	14 Sieve (75 micron)	15 Total Kjeldahl Nitrogen (TKN)	16 Total Organic Carbon (TOC)	17 Dissolved phosphorus	18 phosphate	19 ammonia	20 bacteriological	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE
1	WS11-01	24	05	14	09	51	W						X		X		X	X	X			X	X	X	X	X	X	11	
2	MW16-3-7	24	05	14	09	36							X		X		X	X	X			X	X	X	X	X	X	11	
3	MW16-7-5	24	05	14	11	33							X		X		X	X	X			X	X	X	X	X	X	11	
4	MW16-1-15	24	05	14	13	23							X		X		X	X	X			X	X	X	X	X	X	11	
5	MW16-10-15	24	05	14	14	18							X		X		X	X	X			X	X	X	X	X	X	11	
6	MW16-11-15	24	05	14	15	14							X		X		X	X	X			X	X	X	X	X	X	11	
7	SR24-01	24	05	14	15	31	↓						✓		✓		✓	X	X			X	X	X	X	X	X	11	
8																													
9																													
10																													
11																													
12																													

14-May-24 17:16
Geraldlyn Gouthro
C434263
JJO INS-0003

MCAL-2024-05-830

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITION... AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY C... ...B ACCEPTANCE OF OUR ...E

LAB USE ONLY	Yes	No	°C			
Seal present		✓				
Seal intact						
Cooling media present	✓		9	8	7	

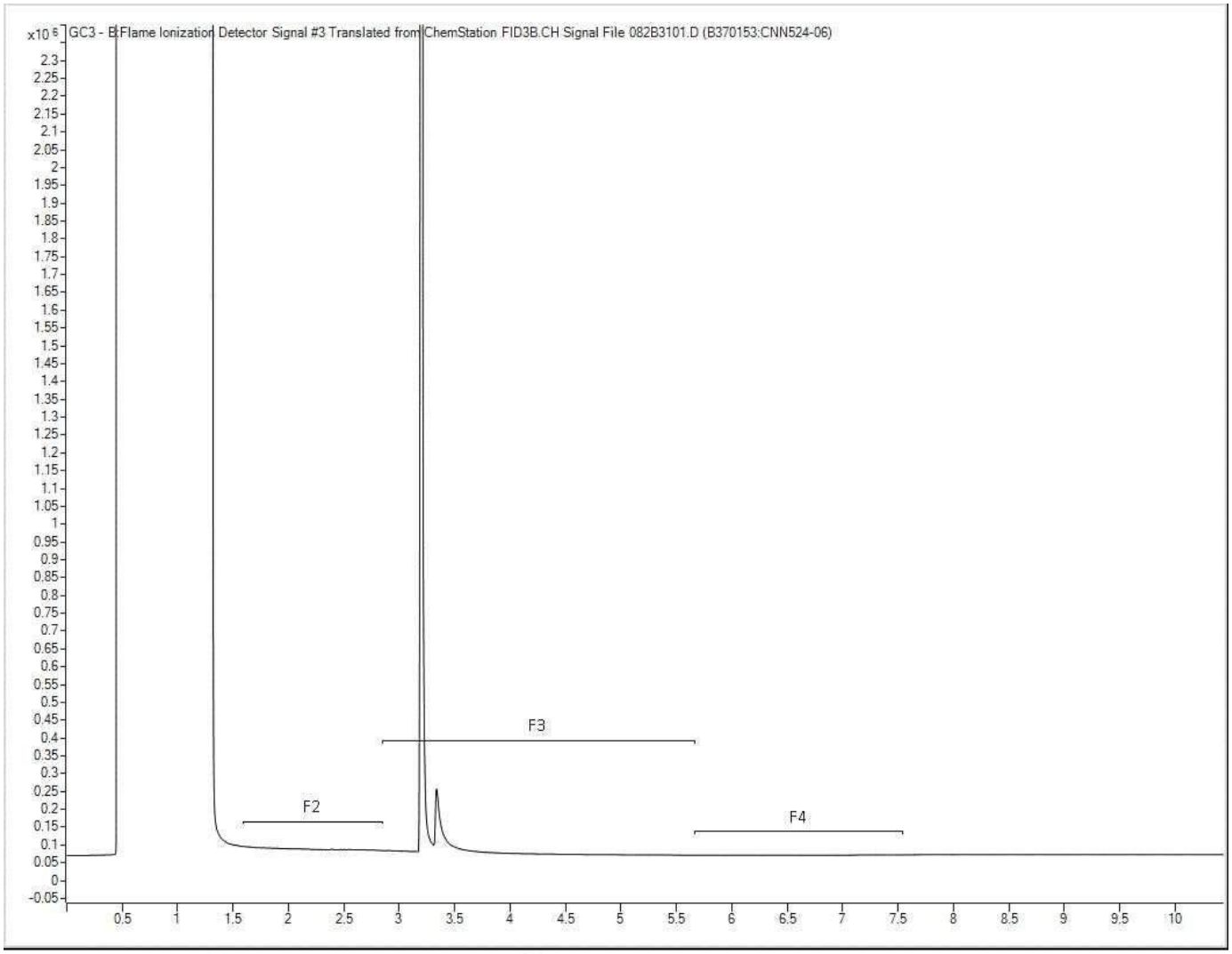
LAB USE ONLY	Yes	No	°C			
Seal present		✓				
Seal intact						
Cooling media present	✓		10	9	9	

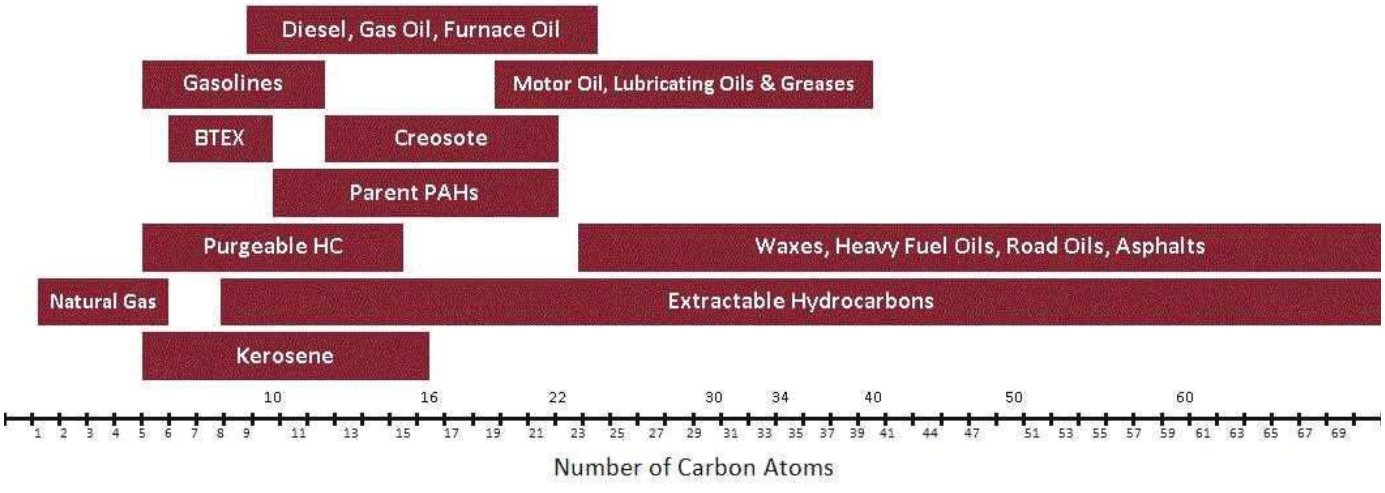
LAB USE ONLY	Yes	No	°C			Temperature reading by:
Seal present						
Seal intact						
Cooling media present						

	Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special instructions
1	Taylor Harris	2024	05	14	17	10	Marjorie Lawtie	2024	05	14	17	16	* total coliforms, e. coli, fecal coliforms, heterotrophic plate count
2													

Dissolved parameters not field filtered as per lab filter

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





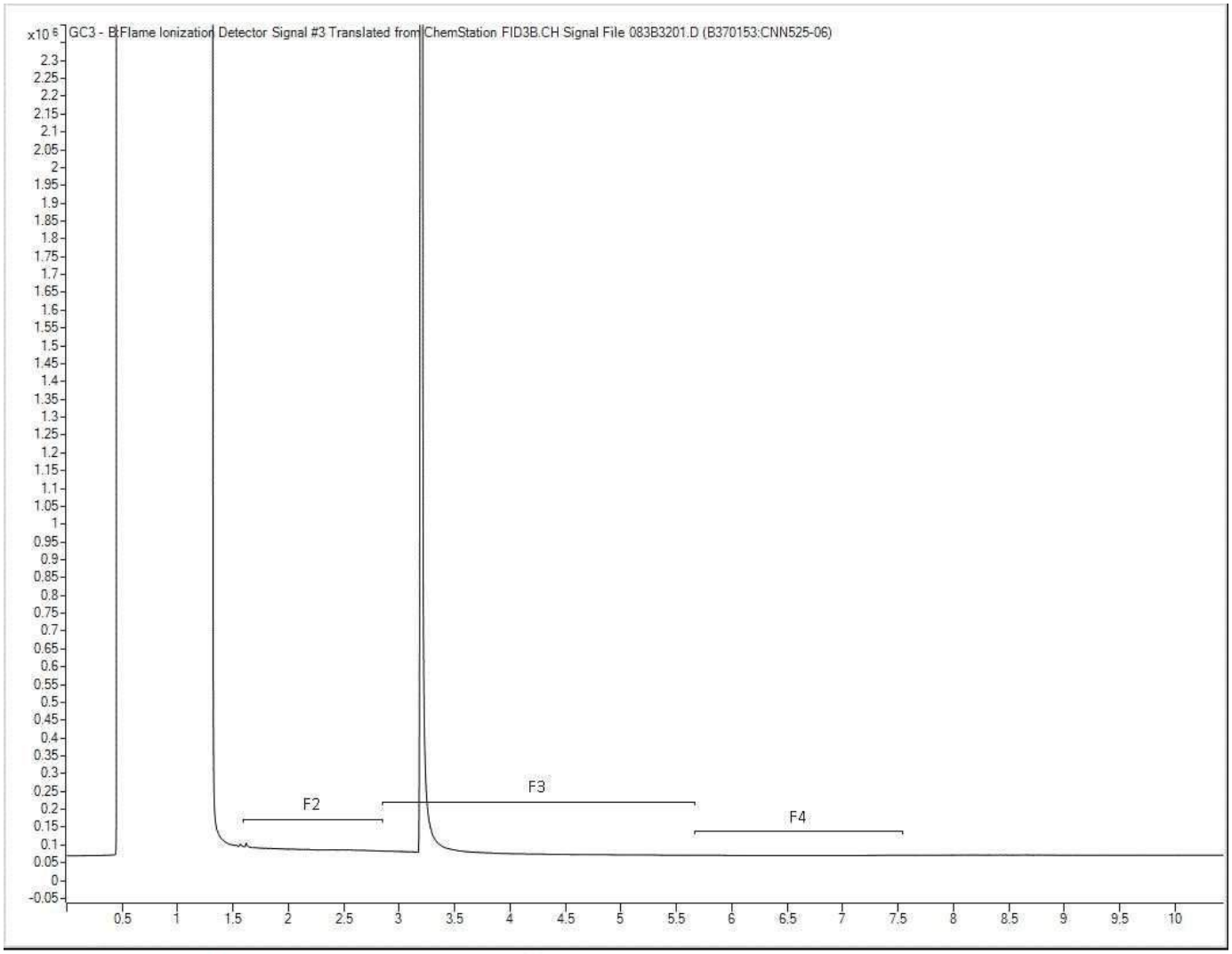
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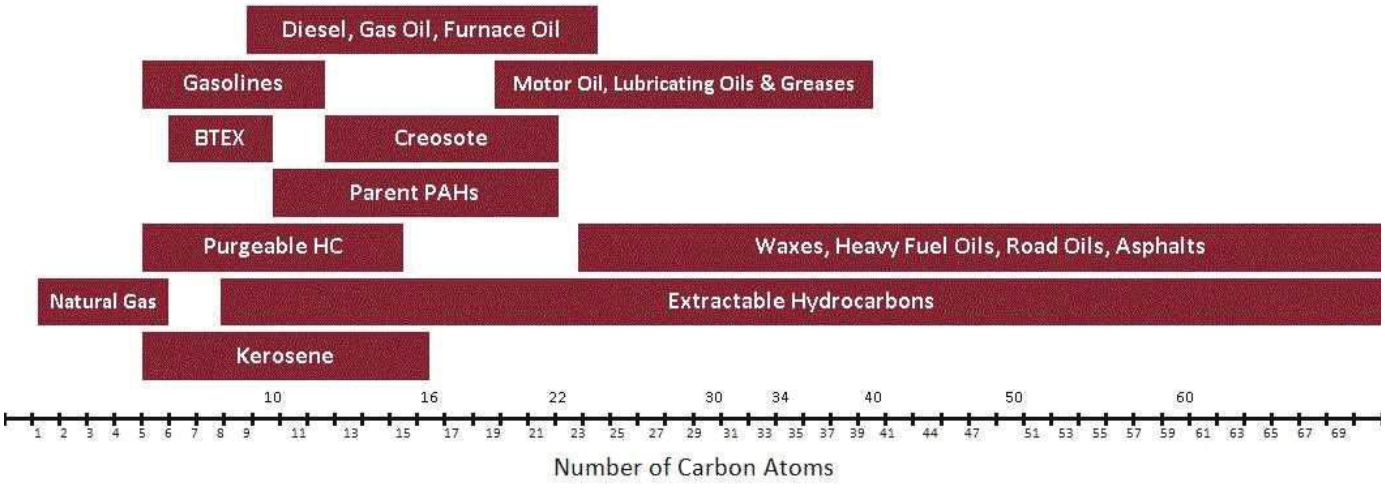
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C434263
Report Date: 2024/05/23
Bureau Veritas Sample: CNN525

STANTEC CONSULTING LTD
Client Project #: 110773396
Client ID: MW16-3-7

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

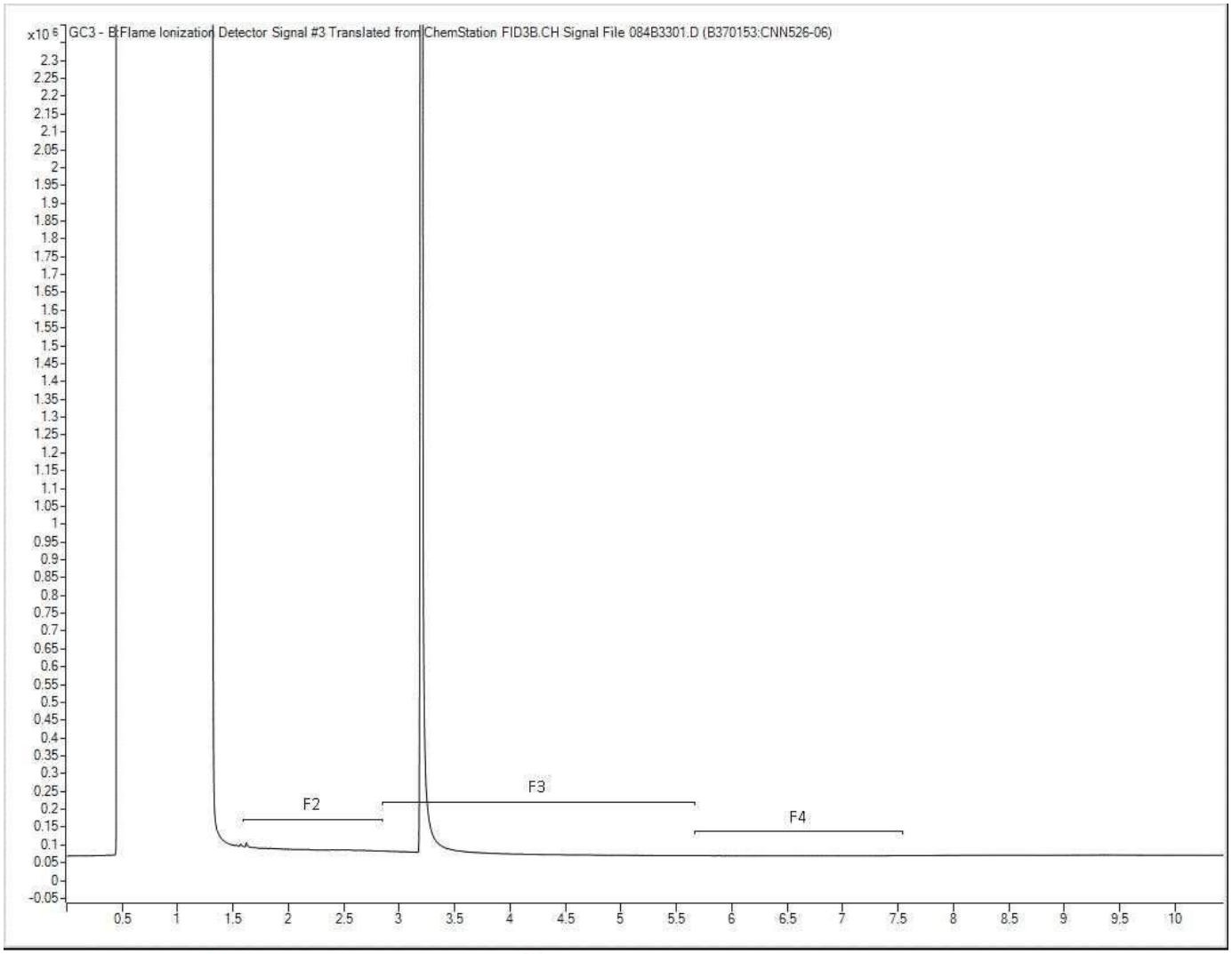


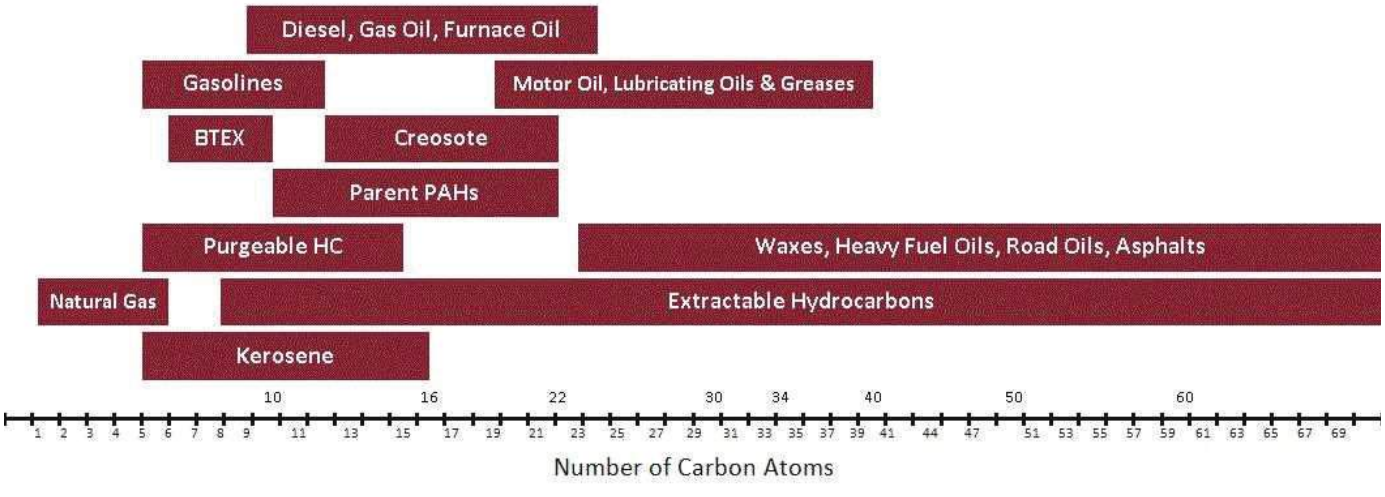


hpchem19\HPchem\1\DATA\2024\05\RUN0516

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





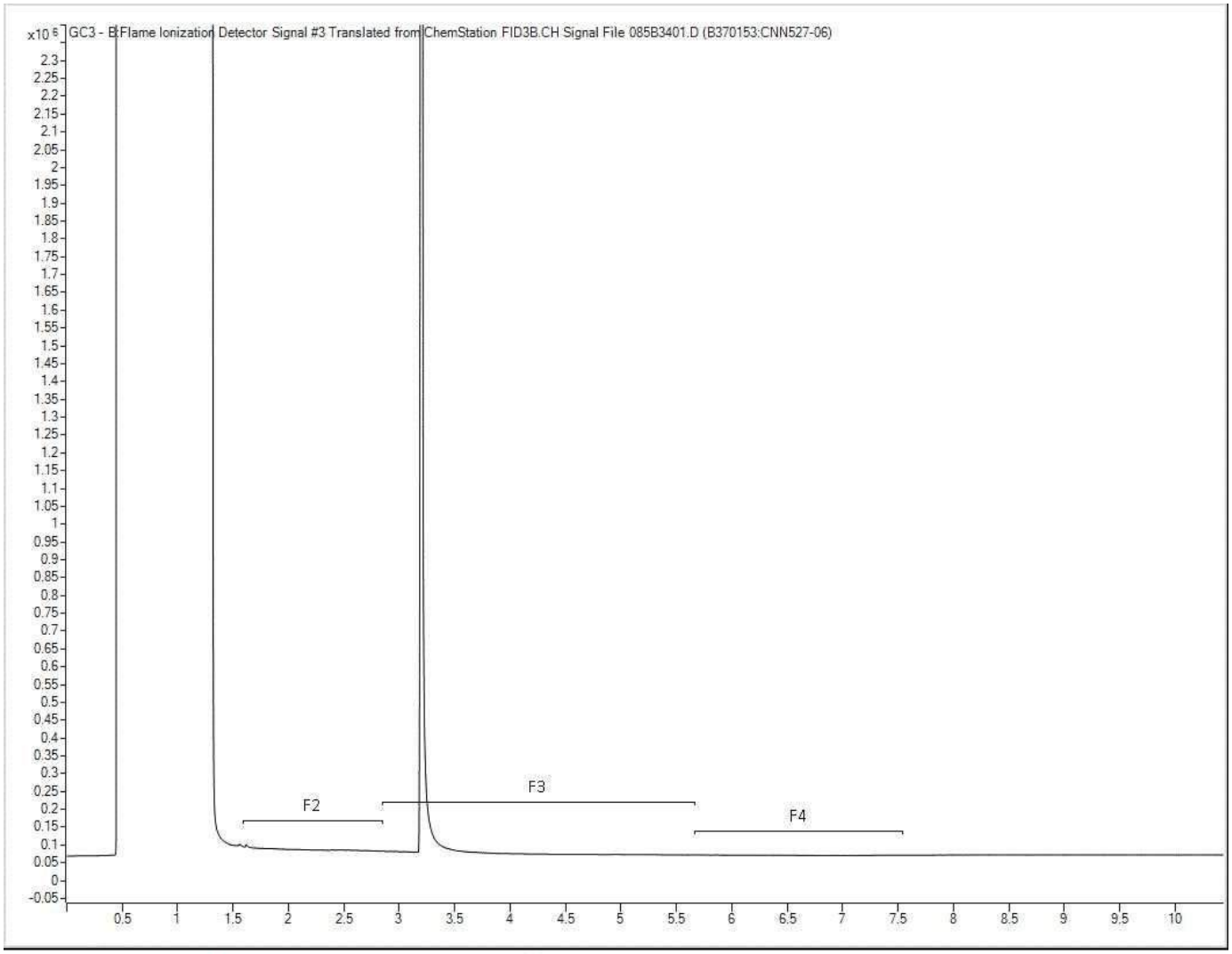
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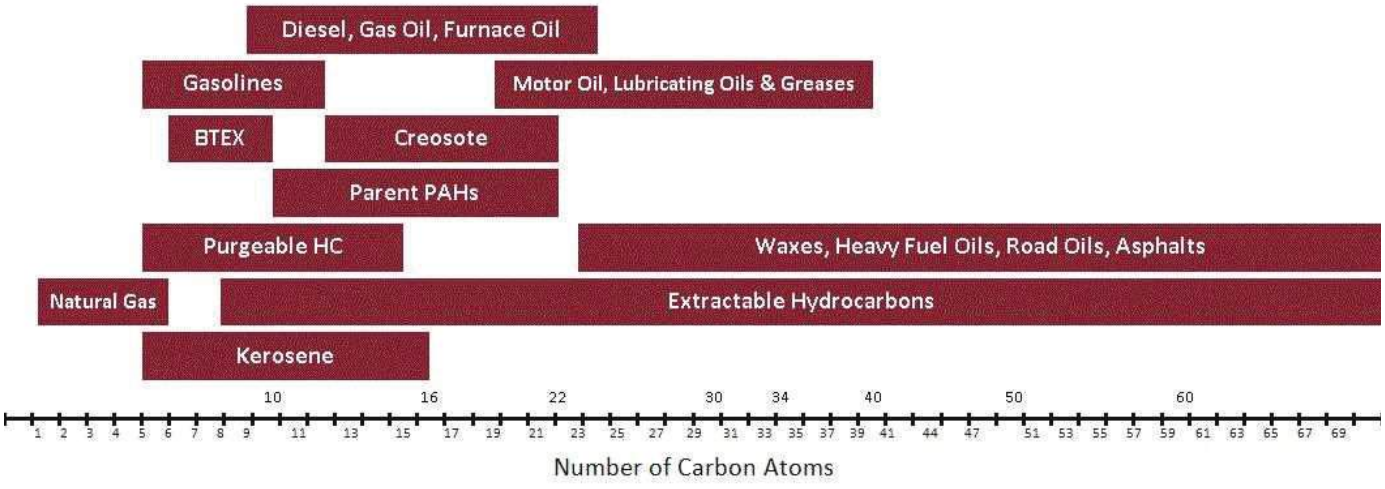
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C434263
Report Date: 2024/05/23
Bureau Veritas Sample: CNN527

STANTEC CONSULTING LTD
Client Project #: 110773396
Client ID: MW16-1-15

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

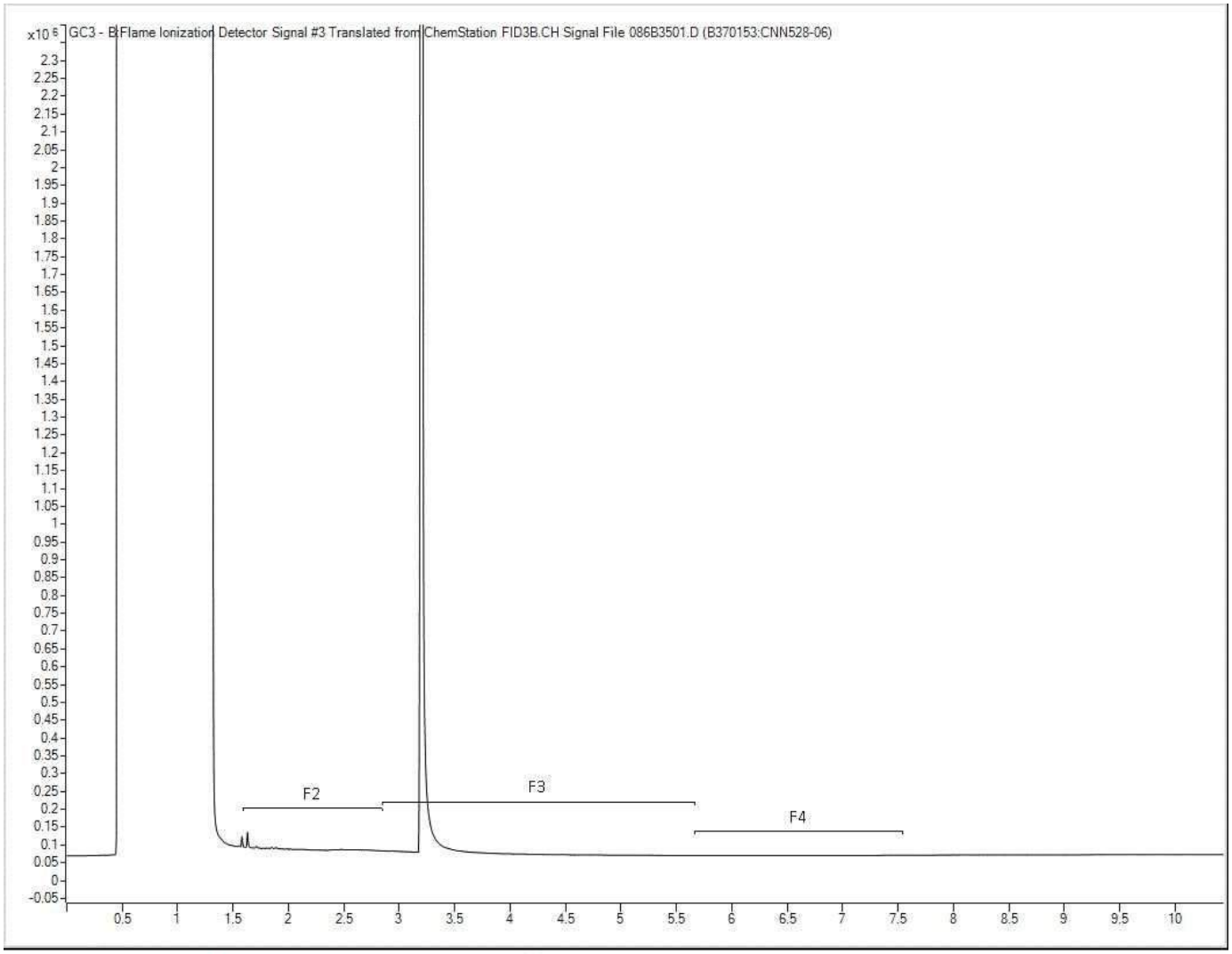


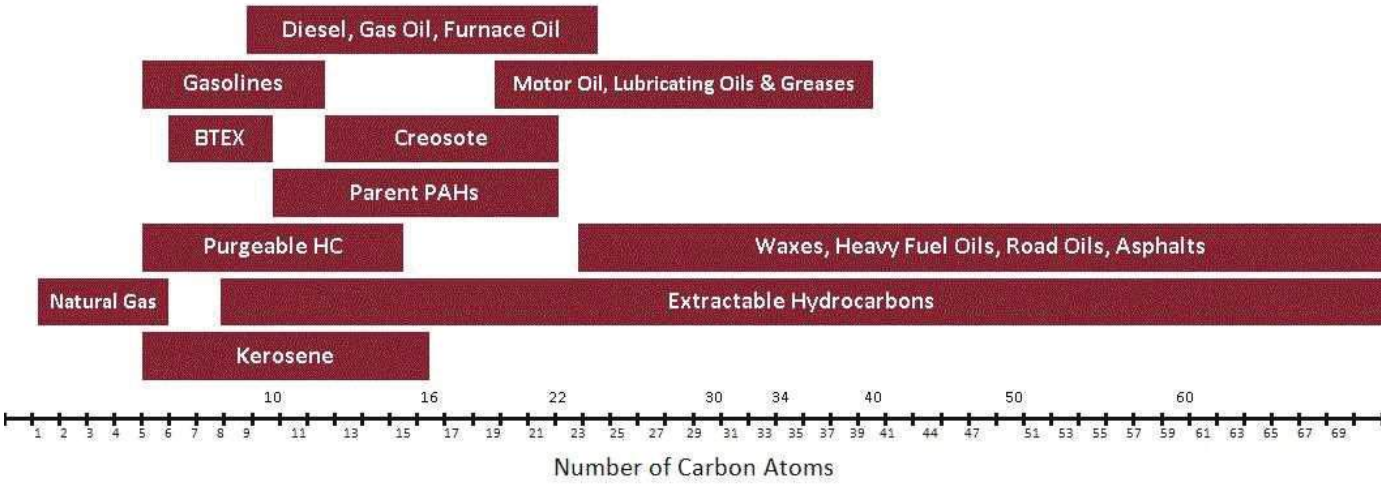


hpchem19\HPchem\1\DATA\2024\05\RUN0516

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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

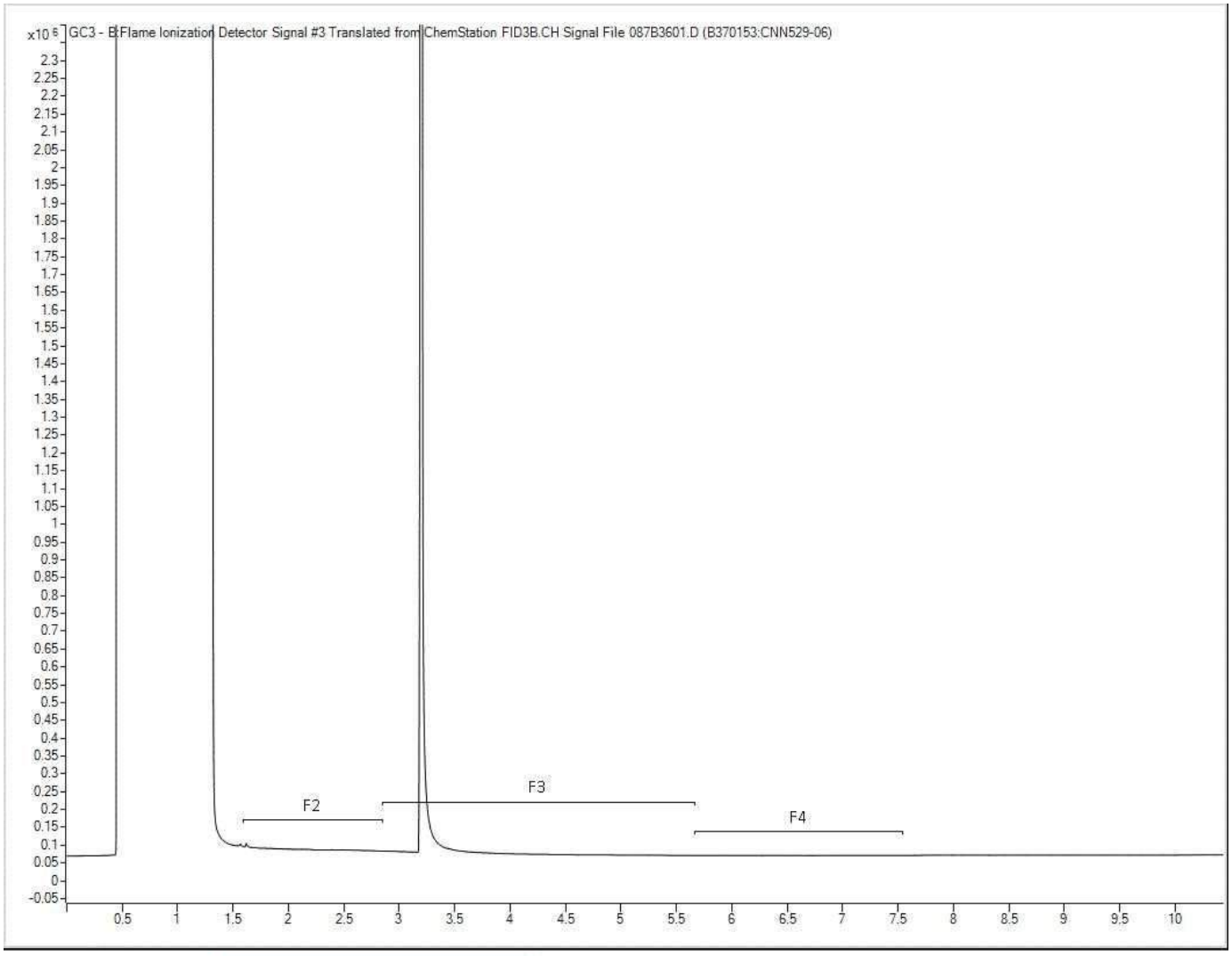


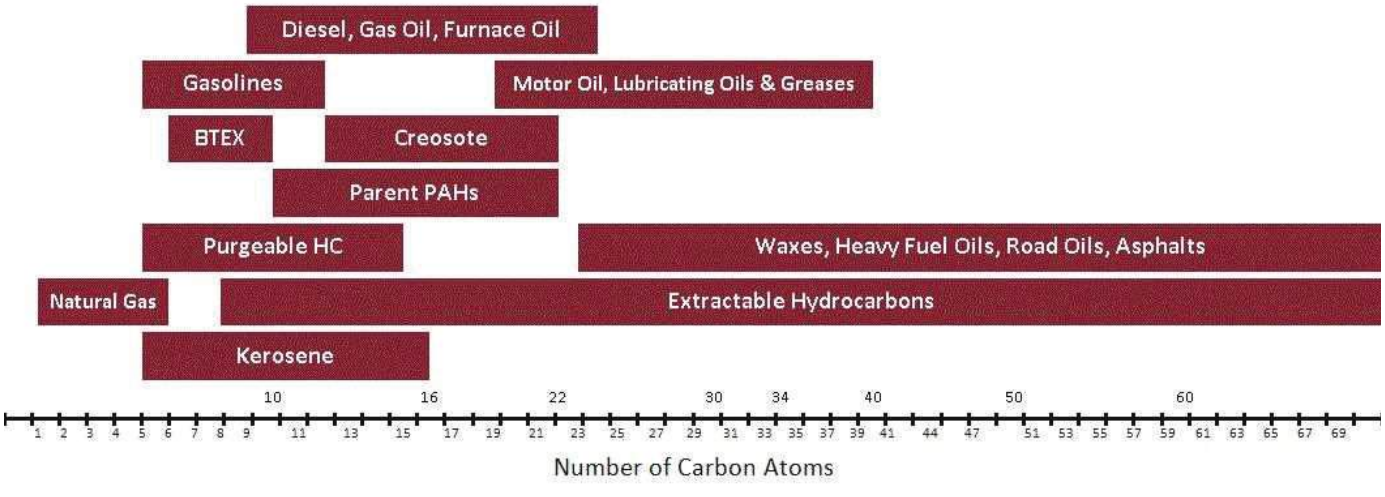


hpchem19\HPchem\1\DATA\2024\05\RUN0516

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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

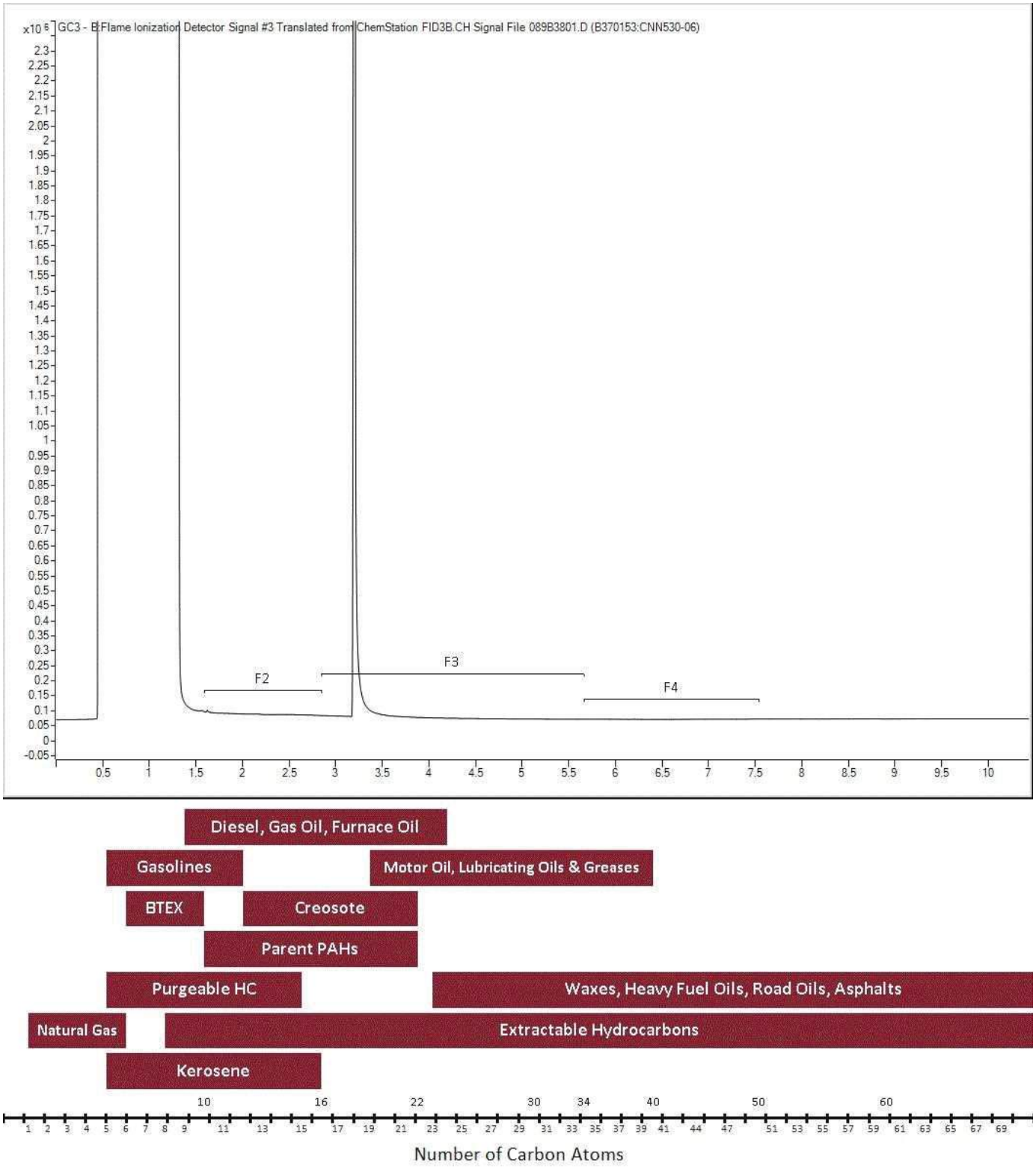




hpchem19\HPchem\1\DATA\2024\05\RUN0516

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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 110773376
Your C.O.C. #: 1 OF 1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/24
Report #: R3504095
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C434265
Received: 2024/05/14, 17:16

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2024/05/21	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2024/05/16	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	1	N/A	2024/05/16		Auto Calc
Cadmium - low level CCME - Dissolved	1	N/A	2024/05/16		Auto Calc
Chloride/Sulphate by Auto Colourimetry	1	N/A	2024/05/15	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	1	2024/05/15	2024/05/16	AB SOP-00089	SM 24 9223 A,B m
Heterotrophic Plate Count Quant	1	2024/05/15	2024/05/17	CAL SOP-00012	SM 24 9215 A, E m
Total Coliforms and E.Coli	1	2024/05/15	2024/05/16	AB SOP-00089	SM 24 9223 A,B m
Carbon (DOC) -Lab Filtered (1)	1	N/A	2024/05/21	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	1	N/A	2024/05/21	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	1	2024/05/15	2024/05/16	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	1	N/A	2024/05/16		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	1	2024/05/16	2024/05/16	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	1	2024/05/16	2024/05/16	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (3)	1	N/A	2024/05/16	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	1	N/A	2024/05/16	AB SOP-00043	EPA 6020b R2 m
Ion Balance	1	N/A	2024/05/22		Auto Calc
Sum of cations, anions	1	N/A	2024/05/16		Auto Calc
Ammonia-N (Total)	1	N/A	2024/05/15	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	1	N/A	2024/05/16		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	1	N/A	2024/05/15	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	1	2024/05/14	2024/05/16		Auto Calc
pH @25°C (5)	1	N/A	2024/05/21	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (6)	1	N/A	2024/05/15	AB SOP-00025	SM 24 4500-P A,F m
Total Dissolved Solids (Calculated)	1	N/A	2024/05/22		Auto Calc
Total Kjeldahl Nitrogen (Total)	1	N/A	2024/05/22	BBY WI-00033	Auto Calc
Nitrogen (Total)	1	2024/05/21	2024/05/22	AB SOP-00093	SM 24 4500-N C m
Total Phosphorus-Dissolved-Lab Filtered (7)	1	2024/05/17	2024/05/17	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau

Your Project #: 110773376
Your C.O.C. #: 1 OF 1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/24
Report #: R3504095
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C434265
Received: 2024/05/14, 17:16

Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(7) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773376
Your C.O.C. #: 1 OF 1

Attention: DYLAN KING

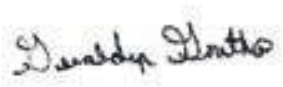
STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/24
Report #: R3504095
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C434265
Received: 2024/05/14, 17:16

Encryption Key



Geraldlyn Gouthro
Key Account Specialist
24 May 2024 09:56:18

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (403) 291-3077

==========

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Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID				CNN532			
Sampling Date				2024/05/14 10:58			
COC Number				1 OF 1			
	UNITS	MAC	AO	SW11-R4-02	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	-	-	<0.10	N/A	0.10	B369366
Volatiles							
Benzene	mg/L	0.005	-	<0.00040	N/A	0.00040	B368705
Toluene	mg/L	0.06	0.024	<0.00040	N/A	0.00040	B368705
Ethylbenzene	mg/L	0.14	0.0016	<0.00040	N/A	0.00040	B368705
m & p-Xylene	mg/L	-	-	<0.00080	N/A	0.00080	B368705
o-Xylene	mg/L	-	-	<0.00040	N/A	0.00040	B368705
Xylenes (Total)	mg/L	0.09	0.02	<0.00089	N/A	0.00089	B369463
F1 (C6-C10) - BTEX	mg/L	-	-	<0.10	N/A	0.10	B369463
F1 (C6-C10)	mg/L	-	-	<0.10	N/A	0.10	B368705
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	-	-	103	N/A	N/A	B368705
4-Bromofluorobenzene (sur.)	%	-	-	102	N/A	N/A	B368705
D4-1,2-Dichloroethane (sur.)	%	-	-	100	N/A	N/A	B368705
O-TERPHENYL (sur.)	%	-	-	104	N/A	N/A	B369366

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID					CNN532			
Sampling Date					2024/05/14 10:58			
COC Number					1 OF 1			
	UNITS	MAC	AO	OG	SW11-R4-02	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	-	-	-	5.2	N/A	N/A	B369301
Cation Sum	meq/L	-	-	-	5.4	N/A	N/A	B369301
Hardness (CaCO3)	mg/L	-	-	-	71	N/A	0.50	B369396
Ion Balance (% Difference)	%	-	-	-	1.8	N/A	N/A	B369300
Nitrate (N)	mg/L	10	-	-	<0.010	N/A	0.010	B369498
Nitrate (NO3)	mg/L	45	-	-	<0.044	N/A	0.044	B370770
Nitrite (NO2)	mg/L	3	-	-	<0.033	N/A	0.033	B370770
Calculated Total Dissolved Solids	mg/L	-	500	-	290	N/A	10	B369304
Elements								
Dissolved Cadmium (Cd)	ug/L	7	-	-	<0.020	N/A	0.020	B369358
Misc. Inorganics								
Conductivity	uS/cm	-	-	-	480	+/- 13	2.0	B375202
pH	pH	-	-	7.0:10.5	8.21	+/- 0.0814	N/A	B375201
Anions								
Alkalinity (PP as CaCO3)	mg/L	-	-	-	<1.0	N/A	1.0	B375198
Alkalinity (Total as CaCO3)	mg/L	-	-	-	190	+/- 14	1.0	B375198
Bicarbonate (HCO3)	mg/L	-	-	-	230	+/- 3.7	1.0	B375198
Carbonate (CO3)	mg/L	-	-	-	<1.0	N/A	1.0	B375198
Hydroxide (OH)	mg/L	-	-	-	<1.0	N/A	1.0	B375198
Chloride (Cl)	mg/L	-	250	-	4.8	+/- 1.2	1.0	B370651
Sulphate (SO4)	mg/L	-	500	-	62	+/- 4.3	1.0	B370651
Nutrients								
Nitrite (N)	mg/L	1	-	-	<0.010	N/A	0.010	B370518
Nitrate plus Nitrite (N)	mg/L	-	-	-	<0.010	N/A	0.010	B370518
Lab Filtered Elements								
Dissolved Aluminum (Al)	mg/L	2.9	-	0.1	<0.0030	N/A	0.0030	B371092
Dissolved Antimony (Sb)	mg/L	0.006	-	-	<0.00060	N/A	0.00060	B371092
Dissolved Arsenic (As)	mg/L	0.01	-	-	<0.00020	N/A	0.00020	B371092
Dissolved Barium (Ba)	mg/L	2	-	-	0.078	+/- <RDL	0.010	B371201
Dissolved Beryllium (Be)	mg/L	-	-	-	<0.0010	N/A	0.0010	B371092
Dissolved Boron (B)	mg/L	5	-	-	0.029	+/- <RDL	0.020	B371201

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID					CNN532			
Sampling Date					2024/05/14 10:58			
COC Number					1 OF 1			
	UNITS	MAC	AO	OG	SW11-R4-02	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	-	-	-	19	+/- 1.9	0.30	B371201
Dissolved Chromium (Cr)	mg/L	0.05	-	-	<0.0010	N/A	0.0010	B371092
Dissolved Cobalt (Co)	mg/L	-	-	-	<0.00030	N/A	0.00030	B371092
Dissolved Copper (Cu)	mg/L	2.0	1.0	-	<0.0010	N/A	0.0010	B371092
Dissolved Iron (Fe)	mg/L	-	0.3	-	<0.060	N/A	0.060	B371201
Dissolved Lead (Pb)	mg/L	0.005	-	-	0.00020	+/- <RDL	0.00020	B371092
Dissolved Lithium (Li)	mg/L	-	-	-	<0.020	N/A	0.020	B371201
Dissolved Magnesium (Mg)	mg/L	-	-	-	6.0	+/- 0.39	0.20	B371201
Dissolved Manganese (Mn)	mg/L	0.12	0.02	-	**0.057**	+/- 0.0041	0.0040	B371201
Dissolved Molybdenum (Mo)	mg/L	-	-	-	0.0017	+/- 0.00049	0.00020	B371092
Dissolved Nickel (Ni)	mg/L	-	-	-	<0.00050	N/A	0.00050	B371092
Dissolved Phosphorus (P)	mg/L	-	-	-	<0.10	N/A	0.10	B371201
Dissolved Potassium (K)	mg/L	-	-	-	0.92	+/- <RDL	0.30	B371201
Dissolved Selenium (Se)	mg/L	0.05	-	-	<0.00020	N/A	0.00020	B371092
Dissolved Silicon (Si)	mg/L	-	-	-	3.7	+/- 0.70	0.50	B371201
Dissolved Silver (Ag)	mg/L	-	-	-	<0.00010	N/A	0.00010	B371092
Dissolved Sodium (Na)	mg/L	-	200	-	90	+/- 8.8	0.50	B371201
Dissolved Strontium (Sr)	mg/L	7	-	-	0.38	+/- 0.037	0.020	B371201
Dissolved Sulphur (S)	mg/L	-	-	-	19	+/- 1.3	0.20	B371201
Dissolved Thallium (Tl)	mg/L	-	-	-	<0.00020	N/A	0.00020	B371092
Dissolved Tin (Sn)	mg/L	-	-	-	<0.0010	N/A	0.0010	B371092
Dissolved Titanium (Ti)	mg/L	-	-	-	<0.0010	N/A	0.0010	B371092
Dissolved Uranium (U)	mg/L	0.02	-	-	<0.00010	N/A	0.00010	B371092
Dissolved Vanadium (V)	mg/L	-	-	-	<0.0010	N/A	0.0010	B371092
Dissolved Zinc (Zn)	mg/L	-	5.0	-	0.028	+/- <RDL	0.0030	B371092

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
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TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CNN532		CNN532			
Sampling Date		2024/05/14 10:58		2024/05/14 10:58			
COC Number		1 OF 1		1 OF 1			
	UNITS	SW11-R4-02	MU	SW11-R4-02 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters							
Total Kjeldahl Nitrogen (Calc)	mg/L	0.268	N/A	N/A	N/A	0.020	B370777
Nutrients							
Total Nitrogen (N)	mg/L	0.27	+/- 0.054	0.28	+/- 0.055	0.020	B374322

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID			CNN532		CNN532			
Sampling Date			2024/05/14 10:58		2024/05/14 10:58			
COC Number			1 OF 1		1 OF 1			
	UNITS	MAC	SW11-R4-02	MU	SW11-R4-02 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Inorganics								
Dissolved Organic Carbon (C)	mg/L	-	<0.50	N/A	N/A	N/A	0.50	B374849
Microbiological Param.								
E.Coli DST	MPN/100mL	1	<1.0	N/A	N/A	N/A	1.0	B370388
Fecal Coliforms	MPN/100mL	-	<1.0	N/A	N/A	N/A	1.0	B370045
Heterotrophic DST	MPN/100mL	-	1000	N/A	N/A	N/A	1.0	B369810
Total Coliforms DST	MPN/100mL	1	<1.0	N/A	N/A	N/A	1.0	B370388
Nutrients								
Total Ammonia (N)	mg/L	-	0.19	+/- 0.024	N/A	N/A	0.015	B370017
Orthophosphate (P)	mg/L	-	0.0032	+/- 0.0034	N/A	N/A	0.0030	B370747
Lab Filtered Nutrients								
Dissolved Phosphorus (P)	mg/L	-	<0.0030 (1)	N/A	<0.0030	N/A	0.0030	B372850

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID			CNN532			
Sampling Date			2024/05/14 10:58			
COC Number			1 OF 1			
	UNITS	MAC	SW11-R4-02	MU	RDL	QC Batch
Elements						
Total Mercury (Hg)	ug/L	1	<0.0019	N/A	0.0019	B371002
Lab Filtered Elements						
Dissolved Mercury (Hg)	ug/L	1	<0.0019	N/A	0.0019	B369667

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	9.0°C

Version 2: CDWG criteria included
MAC,AO,OG: The guidelines that have been included in this report have been taken from the Canadian Drinking Water Quality Summary Table, September 2022.

Criteria A = Maximum Acceptable Concentration (MAC) / Criteria B = Aesthetic Objectives (AO) / Criteria C = Operational Guidance Values (OG)
It is recommended to consult these guidelines when interpreting your data since there are non-numerical guidelines that are not included on this report.

Turbidity Guidelines:
1. Chemically assisted filtration: less than or equal to 0.3 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 1.0 NTU at any time.
2. Slow sand / diatomaceous earth filtration: less than or equal to 1.0 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 3.0 NTU at any time.
3. Membrane filtration: less than or equal to 0.1 NTU in 99% of the measurements made or at least 99% of the time each calendar month. Shall not exceed 0.3 NTU at any time.
4. To ensure effectiveness of disinfection and for good operation of the distribution system, it is recommended that water entering the distribution system have turbidity levels of 1.0 NTU or less.
Measurement of Uncertainty has not been accounted for when stating conformity to the selected criteria, where applicable.
The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B368705	SNA	Matrix Spike	1,4-Difluorobenzene (sur.)	2024/05/14		104	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/14		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/14		97	%	50 - 140
			Benzene	2024/05/14		89	%	50 - 140
			Toluene	2024/05/14		85	%	50 - 140
			Ethylbenzene	2024/05/14		89	%	50 - 140
			m & p-Xylene	2024/05/14		85	%	50 - 140
			o-Xylene	2024/05/14		86	%	50 - 140
			F1 (C6-C10)	2024/05/14		97	%	60 - 140
B368705	SNA	Spiked Blank	1,4-Difluorobenzene (sur.)	2024/05/14		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/14		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/14		94	%	50 - 140
			Benzene	2024/05/14		87	%	60 - 130
			Toluene	2024/05/14		85	%	60 - 130
			Ethylbenzene	2024/05/14		90	%	60 - 130
			m & p-Xylene	2024/05/14		86	%	60 - 130
			o-Xylene	2024/05/14		86	%	60 - 130
			F1 (C6-C10)	2024/05/14		101	%	60 - 140
B368705	SNA	Method Blank	1,4-Difluorobenzene (sur.)	2024/05/14		106	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/14		101	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/14		92	%	50 - 140
			Benzene	2024/05/14	<0.00040		mg/L	
			Toluene	2024/05/14	<0.00040		mg/L	
			Ethylbenzene	2024/05/14	<0.00040		mg/L	
			m & p-Xylene	2024/05/14	<0.00080		mg/L	
			o-Xylene	2024/05/14	<0.00040		mg/L	
			F1 (C6-C10)	2024/05/14	<0.10		mg/L	
B368705	SNA	RPD	Benzene	2024/05/14	NC		%	30
			Toluene	2024/05/14	NC		%	30
			Ethylbenzene	2024/05/14	NC		%	30
			m & p-Xylene	2024/05/14	NC		%	30
			o-Xylene	2024/05/14	NC		%	30
			F1 (C6-C10)	2024/05/14	NC		%	30
B369366	BQU	Matrix Spike	O-TERPHENYL (sur.)	2024/05/15		109	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/15		104	%	60 - 140
B369366	BQU	Spiked Blank	O-TERPHENYL (sur.)	2024/05/15		113	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/15		105	%	60 - 140
B369366	BQU	Method Blank	O-TERPHENYL (sur.)	2024/05/15		108	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/15	<0.10		mg/L	
B369366	BQU	RPD	F2 (C10-C16 Hydrocarbons)	2024/05/15	NC		%	30
B369667	KHU	Matrix Spike	Dissolved Mercury (Hg)	2024/05/16		91	%	80 - 120
B369667	KHU	Spiked Blank	Dissolved Mercury (Hg)	2024/05/16		99	%	80 - 120
B369667	KHU	Method Blank	Dissolved Mercury (Hg)	2024/05/16	<0.0019		ug/L	
B369667	KHU	RPD	Dissolved Mercury (Hg)	2024/05/16	5.4		%	20
B369810	YYL	Method Blank	Heterotrophic DST	2024/05/17	<1.0		mpn/100mL	
B369810	YYL	RPD	Heterotrophic DST	2024/05/17	NC		%	N/A
B370017	CTU	Matrix Spike	Total Ammonia (N)	2024/05/15		104	%	80 - 120
B370017	CTU	Spiked Blank	Total Ammonia (N)	2024/05/15		103	%	80 - 120
B370017	CTU	Method Blank	Total Ammonia (N)	2024/05/15	<0.015		mg/L	
B370017	CTU	RPD	Total Ammonia (N)	2024/05/15	4.7		%	20
B370045	YYL	Method Blank	Fecal Coliforms	2024/05/16	<1.0		MPN/100mL	
B370045	YYL	RPD	Fecal Coliforms	2024/05/16	0 (1)		%	N/A
B370388	YYL	Method Blank	E.Coli DST	2024/05/16	<1.0		mpn/100mL	
			Total Coliforms DST	2024/05/16	<1.0		mpn/100mL	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B370388	YYL	RPD	E.Coli DST	2024/05/16	NC		%	N/A
			Total Coliforms DST	2024/05/16	1.6		%	N/A
B370518	CTU	Matrix Spike	Nitrite (N)	2024/05/16		98	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/16		NC	%	80 - 120
B370518	CTU	Spiked Blank	Nitrite (N)	2024/05/15		99	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/15		102	%	80 - 120
B370518	CTU	Method Blank	Nitrite (N)	2024/05/15	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/15	<0.010		mg/L	
B370518	CTU	RPD	Nitrite (N)	2024/05/15	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/15	1.9		%	20
B370651	TOR	Matrix Spike	Chloride (Cl)	2024/05/15		103	%	80 - 120
			Sulphate (SO4)	2024/05/15		NC	%	80 - 120
B370651	TOR	Spiked Blank	Chloride (Cl)	2024/05/15		105	%	80 - 120
			Sulphate (SO4)	2024/05/15		104	%	80 - 120
B370651	TOR	Method Blank	Chloride (Cl)	2024/05/15	<1.0		mg/L	
			Sulphate (SO4)	2024/05/15	<1.0		mg/L	
B370651	TOR	RPD	Chloride (Cl)	2024/05/15	0.28		%	20
			Sulphate (SO4)	2024/05/15	2.3		%	20
B370747	MAP	Matrix Spike	Orthophosphate (P)	2024/05/15		94	%	80 - 120
B370747	MAP	Spiked Blank	Orthophosphate (P)	2024/05/15		97	%	80 - 120
B370747	MAP	Method Blank	Orthophosphate (P)	2024/05/15	<0.0030		mg/L	
B370747	MAP	RPD	Orthophosphate (P)	2024/05/15	0.63		%	20
B371002	KHU	Matrix Spike [CNN532-08]	Total Mercury (Hg)	2024/05/16		96	%	80 - 120
B371002	KHU	Spiked Blank	Total Mercury (Hg)	2024/05/16		97	%	80 - 120
B371002	KHU	Method Blank	Total Mercury (Hg)	2024/05/16	<0.0019		ug/L	
B371002	KHU	RPD	Total Mercury (Hg)	2024/05/16	NC		%	20
B371092	JAB	Matrix Spike	Dissolved Aluminum (Al)	2024/05/16		100	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/16		98	%	80 - 120
			Dissolved Arsenic (As)	2024/05/16		95	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/16		95	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/16		93	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/16		91	%	80 - 120
			Dissolved Copper (Cu)	2024/05/16		91	%	80 - 120
			Dissolved Lead (Pb)	2024/05/16		90	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/16		98	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/16		92	%	80 - 120
			Dissolved Selenium (Se)	2024/05/16		100	%	80 - 120
			Dissolved Silver (Ag)	2024/05/16		94	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/16		89	%	80 - 120
			Dissolved Tin (Sn)	2024/05/16		99	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/16		95	%	80 - 120
			Dissolved Uranium (U)	2024/05/16		89	%	80 - 120
			Dissolved Vanadium (V)	2024/05/16		95	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/16		91	%	80 - 120
B371092	JAB	Spiked Blank	Dissolved Aluminum (Al)	2024/05/16		117	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/16		103	%	80 - 120
			Dissolved Arsenic (As)	2024/05/16		94	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/16		96	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/16		98	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/16		99	%	80 - 120
			Dissolved Copper (Cu)	2024/05/16		98	%	80 - 120
			Dissolved Lead (Pb)	2024/05/16		96	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/16		101	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Nickel (Ni)	2024/05/16		99	%	80 - 120
			Dissolved Selenium (Se)	2024/05/16		96	%	80 - 120
			Dissolved Silver (Ag)	2024/05/16		99	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/16		93	%	80 - 120
			Dissolved Tin (Sn)	2024/05/16		98	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/16		99	%	80 - 120
			Dissolved Uranium (U)	2024/05/16		93	%	80 - 120
			Dissolved Vanadium (V)	2024/05/16		99	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/16		96	%	80 - 120
B371092	JAB	Method Blank	Dissolved Aluminum (Al)	2024/05/16	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2024/05/16	<0.00060		mg/L	
			Dissolved Arsenic (As)	2024/05/16	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2024/05/16	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2024/05/16	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2024/05/16	<0.00030		mg/L	
			Dissolved Copper (Cu)	2024/05/16	<0.0010		mg/L	
			Dissolved Lead (Pb)	2024/05/16	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2024/05/16	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2024/05/16	<0.00050		mg/L	
			Dissolved Selenium (Se)	2024/05/16	<0.00020		mg/L	
			Dissolved Silver (Ag)	2024/05/16	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2024/05/16	<0.00020		mg/L	
			Dissolved Tin (Sn)	2024/05/16	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2024/05/16	<0.0010		mg/L	
			Dissolved Uranium (U)	2024/05/16	<0.00010		mg/L	
			Dissolved Vanadium (V)	2024/05/16	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2024/05/16	<0.0030		mg/L	
B371092	JAB	RPD	Dissolved Aluminum (Al)	2024/05/16	NC		%	20
			Dissolved Antimony (Sb)	2024/05/16	NC		%	20
			Dissolved Arsenic (As)	2024/05/16	NC		%	20
			Dissolved Beryllium (Be)	2024/05/16	NC		%	20
			Dissolved Chromium (Cr)	2024/05/16	NC		%	20
			Dissolved Cobalt (Co)	2024/05/16	3.6		%	20
			Dissolved Copper (Cu)	2024/05/16	NC		%	20
			Dissolved Lead (Pb)	2024/05/16	NC		%	20
			Dissolved Molybdenum (Mo)	2024/05/16	11		%	20
			Dissolved Nickel (Ni)	2024/05/16	5.8		%	20
			Dissolved Selenium (Se)	2024/05/16	NC		%	20
			Dissolved Silver (Ag)	2024/05/16	NC		%	20
			Dissolved Thallium (Tl)	2024/05/16	NC		%	20
			Dissolved Tin (Sn)	2024/05/16	NC		%	20
			Dissolved Titanium (Ti)	2024/05/16	NC		%	20
			Dissolved Uranium (U)	2024/05/16	2.8		%	20
			Dissolved Vanadium (V)	2024/05/16	NC		%	20
			Dissolved Zinc (Zn)	2024/05/16	11		%	20
B371201	HQV	Matrix Spike	Dissolved Barium (Ba)	2024/05/16		96	%	80 - 120
			Dissolved Boron (B)	2024/05/16		96	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/16		NC	%	80 - 120
			Dissolved Iron (Fe)	2024/05/16		99	%	80 - 120
			Dissolved Lithium (Li)	2024/05/16		95	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/16		98	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/16		93	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/16		102	%	80 - 120
			Dissolved Potassium (K)	2024/05/16		96	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Silicon (Si)	2024/05/16		88	%	80 - 120
			Dissolved Sodium (Na)	2024/05/16		92	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/16		90	%	80 - 120
			Dissolved Sulphur (S)	2024/05/16		99	%	80 - 120
B371201	HQV	Spiked Blank	Dissolved Barium (Ba)	2024/05/16		96	%	80 - 120
			Dissolved Boron (B)	2024/05/16		97	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/16		93	%	80 - 120
			Dissolved Iron (Fe)	2024/05/16		99	%	80 - 120
			Dissolved Lithium (Li)	2024/05/16		93	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/16		95	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/16		98	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/16		100	%	80 - 120
			Dissolved Potassium (K)	2024/05/16		94	%	80 - 120
			Dissolved Silicon (Si)	2024/05/16		92	%	80 - 120
			Dissolved Sodium (Na)	2024/05/16		92	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/16		93	%	80 - 120
			Dissolved Sulphur (S)	2024/05/16		97	%	80 - 120
B371201	HQV	Method Blank	Dissolved Barium (Ba)	2024/05/16	<0.010		mg/L	
			Dissolved Boron (B)	2024/05/16	<0.020		mg/L	
			Dissolved Calcium (Ca)	2024/05/16	<0.30		mg/L	
			Dissolved Iron (Fe)	2024/05/16	<0.060		mg/L	
			Dissolved Lithium (Li)	2024/05/16	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2024/05/16	<0.20		mg/L	
			Dissolved Manganese (Mn)	2024/05/16	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2024/05/16	<0.10		mg/L	
			Dissolved Potassium (K)	2024/05/16	<0.30		mg/L	
			Dissolved Silicon (Si)	2024/05/16	<0.50		mg/L	
			Dissolved Sodium (Na)	2024/05/16	<0.50		mg/L	
			Dissolved Strontium (Sr)	2024/05/16	<0.020		mg/L	
			Dissolved Sulphur (S)	2024/05/16	<0.20		mg/L	
B371201	HQV	RPD	Dissolved Barium (Ba)	2024/05/16	1.7		%	20
			Dissolved Boron (B)	2024/05/16	NC		%	20
			Dissolved Calcium (Ca)	2024/05/16	1.2		%	20
			Dissolved Iron (Fe)	2024/05/16	NC		%	20
			Dissolved Lithium (Li)	2024/05/16	NC		%	20
			Dissolved Magnesium (Mg)	2024/05/16	1.3		%	20
			Dissolved Manganese (Mn)	2024/05/16	2.3		%	20
			Dissolved Phosphorus (P)	2024/05/16	NC		%	20
			Dissolved Potassium (K)	2024/05/16	1.9		%	20
			Dissolved Silicon (Si)	2024/05/16	0.52		%	20
			Dissolved Sodium (Na)	2024/05/16	1.2		%	20
			Dissolved Strontium (Sr)	2024/05/16	0.55		%	20
			Dissolved Sulphur (S)	2024/05/16	0.44		%	20
B372850	MAP	Matrix Spike [CNN532-02]	Dissolved Phosphorus (P)	2024/05/17		99	%	80 - 120
B372850	MAP	QC Standard	Dissolved Phosphorus (P)	2024/05/17		90	%	80 - 120
B372850	MAP	Spiked Blank	Dissolved Phosphorus (P)	2024/05/17		97	%	80 - 120
B372850	MAP	Method Blank	Dissolved Phosphorus (P)	2024/05/17	<0.0030		mg/L	
B372850	MAP	RPD [CNN532-02]	Dissolved Phosphorus (P)	2024/05/17	NC		%	20
B374322	CTU	Matrix Spike [CNN532-04]	Total Nitrogen (N)	2024/05/22		104	%	80 - 120
B374322	CTU	QC Standard	Total Nitrogen (N)	2024/05/22		106	%	80 - 120
B374322	CTU	Spiked Blank	Total Nitrogen (N)	2024/05/22		111	%	80 - 120
B374322	CTU	Method Blank	Total Nitrogen (N)	2024/05/22	<0.020		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B374322	CTU	RPD [CNN532-04]	Total Nitrogen (N)	2024/05/22	3.9		%	20
B374849	JFE	Matrix Spike	Dissolved Organic Carbon (C)	2024/05/21		NC	%	80 - 120
B374849	JFE	Spiked Blank	Dissolved Organic Carbon (C)	2024/05/21		103	%	80 - 120
B374849	JFE	Method Blank	Dissolved Organic Carbon (C)	2024/05/21	<0.50		mg/L	
B374849	JFE	RPD	Dissolved Organic Carbon (C)	2024/05/21	3.6		%	20
B375198	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/21		98	%	80 - 120
B375198	JVM	Method Blank	Alkalinity (PP as CaCO3)	2024/05/21	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/21	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/21	<1.0		mg/L	
			Carbonate (CO3)	2024/05/21	<1.0		mg/L	
			Hydroxide (OH)	2024/05/21	<1.0		mg/L	
B375198	JVM	RPD	Alkalinity (PP as CaCO3)	2024/05/21	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/21	0.19		%	20
			Bicarbonate (HCO3)	2024/05/21	0.19		%	20
			Carbonate (CO3)	2024/05/21	NC		%	20
			Hydroxide (OH)	2024/05/21	NC		%	20
B375201	JVM	Spiked Blank	pH	2024/05/21		100	%	97 - 103
B375201	JVM	RPD	pH	2024/05/21	0.25		%	N/A
B375202	JVM	Spiked Blank	Conductivity	2024/05/21		100	%	90 - 110
B375202	JVM	Method Blank	Conductivity	2024/05/21	<2.0		uS/cm	
B375202	JVM	RPD	Conductivity	2024/05/21	0.51		%	10

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

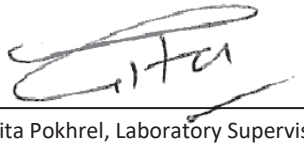
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Detection limit raised due to matrix interference.

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Gita Pokhrel, Laboratory Supervisor



Rahul Suryawanshi, Senior Analyst



Sandy Yuan, M.Sc., QP, Scientific Specialist



Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist



Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

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- [ ] Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

Page 1 of 1

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Project Information	
Company:	Stantec	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	10220 103 Ave NW # 300	Street Address:		Project #:	110773396
City: Edmonton	Prov: AB Postal Code: T5J 3K4	City:	Prov: Postal Code:	Site #:	
Phone:	780 969 2223	Phone:		Site Location:	
Email:	dylan.king@stantec.com	Email:		Site Location Province:	AB
Copies:		Copies:		Sampled By:	WT / TH

C434265

LAB USE ONLY - PLACE STICKER HERE

Rush Confirmation #:

Regulatory Criteria

- [ ] AT1
- [ ] CCME
- [ ] Drinking Water - Canada
- [ ] Drinking Water - Manitoba
- [ ] Saskatchewan
- [x] Drinking Water - Alberta
- [ ] Other

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)
- [x] 5 to 7 Day
- [ ] 10 Day

Rush Turnaround Time (TAT) Surcharges apply
- [ ] Same Day
- [ ] 1 Day
- [ ] 2 Day
- [ ] 3 Day
- [ ] 4 Day

Date Required: YY MM DD

Comments

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F1-F2	7 BTEX F3-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 ~~Salinity~~ TKN	14 ~~SAR~~ DOC	15 Texture (% sand, silt, clay)	16 Basic class II landfill	17 Dissolved Phosphorus	18 Phosphate	19 Ammonia	20 Bacteriological	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE
1	SW11-R4-02	24	05	14	10	58	Water						X		X		X	X	X	X	X			X	X	X	X	11	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

MCAL-2024-05-831

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR [illegible] WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY.

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		✓	9	1	0	8
Seal intact		✓				
Cooling media present	✓					

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present						
Seal intact						
Cooling media present						

LAB USE ONLY	Yes	No	°C	1	2	3	Temperature reading by:
Seal present							
Seal intact							
Cooling media present							

Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special Instructions
1 Taylor Harris	2024	05	14	17	10	1 Jolette Margorie Lauture	2024	05	14	17	16	& Total coliforms, e.coli, fecal coliforms. Heterotrophic plate count
2						2						

Dissolved parameters not field filtered – please lab filter

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CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

Page 1 of 1

C434265

LAB USE ONLY - PLACE STICKER HERE

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Project Information	
Company:	Stantec	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	10220 103 Ave NW # 300	Street Address:		Project #:	110773396
City:	Edmonton Prov: AB Postal Code: T5J 3K4	City:	Prov: Postal Code:	Site #:	
Phone:	780 969 2223	Phone:		Site Location:	
Email:	dylan.king@stantec.com	Email:		Site Location Province:	AB
Copies:		Copies:		Sampled By:	WT / TH

Rush Confirmation #:

Regulatory Criteria

- [ ] AT1
- [ ] CCME
- [ ] Drinking Water - Canada
- [ ] Drinking Water - Manitoba
- [ ] Saskatchewan
- [x] Drinking Water - Alberta
- [ ] Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)
- [x] 5 to 7 Day
- [ ] 10 Day

Rush Turnaround Time (TAT) Surcharges apply
- [ ] Same Day
- [ ] 1 Day
- [ ] 2 Day
- [ ] 3 Day
- [ ] 4 Day

Date Required: YY MM DD

Comments

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F1-F2	7 BTEX F3-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 Salinity	14 Sieve (Sediment)	15 Texture (% sand, silt, clay)	16 Basic class II landfill	17 Dissolved Phosphorus	18 Phosphate	19 Ammonia as N	20 Bacteriological & TKN DOC	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE
1	SW11-R4-02	24	05	14	10	58	Water						X		X		X	X	X	X	X			X	X	X	X	11	
2																													
3																													
4																													
5																													
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MCAL-2024-05-831

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR [illegible] WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		✓	9	1	0	8
Seal intact		✓				
Cooling media present	✓					

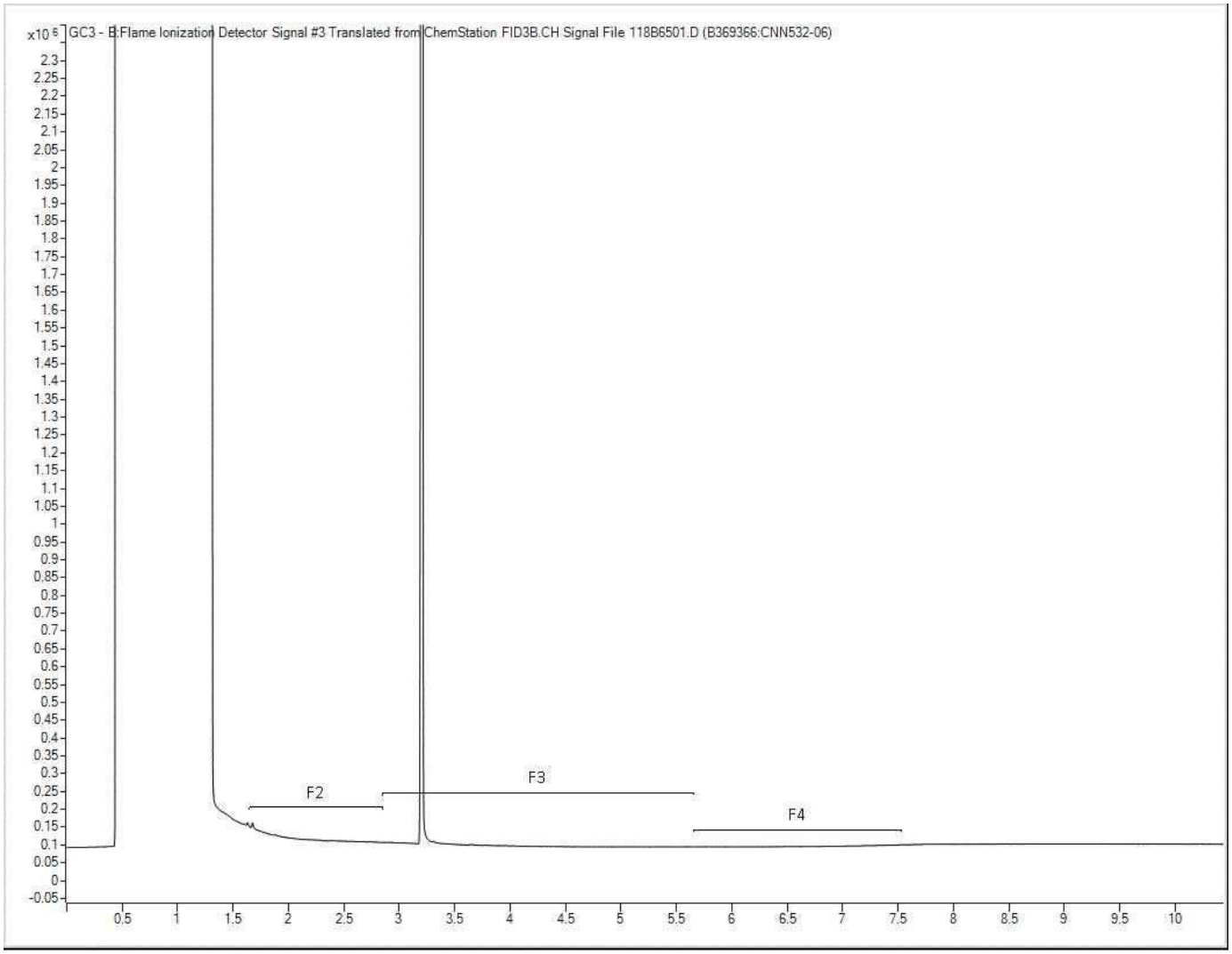
LAB USE ONLY	Yes	No	°C	1	2	3
Seal present						
Seal intact						
Cooling media present						

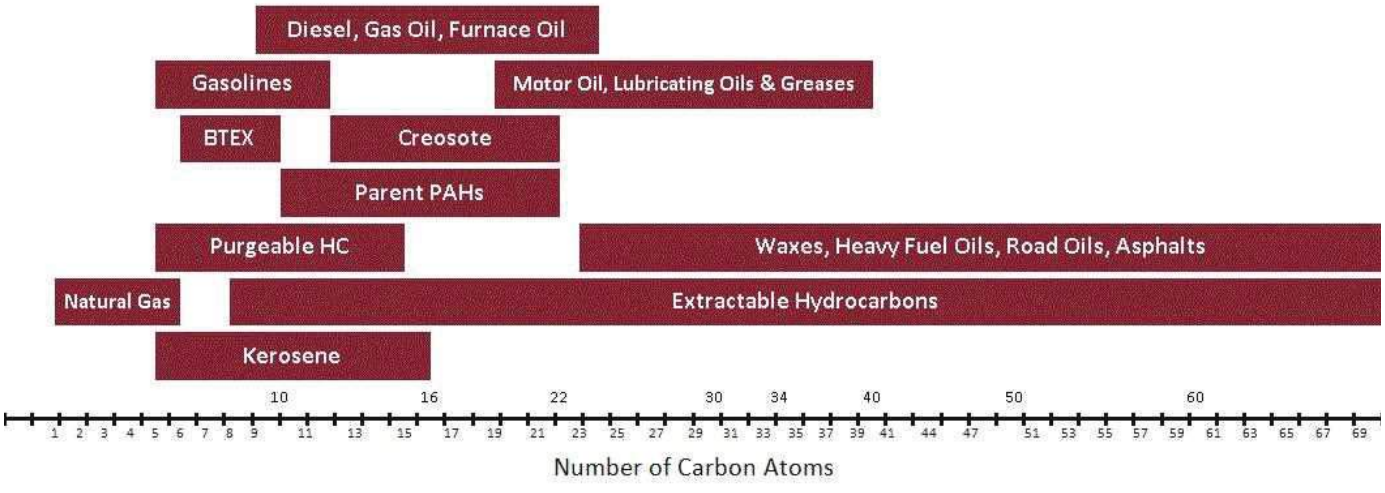
LAB USE ONLY	Yes	No	°C	1	2	3	Temperature reading by:
Seal present							
Seal intact							
Cooling media present							

Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special Instructions
1 Taylor Harris	2024	05	14	17	10	1 [illegible] Margorie Lauder	2024	05	14	17	16	& Total coliforms, e.coli, fecal coliforms. Heterotrophic plate count
2						2						

Dissolved parameters not field filtered – please lab filter

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





hpchem13\HPchem\1\DATA\2024\05\RUN0515

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 110773396
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/24
Report #: R3504096
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C434266
Received: 2024/05/14, 17:16

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2024/05/21	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2024/05/16	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	1	N/A	2024/05/16		Auto Calc
Cadmium - low level CCME - Dissolved	1	N/A	2024/05/16		Auto Calc
Chloride/Sulphate by Auto Colourimetry	1	N/A	2024/05/15	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	1	2024/05/15	2024/05/16	AB SOP-00089	SM 24 9223 A,B m
Heterotrophic Plate Count Quant	1	2024/05/15	2024/05/17	CAL SOP-00012	SM 24 9215 A, E m
Total Coliforms and E.Coli	1	2024/05/15	2024/05/16	AB SOP-00089	SM 24 9223 A,B m
Carbon (DOC) -Lab Filtered (1)	1	N/A	2024/05/21	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	1	N/A	2024/05/21	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	1	2024/05/15	2024/05/16	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	1	N/A	2024/05/16		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	1	2024/05/16	2024/05/16	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	1	2024/05/16	2024/05/16	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (3)	1	N/A	2024/05/16	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	1	N/A	2024/05/16	AB SOP-00043	EPA 6020b R2 m
Ion Balance	1	N/A	2024/05/22		Auto Calc
Sum of cations, anions	1	N/A	2024/05/16		Auto Calc
Ammonia-N (Total)	1	N/A	2024/05/15	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	1	N/A	2024/05/16		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	1	N/A	2024/05/15	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	1	2024/05/14	2024/05/16		Auto Calc
pH @25°C (5)	1	N/A	2024/05/21	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (6)	1	N/A	2024/05/15	AB SOP-00025	SM 24 4500-P A,F m
Total Dissolved Solids (Calculated)	1	N/A	2024/05/22		Auto Calc
Total Kjeldahl Nitrogen (Total)	1	N/A	2024/05/22	BBY WI-00033	Auto Calc
Nitrogen (Total)	1	2024/05/21	2024/05/22	AB SOP-00093	SM 24 4500-N C m
Total Phosphorus-Dissolved-Lab Filtered (7)	1	2024/05/17	2024/05/17	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau

Your Project #: 110773396
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/24
Report #: R3504096
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C434266
Received: 2024/05/14, 17:16

Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(7) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Your C.O.C. #: 1/1

Attention: DYLAN KING

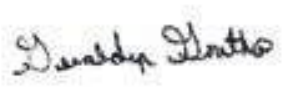
STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/24
Report #: R3504096
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C434266
Received: 2024/05/14, 17:16

Encryption Key



Geraldlyn Gouthro
Key Account Specialist
24 May 2024 09:57:31

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (403) 291-3077

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID				CNN533			
Sampling Date				2024/05/14 12:47			
COC Number				1/1			
	UNITS	MAC	AO	W551-01	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	-	-	<0.10	N/A	0.10	B369366
Volatiles							
Benzene	mg/L	0.005	-	<0.00040	N/A	0.00040	B368705
Toluene	mg/L	0.06	0.024	<0.00040	N/A	0.00040	B368705
Ethylbenzene	mg/L	0.14	0.0016	<0.00040	N/A	0.00040	B368705
m & p-Xylene	mg/L	-	-	<0.00080	N/A	0.00080	B368705
o-Xylene	mg/L	-	-	<0.00040	N/A	0.00040	B368705
Xylenes (Total)	mg/L	0.09	0.02	<0.00089	N/A	0.00089	B369463
F1 (C6-C10) - BTEX	mg/L	-	-	<0.10	N/A	0.10	B369463
F1 (C6-C10)	mg/L	-	-	<0.10	N/A	0.10	B368705
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	-	-	105	N/A	N/A	B368705
4-Bromofluorobenzene (sur.)	%	-	-	103	N/A	N/A	B368705
D4-1,2-Dichloroethane (sur.)	%	-	-	103	N/A	N/A	B368705
O-TERPHENYL (sur.)	%	-	-	104	N/A	N/A	B369366

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID					CNN533		CNN533			
Sampling Date					2024/05/14 12:47		2024/05/14 12:47			
COC Number					1/1		1/1			
	UNITS	MAC	AO	OG	W551-01	MU	W551-01 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	-	-	-	9.0	N/A	N/A	N/A	N/A	B369301
Cation Sum	meq/L	-	-	-	9.0	N/A	N/A	N/A	N/A	B369301
Hardness (CaCO3)	mg/L	-	-	-	190	N/A	N/A	N/A	0.50	B369396
Ion Balance (% Difference)	%	-	-	-	0.0070	N/A	N/A	N/A	N/A	B369300
Nitrate (N)	mg/L	10	-	-	<0.010	N/A	N/A	N/A	0.010	B369498
Nitrate (NO3)	mg/L	45	-	-	<0.044	N/A	N/A	N/A	0.044	B370770
Nitrite (NO2)	mg/L	3	-	-	<0.033	N/A	N/A	N/A	0.033	B370770
Calculated Total Dissolved Solids	mg/L	-	500	-	**520**	N/A	N/A	N/A	10	B369304
Elements										
Dissolved Cadmium (Cd)	ug/L	7	-	-	<0.020	N/A	N/A	N/A	0.020	B369358
Misc. Inorganics										
Conductivity	uS/cm	-	-	-	790	+/- 21	790	+/- 21	2.0	B375202
pH	pH	-	-	7.0:10.5	7.91	+/- 0.0784	7.90	+/- 0.0782	N/A	B375201
Anions										
Alkalinity (PP as CaCO3)	mg/L	-	-	-	<1.0	N/A	<1.0	N/A	1.0	B375198
Alkalinity (Total as CaCO3)	mg/L	-	-	-	300	+/- 22	300	+/- 22	1.0	B375198
Bicarbonate (HCO3)	mg/L	-	-	-	370	+/- 5.7	370	+/- 5.8	1.0	B375198
Carbonate (CO3)	mg/L	-	-	-	<1.0	N/A	<1.0	N/A	1.0	B375198
Hydroxide (OH)	mg/L	-	-	-	<1.0	N/A	<1.0	N/A	1.0	B375198
Chloride (Cl)	mg/L	-	250	-	<1.0	N/A	N/A	N/A	1.0	B370651
Sulphate (SO4)	mg/L	-	500	-	140	+/- 9.4	N/A	N/A	5.0	B370651
Nutrients										
Nitrite (N)	mg/L	1	-	-	<0.010	N/A	N/A	N/A	0.010	B370518
Nitrate plus Nitrite (N)	mg/L	-	-	-	<0.010	N/A	N/A	N/A	0.010	B370518
Lab Filtered Elements										
Dissolved Aluminum (Al)	mg/L	2.9	-	0.1	<0.0030	N/A	N/A	N/A	0.0030	B371092
Dissolved Antimony (Sb)	mg/L	0.006	-	-	<0.00060	N/A	N/A	N/A	0.00060	B371092
Dissolved Arsenic (As)	mg/L	0.01	-	-	0.00070	+/- <RDL	N/A	N/A	0.00020	B371092
Dissolved Barium (Ba)	mg/L	2	-	-	0.015	+/- <RDL	N/A	N/A	0.010	B371201
Dissolved Beryllium (Be)	mg/L	-	-	-	<0.0010	N/A	N/A	N/A	0.0010	B371092

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID					CNN533		CNN533			
Sampling Date					2024/05/14 12:47		2024/05/14 12:47			
COC Number					1/1		1/1			
	UNITS	MAC	AO	OG	W551-01	MU	W551-01 Lab-Dup	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	5	-	-	0.095	+/- <RDL	N/A	N/A	0.020	B371201
Dissolved Calcium (Ca)	mg/L	-	-	-	57	+/- 5.7	N/A	N/A	0.30	B371201
Dissolved Chromium (Cr)	mg/L	0.05	-	-	<0.0010	N/A	N/A	N/A	0.0010	B371092
Dissolved Cobalt (Co)	mg/L	-	-	-	<0.00030	N/A	N/A	N/A	0.00030	B371092
Dissolved Copper (Cu)	mg/L	2.0	1.0	-	<0.0010	N/A	N/A	N/A	0.0010	B371092
Dissolved Iron (Fe)	mg/L	-	0.3	-	<0.060	N/A	N/A	N/A	0.060	B371201
Dissolved Lead (Pb)	mg/L	0.005	-	-	<0.00020	N/A	N/A	N/A	0.00020	B371092
Dissolved Lithium (Li)	mg/L	-	-	-	0.024	+/- <RDL	N/A	N/A	0.020	B371201
Dissolved Magnesium (Mg)	mg/L	-	-	-	11	+/- 0.69	N/A	N/A	0.20	B371201
Dissolved Manganese (Mn)	mg/L	0.12	0.02	-	**0.14**	+/- 0.0099	N/A	N/A	0.0040	B371201
Dissolved Molybdenum (Mo)	mg/L	-	-	-	0.0052	+/- 0.0013	N/A	N/A	0.00020	B371092
Dissolved Nickel (Ni)	mg/L	-	-	-	<0.00050	N/A	N/A	N/A	0.00050	B371092
Dissolved Phosphorus (P)	mg/L	-	-	-	<0.10	N/A	N/A	N/A	0.10	B371201
Dissolved Potassium (K)	mg/L	-	-	-	1.1	+/- <RDL	N/A	N/A	0.30	B371201
Dissolved Selenium (Se)	mg/L	0.05	-	-	<0.00020	N/A	N/A	N/A	0.00020	B371092
Dissolved Silicon (Si)	mg/L	-	-	-	4.8	+/- 0.92	N/A	N/A	0.50	B371201
Dissolved Silver (Ag)	mg/L	-	-	-	<0.00010	N/A	N/A	N/A	0.00010	B371092
Dissolved Sodium (Na)	mg/L	-	200	-	120	+/- 12	N/A	N/A	0.50	B371201
Dissolved Strontium (Sr)	mg/L	7	-	-	0.52	+/- 0.051	N/A	N/A	0.020	B371201
Dissolved Sulphur (S)	mg/L	-	-	-	42	+/- 2.8	N/A	N/A	0.20	B371201
Dissolved Thallium (Tl)	mg/L	-	-	-	<0.00020	N/A	N/A	N/A	0.00020	B371092
Dissolved Tin (Sn)	mg/L	-	-	-	<0.0010	N/A	N/A	N/A	0.0010	B371092
Dissolved Titanium (Ti)	mg/L	-	-	-	<0.0010	N/A	N/A	N/A	0.0010	B371092
Dissolved Uranium (U)	mg/L	0.02	-	-	0.00015	+/- <RDL	N/A	N/A	0.00010	B371092
Dissolved Vanadium (V)	mg/L	-	-	-	<0.0010	N/A	N/A	N/A	0.0010	B371092
Dissolved Zinc (Zn)	mg/L	-	5.0	-	<0.0030	N/A	N/A	N/A	0.0030	B371092

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CNN533			
Sampling Date		2024/05/14 12:47			
COC Number		1/1			
	UNITS	**W551-01**	**MU**	**RDL**	**QC Batch**
Calculated Parameters					
Total Kjeldahl Nitrogen (Calc)	mg/L	0.388	N/A	0.020	B370777
Nutrients					
Total Nitrogen (N)	mg/L	0.39	+/- 0.069	0.020	B374322

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C434266
Report Date: 2024/05/24

STANTEC CONSULTING LTD
Client Project #: 110773396
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID			CNN533		CNN533			
Sampling Date			2024/05/14 12:47		2024/05/14 12:47			
COC Number			1/1		1/1			
	UNITS	**MAC**	**W551-01**	**MU**	**W551-01 Lab-Dup**	**MU**	**RDL**	**QC Batch**
Lab Filtered Inorganics								
Dissolved Organic Carbon (C)	mg/L	-	1.1	+/- <RDL	N/A	N/A	0.50	B374849
Microbiological Param.								
E.Coli DST	MPN/100mL	1	<1.0	N/A	N/A	N/A	1.0	B370388
Fecal Coliforms	MPN/100mL	-	<1.0	N/A	N/A	N/A	1.0	B370045
Heterotrophic DST	MPN/100mL	-	85	N/A	N/A	N/A	1.0	B369810
Total Coliforms DST	MPN/100mL	1	<1.0	N/A	N/A	N/A	1.0	B370388
Nutrients								
Total Ammonia (N)	mg/L	-	0.26	+/- 0.031	0.28	+/- 0.032	0.015	B370017
Orthophosphate (P)	mg/L	-	<0.0030	N/A	N/A	N/A	0.0030	B370747
Lab Filtered Nutrients								
Dissolved Phosphorus (P)	mg/L	-	<0.0030	N/A	N/A	N/A	0.0030	B372850

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID			CNN533			
Sampling Date			2024/05/14 12:47			
COC Number			1/1			
	UNITS	**MAC**	**W551-01**	**MU**	**RDL**	**QC Batch**
Elements						
Total Mercury (Hg)	ug/L	1	<0.0019	N/A	0.0019	B371002
Lab Filtered Elements						
Dissolved Mercury (Hg)	ug/L	1	<0.0019	N/A	0.0019	B369667

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	7.7°C

Version 2: CDWG criteria included
MAC,AO,OG: The guidelines that have been included in this report have been taken from the Canadian Drinking Water Quality Summary Table, September 2022.

Criteria A = Maximum Acceptable Concentration (MAC) / Criteria B = Aesthetic Objectives (AO) / Criteria C = Operational Guidance Values (OG)
It is recommended to consult these guidelines when interpreting your data since there are non-numerical guidelines that are not included on this report.

Turbidity Guidelines:
1. Chemically assisted filtration: less than or equal to 0.3 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 1.0 NTU at any time.
2. Slow sand / diatomaceous earth filtration: less than or equal to 1.0 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 3.0 NTU at any time.
3. Membrane filtration: less than or equal to 0.1 NTU in 99% of the measurements made or at least 99% of the time each calendar month. Shall not exceed 0.3 NTU at any time.
4. To ensure effectiveness of disinfection and for good operation of the distribution system, it is recommended that water entering the distribution system have turbidity levels of 1.0 NTU or less.
Measurement of Uncertainty has not been accounted for when stating conformity to the selected criteria, where applicable.
The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B368705	SNA	Matrix Spike	1,4-Difluorobenzene (sur.)	2024/05/14		104	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/14		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/14		97	%	50 - 140
			Benzene	2024/05/14		89	%	50 - 140
			Toluene	2024/05/14		85	%	50 - 140
			Ethylbenzene	2024/05/14		89	%	50 - 140
			m & p-Xylene	2024/05/14		85	%	50 - 140
			o-Xylene	2024/05/14		86	%	50 - 140
			F1 (C6-C10)	2024/05/14		97	%	60 - 140
B368705	SNA	Spiked Blank	1,4-Difluorobenzene (sur.)	2024/05/14		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/14		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/14		94	%	50 - 140
			Benzene	2024/05/14		87	%	60 - 130
			Toluene	2024/05/14		85	%	60 - 130
			Ethylbenzene	2024/05/14		90	%	60 - 130
			m & p-Xylene	2024/05/14		86	%	60 - 130
			o-Xylene	2024/05/14		86	%	60 - 130
			F1 (C6-C10)	2024/05/14		101	%	60 - 140
B368705	SNA	Method Blank	1,4-Difluorobenzene (sur.)	2024/05/14		106	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/14		101	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/14		92	%	50 - 140
			Benzene	2024/05/14	<0.00040		mg/L	
			Toluene	2024/05/14	<0.00040		mg/L	
			Ethylbenzene	2024/05/14	<0.00040		mg/L	
			m & p-Xylene	2024/05/14	<0.00080		mg/L	
			o-Xylene	2024/05/14	<0.00040		mg/L	
			F1 (C6-C10)	2024/05/14	<0.10		mg/L	
B368705	SNA	RPD	Benzene	2024/05/14	NC		%	30
			Toluene	2024/05/14	NC		%	30
			Ethylbenzene	2024/05/14	NC		%	30
			m & p-Xylene	2024/05/14	NC		%	30
			o-Xylene	2024/05/14	NC		%	30
			F1 (C6-C10)	2024/05/14	NC		%	30
B369366	BQU	Matrix Spike	O-TERPHENYL (sur.)	2024/05/15		109	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/15		104	%	60 - 140
B369366	BQU	Spiked Blank	O-TERPHENYL (sur.)	2024/05/15		113	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/15		105	%	60 - 140
B369366	BQU	Method Blank	O-TERPHENYL (sur.)	2024/05/15		108	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/15	<0.10		mg/L	
B369366	BQU	RPD	F2 (C10-C16 Hydrocarbons)	2024/05/15	NC		%	30
B369667	KHU	Matrix Spike	Dissolved Mercury (Hg)	2024/05/16		91	%	80 - 120
B369667	KHU	Spiked Blank	Dissolved Mercury (Hg)	2024/05/16		99	%	80 - 120
B369667	KHU	Method Blank	Dissolved Mercury (Hg)	2024/05/16	<0.0019		ug/L	
B369667	KHU	RPD	Dissolved Mercury (Hg)	2024/05/16	5.4		%	20
B369810	YYL	Method Blank	Heterotrophic DST	2024/05/17	<1.0		mpn/100mL	
B369810	YYL	RPD	Heterotrophic DST	2024/05/17	NC		%	N/A
B370017	CTU	Matrix Spike [CNN533-09]	Total Ammonia (N)	2024/05/15		104	%	80 - 120
B370017	CTU	Spiked Blank	Total Ammonia (N)	2024/05/15		103	%	80 - 120
B370017	CTU	Method Blank	Total Ammonia (N)	2024/05/15	<0.015		mg/L	
B370017	CTU	RPD [CNN533-09]	Total Ammonia (N)	2024/05/15	4.7		%	20
B370045	YYL	Method Blank	Fecal Coliforms	2024/05/16	<1.0		MPN/100mL	
B370045	YYL	RPD	Fecal Coliforms	2024/05/16	0 (1)		%	N/A
B370388	YYL	Method Blank	E.Coli DST	2024/05/16	<1.0		mpn/100mL	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Coliforms DST	2024/05/16	<1.0		mpn/100mL	
B370388	YYL	RPD	E.Coli DST	2024/05/16	NC		%	N/A
			Total Coliforms DST	2024/05/16	1.6		%	N/A
B370518	CTU	Matrix Spike	Nitrite (N)	2024/05/16		98	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/16		NC	%	80 - 120
B370518	CTU	Spiked Blank	Nitrite (N)	2024/05/15		99	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/15		102	%	80 - 120
B370518	CTU	Method Blank	Nitrite (N)	2024/05/15	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/15	<0.010		mg/L	
B370518	CTU	RPD	Nitrite (N)	2024/05/15	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/15	1.9		%	20
B370651	TOR	Matrix Spike	Chloride (Cl)	2024/05/15		103	%	80 - 120
			Sulphate (SO4)	2024/05/15		NC	%	80 - 120
B370651	TOR	Spiked Blank	Chloride (Cl)	2024/05/15		105	%	80 - 120
			Sulphate (SO4)	2024/05/15		104	%	80 - 120
B370651	TOR	Method Blank	Chloride (Cl)	2024/05/15	<1.0		mg/L	
			Sulphate (SO4)	2024/05/15	<1.0		mg/L	
B370651	TOR	RPD	Chloride (Cl)	2024/05/15	0.28		%	20
			Sulphate (SO4)	2024/05/15	2.3		%	20
B370747	MAP	Matrix Spike	Orthophosphate (P)	2024/05/15		94	%	80 - 120
B370747	MAP	Spiked Blank	Orthophosphate (P)	2024/05/15		97	%	80 - 120
B370747	MAP	Method Blank	Orthophosphate (P)	2024/05/15	<0.0030		mg/L	
B370747	MAP	RPD	Orthophosphate (P)	2024/05/15	0.63		%	20
B371002	KHU	Matrix Spike	Total Mercury (Hg)	2024/05/16		96	%	80 - 120
B371002	KHU	Spiked Blank	Total Mercury (Hg)	2024/05/16		97	%	80 - 120
B371002	KHU	Method Blank	Total Mercury (Hg)	2024/05/16	<0.0019		ug/L	
B371002	KHU	RPD	Total Mercury (Hg)	2024/05/16	NC		%	20
B371092	JAB	Matrix Spike	Dissolved Aluminum (Al)	2024/05/16		100	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/16		98	%	80 - 120
			Dissolved Arsenic (As)	2024/05/16		95	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/16		95	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/16		93	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/16		91	%	80 - 120
			Dissolved Copper (Cu)	2024/05/16		91	%	80 - 120
			Dissolved Lead (Pb)	2024/05/16		90	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/16		98	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/16		92	%	80 - 120
			Dissolved Selenium (Se)	2024/05/16		100	%	80 - 120
			Dissolved Silver (Ag)	2024/05/16		94	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/16		89	%	80 - 120
			Dissolved Tin (Sn)	2024/05/16		99	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/16		95	%	80 - 120
			Dissolved Uranium (U)	2024/05/16		89	%	80 - 120
			Dissolved Vanadium (V)	2024/05/16		95	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/16		91	%	80 - 120
B371092	JAB	Spiked Blank	Dissolved Aluminum (Al)	2024/05/16		117	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/16		103	%	80 - 120
			Dissolved Arsenic (As)	2024/05/16		94	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/16		96	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/16		98	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/16		99	%	80 - 120
			Dissolved Copper (Cu)	2024/05/16		98	%	80 - 120
			Dissolved Lead (Pb)	2024/05/16		96	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/16		101	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Nickel (Ni)	2024/05/16		99	%	80 - 120
			Dissolved Selenium (Se)	2024/05/16		96	%	80 - 120
			Dissolved Silver (Ag)	2024/05/16		99	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/16		93	%	80 - 120
			Dissolved Tin (Sn)	2024/05/16		98	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/16		99	%	80 - 120
			Dissolved Uranium (U)	2024/05/16		93	%	80 - 120
			Dissolved Vanadium (V)	2024/05/16		99	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/16		96	%	80 - 120
B371092	JAB	Method Blank	Dissolved Aluminum (Al)	2024/05/16	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2024/05/16	<0.00060		mg/L	
			Dissolved Arsenic (As)	2024/05/16	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2024/05/16	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2024/05/16	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2024/05/16	<0.00030		mg/L	
			Dissolved Copper (Cu)	2024/05/16	<0.0010		mg/L	
			Dissolved Lead (Pb)	2024/05/16	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2024/05/16	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2024/05/16	<0.00050		mg/L	
			Dissolved Selenium (Se)	2024/05/16	<0.00020		mg/L	
			Dissolved Silver (Ag)	2024/05/16	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2024/05/16	<0.00020		mg/L	
			Dissolved Tin (Sn)	2024/05/16	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2024/05/16	<0.0010		mg/L	
			Dissolved Uranium (U)	2024/05/16	<0.00010		mg/L	
			Dissolved Vanadium (V)	2024/05/16	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2024/05/16	<0.0030		mg/L	
B371092	JAB	RPD	Dissolved Aluminum (Al)	2024/05/16	NC		%	20
			Dissolved Antimony (Sb)	2024/05/16	NC		%	20
			Dissolved Arsenic (As)	2024/05/16	NC		%	20
			Dissolved Beryllium (Be)	2024/05/16	NC		%	20
			Dissolved Chromium (Cr)	2024/05/16	NC		%	20
			Dissolved Cobalt (Co)	2024/05/16	3.6		%	20
			Dissolved Copper (Cu)	2024/05/16	NC		%	20
			Dissolved Lead (Pb)	2024/05/16	NC		%	20
			Dissolved Molybdenum (Mo)	2024/05/16	11		%	20
			Dissolved Nickel (Ni)	2024/05/16	5.8		%	20
			Dissolved Selenium (Se)	2024/05/16	NC		%	20
			Dissolved Silver (Ag)	2024/05/16	NC		%	20
			Dissolved Thallium (Tl)	2024/05/16	NC		%	20
			Dissolved Tin (Sn)	2024/05/16	NC		%	20
			Dissolved Titanium (Ti)	2024/05/16	NC		%	20
			Dissolved Uranium (U)	2024/05/16	2.8		%	20
			Dissolved Vanadium (V)	2024/05/16	NC		%	20
			Dissolved Zinc (Zn)	2024/05/16	11		%	20
B371201	HQV	Matrix Spike	Dissolved Barium (Ba)	2024/05/16		96	%	80 - 120
			Dissolved Boron (B)	2024/05/16		96	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/16		NC	%	80 - 120
			Dissolved Iron (Fe)	2024/05/16		99	%	80 - 120
			Dissolved Lithium (Li)	2024/05/16		95	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/16		98	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/16		93	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/16		102	%	80 - 120
			Dissolved Potassium (K)	2024/05/16		96	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Silicon (Si)	2024/05/16		88	%	80 - 120
			Dissolved Sodium (Na)	2024/05/16		92	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/16		90	%	80 - 120
			Dissolved Sulphur (S)	2024/05/16		99	%	80 - 120
B371201	HQV	Spiked Blank	Dissolved Barium (Ba)	2024/05/16		96	%	80 - 120
			Dissolved Boron (B)	2024/05/16		97	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/16		93	%	80 - 120
			Dissolved Iron (Fe)	2024/05/16		99	%	80 - 120
			Dissolved Lithium (Li)	2024/05/16		93	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/16		95	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/16		98	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/16		100	%	80 - 120
			Dissolved Potassium (K)	2024/05/16		94	%	80 - 120
			Dissolved Silicon (Si)	2024/05/16		92	%	80 - 120
			Dissolved Sodium (Na)	2024/05/16		92	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/16		93	%	80 - 120
			Dissolved Sulphur (S)	2024/05/16		97	%	80 - 120
B371201	HQV	Method Blank	Dissolved Barium (Ba)	2024/05/16	<0.010		mg/L	
			Dissolved Boron (B)	2024/05/16	<0.020		mg/L	
			Dissolved Calcium (Ca)	2024/05/16	<0.30		mg/L	
			Dissolved Iron (Fe)	2024/05/16	<0.060		mg/L	
			Dissolved Lithium (Li)	2024/05/16	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2024/05/16	<0.20		mg/L	
			Dissolved Manganese (Mn)	2024/05/16	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2024/05/16	<0.10		mg/L	
			Dissolved Potassium (K)	2024/05/16	<0.30		mg/L	
			Dissolved Silicon (Si)	2024/05/16	<0.50		mg/L	
			Dissolved Sodium (Na)	2024/05/16	<0.50		mg/L	
			Dissolved Strontium (Sr)	2024/05/16	<0.020		mg/L	
			Dissolved Sulphur (S)	2024/05/16	<0.20		mg/L	
B371201	HQV	RPD	Dissolved Barium (Ba)	2024/05/16	1.7		%	20
			Dissolved Boron (B)	2024/05/16	NC		%	20
			Dissolved Calcium (Ca)	2024/05/16	1.2		%	20
			Dissolved Iron (Fe)	2024/05/16	NC		%	20
			Dissolved Lithium (Li)	2024/05/16	NC		%	20
			Dissolved Magnesium (Mg)	2024/05/16	1.3		%	20
			Dissolved Manganese (Mn)	2024/05/16	2.3		%	20
			Dissolved Phosphorus (P)	2024/05/16	NC		%	20
			Dissolved Potassium (K)	2024/05/16	1.9		%	20
			Dissolved Silicon (Si)	2024/05/16	0.52		%	20
			Dissolved Sodium (Na)	2024/05/16	1.2		%	20
			Dissolved Strontium (Sr)	2024/05/16	0.55		%	20
			Dissolved Sulphur (S)	2024/05/16	0.44		%	20
B372850	MAP	Matrix Spike	Dissolved Phosphorus (P)	2024/05/17		99	%	80 - 120
B372850	MAP	QC Standard	Dissolved Phosphorus (P)	2024/05/17		90	%	80 - 120
B372850	MAP	Spiked Blank	Dissolved Phosphorus (P)	2024/05/17		97	%	80 - 120
B372850	MAP	Method Blank	Dissolved Phosphorus (P)	2024/05/17	<0.0030		mg/L	
B372850	MAP	RPD	Dissolved Phosphorus (P)	2024/05/17	NC		%	20
B374322	CTU	Matrix Spike	Total Nitrogen (N)	2024/05/22		104	%	80 - 120
B374322	CTU	QC Standard	Total Nitrogen (N)	2024/05/22		106	%	80 - 120
B374322	CTU	Spiked Blank	Total Nitrogen (N)	2024/05/22		111	%	80 - 120
B374322	CTU	Method Blank	Total Nitrogen (N)	2024/05/22	<0.020		mg/L	
B374322	CTU	RPD	Total Nitrogen (N)	2024/05/22	3.9		%	20
B374849	JFE	Matrix Spike	Dissolved Organic Carbon (C)	2024/05/21		NC	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B374849	JFE	Spiked Blank	Dissolved Organic Carbon (C)	2024/05/21		103	%	80 - 120
B374849	JFE	Method Blank	Dissolved Organic Carbon (C)	2024/05/21	<0.50		mg/L	
B374849	JFE	RPD	Dissolved Organic Carbon (C)	2024/05/21	3.6		%	20
B375198	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/21		98	%	80 - 120
B375198	JVM	Method Blank	Alkalinity (PP as CaCO3)	2024/05/21	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/21	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/21	<1.0		mg/L	
			Carbonate (CO3)	2024/05/21	<1.0		mg/L	
			Hydroxide (OH)	2024/05/21	<1.0		mg/L	
B375198	JVM	RPD [CNN533-02]	Alkalinity (PP as CaCO3)	2024/05/21	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/21	0.19		%	20
			Bicarbonate (HCO3)	2024/05/21	0.19		%	20
			Carbonate (CO3)	2024/05/21	NC		%	20
			Hydroxide (OH)	2024/05/21	NC		%	20
B375201	JVM	Spiked Blank	pH	2024/05/21		100	%	97 - 103
B375201	JVM	RPD [CNN533-02]	pH	2024/05/21	0.25		%	N/A
B375202	JVM	Spiked Blank	Conductivity	2024/05/21		100	%	90 - 110
B375202	JVM	Method Blank	Conductivity	2024/05/21	<2.0		uS/cm	
B375202	JVM	RPD [CNN533-02]	Conductivity	2024/05/21	0.51		%	10

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

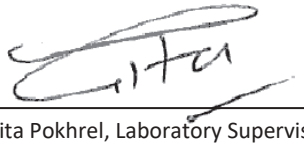
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Detection limit raised due to matrix interference.

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Gita Pokhrel, Laboratory Supervisor



Rahul Suryawanshi, Senior Analyst



Sandy Yuan, M.Sc., QP, Scientific Specialist



Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist



Automated Statchk

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CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

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C434266
LAB USE ONLY - PLACE STICKER HERE

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Project Information	
Company:	Stantec Consulting	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	#300, 10220 103 Ave NW	Street Address:		Project #:	110773396
City:	Edmonton Prov: AB Postal Code: T5J0K4	City: Prov: Postal Code:		Site #:	
Phone:	780 9692223	Phone:		Site Location:	
Email:	dylan.king@stantec.com	Email:		Site Location Province:	AB
Copies:		Copies:		Sampled By:	WT/TH

Regulatory Criteria

☑ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba
☐ Saskatchewan ☑ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Rush Confirmation #:

Regular Turnaround Time (TAT)
☑ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply
☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	FIELD FILTERED	FIELD PRESERVED	LAB FILTRATION REQUIRED	BTEX F1	VOCs	BTEX F1-F2	BTEX F1-F4	Routine water	Regulated metals - total	Regulated metals - dissolved	Mercury - total	Mercury - dissolved	Salinity 4	Sieve (75 micron)	Total Kjeldahl nitrogen (TKN)	Total organic carbon (TOC)	dissolved phosphorus	phosphate	cyanide	Bacteriological #	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE
1	WS51-01	24	05	14	12	47	Water						X		X		X	X	X			X	X	X	X	X	X	11	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Comments

MCAL-2024-05-832

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF [illegible] ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C	Temperature reading by:
Seal present		✓	1 6 2 8 3 9	
Seal intact				
Cooling media present				

LAB USE ONLY	Yes	No	°C	Temperature reading by:
Seal present			1 2 3	
Seal intact				
Cooling media present				

LAB USE ONLY	Yes	No	°C	Temperature reading by:
Seal present			1 2 3	
Seal intact				
Cooling media present				

	Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special Instructions
1	Taylor Harris	2024	05	14	17	10		2024	05	14	17	16	* total coliforms, e. coli, fecal coliforms, heterotrophic plate count
2													

Dissolved parameters not field filtered - PIS lab filter

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CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

Page 1 of 1

C434266
LAB USE ONLY - PLACE STICKER HERE

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Project Information	
Company:	Stantec Consulting	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	#300, 10220 103 Ave NW	Street Address:		Project #:	110773396
City:	Edmonton Prov: AB Postal Code: T5J0K4	City: Prov: Postal Code:		Site #:	
Phone:	780 9692223	Phone:		Site Location:	
Email:	dylan.king@stantec.com	Email:		Site Location Province:	AB
Copies:		Copies:		Sampled By:	WT/TH

Rush Confirmation #:

Regulatory Criteria

☑ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba
☐ Saskatchewan ☑ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)
☑ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply
☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

Comments

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	FIELD FILTERED	FIELD PRESERVED	LAB FILTRATION REQUIRED	BTEX F1	VOCs	BTEX F1-F2	BTEX F1-F4	Routine water	Regulated metals - total	Regulated metals - dissolved	Mercury - total	Mercury - dissolved	Salinity 4	Sieve (75 micron)	Total [illegible] (TKN)	[illegible] DOC	Dissolved phosphorus	phosphate	cyanide	Bacteriological #	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE
1	WS51-01	24	05	14	12	47	Water						X		X		X	X	X			X	X	X	X	X	X	11	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

MCAL-2024-05-832

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF [illegible] ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C	Temperature reading by:
Seal present		✓	1: 6	
Seal intact			2: 8	
Cooling media present			3: 9	

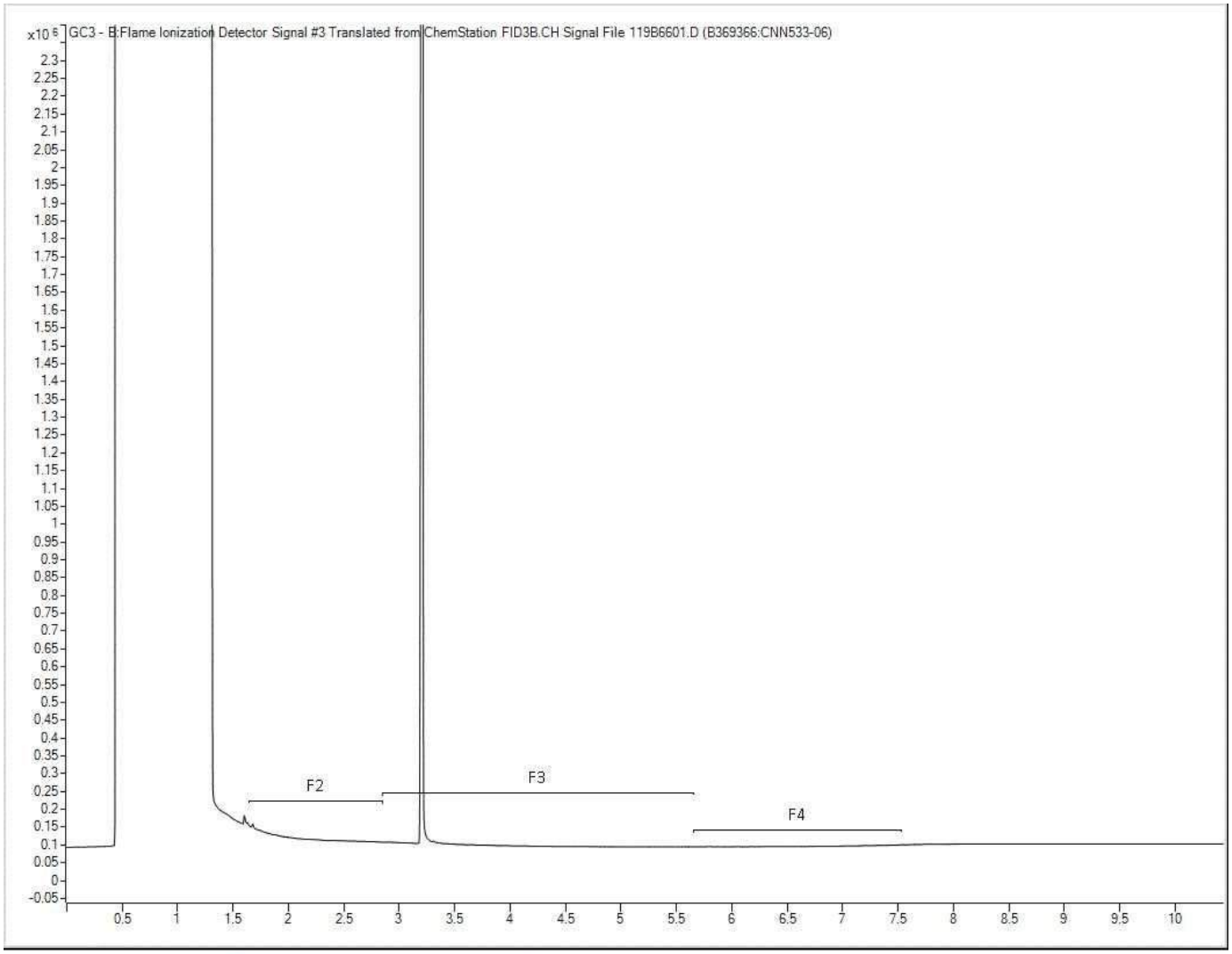
LAB USE ONLY	Yes	No	°C	Temperature reading by:
Seal present			1	
Seal intact			2	
Cooling media present			3	

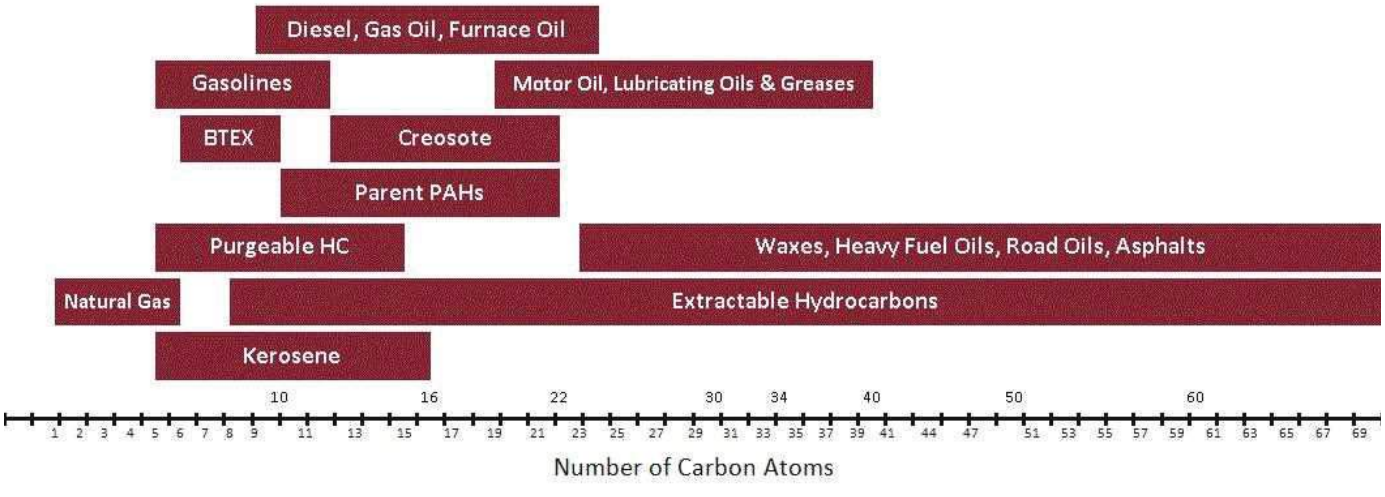
LAB USE ONLY	Yes	No	°C	Temperature reading by:
Seal present			1	
Seal intact			2	
Cooling media present			3	

	Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special Instructions
1	Taylor Harris	2024	05	14	17	10	[illegible] Stagnelanto	2024	05	14	17	16	* total coliforms, e. coli, fecal coliforms, heterotrophic plate count
2													

Dissolved parameters not field filtered - PIS lab filter

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





hpchem13\HPchem\1\DATA\2024\05\RUN0515

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 110773396
Your C.O.C. #: 1OF1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/27
Report #: R3504705
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C434936
Received: 2024/05/15, 17:15

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	2	N/A	2024/05/22	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	2	N/A	2024/05/22	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	2	N/A	2024/05/22		Auto Calc
Cadmium - low level CCME - Dissolved	2	N/A	2024/05/21		Auto Calc
Chloride/Sulphate by Auto Colourimetry	2	N/A	2024/05/18	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	2	2024/05/16	2024/05/17	AB SOP-00089	SM 24 9223 A,B m
Heterotrophic Plate Count Quant	2	2024/05/16	2024/05/18	CAL SOP-00012	SM 24 9215 A, E m
Total Coliforms and E.Coli	2	2024/05/16	2024/05/17	AB SOP-00089	SM 24 9223 A,B m
Carbon (DOC) -Lab Filtered (1)	2	N/A	2024/05/22	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	2	N/A	2024/05/22	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	2	2024/05/21	2024/05/21	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	2	N/A	2024/05/19		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	1	2024/05/21	2024/05/21	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Dissolved) by CV-Lab Filtered	1	2024/05/22	2024/05/22	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	2	2024/05/17	2024/05/21	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (3)	2	N/A	2024/05/19	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	2	N/A	2024/05/21	AB SOP-00043	EPA 6020b R2 m
Ion Balance	2	N/A	2024/05/23		Auto Calc
Sum of cations, anions	2	N/A	2024/05/19		Auto Calc
Ammonia-N (Total)	2	N/A	2024/05/21	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	2	N/A	2024/05/18		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	2	N/A	2024/05/18	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	2	2024/05/16	2024/05/18		Auto Calc
pH @25°C (5)	2	N/A	2024/05/22	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (6)	1	N/A	2024/05/17	AB SOP-00025	SM 24 4500-P A,F m
Orthophosphate by Automated Analyzer (6)	1	N/A	2024/05/24	AB SOP-00025	SM 24 4500-P A,F m
Total Dissolved Solids (Calculated)	2	N/A	2024/05/23		Auto Calc
Total Kjeldahl Nitrogen (Total)	2	N/A	2024/05/23	BBY WI-00033	Auto Calc
Nitrogen (Total)	2	2024/05/22	2024/05/22	AB SOP-00093	SM 24 4500-N C m
Total Phosphorus-Dissolved-Lab Filtered (7)	2	2024/05/22	2024/05/22	AB SOP-00024	SM 24 4500-P A,B,F m

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Your C.O.C. #: 1OF1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/27
Report #: R3504705
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C434936
Received: 2024/05/15, 17:15

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(7) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Your C.O.C. #: 1OF1

Attention: DYLAN KING

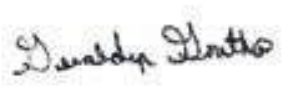
STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
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CANADA T5J 0K4

Report Date: 2024/05/27
Report #: R3504705
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C434936
Received: 2024/05/15, 17:15

Encryption Key



Geraldlyn Gouthro
Key Account Specialist
27 May 2024 10:11:07

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (403) 291-3077

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID				CNQ415		CNQ415		CNQ416			
Sampling Date				2024/05/15 11:48		2024/05/15 11:48		2024/05/15 10:48			
COC Number				1OF1		1OF1		1OF1			
	UNITS	MAC	AO	WS81-01	MU	WS81-01 Lab-Dup	MU	WS81-02	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	-	-	<0.10	N/A	N/A	N/A	<0.10	N/A	0.10	B372262
Volatiles											
Benzene	mg/L	0.005	-	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372608
Toluene	mg/L	0.06	0.024	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372608
Ethylbenzene	mg/L	0.14	0.0016	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372608
m & p-Xylene	mg/L	-	-	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B372608
o-Xylene	mg/L	-	-	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372608
Xylenes (Total)	mg/L	0.09	0.02	<0.00089	N/A	N/A	N/A	<0.00089	N/A	0.00089	B371612
F1 (C6-C10) - BTEX	mg/L	-	-	<0.10	N/A	N/A	N/A	<0.10	N/A	0.10	B371612
F1 (C6-C10)	mg/L	-	-	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B372608
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	-	-	100	N/A	101	N/A	100	N/A	N/A	B372608
4-Bromofluorobenzene (sur.)	%	-	-	101	N/A	102	N/A	100	N/A	N/A	B372608
D4-1,2-Dichloroethane (sur.)	%	-	-	93	N/A	97	N/A	93	N/A	N/A	B372608
O-TERPHENYL (sur.)	%	-	-	98	N/A	N/A	N/A	99	N/A	N/A	B372262

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID					CNQ415			CNQ416			
Sampling Date					2024/05/15 11:48			2024/05/15 10:48			
COC Number					1OF1			1OF1			
	UNITS	MAC	AO	OG	WS81-01	MU	RDL	WS81-02	MU	RDL	QC Batch
Calculated Parameters											
Anion Sum	meq/L	-	-	-	15	N/A	N/A	18	N/A	N/A	B371383
Cation Sum	meq/L	-	-	-	15	N/A	N/A	19	N/A	N/A	B371383
Hardness (CaCO3)	mg/L	-	-	-	470	N/A	0.50	270	N/A	0.50	B371381
Ion Balance (% Difference)	%	-	-	-	0.92	N/A	N/A	2.7	N/A	N/A	B371382
Nitrate (N)	mg/L	10	-	-	**12**	N/A	0.25	0.89	N/A	0.010	B371384
Nitrate (NO3)	mg/L	45	-	-	**52**	N/A	1.1	4.0	N/A	0.044	B372865
Nitrite (NO2)	mg/L	3	-	-	<0.033	N/A	0.033	0.14	N/A	0.033	B372865
Calculated Total Dissolved Solids	mg/L	-	500	-	**840**	N/A	10	**1000**	N/A	10	B371385
Elements											
Dissolved Cadmium (Cd)	ug/L	7	-	-	<0.020	N/A	0.020	<0.020	N/A	0.020	B371474
Misc. Inorganics											
Conductivity	uS/cm	-	-	-	1300	+/- 35	2.0	1600	+/- 42	2.0	B375767
pH	pH	-	-	7.0:10.5	8.05	+/- 0.0798	N/A	8.18	+/- 0.0810	N/A	B375766
Anions											
Alkalinity (PP as CaCO3)	mg/L	-	-	-	<1.0	N/A	1.0	<1.0	N/A	1.0	B375755
Alkalinity (Total as CaCO3)	mg/L	-	-	-	420	+/- 31	1.0	570	+/- 42	1.0	B375755
Bicarbonate (HCO3)	mg/L	-	-	-	510	+/- 7.9	1.0	700	+/- 11	1.0	B375755
Carbonate (CO3)	mg/L	-	-	-	<1.0	N/A	1.0	<1.0	N/A	1.0	B375755
Hydroxide (OH)	mg/L	-	-	-	<1.0	N/A	1.0	<1.0	N/A	1.0	B375755
Chloride (Cl)	mg/L	-	250	-	90	+/- 6.9	1.0	18	+/- 1.9	1.0	B373831
Sulphate (SO4)	mg/L	-	500	-	160	+/- 10	5.0	270	+/- 17	5.0	B373831
Nutrients											
Nitrite (N)	mg/L	1	-	-	<0.010	N/A	0.010	0.044	+/- <RDL	0.010	B373749
Nitrate plus Nitrite (N)	mg/L	-	-	-	12	+/- 0.99	0.25	0.94	+/- 0.085	0.010	B373749
Lab Filtered Elements											
Dissolved Aluminum (Al)	mg/L	2.9	-	0.1	<0.0030	N/A	0.0030	<0.0030	N/A	0.0030	B374332
Dissolved Antimony (Sb)	mg/L	0.006	-	-	<0.00060	N/A	0.00060	<0.00060	N/A	0.00060	B374332
Dissolved Arsenic (As)	mg/L	0.01	-	-	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	B374332
Dissolved Barium (Ba)	mg/L	2	-	-	0.025	+/- <RDL	0.010	0.042	+/- <RDL	0.010	B373998
Dissolved Beryllium (Be)	mg/L	-	-	-	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B374332
Dissolved Boron (B)	mg/L	5	-	-	0.14	+/- <RDL	0.020	0.17	+/- <RDL	0.020	B373998

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID					CNQ415			CNQ416			
Sampling Date					2024/05/15 11:48			2024/05/15 10:48			
COC Number					1OF1			1OF1			
	UNITS	MAC	AO	OG	WS81-01	MU	RDL	WS81-02	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	-	-	-	99	+/- 10	0.30	60	+/- 6.1	0.30	B373998
Dissolved Chromium (Cr)	mg/L	0.05	-	-	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B374332
Dissolved Cobalt (Co)	mg/L	-	-	-	<0.00030	N/A	0.00030	<0.00030	N/A	0.00030	B374332
Dissolved Copper (Cu)	mg/L	2.0	1.0	-	0.0049	+/- 0.0014	0.0010	<0.0010	N/A	0.0010	B374332
Dissolved Iron (Fe)	mg/L	-	0.3	-	<0.060	N/A	0.060	<0.060	N/A	0.060	B373998
Dissolved Lead (Pb)	mg/L	0.005	-	-	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	B374332
Dissolved Lithium (Li)	mg/L	-	-	-	0.045	+/- <RDL	0.020	0.045	+/- <RDL	0.020	B373998
Dissolved Magnesium (Mg)	mg/L	-	-	-	55	+/- 3.5	0.20	29	+/- 1.8	0.20	B373998
Dissolved Manganese (Mn)	mg/L	0.12	0.02	-	<0.0040	N/A	0.0040	0.016	+/- <RDL	0.0040	B373998
Dissolved Molybdenum (Mo)	mg/L	-	-	-	0.0042	+/- 0.0011	0.00020	0.0018	+/- 0.00051	0.00020	B374332
Dissolved Nickel (Ni)	mg/L	-	-	-	0.00061	+/- <RDL	0.00050	0.00064	+/- <RDL	0.00050	B374332
Dissolved Phosphorus (P)	mg/L	-	-	-	<0.10	N/A	0.10	<0.10	N/A	0.10	B373998
Dissolved Potassium (K)	mg/L	-	-	-	2.2	+/- <RDL	0.30	1.8	+/- <RDL	0.30	B373998
Dissolved Selenium (Se)	mg/L	0.05	-	-	0.0022	+/- 0.00021	0.00020	0.0011	+/- <RDL	0.00020	B374332
Dissolved Silicon (Si)	mg/L	-	-	-	3.5	+/- 0.66	0.50	3.1	+/- 0.60	0.50	B373998
Dissolved Silver (Ag)	mg/L	-	-	-	<0.00010	N/A	0.00010	<0.00010	N/A	0.00010	B374332
Dissolved Sodium (Na)	mg/L	-	200	-	130	+/- 13	0.50	**300**	+/- 30	0.50	B373998
Dissolved Strontium (Sr)	mg/L	7	-	-	1.2	+/- 0.12	0.020	1.0	+/- 0.098	0.020	B373998
Dissolved Sulphur (S)	mg/L	-	-	-	50	+/- 3.3	0.20	94	+/- 6.3	0.20	B373998
Dissolved Thallium (Tl)	mg/L	-	-	-	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	B374332
Dissolved Tin (Sn)	mg/L	-	-	-	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B374332
Dissolved Titanium (Ti)	mg/L	-	-	-	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B374332
Dissolved Uranium (U)	mg/L	0.02	-	-	0.0033	+/- 0.00031	0.00010	0.0058	+/- 0.00053	0.00010	B374332
Dissolved Vanadium (V)	mg/L	-	-	-	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B374332
Dissolved Zinc (Zn)	mg/L	-	5.0	-	0.011	+/- <RDL	0.0030	0.0052	+/- <RDL	0.0030	B374332

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID					CNQ416			
Sampling Date					2024/05/15 10:48			
COC Number					1OF1			
	UNITS	MAC	AO	OG	WS81-02 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Elements								
Dissolved Aluminum (Al)	mg/L	2.9	-	0.1	<0.0030	N/A	0.0030	B374332
Dissolved Antimony (Sb)	mg/L	0.006	-	-	<0.00060	N/A	0.00060	B374332
Dissolved Arsenic (As)	mg/L	0.01	-	-	<0.00020	N/A	0.00020	B374332
Dissolved Beryllium (Be)	mg/L	-	-	-	<0.0010	N/A	0.0010	B374332
Dissolved Chromium (Cr)	mg/L	0.05	-	-	<0.0010	N/A	0.0010	B374332
Dissolved Cobalt (Co)	mg/L	-	-	-	<0.00030	N/A	0.00030	B374332
Dissolved Copper (Cu)	mg/L	2.0	1.0	-	<0.0010	N/A	0.0010	B374332
Dissolved Lead (Pb)	mg/L	0.005	-	-	<0.00020	N/A	0.00020	B374332
Dissolved Molybdenum (Mo)	mg/L	-	-	-	0.0014	+/- 0.00043	0.00020	B374332
Dissolved Nickel (Ni)	mg/L	-	-	-	0.00067	+/- <RDL	0.00050	B374332
Dissolved Selenium (Se)	mg/L	0.05	-	-	0.0011	+/- <RDL	0.00020	B374332
Dissolved Silver (Ag)	mg/L	-	-	-	<0.00010	N/A	0.00010	B374332
Dissolved Thallium (Tl)	mg/L	-	-	-	<0.00020	N/A	0.00020	B374332
Dissolved Tin (Sn)	mg/L	-	-	-	<0.0010	N/A	0.0010	B374332
Dissolved Titanium (Ti)	mg/L	-	-	-	<0.0010	N/A	0.0010	B374332
Dissolved Uranium (U)	mg/L	0.02	-	-	0.0059	+/- 0.00053	0.00010	B374332
Dissolved Vanadium (V)	mg/L	-	-	-	<0.0010	N/A	0.0010	B374332
Dissolved Zinc (Zn)	mg/L	-	5.0	-	<0.0030	N/A	0.0030	B374332

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CNQ415			CNQ416			
Sampling Date		2024/05/15 11:48			2024/05/15 10:48			
COC Number		1OF1			1OF1			
	UNITS	WS81-01	MU	RDL	WS81-02	MU	RDL	QC Batch
Calculated Parameters								
Total Kjeldahl Nitrogen (Calc)	mg/L	<0.25	N/A	0.25	<0.020	N/A	0.020	B372864
Nutrients								
Total Nitrogen (N)	mg/L	8.9 (1)	+/- 1.3	0.10	0.94	+/- 0.14	0.020	B376175

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Nitrogen < Nitrate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C434936
Report Date: 2024/05/27

STANTEC CONSULTING LTD
Client Project #: 110773396
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID			CNQ415		CNQ415			CNQ416			
Sampling Date			2024/05/15 11:48		2024/05/15 11:48			2024/05/15 10:48			
COC Number			1OF1		1OF1			1OF1			
	UNITS	MAC	WS81-01	MU	WS81-01 Lab-Dup	MU	QC Batch	WS81-02	MU	RDL	QC Batch
Lab Filtered Inorganics											
Dissolved Organic Carbon (C)	mg/L	-	2.4	+/- <RDL	N/A	N/A	B376080	2.6	+/- 0.50	0.50	B376080
Microbiological Param.											
E.Coli DST	MPN/100mL	1	<1.0	N/A	N/A	N/A	B371950	<1.0	N/A	1.0	B371950
Fecal Coliforms	MPN/100mL	-	<1.0	N/A	N/A	N/A	B371985	<1.0	N/A	1.0	B371985
Heterotrophic DST	MPN/100mL	-	57	N/A	36	N/A	B372018	75	N/A	1.0	B372018
Total Coliforms DST	MPN/100mL	1	<1.0	N/A	N/A	N/A	B371950	<1.0	N/A	1.0	B371950
Nutrients											
Total Ammonia (N)	mg/L	-	<0.015	N/A	N/A	N/A	B374941	0.036	+/- <RDL	0.015	B374941
Orthophosphate (P)	mg/L	-	0.0031	+/- 0.0034	N/A	N/A	B373649	<0.0030	N/A	0.0030	B378409
Lab Filtered Nutrients											
Dissolved Phosphorus (P)	mg/L	-	<0.0030 (1)	N/A	N/A	N/A	B375524	<0.0030	N/A	0.0030	B375524

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Bureau Veritas ID			CNQ416			
Sampling Date			2024/05/15 10:48			
COC Number			1OF1			
	UNITS	MAC	WS81-02 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Nutrients						
Dissolved Phosphorus (P)	mg/L	-	<0.0030	N/A	0.0030	B375524

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C434936
Report Date: 2024/05/27

STANTEC CONSULTING LTD
Client Project #: 110773396
Sampler Initials: WT

MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID			CNQ415			CNQ416			
Sampling Date			2024/05/15 11:48			2024/05/15 10:48			
COC Number			1OF1			1OF1			
	UNITS	MAC	WS81-01	MU	QC Batch	WS81-02	MU	RDL	QC Batch
Elements									
Total Mercury (Hg)	ug/L	1	<0.0019	N/A	B372352	<0.0019	N/A	0.0019	B372352
Lab Filtered Elements									
Dissolved Mercury (Hg)	ug/L	1	<0.0019	N/A	B375657	<0.0019	N/A	0.0019	B374529

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	9.7°C

Version 2: CDWG criteria included.

Sample CNQ416 [WS81-02] : Sample was analyzed past method specified hold time for Orthophosphate by Automated Analyzer. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.
MAC,AO,OG: The guidelines that have been included in this report have been taken from the Canadian Drinking Water Quality Summary Table, September 2022.

Criteria A = Maximum Acceptable Concentration (MAC) / Criteria B = Aesthetic Objectives (AO) / Criteria C = Operational Guidance Values (OG)
It is recommended to consult these guidelines when interpreting your data since there are non-numerical guidelines that are not included on this report.

Turbidity Guidelines:
1. Chemically assisted filtration: less than or equal to 0.3 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 1.0 NTU at any time.
2. Slow sand / diatomaceous earth filtration: less than or equal to 1.0 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 3.0 NTU at any time.
3. Membrane filtration: less than or equal to 0.1 NTU in 99% of the measurements made or at least 99% of the time each calendar month. Shall not exceed 0.3 NTU at any time.
4. To ensure effectiveness of disinfection and for good operation of the distribution system, it is recommended that water entering the distribution system have turbidity levels of 1.0 NTU or less.
Measurement of Uncertainty has not been accounted for when stating conformity to the selected criteria, where applicable.

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B371950	SOG	Method Blank	E.Coli DST	2024/05/17	<1.0		mpn/100mL	
			Total Coliforms DST	2024/05/17	<1.0		mpn/100mL	
B371950	SOG	RPD	E.Coli DST	2024/05/17	NC		%	N/A
			Total Coliforms DST	2024/05/17	40		%	N/A
B371985	YYL	Method Blank	Fecal Coliforms	2024/05/17	<1.0		MPN/100mL	
B371985	YYL	RPD	Fecal Coliforms	2024/05/17	NC		%	N/A
B372018	SOG	Method Blank	Heterotrophic DST	2024/05/18	<1.0		mpn/100mL	
B372018	SOG	RPD [CNQ415-10]	Heterotrophic DST	2024/05/18	44		%	N/A
B372262	GG3	Spiked Blank	O-TERPHENYL (sur.)	2024/05/21		111	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/21		102	%	60 - 140
B372262	GG3	Method Blank	O-TERPHENYL (sur.)	2024/05/21		106	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/21	<0.10		mg/L	
B372352	MPK	Matrix Spike [CNQ416-09]	Total Mercury (Hg)	2024/05/21		94	%	80 - 120
B372352	MPK	Spiked Blank	Total Mercury (Hg)	2024/05/21		97	%	80 - 120
B372352	MPK	Method Blank	Total Mercury (Hg)	2024/05/21	<0.0019		ug/L	
B372352	MPK	RPD	Total Mercury (Hg)	2024/05/21	NC		%	20
B372608	DO1	Matrix Spike [CNQ416-06]	1,4-Difluorobenzene (sur.)	2024/05/22		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/22		104	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/22		98	%	50 - 140
			Benzene	2024/05/22		82	%	50 - 140
			Toluene	2024/05/22		81	%	50 - 140
			Ethylbenzene	2024/05/22		87	%	50 - 140
			m & p-Xylene	2024/05/22		86	%	50 - 140
			o-Xylene	2024/05/22		87	%	50 - 140
			F1 (C6-C10)	2024/05/22		67	%	60 - 140
B372608	DO1	Spiked Blank	1,4-Difluorobenzene (sur.)	2024/05/22		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/22		106	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/22		94	%	50 - 140
			Benzene	2024/05/22		81	%	60 - 130
			Toluene	2024/05/22		82	%	60 - 130
			Ethylbenzene	2024/05/22		88	%	60 - 130
			m & p-Xylene	2024/05/22		88	%	60 - 130
			o-Xylene	2024/05/22		88	%	60 - 130
			F1 (C6-C10)	2024/05/22		93	%	60 - 140
B372608	DO1	Method Blank	1,4-Difluorobenzene (sur.)	2024/05/22		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/22		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/22		95	%	50 - 140
			Benzene	2024/05/22	<0.00040		mg/L	
			Toluene	2024/05/22	<0.00040		mg/L	
			Ethylbenzene	2024/05/22	<0.00040		mg/L	
			m & p-Xylene	2024/05/22	<0.00080		mg/L	
			o-Xylene	2024/05/22	<0.00040		mg/L	
			F1 (C6-C10)	2024/05/22	<0.10		mg/L	
B372608	DO1	RPD [CNQ415-06]	Benzene	2024/05/22	NC		%	30
			Toluene	2024/05/22	NC		%	30
			Ethylbenzene	2024/05/22	NC		%	30
			m & p-Xylene	2024/05/22	NC		%	30
			o-Xylene	2024/05/22	NC		%	30
			F1 (C6-C10)	2024/05/22	NC		%	30
B373649	CTU	Matrix Spike	Orthophosphate (P)	2024/05/17		91	%	80 - 120
B373649	CTU	Spiked Blank	Orthophosphate (P)	2024/05/17		95	%	80 - 120
B373649	CTU	Method Blank	Orthophosphate (P)	2024/05/17	<0.0030		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B373649	CTU	RPD	Orthophosphate (P)	2024/05/17	NC		%	20
B373749	ISW	Matrix Spike	Nitrite (N)	2024/05/18		100	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/18		98	%	80 - 120
B373749	ISW	Spiked Blank	Nitrite (N)	2024/05/18		97	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/18		102	%	80 - 120
B373749	ISW	Method Blank	Nitrite (N)	2024/05/18	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/18	<0.010		mg/L	
B373749	ISW	RPD	Nitrite (N)	2024/05/18	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/18	NC		%	20
B373831	CTU	Matrix Spike	Chloride (Cl)	2024/05/18		NC	%	80 - 120
			Sulphate (SO4)	2024/05/18		NC	%	80 - 120
B373831	CTU	Spiked Blank	Chloride (Cl)	2024/05/18		104	%	80 - 120
			Sulphate (SO4)	2024/05/18		97	%	80 - 120
B373831	CTU	Method Blank	Chloride (Cl)	2024/05/18	<1.0		mg/L	
			Sulphate (SO4)	2024/05/18	<1.0		mg/L	
B373831	CTU	RPD	Chloride (Cl)	2024/05/18	0.44		%	20
			Sulphate (SO4)	2024/05/18	4.7		%	20
B373998	VSC	Matrix Spike	Dissolved Barium (Ba)	2024/05/19		97	%	80 - 120
			Dissolved Boron (B)	2024/05/19		98	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/19		98	%	80 - 120
			Dissolved Iron (Fe)	2024/05/19		104	%	80 - 120
			Dissolved Lithium (Li)	2024/05/19		95	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/19		99	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/19		103	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/19		102	%	80 - 120
			Dissolved Potassium (K)	2024/05/19		98	%	80 - 120
			Dissolved Silicon (Si)	2024/05/19		95	%	80 - 120
			Dissolved Sodium (Na)	2024/05/19		NC	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/19		96	%	80 - 120
			Dissolved Sulphur (S)	2024/05/19		99	%	80 - 120
B373998	VSC	Spiked Blank	Dissolved Barium (Ba)	2024/05/19		98	%	80 - 120
			Dissolved Boron (B)	2024/05/19		99	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/19		98	%	80 - 120
			Dissolved Iron (Fe)	2024/05/19		100	%	80 - 120
			Dissolved Lithium (Li)	2024/05/19		96	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/19		98	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/19		98	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/19		99	%	80 - 120
			Dissolved Potassium (K)	2024/05/19		99	%	80 - 120
			Dissolved Silicon (Si)	2024/05/19		94	%	80 - 120
			Dissolved Sodium (Na)	2024/05/19		97	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/19		96	%	80 - 120
			Dissolved Sulphur (S)	2024/05/19		96	%	80 - 120
B373998	VSC	Method Blank	Dissolved Barium (Ba)	2024/05/19	<0.010		mg/L	
			Dissolved Boron (B)	2024/05/19	<0.020		mg/L	
			Dissolved Calcium (Ca)	2024/05/19	<0.30		mg/L	
			Dissolved Iron (Fe)	2024/05/19	<0.060		mg/L	
			Dissolved Lithium (Li)	2024/05/19	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2024/05/19	<0.20		mg/L	
			Dissolved Manganese (Mn)	2024/05/19	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2024/05/19	<0.10		mg/L	
			Dissolved Potassium (K)	2024/05/19	<0.30		mg/L	
			Dissolved Silicon (Si)	2024/05/19	<0.50		mg/L	
			Dissolved Sodium (Na)	2024/05/19	<0.50		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Strontium (Sr)	2024/05/19	<0.020		mg/L	
			Dissolved Sulphur (S)	2024/05/19	<0.20		mg/L	
B373998	VSC	RPD	Dissolved Calcium (Ca)	2024/05/19	0.83		%	20
			Dissolved Iron (Fe)	2024/05/19	NC		%	20
			Dissolved Magnesium (Mg)	2024/05/19	0.80		%	20
			Dissolved Manganese (Mn)	2024/05/19	NC		%	20
			Dissolved Potassium (K)	2024/05/19	0.60		%	20
			Dissolved Sodium (Na)	2024/05/19	0.91		%	20
B374332	KH2	Matrix Spike [CNQ416-01]	Dissolved Aluminum (Al)	2024/05/21		98	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/21		94	%	80 - 120
			Dissolved Arsenic (As)	2024/05/21		96	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/21		94	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/21		92	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/21		93	%	80 - 120
			Dissolved Copper (Cu)	2024/05/21		92	%	80 - 120
			Dissolved Lead (Pb)	2024/05/21		91	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/21		102	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/21		91	%	80 - 120
			Dissolved Selenium (Se)	2024/05/21		95	%	80 - 120
			Dissolved Silver (Ag)	2024/05/21		94	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/21		91	%	80 - 120
			Dissolved Tin (Sn)	2024/05/21		96	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/21		92	%	80 - 120
			Dissolved Uranium (U)	2024/05/21		95	%	80 - 120
			Dissolved Vanadium (V)	2024/05/21		95	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/21		94	%	80 - 120
B374332	KH2	Spiked Blank	Dissolved Aluminum (Al)	2024/05/21		109	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/21		96	%	80 - 120
			Dissolved Arsenic (As)	2024/05/21		96	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/21		100	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/21		97	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/21		100	%	80 - 120
			Dissolved Copper (Cu)	2024/05/21		99	%	80 - 120
			Dissolved Lead (Pb)	2024/05/21		98	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/21		101	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/21		99	%	80 - 120
			Dissolved Selenium (Se)	2024/05/21		97	%	80 - 120
			Dissolved Silver (Ag)	2024/05/21		99	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/21		96	%	80 - 120
			Dissolved Tin (Sn)	2024/05/21		97	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/21		98	%	80 - 120
			Dissolved Uranium (U)	2024/05/21		101	%	80 - 120
			Dissolved Vanadium (V)	2024/05/21		97	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/21		100	%	80 - 120
B374332	KH2	Method Blank	Dissolved Aluminum (Al)	2024/05/21	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2024/05/21	<0.00060		mg/L	
			Dissolved Arsenic (As)	2024/05/21	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2024/05/21	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2024/05/21	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2024/05/21	<0.00030		mg/L	
			Dissolved Copper (Cu)	2024/05/21	<0.0010		mg/L	
			Dissolved Lead (Pb)	2024/05/21	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2024/05/21	<0.00020		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Nickel (Ni)	2024/05/21	<0.00050		mg/L	
			Dissolved Selenium (Se)	2024/05/21	<0.00020		mg/L	
			Dissolved Silver (Ag)	2024/05/21	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2024/05/21	<0.00020		mg/L	
			Dissolved Tin (Sn)	2024/05/21	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2024/05/21	<0.0010		mg/L	
			Dissolved Uranium (U)	2024/05/21	<0.00010		mg/L	
			Dissolved Vanadium (V)	2024/05/21	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2024/05/21	<0.0030		mg/L	
B374332	KH2	RPD [CNQ416-01]	Dissolved Aluminum (Al)	2024/05/21	NC		%	20
			Dissolved Antimony (Sb)	2024/05/21	NC		%	20
			Dissolved Arsenic (As)	2024/05/21	NC		%	20
			Dissolved Beryllium (Be)	2024/05/21	NC		%	20
			Dissolved Chromium (Cr)	2024/05/21	NC		%	20
			Dissolved Cobalt (Co)	2024/05/21	NC		%	20
			Dissolved Copper (Cu)	2024/05/21	NC		%	20
			Dissolved Lead (Pb)	2024/05/21	NC		%	20
			Dissolved Molybdenum (Mo)	2024/05/21	NC		%	20
			Dissolved Nickel (Ni)	2024/05/21	4.6		%	20
			Dissolved Selenium (Se)	2024/05/21	4.0		%	20
			Dissolved Silver (Ag)	2024/05/21	NC		%	20
			Dissolved Thallium (Tl)	2024/05/21	NC		%	20
			Dissolved Tin (Sn)	2024/05/21	NC		%	20
			Dissolved Titanium (Ti)	2024/05/21	NC		%	20
			Dissolved Uranium (U)	2024/05/21	1.8		%	20
			Dissolved Vanadium (V)	2024/05/21	NC		%	20
			Dissolved Zinc (Zn)	2024/05/21	NC		%	20
B374529	MPK	Matrix Spike	Dissolved Mercury (Hg)	2024/05/21		87	%	80 - 120
B374529	MPK	Spiked Blank	Dissolved Mercury (Hg)	2024/05/21		97	%	80 - 120
B374529	MPK	Method Blank	Dissolved Mercury (Hg)	2024/05/21	<0.0019		ug/L	
B374529	MPK	RPD	Dissolved Mercury (Hg)	2024/05/21	NC		%	20
B374941	AFI	Matrix Spike	Total Ammonia (N)	2024/05/21		107	%	80 - 120
B374941	AFI	Spiked Blank	Total Ammonia (N)	2024/05/21		104	%	80 - 120
B374941	AFI	Method Blank	Total Ammonia (N)	2024/05/21	<0.015		mg/L	
B374941	AFI	RPD	Total Ammonia (N)	2024/05/21	NC		%	20
B375524	CTU	Matrix Spike [CNQ416-01]	Dissolved Phosphorus (P)	2024/05/22		97	%	80 - 120
B375524	CTU	QC Standard	Dissolved Phosphorus (P)	2024/05/22		92	%	80 - 120
B375524	CTU	Spiked Blank	Dissolved Phosphorus (P)	2024/05/22		97	%	80 - 120
B375524	CTU	Method Blank	Dissolved Phosphorus (P)	2024/05/22	<0.0030		mg/L	
B375524	CTU	RPD [CNQ416-01]	Dissolved Phosphorus (P)	2024/05/22	NC		%	20
B375657	KHU	Matrix Spike	Dissolved Mercury (Hg)	2024/05/22		94	%	80 - 120
B375657	KHU	Spiked Blank	Dissolved Mercury (Hg)	2024/05/22		98	%	80 - 120
B375657	KHU	Method Blank	Dissolved Mercury (Hg)	2024/05/22	<0.0019		ug/L	
B375657	KHU	RPD	Dissolved Mercury (Hg)	2024/05/22	NC		%	20
B375755	A5S	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/22		98	%	80 - 120
B375755	A5S	Method Blank	Alkalinity (PP as CaCO3)	2024/05/22	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/22	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/22	<1.0		mg/L	
			Carbonate (CO3)	2024/05/22	<1.0		mg/L	
			Hydroxide (OH)	2024/05/22	<1.0		mg/L	
B375755	A5S	RPD	Alkalinity (PP as CaCO3)	2024/05/22	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/22	0.62		%	20
			Bicarbonate (HCO3)	2024/05/22	0.62		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Carbonate (CO3)	2024/05/22	NC		%	20
			Hydroxide (OH)	2024/05/22	NC		%	20
B375766	A5S	Spiked Blank	pH	2024/05/22		100	%	97 - 103
B375766	A5S	RPD	pH	2024/05/22	0.13		%	N/A
B375767	A5S	Spiked Blank	Conductivity	2024/05/22		101	%	90 - 110
B375767	A5S	Method Blank	Conductivity	2024/05/22	<2.0		uS/cm	
B375767	A5S	RPD	Conductivity	2024/05/22	0		%	10
B376080	MDO	Matrix Spike	Dissolved Organic Carbon (C)	2024/05/22		NC	%	80 - 120
B376080	MDO	Spiked Blank	Dissolved Organic Carbon (C)	2024/05/22		105	%	80 - 120
B376080	MDO	Method Blank	Dissolved Organic Carbon (C)	2024/05/22	<0.50		mg/L	
B376080	MDO	RPD	Dissolved Organic Carbon (C)	2024/05/22	3.2		%	20
B376175	YL7	Matrix Spike	Total Nitrogen (N)	2024/05/22		103	%	80 - 120
B376175	YL7	QC Standard	Total Nitrogen (N)	2024/05/22		101	%	80 - 120
B376175	YL7	Spiked Blank	Total Nitrogen (N)	2024/05/22		102	%	80 - 120
B376175	YL7	Method Blank	Total Nitrogen (N)	2024/05/22	<0.020		mg/L	
B376175	YL7	RPD	Total Nitrogen (N)	2024/05/22	1.7		%	20
B378409	CTU	Matrix Spike	Orthophosphate (P)	2024/05/24		100	%	80 - 120
B378409	CTU	Spiked Blank	Orthophosphate (P)	2024/05/24		91	%	80 - 120
B378409	CTU	Method Blank	Orthophosphate (P)	2024/05/24	<0.0030		mg/L	
B378409	CTU	RPD	Orthophosphate (P)	2024/05/24	NC		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

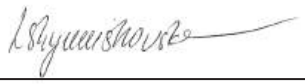
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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VALIDATION SIGNATURE PAGE

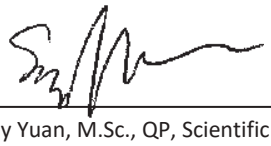
The analytical data and all QC contained in this report were reviewed and validated by:



Luba Shymushovska, B.Sc., QP, Senior Analyst, Organics



Rahul Suryawanshi, Senior Analyst



Sandy Yuan, M.Sc., QP, Scientific Specialist



Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

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MCAL-2024-05-921

1/1

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- ☐ Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Quotation #:	
Company:	Stantec	Company:		P.O. #/ AFE#:	LAB USE ONLY - PLACE STICKER HERE
Contact Name:	Dylan King	Contact Name:		Project #:	110773396
Street Address:	10220 103 Ave NW # 300	Street Address:		Site #:	
City:	Edmonton Prov: AB Postal Code: T5J 3W4	City: Prov: Postal Code:		Site Location:	Rush Confirmation #:
Phone:	780 969 2223	Phone:		Site Location Province:	AB
Email:	dylan.king@stantec.com	Email:		Sampled By:	WT / TH
Copies:		Copies:			

Regulatory Criteria

☐ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba
☐ Saskatchewan ☑ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)
☑ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply
☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F1-F2	7 BTEX F1-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 Salinity TKN	14 Sieve DOC	15 Texture (% sand, silt, clay)	16 Basic class II landfill	17 Dissolved Phosphorus	18 Phosphate	19 Ammonia	20 Butyrolactol	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE	Comments
1	WS81-01	24	05	15	11	18	water						X		X		X	X	X	X	X			X	X	X	X	11		
2	WS81-02	24	05	15	10	48	Water						X		X		X	X	Y	X	X			X	X	X	X	11		
3																														
4																														
5																														
6																														
7																														
8																														
9																														
10																														
11																														
12																														

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		☑				
Seal intact		☑				
Cooling media present	☑		9	10	10	

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present						
Seal intact						
Cooling media present						

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present						
Seal intact						
Cooling media present						

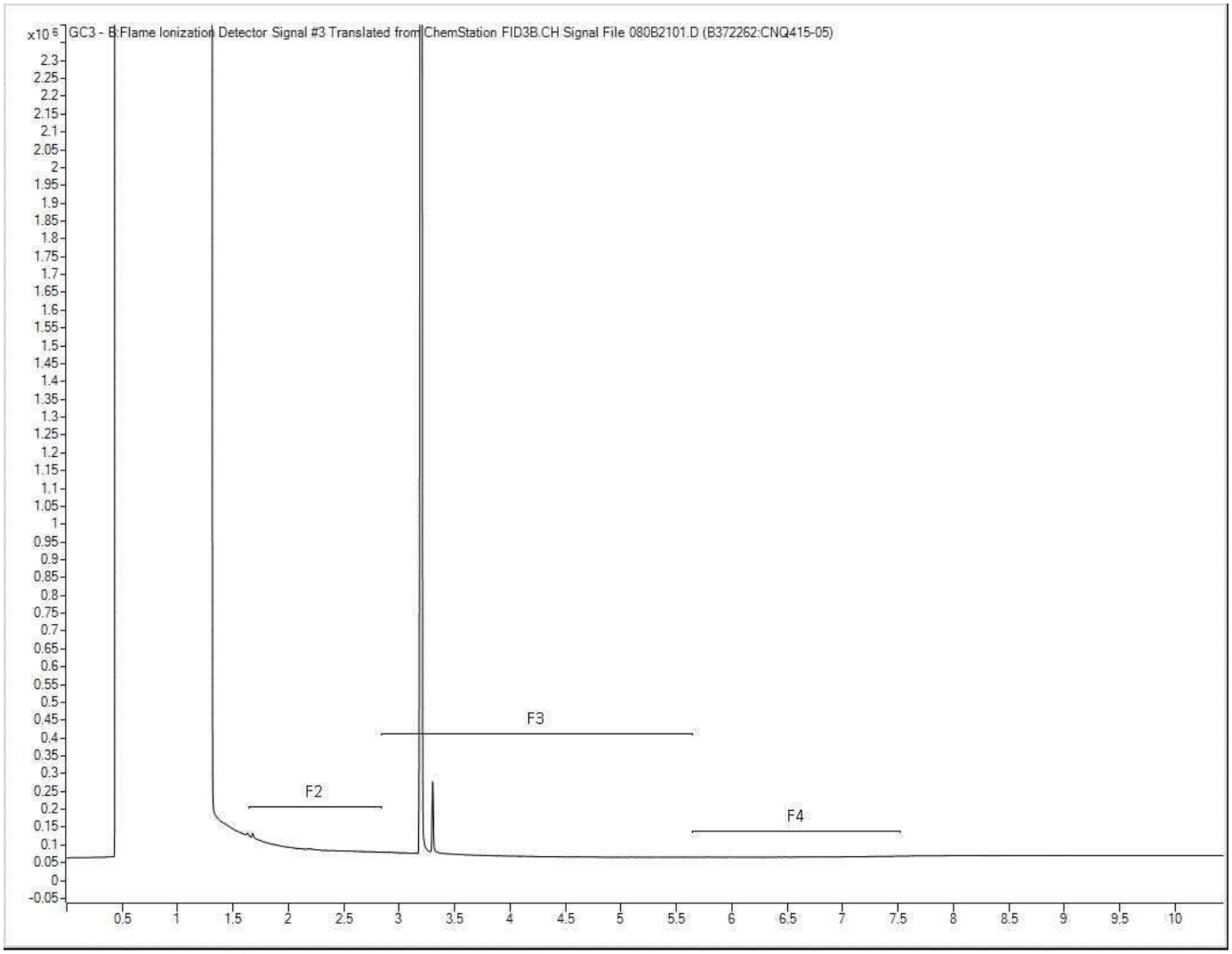
Temperature reading by:

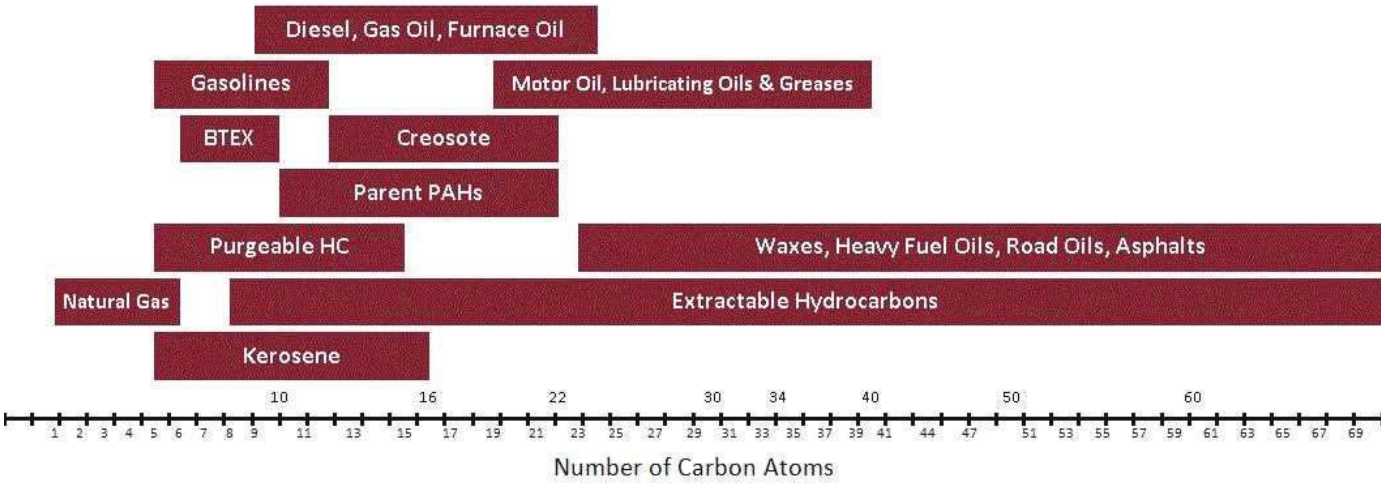
	Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special Instructions
1	Taylor Harris	2024	05	15	17	10	1 OLA OLA OLATUNJI	24	05	15	17	15	* Total coliforms, E.coli, Fecal coliforms, Heterotrophic plate count
2							2						

Dissolved parameters not field filtered - please lab

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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

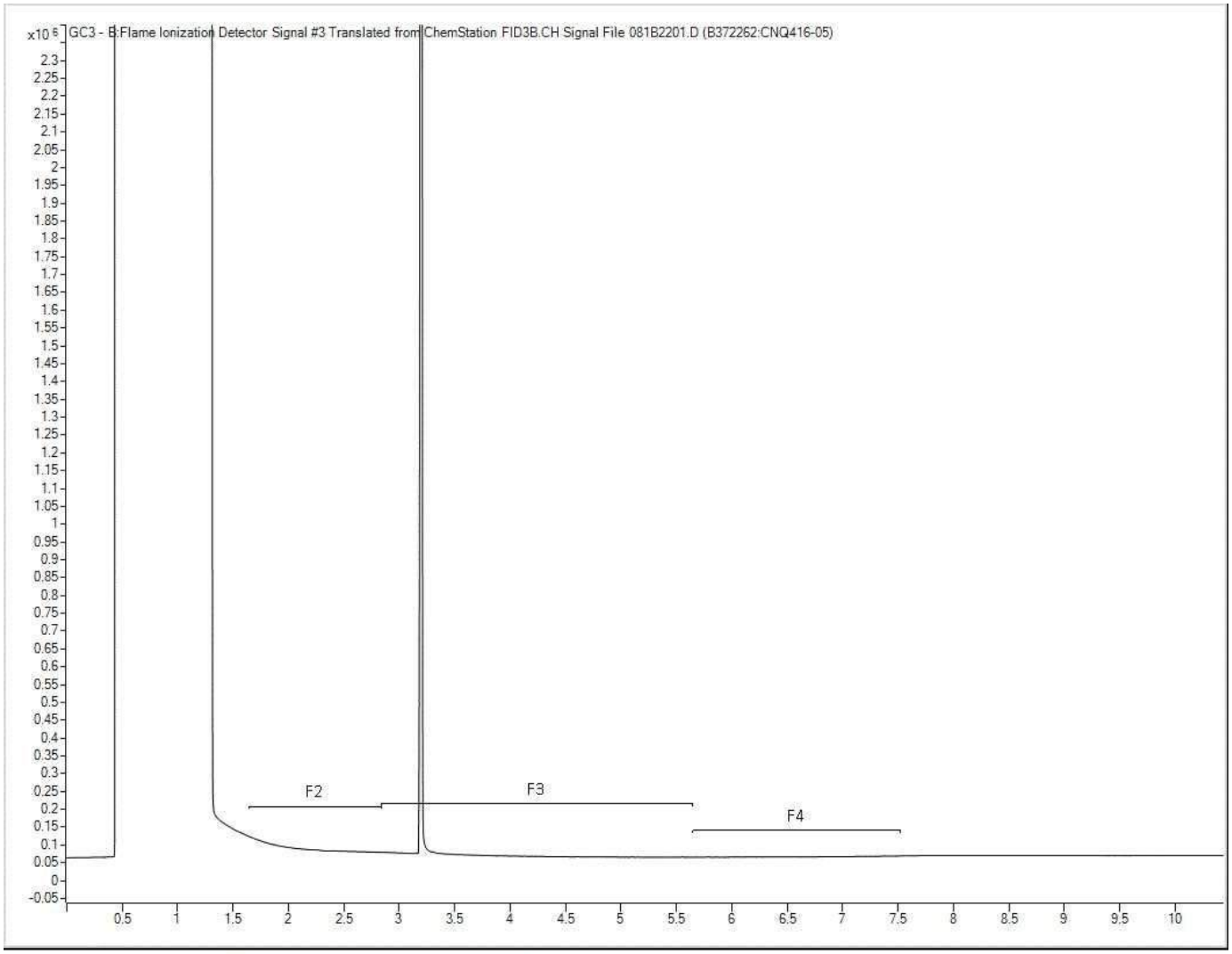


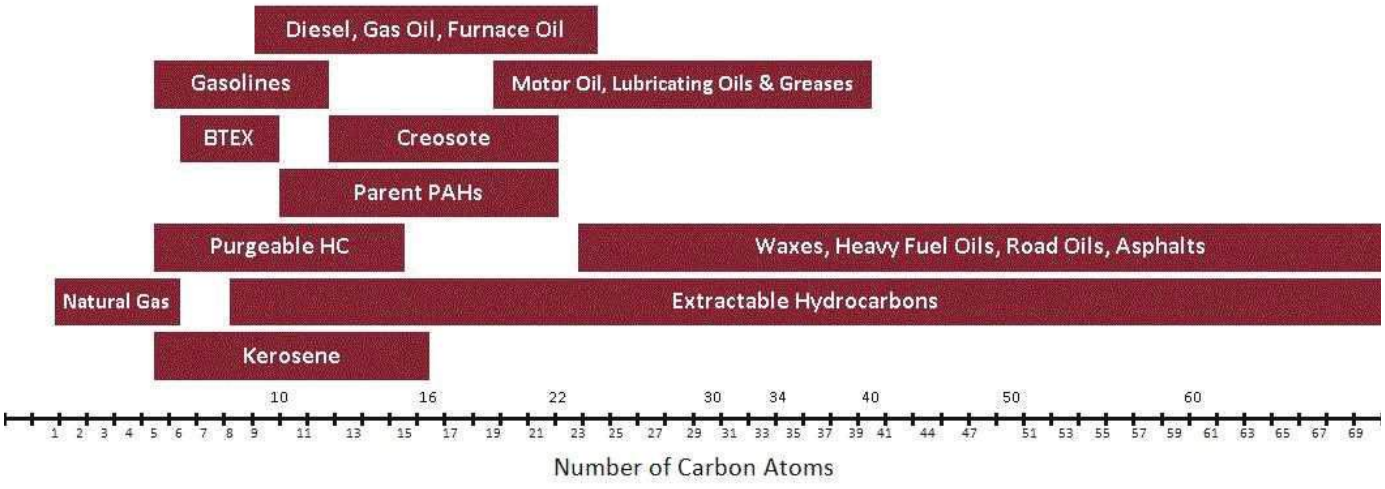


hpchem13\HPchem\1\DATA\2024\05\RUN0521

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





hpchem13\HPchem\1\DATA\2024\05\RUN0521

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 110773396
Your C.O.C. #: 1OF1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/27
Report #: R3504732
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C434999
Received: 2024/05/15, 17:15

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	2	N/A	2024/05/22	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	2	N/A	2024/05/18	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	2	N/A	2024/05/19		Auto Calc
Cadmium - low level CCME - Dissolved	2	N/A	2024/05/19		Auto Calc
Chloride/Sulphate by Auto Colourimetry	2	N/A	2024/05/17	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	2	2024/05/16	2024/05/17	AB SOP-00089	SM 24 9223 A,B m
Heterotrophic Plate Count Quant	2	2024/05/16	2024/05/18	CAL SOP-00012	SM 24 9215 A, E m
Total Coliforms and E.Coli	2	2024/05/16	2024/05/17	AB SOP-00089	SM 24 9223 A,B m
Carbon (DOC) -Lab Filtered (1)	2	N/A	2024/05/23	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	2	N/A	2024/05/22	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	2	2024/05/21	2024/05/21	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	2	N/A	2024/05/19		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	2	2024/05/22	2024/05/22	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	2	2024/05/17	2024/05/21	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (3)	2	N/A	2024/05/19	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	2	N/A	2024/05/19	AB SOP-00043	EPA 6020b R2 m
Ion Balance	2	N/A	2024/05/23		Auto Calc
Sum of cations, anions	2	N/A	2024/05/19		Auto Calc
Ammonia-N (Total)	2	N/A	2024/05/21	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	2	N/A	2024/05/18		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	2	N/A	2024/05/17	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	2	2024/05/16	2024/05/18		Auto Calc
pH @25°C (5)	2	N/A	2024/05/22	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (6)	2	N/A	2024/05/17	AB SOP-00025	SM 24 4500-P A,F m
Total Dissolved Solids (Calculated)	2	N/A	2024/05/23		Auto Calc
Total Kjeldahl Nitrogen (Total)	2	N/A	2024/05/23	BBY WI-00033	Auto Calc
Nitrogen (Total)	2	2024/05/22	2024/05/22	AB SOP-00093	SM 24 4500-N C m
Total Phosphorus-Dissolved-Lab Filtered (7)	2	2024/05/22	2024/05/22	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau

Your Project #: 110773396
Your C.O.C. #: 1OF1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/27
Report #: R3504732
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C434999
Received: 2024/05/15, 17:15

Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
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Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(7) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Your C.O.C. #: 1OF1

Attention: DYLAN KING

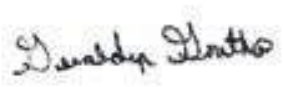
STANTEC CONSULTING LTD
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EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/27
Report #: R3504732
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C434999
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Encryption Key



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27 May 2024 10:46:03

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Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID				CNQ628		CNQ629			
Sampling Date				2024/05/15 13:11		2024/05/15 12:25			
COC Number				1OF1		1OF1			
	UNITS	MAC	AO	WS62-01	MU	NE7-R3-01	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	-	-	<0.10	N/A	<0.10	N/A	0.10	B372262
Volatiles									
Benzene	mg/L	0.005	-	<0.00040	N/A	<0.00040	N/A	0.00040	B373311
Toluene	mg/L	0.06	0.024	<0.00040	N/A	<0.00040	N/A	0.00040	B373311
Ethylbenzene	mg/L	0.14	0.0016	<0.00040	N/A	<0.00040	N/A	0.00040	B373311
m & p-Xylene	mg/L	-	-	<0.00080	N/A	<0.00080	N/A	0.00080	B373311
o-Xylene	mg/L	-	-	<0.00040	N/A	<0.00040	N/A	0.00040	B373311
Xylenes (Total)	mg/L	0.09	0.02	<0.00089	N/A	<0.00089	N/A	0.00089	B371776
F1 (C6-C10) - BTEX	mg/L	-	-	<0.10	N/A	<0.10	N/A	0.10	B371776
F1 (C6-C10)	mg/L	-	-	<0.10	N/A	<0.10	N/A	0.10	B373311
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	-	-	103	N/A	104	N/A	N/A	B373311
4-Bromofluorobenzene (sur.)	%	-	-	97	N/A	97	N/A	N/A	B373311
D4-1,2-Dichloroethane (sur.)	%	-	-	107	N/A	109	N/A	N/A	B373311
O-TERPHENYL (sur.)	%	-	-	94	N/A	101	N/A	N/A	B372262

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID					CNQ628			CNQ629			
Sampling Date					2024/05/15 13:11			2024/05/15 12:25			
COC Number					1OF1			1OF1			
	UNITS	MAC	AO	OG	WS62-01	MU	QC Batch	NE7-R3-01	MU	RDL	QC Batch
Calculated Parameters											
Anion Sum	meq/L	-	-	-	7.1	N/A	B371754	5.1	N/A	N/A	B371754
Cation Sum	meq/L	-	-	-	7.6	N/A	B371754	5.6	N/A	N/A	B371754
Hardness (CaCO3)	mg/L	-	-	-	360	N/A	B371795	260	N/A	0.50	B371795
Ion Balance (% Difference)	%	-	-	-	3.1	N/A	B371798	4.4	N/A	N/A	B371798
Nitrate (N)	mg/L	10	-	-	0.11	N/A	B371782	0.94	N/A	0.010	B371782
Nitrate (NO3)	mg/L	45	-	-	0.48	N/A	B372865	4.2	N/A	0.044	B372865
Nitrite (NO2)	mg/L	3	-	-	<0.033	N/A	B372865	<0.033	N/A	0.033	B372865
Calculated Total Dissolved Solids	mg/L	-	500	-	390	N/A	B371756	280	N/A	10	B371882
Elements											
Dissolved Cadmium (Cd)	ug/L	7	-	-	<0.020	N/A	B371474	<0.020	N/A	0.020	B371474
Misc. Inorganics											
Conductivity	uS/cm	-	-	-	620	+/- 17	B375711	460	+/- 13	2.0	B375711
pH	pH	-	-	7.0:10.5	7.73	+/- 0.0766	B375709	7.65	+/- 0.0758	N/A	B375709
Anions											
Alkalinity (PP as CaCO3)	mg/L	-	-	-	<1.0	N/A	B375705	<1.0	N/A	1.0	B375705
Alkalinity (Total as CaCO3)	mg/L	-	-	-	240	+/- 18	B375705	190	+/- 14	1.0	B375705
Bicarbonate (HCO3)	mg/L	-	-	-	290	+/- 4.7	B375705	230	+/- 3.7	1.0	B375705
Carbonate (CO3)	mg/L	-	-	-	<1.0	N/A	B375705	<1.0	N/A	1.0	B375705
Hydroxide (OH)	mg/L	-	-	-	<1.0	N/A	B375705	<1.0	N/A	1.0	B375705
Chloride (Cl)	mg/L	-	250	-	5.0	+/- 1.2	B373315	10	+/- 1.4	1.0	B373315
Sulphate (SO4)	mg/L	-	500	-	100	+/- 6.8	B373315	48	+/- 3.4	1.0	B373315
Nutrients											
Nitrite (N)	mg/L	1	-	-	<0.010	N/A	B373502	<0.010	N/A	0.010	B373502
Nitrate plus Nitrite (N)	mg/L	-	-	-	0.11	+/- 0.016	B373502	0.94	+/- 0.085	0.010	B373502
Lab Filtered Elements											
Dissolved Aluminum (Al)	mg/L	2.9	-	0.1	<0.0030	N/A	B374016	<0.0030	N/A	0.0030	B374016
Dissolved Antimony (Sb)	mg/L	0.006	-	-	<0.00060	N/A	B374016	<0.00060	N/A	0.00060	B374016
Dissolved Arsenic (As)	mg/L	0.01	-	-	<0.00020	N/A	B374016	<0.00020	N/A	0.00020	B374016
Dissolved Barium (Ba)	mg/L	2	-	-	0.067	+/- <RDL	B374018	0.099	+/- <RDL	0.010	B374018
Dissolved Beryllium (Be)	mg/L	-	-	-	<0.0010	N/A	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Boron (B)	mg/L	5	-	-	<0.020	N/A	B374018	<0.020	N/A	0.020	B374018

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID					CNQ628			CNQ629			
Sampling Date					2024/05/15 13:11			2024/05/15 12:25			
COC Number					1OF1			1OF1			
	UNITS	MAC	AO	OG	WS62-01	MU	QC Batch	NE7-R3-01	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	-	-	-	99	+/- 10	B374018	71	+/- 7.2	0.30	B374018
Dissolved Chromium (Cr)	mg/L	0.05	-	-	<0.0010	N/A	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Cobalt (Co)	mg/L	-	-	-	<0.00030	N/A	B374016	<0.00030	N/A	0.00030	B374016
Dissolved Copper (Cu)	mg/L	2.0	1.0	-	0.020	+/- 0.0056	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Iron (Fe)	mg/L	-	0.3	-	<0.060	N/A	B374018	<0.060	N/A	0.060	B374018
Dissolved Lead (Pb)	mg/L	0.005	-	-	<0.00020	N/A	B374016	<0.00020	N/A	0.00020	B374016
Dissolved Lithium (Li)	mg/L	-	-	-	<0.020	N/A	B374018	<0.020	N/A	0.020	B374018
Dissolved Magnesium (Mg)	mg/L	-	-	-	26	+/- 1.7	B374018	19	+/- 1.2	0.20	B374018
Dissolved Manganese (Mn)	mg/L	0.12	0.02	-	0.0044	+/- <RDL	B374018	<0.0040	N/A	0.0040	B374018
Dissolved Molybdenum (Mo)	mg/L	-	-	-	0.00045	+/- 0.00025	B374016	0.00067	+/- 0.00029	0.00020	B374016
Dissolved Nickel (Ni)	mg/L	-	-	-	<0.00050	N/A	B374016	<0.00050	N/A	0.00050	B374016
Dissolved Phosphorus (P)	mg/L	-	-	-	<0.10	N/A	B374018	<0.10	N/A	0.10	B374018
Dissolved Potassium (K)	mg/L	-	-	-	2.3	+/- <RDL	B374018	3.4	+/- <RDL	0.30	B374018
Dissolved Selenium (Se)	mg/L	0.05	-	-	0.0015	+/- <RDL	B374016	0.00046	+/- <RDL	0.00020	B374016
Dissolved Silicon (Si)	mg/L	-	-	-	2.8	+/- 0.53	B374018	2.5	+/- <RDL	0.50	B374018
Dissolved Silver (Ag)	mg/L	-	-	-	<0.00010	N/A	B374016	<0.00010	N/A	0.00010	B374016
Dissolved Sodium (Na)	mg/L	-	200	-	8.2	+/- 0.88	B374018	8.3	+/- 0.88	0.50	B374018
Dissolved Strontium (Sr)	mg/L	7	-	-	0.46	+/- 0.045	B374018	0.32	+/- 0.032	0.020	B374018
Dissolved Sulphur (S)	mg/L	-	-	-	31	+/- 2.1	B374018	14	+/- 0.95	0.20	B374018
Dissolved Thallium (Tl)	mg/L	-	-	-	<0.00020	N/A	B374016	<0.00020	N/A	0.00020	B374016
Dissolved Tin (Sn)	mg/L	-	-	-	<0.0010	N/A	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Titanium (Ti)	mg/L	-	-	-	<0.0010	N/A	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Uranium (U)	mg/L	0.02	-	-	0.0012	+/- 0.00013	B374016	0.00061	+/- <RDL	0.00010	B374016
Dissolved Vanadium (V)	mg/L	-	-	-	<0.0010	N/A	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Zinc (Zn)	mg/L	-	5.0	-	0.050	+/- 0.0044	B374016	0.0089	+/- <RDL	0.0030	B374016

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

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TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CNQ628		CNQ629			
Sampling Date		2024/05/15 13:11		2024/05/15 12:25			
COC Number		1OF1		1OF1			
	UNITS	WS62-01	MU	NE7-R3-01	MU	RDL	QC Batch
Calculated Parameters							
Total Kjeldahl Nitrogen (Calc)	mg/L	0.154	N/A	0.112	N/A	0.020	B372867
Nutrients							
Total Nitrogen (N)	mg/L	0.26	+/- 0.054	1.1	+/- 0.16	0.020	B376175

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID			CNQ628		CNQ628			CNQ629			
Sampling Date			2024/05/15 13:11		2024/05/15 13:11			2024/05/15 12:25			
COC Number			1OF1		1OF1			1OF1			
	UNITS	MAC	WS62-01	MU	WS62-01 Lab-Dup	MU	QC Batch	NE7-R3-01	MU	RDL	QC Batch
Lab Filtered Inorganics											
Dissolved Organic Carbon (C)	mg/L	-	1.6	+/- <RDL	N/A	N/A	B377384	1.5	+/- <RDL	0.50	B377384
Microbiological Param.											
E.Coli DST	MPN/100mL	1	<1.0	N/A	N/A	N/A	B371950	<1.0	N/A	1.0	B371950
Fecal Coliforms	MPN/100mL	-	<1.0	N/A	N/A	N/A	B371985	1.0	N/A	1.0	B371985
Heterotrophic DST	MPN/100mL	-	35	N/A	N/A	N/A	B372018	170	N/A	1.0	B372018
Total Coliforms DST	MPN/100mL	1	<1.0	N/A	N/A	N/A	B371950	<1.0	N/A	1.0	B371950
Nutrients											
Total Ammonia (N)	mg/L	-	<0.015	N/A	N/A	N/A	B374941	<0.015	N/A	0.015	B374941
Orthophosphate (P)	mg/L	-	<0.0030	N/A	N/A	N/A	B373475	<0.0030	N/A	0.0030	B373475
Lab Filtered Nutrients											
Dissolved Phosphorus (P)	mg/L	-	<0.0030	N/A	<0.0030	N/A	B375706	<0.0030	N/A	0.0030	B375529

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID			CNQ628		CNQ629		CNQ629			
Sampling Date			2024/05/15 13:11		2024/05/15 12:25		2024/05/15 12:25			
COC Number			1OF1		1OF1		1OF1			
	UNITS	MAC	WS62-01	MU	NE7-R3-01	MU	NE7-R3-01 Lab-Dup	MU	RDL	QC Batch
Elements										
Total Mercury (Hg)	ug/L	1	<0.0019	N/A	<0.0019	N/A	<0.0019	N/A	0.0019	B372352
Lab Filtered Elements										
Dissolved Mercury (Hg)	ug/L	1	<0.0019	N/A	<0.0019	N/A	N/A	N/A	0.0019	B375657

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	9.7°C

Version 2: CDWG criteria included.
MAC,AO,OG: The guidelines that have been included in this report have been taken from the Canadian Drinking Water Quality Summary Table, September 2022.

Criteria A = Maximum Acceptable Concentration (MAC) / Criteria B = Aesthetic Objectives (AO) / Criteria C = Operational Guidance Values (OG)
It is recommended to consult these guidelines when interpreting your data since there are non-numerical guidelines that are not included on this report.

Turbidity Guidelines:
1. Chemically assisted filtration: less than or equal to 0.3 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 1.0 NTU at any time.
2. Slow sand / diatomaceous earth filtration: less than or equal to 1.0 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 3.0 NTU at any time.
3. Membrane filtration: less than or equal to 0.1 NTU in 99% of the measurements made or at least 99% of the time each calendar month. Shall not exceed 0.3 NTU at any time.
4. To ensure effectiveness of disinfection and for good operation of the distribution system, it is recommended that water entering the distribution system have turbidity levels of 1.0 NTU or less.
Measurement of Uncertainty has not been accounted for when stating conformity to the selected criteria, where applicable.
The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B371950	SOG	Method Blank	E.Coli DST	2024/05/17	<1.0		mpn/100mL	
			Total Coliforms DST	2024/05/17	<1.0		mpn/100mL	
B371950	SOG	RPD	E.Coli DST	2024/05/17	NC		%	N/A
			Total Coliforms DST	2024/05/17	40		%	N/A
B371985	YYL	Method Blank	Fecal Coliforms	2024/05/17	<1.0		MPN/100mL	
B371985	YYL	RPD	Fecal Coliforms	2024/05/17	NC		%	N/A
B372018	SOG	Method Blank	Heterotrophic DST	2024/05/18	<1.0		mpn/100mL	
B372018	SOG	RPD	Heterotrophic DST	2024/05/18	44		%	N/A
B372262	GG3	Spiked Blank	O-TERPHENYL (sur.)	2024/05/21		111	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/21		102	%	60 - 140
B372262	GG3	Method Blank	O-TERPHENYL (sur.)	2024/05/21		106	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/21	<0.10		mg/L	
B372352	MPK	Matrix Spike	Total Mercury (Hg)	2024/05/21		94	%	80 - 120
B372352	MPK	Spiked Blank	Total Mercury (Hg)	2024/05/21		97	%	80 - 120
B372352	MPK	Method Blank	Total Mercury (Hg)	2024/05/21	<0.0019		ug/L	
B372352	MPK	RPD [CNQ629-08]	Total Mercury (Hg)	2024/05/21	NC		%	20
B373311	RIL	Matrix Spike	1,4-Difluorobenzene (sur.)	2024/05/18		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/18		104	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/18		102	%	50 - 140
			Benzene	2024/05/18		100	%	50 - 140
			Toluene	2024/05/18		101	%	50 - 140
			Ethylbenzene	2024/05/18		104	%	50 - 140
			m & p-Xylene	2024/05/18		102	%	50 - 140
			o-Xylene	2024/05/18		96	%	50 - 140
			F1 (C6-C10)	2024/05/18		108	%	60 - 140
B373311	RIL	Spiked Blank	1,4-Difluorobenzene (sur.)	2024/05/18		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/18		105	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/18		102	%	50 - 140
			Benzene	2024/05/18		101	%	60 - 130
			Toluene	2024/05/18		102	%	60 - 130
			Ethylbenzene	2024/05/18		105	%	60 - 130
			m & p-Xylene	2024/05/18		105	%	60 - 130
			o-Xylene	2024/05/18		99	%	60 - 130
			F1 (C6-C10)	2024/05/18		106	%	60 - 140
B373311	RIL	Method Blank	1,4-Difluorobenzene (sur.)	2024/05/18		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/18		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/18		107	%	50 - 140
			Benzene	2024/05/18	<0.00040		mg/L	
			Toluene	2024/05/18	<0.00040		mg/L	
			Ethylbenzene	2024/05/18	<0.00040		mg/L	
			m & p-Xylene	2024/05/18	<0.00080		mg/L	
			o-Xylene	2024/05/18	<0.00040		mg/L	
			F1 (C6-C10)	2024/05/18	<0.10		mg/L	
B373311	RIL	RPD	Benzene	2024/05/18	NC		%	30
			Toluene	2024/05/18	NC		%	30
			Ethylbenzene	2024/05/18	NC		%	30
			m & p-Xylene	2024/05/18	NC		%	30
			o-Xylene	2024/05/18	NC		%	30
			F1 (C6-C10)	2024/05/18	NC		%	30
B373315	SKM	Matrix Spike	Chloride (Cl)	2024/05/17		95	%	80 - 120
			Sulphate (SO4)	2024/05/17		NC	%	80 - 120
B373315	SKM	Spiked Blank	Chloride (Cl)	2024/05/17		98	%	80 - 120
			Sulphate (SO4)	2024/05/17		101	%	80 - 120
B373315	SKM	Method Blank	Chloride (Cl)	2024/05/17	<1.0		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Sulphate (SO4)	2024/05/17	<1.0		mg/L	
B373315	SKM	RPD	Chloride (Cl)	2024/05/17	1.1		%	20
			Sulphate (SO4)	2024/05/17	1.3		%	20
B373475	MAP	Matrix Spike	Orthophosphate (P)	2024/05/17		92	%	80 - 120
B373475	MAP	Spiked Blank	Orthophosphate (P)	2024/05/17		96	%	80 - 120
B373475	MAP	Method Blank	Orthophosphate (P)	2024/05/17	<0.0030		mg/L	
B373475	MAP	RPD	Orthophosphate (P)	2024/05/17	5.1		%	20
B373502	ISW	Matrix Spike	Nitrite (N)	2024/05/17		93	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/17		127 (1)	%	80 - 120
B373502	ISW	Spiked Blank	Nitrite (N)	2024/05/17		99	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/17		103	%	80 - 120
B373502	ISW	Method Blank	Nitrite (N)	2024/05/17	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/17	<0.010		mg/L	
B373502	ISW	RPD	Nitrite (N)	2024/05/17	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/17	2.9		%	20
B374016	JAB	Matrix Spike	Dissolved Aluminum (Al)	2024/05/19		99	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/19		95	%	80 - 120
			Dissolved Arsenic (As)	2024/05/19		97	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/19		104	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/19		90	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/19		92	%	80 - 120
			Dissolved Copper (Cu)	2024/05/19		89	%	80 - 120
			Dissolved Lead (Pb)	2024/05/19		93	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/19		108	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/19		90	%	80 - 120
			Dissolved Selenium (Se)	2024/05/19		111	%	80 - 120
			Dissolved Silver (Ag)	2024/05/19		94	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/19		94	%	80 - 120
			Dissolved Tin (Sn)	2024/05/19		101	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/19		89	%	80 - 120
			Dissolved Uranium (U)	2024/05/19		NC	%	80 - 120
			Dissolved Vanadium (V)	2024/05/19		95	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/19		88	%	80 - 120
B374016	JAB	Spiked Blank	Dissolved Aluminum (Al)	2024/05/19		92	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/19		88	%	80 - 120
			Dissolved Arsenic (As)	2024/05/19		85	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/19		100	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/19		85	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/19		88	%	80 - 120
			Dissolved Copper (Cu)	2024/05/19		87	%	80 - 120
			Dissolved Lead (Pb)	2024/05/19		91	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/19		94	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/19		87	%	80 - 120
			Dissolved Selenium (Se)	2024/05/19		94	%	80 - 120
			Dissolved Silver (Ag)	2024/05/19		91	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/19		89	%	80 - 120
			Dissolved Tin (Sn)	2024/05/19		90	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/19		84	%	80 - 120
			Dissolved Uranium (U)	2024/05/19		91	%	80 - 120
			Dissolved Vanadium (V)	2024/05/19		88	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/19		84	%	80 - 120
B374016	JAB	Method Blank	Dissolved Aluminum (Al)	2024/05/19	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2024/05/19	<0.00060		mg/L	
			Dissolved Arsenic (As)	2024/05/19	<0.00020		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Beryllium (Be)	2024/05/19	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2024/05/19	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2024/05/19	<0.00030		mg/L	
			Dissolved Copper (Cu)	2024/05/19	<0.0010		mg/L	
			Dissolved Lead (Pb)	2024/05/19	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2024/05/19	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2024/05/19	<0.00050		mg/L	
			Dissolved Selenium (Se)	2024/05/19	<0.00020		mg/L	
			Dissolved Silver (Ag)	2024/05/19	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2024/05/19	<0.00020		mg/L	
			Dissolved Tin (Sn)	2024/05/19	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2024/05/19	<0.0010		mg/L	
			Dissolved Uranium (U)	2024/05/19	<0.00010		mg/L	
			Dissolved Vanadium (V)	2024/05/19	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2024/05/19	<0.0030		mg/L	
B374016	JAB	RPD	Dissolved Aluminum (Al)	2024/05/19	NC		%	20
			Dissolved Antimony (Sb)	2024/05/19	NC		%	20
			Dissolved Arsenic (As)	2024/05/19	15		%	20
			Dissolved Beryllium (Be)	2024/05/19	NC		%	20
			Dissolved Chromium (Cr)	2024/05/19	NC		%	20
			Dissolved Cobalt (Co)	2024/05/19	NC		%	20
			Dissolved Copper (Cu)	2024/05/19	8.7		%	20
			Dissolved Lead (Pb)	2024/05/19	NC		%	20
			Dissolved Molybdenum (Mo)	2024/05/19	2.1		%	20
			Dissolved Nickel (Ni)	2024/05/19	0.63		%	20
			Dissolved Selenium (Se)	2024/05/19	3.9 (2)		%	20
			Dissolved Silver (Ag)	2024/05/19	NC		%	20
			Dissolved Thallium (Tl)	2024/05/19	NC		%	20
			Dissolved Tin (Sn)	2024/05/19	NC		%	20
			Dissolved Titanium (Ti)	2024/05/19	NC		%	20
			Dissolved Uranium (U)	2024/05/19	4.8		%	20
			Dissolved Vanadium (V)	2024/05/19	NC		%	20
			Dissolved Zinc (Zn)	2024/05/19	NC		%	20
B374018	VSC	Matrix Spike	Dissolved Barium (Ba)	2024/05/19		94	%	80 - 120
			Dissolved Boron (B)	2024/05/19		99	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/19		96	%	80 - 120
			Dissolved Iron (Fe)	2024/05/19		92	%	80 - 120
			Dissolved Lithium (Li)	2024/05/19		97	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/19		99	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/19		94	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/19		93	%	80 - 120
			Dissolved Potassium (K)	2024/05/19		98	%	80 - 120
			Dissolved Silicon (Si)	2024/05/19		82	%	80 - 120
			Dissolved Sodium (Na)	2024/05/19		99	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/19		93	%	80 - 120
			Dissolved Sulphur (S)	2024/05/19		91	%	80 - 120
B374018	VSC	Spiked Blank	Dissolved Barium (Ba)	2024/05/19		98	%	80 - 120
			Dissolved Boron (B)	2024/05/19		101	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/19		101	%	80 - 120
			Dissolved Iron (Fe)	2024/05/19		104	%	80 - 120
			Dissolved Lithium (Li)	2024/05/19		101	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/19		104	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/19		103	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/19		100	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Potassium (K)	2024/05/19		100	%	80 - 120
			Dissolved Silicon (Si)	2024/05/19		96	%	80 - 120
			Dissolved Sodium (Na)	2024/05/19		102	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/19		96	%	80 - 120
			Dissolved Sulphur (S)	2024/05/19		96	%	80 - 120
B374018	VSC	Method Blank	Dissolved Barium (Ba)	2024/05/19	<0.010		mg/L	
			Dissolved Boron (B)	2024/05/19	<0.020		mg/L	
			Dissolved Calcium (Ca)	2024/05/19	<0.30		mg/L	
			Dissolved Iron (Fe)	2024/05/19	<0.060		mg/L	
			Dissolved Lithium (Li)	2024/05/19	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2024/05/19	<0.20		mg/L	
			Dissolved Manganese (Mn)	2024/05/19	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2024/05/19	<0.10		mg/L	
			Dissolved Potassium (K)	2024/05/19	<0.30		mg/L	
			Dissolved Silicon (Si)	2024/05/19	<0.50		mg/L	
			Dissolved Sodium (Na)	2024/05/19	<0.50		mg/L	
			Dissolved Strontium (Sr)	2024/05/19	<0.020		mg/L	
			Dissolved Sulphur (S)	2024/05/19	<0.20		mg/L	
B374018	VSC	RPD	Dissolved Calcium (Ca)	2024/05/19	0.61		%	20
			Dissolved Iron (Fe)	2024/05/19	14		%	20
			Dissolved Magnesium (Mg)	2024/05/19	0.82		%	20
			Dissolved Manganese (Mn)	2024/05/19	NC		%	20
			Dissolved Potassium (K)	2024/05/19	0.45		%	20
			Dissolved Sodium (Na)	2024/05/19	0.092		%	20
B374941	AFI	Matrix Spike	Total Ammonia (N)	2024/05/21		107	%	80 - 120
B374941	AFI	Spiked Blank	Total Ammonia (N)	2024/05/21		104	%	80 - 120
B374941	AFI	Method Blank	Total Ammonia (N)	2024/05/21	<0.015		mg/L	
B374941	AFI	RPD	Total Ammonia (N)	2024/05/21	NC		%	20
B375529	CTU	Matrix Spike	Dissolved Phosphorus (P)	2024/05/22		104	%	80 - 120
B375529	CTU	QC Standard	Dissolved Phosphorus (P)	2024/05/22		91	%	80 - 120
B375529	CTU	Spiked Blank	Dissolved Phosphorus (P)	2024/05/22		96	%	80 - 120
B375529	CTU	Method Blank	Dissolved Phosphorus (P)	2024/05/22	<0.0030		mg/L	
B375529	CTU	RPD	Dissolved Phosphorus (P)	2024/05/22	6.4		%	20
B375657	KHU	Matrix Spike	Dissolved Mercury (Hg)	2024/05/22		94	%	80 - 120
B375657	KHU	Spiked Blank	Dissolved Mercury (Hg)	2024/05/22		98	%	80 - 120
B375657	KHU	Method Blank	Dissolved Mercury (Hg)	2024/05/22	<0.0019		ug/L	
B375657	KHU	RPD	Dissolved Mercury (Hg)	2024/05/22	NC		%	20
B375705	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/22		100	%	80 - 120
B375705	JVM	Method Blank	Alkalinity (PP as CaCO3)	2024/05/22	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/22	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/22	<1.0		mg/L	
			Carbonate (CO3)	2024/05/22	<1.0		mg/L	
			Hydroxide (OH)	2024/05/22	<1.0		mg/L	
B375705	JVM	RPD	Alkalinity (PP as CaCO3)	2024/05/22	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/22	0.35		%	20
			Bicarbonate (HCO3)	2024/05/22	0.35		%	20
			Carbonate (CO3)	2024/05/22	NC		%	20
			Hydroxide (OH)	2024/05/22	NC		%	20
B375706	CTU	Matrix Spike [CNQ628-01]	Dissolved Phosphorus (P)	2024/05/22		92	%	80 - 120
B375706	CTU	QC Standard	Dissolved Phosphorus (P)	2024/05/22		93	%	80 - 120
B375706	CTU	Spiked Blank	Dissolved Phosphorus (P)	2024/05/22		96	%	80 - 120
B375706	CTU	Method Blank	Dissolved Phosphorus (P)	2024/05/22	<0.0030		mg/L	
B375706	CTU	RPD [CNQ628-01]	Dissolved Phosphorus (P)	2024/05/22	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B375709	JVM	Spiked Blank	pH	2024/05/22		100	%	97 - 103
B375709	JVM	RPD	pH	2024/05/22	0.37		%	N/A
B375711	JVM	Spiked Blank	Conductivity	2024/05/22		100	%	90 - 110
B375711	JVM	Method Blank	Conductivity	2024/05/22	<2.0		uS/cm	
B375711	JVM	RPD	Conductivity	2024/05/22	0.27		%	10
B376175	YL7	Matrix Spike	Total Nitrogen (N)	2024/05/22		103	%	80 - 120
B376175	YL7	QC Standard	Total Nitrogen (N)	2024/05/22		101	%	80 - 120
B376175	YL7	Spiked Blank	Total Nitrogen (N)	2024/05/22		102	%	80 - 120
B376175	YL7	Method Blank	Total Nitrogen (N)	2024/05/22	<0.020		mg/L	
B376175	YL7	RPD	Total Nitrogen (N)	2024/05/22	1.7		%	20
B377384	MDO	Matrix Spike	Dissolved Organic Carbon (C)	2024/05/23		93	%	80 - 120
B377384	MDO	Spiked Blank	Dissolved Organic Carbon (C)	2024/05/23		103	%	80 - 120
B377384	MDO	Method Blank	Dissolved Organic Carbon (C)	2024/05/23	<0.50		mg/L	
B377384	MDO	RPD	Dissolved Organic Carbon (C)	2024/05/23	0.27		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

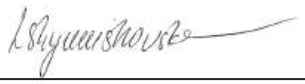
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(2) Detection limits raised due to matrix interference.

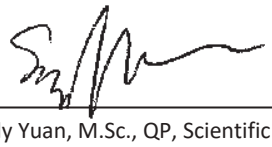
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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Luba Shymushovska, B.Sc., QP, Senior Analyst, Organics



Sandy Yuan, M.Sc., QP, Scientific Specialist



Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

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MCAL-2024-05-920

1/1

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CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

Page 1 of 1

Invoice Information	Invoice to (requires report) ☒	Report Information		Project Information	
Company:	Stantec Consulting	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	#300, 10220 103 Ave NW	Street Address:		Project #:	110773396
City:	Edmonton Prov: AB Postal Code: T5J0K4	City:	Prov: Postal Code:	Site #:	
Phone:	780 969 2223	Phone:		Site Location:	
Email:	dylan.king@stantec.com	Email:		Site Location Province:	AB
Copies:		Copies:		Sampled By:	WT/TH

LAB USE ONLY - PLACE STICKER HERE

C434499

Rush Confirmation #:

Regulatory Criteria

☐ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba
☐ Saskatchewan ☒ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	FIELD FILTERED	FIELD PRESERVED	LAB FILTRATION REQUIRED	BTEX F1	VOCs	BTEX F1-F2	BTEX F3-F4	Routine water	Regulated metals - total	Regulated metals - dissolved	Mercury - total	Mercury - dissolved	Salinity 4	Sieve (75 micron)	Toluene (Residue, air, clay) DOC	Basic Lassat Turbidity TKN	dissolved phosphorus	phosphate	ammonia	bacteriological *	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE
1	WS62-01	24	05	15	13	11	water						X		X		X	X	X			X	X	X	X	X	X	11	
2	NE7-R3-01	24	05	15	12	25	water						X		X		X	X	X			X	X	X	X	X	X	11	
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Regular Turnaround Time (TAT): ☒ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply: ☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

Comments

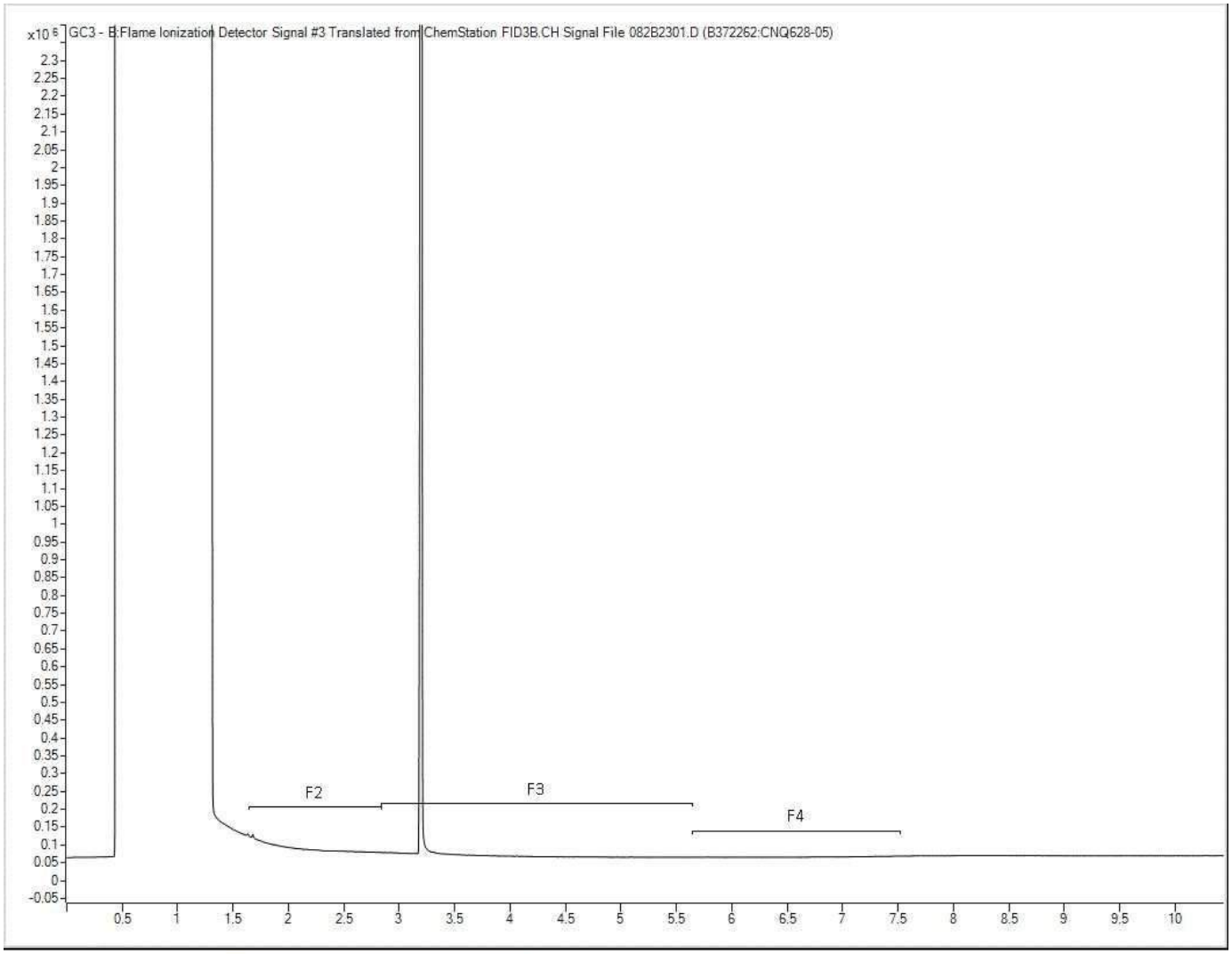
*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

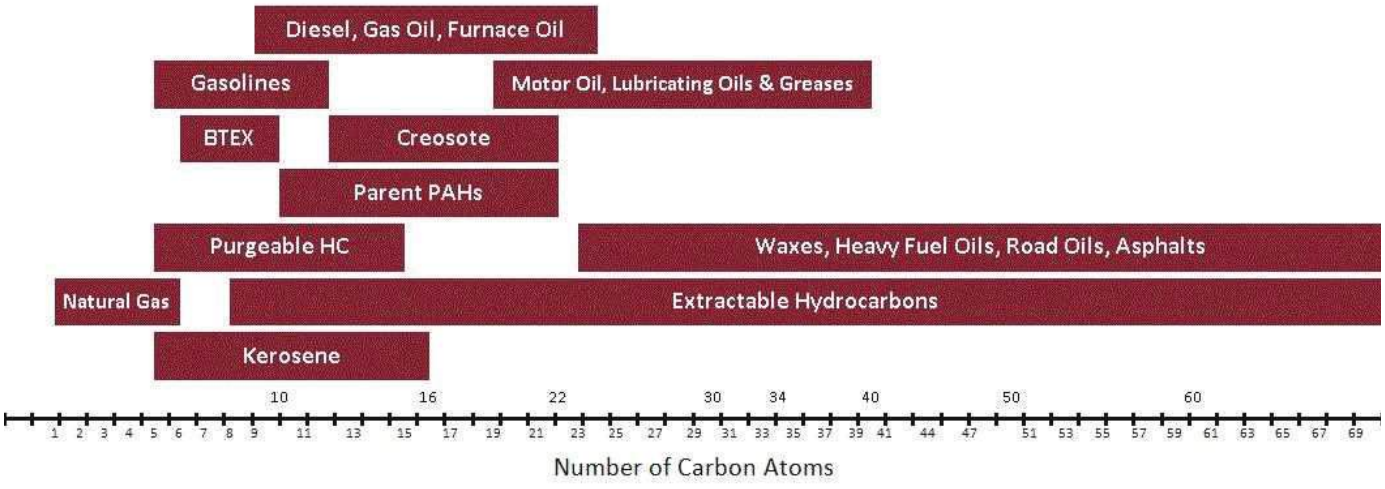
LAB USE ONLY	Yes	No	°C				LAB USE ONLY	Yes	No	°C				LAB USE ONLY	Yes	No	°C				Temperature reading by:
Seal present		✓					Seal present		✓					Seal present							
Seal intact		✓					Seal intact		✓					Seal intact							
Cooling media present	✓			9	10	10	Cooling media present	✓			9	00	10	Cooling media present				1	2	3	
				1	2	3					1	2	3								

	Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special Instructions
1	Taylor Harris	2024	05	15	17	10	OLA OLA OLA TUNJI	24	05	15	17	15	* total coliforms, e.coli, fecal coliforms, heterotrophic plate count
2													

Dissolved parameters do not filtered pls lab filter.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

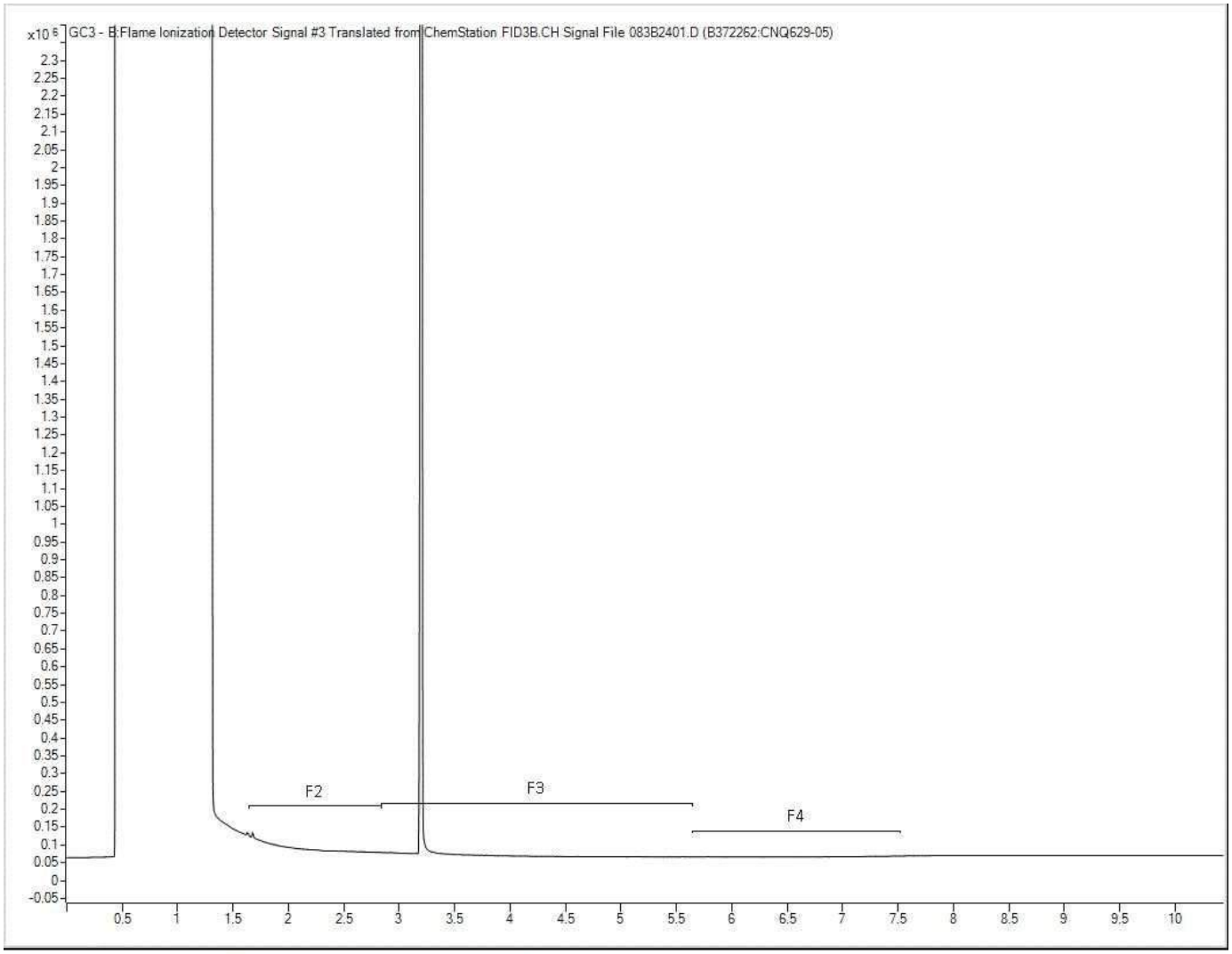


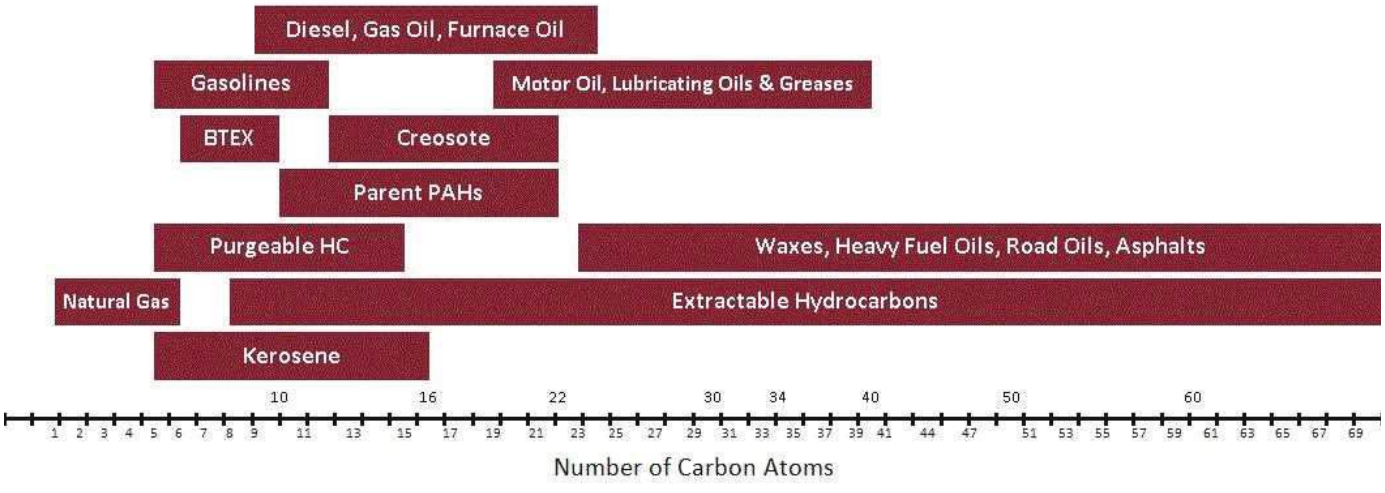


hpchem13\HPchem\1\DATA\2024\05\RUN0521

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





hpchem13\HPchem\1\DATA\2024\05\RUN0521

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 110773396
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/24
Report #: R3504310
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C435079
Received: 2024/05/15, 17:15

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	8	N/A	2024/05/23	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	8	N/A	2024/05/19	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	8	N/A	2024/05/19		Auto Calc
Cadmium - low level CCME - Dissolved	8	N/A	2024/05/19		Auto Calc
Chloride/Sulphate by Auto Colourimetry	8	N/A	2024/05/19	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	8	2024/05/16	2024/05/17	AB SOP-00089	SM 24 9223 A,B m
Heterotrophic Plate Count Quant	8	2024/05/16	2024/05/18	CAL SOP-00012	SM 24 9215 A, E m
Total Coliforms and E.Coli	8	2024/05/16	2024/05/17	AB SOP-00089	SM 24 9223 A,B m
Carbon (DOC) -Lab Filtered (1)	2	N/A	2024/05/22	AB SOP-00087	MMCW 119 1996 m
Carbon (DOC) -Lab Filtered (1)	6	N/A	2024/05/23	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	8	N/A	2024/05/23	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	8	2024/05/17	2024/05/22	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	7	N/A	2024/05/19		Auto Calc
Hardness	1	N/A	2024/05/23		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	8	2024/05/22	2024/05/22	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	8	2024/05/17	2024/05/21	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (3)	8	N/A	2024/05/19	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	8	N/A	2024/05/19	AB SOP-00043	EPA 6020b R2 m
Ion Balance	8	N/A	2024/05/23		Auto Calc
Sum of cations, anions	7	N/A	2024/05/19		Auto Calc
Sum of cations, anions	1	N/A	2024/05/23		Auto Calc
Ammonia-N (Total)	7	N/A	2024/05/21	AB SOP-00007	SM 24 4500 NH3 A G m
Ammonia-N (Total)	1	N/A	2024/05/23	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	8	N/A	2024/05/19		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	8	N/A	2024/05/18	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	8	2024/05/16	2024/05/19		Auto Calc
pH @25°C (5)	8	N/A	2024/05/23	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (6)	8	N/A	2024/05/17	AB SOP-00025	SM 24 4500-P A,F m
Total Dissolved Solids (Calculated)	8	N/A	2024/05/23		Auto Calc
Total Kjeldahl Nitrogen (Total)	8	N/A	2024/05/23	BBY WI-00033	Auto Calc
Nitrogen (Total)	8	2024/05/22	2024/05/22	AB SOP-00093	SM 24 4500-N C m

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/24
Report #: R3504310
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C435079
Received: 2024/05/15, 17:15

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Phosphorus-Dissolved-Lab Filtered (7)	8	2024/05/22	2024/05/22	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(7) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Your Project #: 110773396
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Report Date: 2024/05/24
Report #: R3504310
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C435079
Received: 2024/05/15, 17:15

Encryption Key



Bureau Veritas
24 May 2024 15:25:13

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (403) 291-3077

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Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CNR021			CNR022			CNR023			
Sampling Date		2024/05/15 08:02			2024/05/15 08:49			2024/05/15 09:37			
COC Number		1/1			1/1			1/1			
	UNITS	MW 16-26	MU	RDL	RMW 16-5-12	MU	RDL	MW 16-4-22	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	0.80	+/- 0.38	0.10	<0.10	N/A	0.10	<0.10	N/A	0.10	B373412
Volatiles											
Benzene	mg/L	<0.00040	N/A	0.00040	<0.00050 (1)	N/A	0.00050	<0.00040	N/A	0.00040	B372547
Toluene	mg/L	<0.00040	N/A	0.00040	<0.00040	N/A	0.00040	<0.00040	N/A	0.00040	B372547
Ethylbenzene	mg/L	<0.00040	N/A	0.00040	<0.00040	N/A	0.00040	<0.00040	N/A	0.00040	B372547
m & p-Xylene	mg/L	<0.00080	N/A	0.00080	<0.00080	N/A	0.00080	<0.00080	N/A	0.00080	B372547
o-Xylene	mg/L	<0.00040	N/A	0.00040	<0.00040	N/A	0.00040	<0.00040	N/A	0.00040	B372547
Xylenes (Total)	mg/L	<0.00089	N/A	0.00089	<0.00089	N/A	0.00089	<0.00089	N/A	0.00089	B372002
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	0.10	<0.10	N/A	0.10	<0.10	N/A	0.10	B372002
F1 (C6-C10)	mg/L	<0.10	N/A	0.10	<0.10	N/A	0.10	<0.10	N/A	0.10	B372547
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	101	N/A	N/A	102	N/A	N/A	103	N/A	N/A	B372547
4-Bromofluorobenzene (sur.)	%	98	N/A	N/A	103	N/A	N/A	102	N/A	N/A	B372547
D4-1,2-Dichloroethane (sur.)	%	104	N/A	N/A	101	N/A	N/A	101	N/A	N/A	B372547
O-TERPHENYL (sur.)	%	95	N/A	N/A	98	N/A	N/A	98	N/A	N/A	B373412

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to interferent.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CNR024		CNR025		CNR026		CNR027			
Sampling Date		2024/05/15 15:16		2024/05/15 14:55		2024/05/15 15:27		2024/05/15 15:45			
COC Number		1/1		1/1		1/1		1/1			
	UNITS	RMW 16-23-7	MU	RMW 16-23-14	MU	RMW 16-23-32	MU	SR24-02	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B373412
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372547
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372547
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372547
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B372547
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372547
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B372002
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B372002
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B372547
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	103	N/A	103	N/A	102	N/A	103	N/A	N/A	B372547
4-Bromofluorobenzene (sur.)	%	101	N/A	102	N/A	100	N/A	101	N/A	N/A	B372547
D4-1,2-Dichloroethane (sur.)	%	102	N/A	103	N/A	107	N/A	103	N/A	N/A	B372547
O-TERPHENYL (sur.)	%	98	N/A	99	N/A	96	N/A	97	N/A	N/A	B373412

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CNR028			
Sampling Date		2024/05/15 16:01			
COC Number		1/1			
	UNITS	SR24-03	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	0.10	B373412
Volatiles					
Benzene	mg/L	<0.00040	N/A	0.00040	B372547
Toluene	mg/L	<0.00040	N/A	0.00040	B372547
Ethylbenzene	mg/L	<0.00040	N/A	0.00040	B372547
m & p-Xylene	mg/L	<0.00080	N/A	0.00080	B372547
o-Xylene	mg/L	<0.00040	N/A	0.00040	B372547
Xylenes (Total)	mg/L	<0.00089	N/A	0.00089	B372002
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	0.10	B372002
F1 (C6-C10)	mg/L	<0.10	N/A	0.10	B372547
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	101	N/A	N/A	B372547
4-Bromofluorobenzene (sur.)	%	101	N/A	N/A	B372547
D4-1,2-Dichloroethane (sur.)	%	101	N/A	N/A	B372547
O-TERPHENYL (sur.)	%	107	N/A	N/A	B373412

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR021				CNR022			
Sampling Date		2024/05/15 08:02				2024/05/15 08:49			
COC Number		1/1				1/1			
	UNITS	MW 16-26	MU	RDL	QC Batch	RMW 16-5-12	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	89	N/A	N/A	B372033	8.1	N/A	N/A	B372033
Cation Sum	meq/L	97	N/A	N/A	B372033	9.5	N/A	N/A	B372033
Hardness (CaCO3)	mg/L	3100	N/A	0.50	B372005	320	N/A	0.50	B372005
Ion Balance (% Difference)	%	4.1	N/A	N/A	B372007	8.0	N/A	N/A	B372007
Nitrate (N)	mg/L	<0.050	N/A	0.050	B371968	<0.010	N/A	0.010	B371968
Nitrate (NO3)	mg/L	<0.22	N/A	0.22	B372872	<0.044	N/A	0.044	B372872
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B372872	<0.033	N/A	0.033	B372872
Calculated Total Dissolved Solids	mg/L	5800	N/A	50	B372015	440	N/A	10	B372015
Elements									
Dissolved Cadmium (Cd)	ug/L	0.12	+/- 0.052	0.020	B371896	<0.020	N/A	0.020	B371896
Misc. Inorganics									
Conductivity	uS/cm	6500	+/- 170	2.0	B375800	720	+/- 19	2.0	B375800
pH	pH	7.90	+/- 0.0783	N/A	B375799	8.09	+/- 0.0802	N/A	B375799
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B375796	<1.0	N/A	1.0	B375796
Alkalinity (Total as CaCO3)	mg/L	660	+/- 49	1.0	B375796	360	+/- 27	1.0	B375796
Bicarbonate (HCO3)	mg/L	800	+/- 12	1.0	B375796	440	+/- 6.9	1.0	B375796
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B375796	<1.0	N/A	1.0	B375796
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B375796	<1.0	N/A	1.0	B375796
Chloride (Cl)	mg/L	1.5	+/- 1.2	1.0	B374043	1.5	+/- 1.2	1.0	B374048
Sulphate (SO4)	mg/L	3700	+/- 230	50	B377868	40	+/- 2.9	1.0	B374048
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B373950	<0.010	N/A	0.010	B373950
Nitrate plus Nitrite (N)	mg/L	<0.050 (1)	N/A	0.050	B373950	<0.010	N/A	0.010	B373950
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B374016	<0.0030	N/A	0.0030	B374016
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B374016	<0.00060	N/A	0.00060	B374016
Dissolved Arsenic (As)	mg/L	0.00056	+/- <RDL	0.00020	B374016	0.00039	+/- <RDL	0.00020	B374016
Dissolved Barium (Ba)	mg/L	<0.010	N/A	0.010	B374001	0.067	+/- <RDL	0.010	B374026

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR021				CNR022			
Sampling Date		2024/05/15 08:02				2024/05/15 08:49			
COC Number		1/1				1/1			
	UNITS	MW 16-26	MU	RDL	QC Batch	RMW 16-5-12	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Boron (B)	mg/L	0.10	+/- <RDL	0.020	B374001	0.10	+/- <RDL	0.020	B374026
Dissolved Calcium (Ca)	mg/L	420	+/- 42	0.30	B374001	69	+/- 7.0	0.30	B374026
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Cobalt (Co)	mg/L	0.0020	+/- <RDL	0.00030	B374016	0.00035	+/- <RDL	0.00030	B374016
Dissolved Copper (Cu)	mg/L	0.0012	+/- <RDL	0.0010	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B374001	<0.060	N/A	0.060	B374026
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B374016	<0.00020	N/A	0.00020	B374016
Dissolved Lithium (Li)	mg/L	0.12	+/- <RDL	0.020	B374001	<0.020	N/A	0.020	B374026
Dissolved Magnesium (Mg)	mg/L	500	+/- 32	1.0	B374001	35	+/- 2.2	0.20	B374026
Dissolved Manganese (Mn)	mg/L	1.3	+/- 0.085	0.0040	B374001	0.15	+/- 0.011	0.0040	B374026
Dissolved Molybdenum (Mo)	mg/L	0.00062	+/- 0.00028	0.00020	B374016	0.0011	+/- 0.00036	0.00020	B374016
Dissolved Nickel (Ni)	mg/L	0.0048	+/- <RDL	0.00050	B374016	0.00087	+/- <RDL	0.00050	B374016
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B374001	<0.10	N/A	0.10	B374026
Dissolved Potassium (K)	mg/L	8.3	+/- 0.42	0.30	B374001	6.8	+/- 0.36	0.30	B374026
Dissolved Selenium (Se)	mg/L	<0.00080 (1)	N/A	0.00080	B374016	0.00025	+/- <RDL	0.00020	B374016
Dissolved Silicon (Si)	mg/L	5.0	+/- 0.96	0.50	B374001	3.0	+/- 0.58	0.50	B374026
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B374016	<0.00010	N/A	0.00010	B374016
Dissolved Sodium (Na)	mg/L	790	+/- 77	2.5	B374001	70	+/- 6.9	0.50	B374026
Dissolved Strontium (Sr)	mg/L	6.3	+/- 0.62	0.10	B374001	1.4	+/- 0.14	0.020	B374026
Dissolved Sulphur (S)	mg/L	1400	+/- 93	1.0	B374001	14	+/- 0.92	0.20	B374026
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B374016	<0.00020	N/A	0.00020	B374016
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Uranium (U)	mg/L	0.025	+/- 0.0023	0.00010	B374016	0.0014	+/- 0.00014	0.00010	B374016
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Zinc (Zn)	mg/L	0.0047	+/- <RDL	0.0030	B374016	<0.0030	N/A	0.0030	B374016

RDL = Reportable Detection Limit
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N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR023			CNR024			
Sampling Date		2024/05/15 09:37			2024/05/15 15:16			
COC Number		1/1			1/1			
	UNITS	MW 16-4-22	MU	RDL	RMW 16-23-7	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	57	N/A	N/A	11	N/A	N/A	B372033
Cation Sum	meq/L	61	N/A	N/A	12	N/A	N/A	B372033
Hardness (CaCO3)	mg/L	2100	N/A	0.50	480	N/A	0.50	B372005
Ion Balance (% Difference)	%	3.9	N/A	N/A	2.6	N/A	N/A	B372007
Nitrate (N)	mg/L	<0.050	N/A	0.050	<0.010	N/A	0.010	B371968
Nitrate (NO3)	mg/L	<0.22	N/A	0.22	<0.044	N/A	0.044	B372872
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	<0.033	N/A	0.033	B372872
Calculated Total Dissolved Solids	mg/L	3700	N/A	25	600	N/A	10	B372015
Elements								
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	<0.020	N/A	0.020	B371896
Misc. Inorganics								
Conductivity	uS/cm	4300	+/- 110	2.0	980	+/- 26	2.0	B375800
pH	pH	7.85	+/- 0.0778	N/A	7.98	+/- 0.0791	N/A	B375799
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	B375796
Alkalinity (Total as CaCO3)	mg/L	480	+/- 35	1.0	330	+/- 24	1.0	B375796
Bicarbonate (HCO3)	mg/L	580	+/- 8.9	1.0	400	+/- 6.2	1.0	B375796
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	B375796
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	B375796
Chloride (Cl)	mg/L	1.1	+/- 1.2	1.0	51	+/- 4.1	1.0	B374043
Sulphate (SO4)	mg/L	2300	+/- 140	25	140	+/- 9.4	5.0	B374043
Nutrients								
Nitrite (N)	mg/L	<0.010	N/A	0.010	<0.010	N/A	0.010	B373950
Nitrate plus Nitrite (N)	mg/L	<0.050	N/A	0.050	<0.010	N/A	0.010	B373950
Lab Filtered Elements								
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	<0.0030	N/A	0.0030	B374016
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	<0.00060	N/A	0.00060	B374016
Dissolved Arsenic (As)	mg/L	0.00096	+/- <RDL	0.00020	<0.00020	N/A	0.00020	B374016
Dissolved Barium (Ba)	mg/L	0.014	+/- <RDL	0.010	0.045	+/- <RDL	0.010	B374001

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR023			CNR024			
Sampling Date		2024/05/15 09:37			2024/05/15 15:16			
COC Number		1/1			1/1			
	UNITS	MW 16-4-22	MU	RDL	RMW 16-23-7	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B374016
Dissolved Boron (B)	mg/L	0.12	+/- <RDL	0.020	0.021	+/- <RDL	0.020	B374001
Dissolved Calcium (Ca)	mg/L	470	+/- 48	0.30	120	+/- 12	0.30	B374001
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B374016
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	0.00042	+/- <RDL	0.00030	B374016
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B374016
Dissolved Iron (Fe)	mg/L	0.18	+/- <RDL	0.060	<0.060	N/A	0.060	B374001
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	B374016
Dissolved Lithium (Li)	mg/L	0.11	+/- <RDL	0.020	<0.020	N/A	0.020	B374001
Dissolved Magnesium (Mg)	mg/L	220	+/- 14	0.20	46	+/- 2.9	0.20	B374001
Dissolved Manganese (Mn)	mg/L	0.80	+/- 0.054	0.0040	0.39	+/- 0.026	0.0040	B374001
Dissolved Molybdenum (Mo)	mg/L	0.00082	+/- 0.00031	0.00020	0.0010	+/- 0.00035	0.00020	B374016
Dissolved Nickel (Ni)	mg/L	0.00054	+/- <RDL	0.00050	0.00075	+/- <RDL	0.00050	B374016
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	<0.10	N/A	0.10	B374001
Dissolved Potassium (K)	mg/L	9.4	+/- 0.48	0.30	4.7	+/- <RDL	0.30	B374001
Dissolved Selenium (Se)	mg/L	<0.00080 (1)	N/A	0.00080	<0.00020	N/A	0.00020	B374016
Dissolved Silicon (Si)	mg/L	4.8	+/- 0.92	0.50	3.6	+/- 0.69	0.50	B374001
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	<0.00010	N/A	0.00010	B374016
Dissolved Sodium (Na)	mg/L	440	+/- 43	0.50	45	+/- 4.4	0.50	B374001
Dissolved Strontium (Sr)	mg/L	6.9	+/- 0.67	0.10	0.70	+/- 0.068	0.020	B374001
Dissolved Sulphur (S)	mg/L	850	+/- 56	1.0	45	+/- 3.0	0.20	B374001
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	B374016
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	0.0016	+/- <RDL	0.0010	B374016
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B374016
Dissolved Uranium (U)	mg/L	0.0021	+/- 0.00020	0.00010	0.0018	+/- 0.00018	0.00010	B374016
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	B374016
Dissolved Zinc (Zn)	mg/L	0.0038	+/- <RDL	0.0030	0.0030	+/- <RDL	0.0030	B374016

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR025		CNR025			
Sampling Date		2024/05/15 14:55		2024/05/15 14:55			
COC Number		1/1		1/1			
	UNITS	RMW 16-23-14	MU	RMW 16-23-14 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	13	N/A	N/A	N/A	N/A	B372033
Cation Sum	meq/L	13	N/A	N/A	N/A	N/A	B372033
Hardness (CaCO3)	mg/L	380	N/A	N/A	N/A	0.50	B372005
Ion Balance (% Difference)	%	1.7	N/A	N/A	N/A	N/A	B372007
Nitrate (N)	mg/L	<0.010	N/A	N/A	N/A	0.010	B371968
Nitrate (NO3)	mg/L	<0.044	N/A	N/A	N/A	0.044	B372872
Nitrite (NO2)	mg/L	<0.033	N/A	N/A	N/A	0.033	B372872
Calculated Total Dissolved Solids	mg/L	730	N/A	N/A	N/A	10	B372015
Elements							
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	N/A	N/A	0.020	B371896
Misc. Inorganics							
Conductivity	uS/cm	1100	+/- 30	N/A	N/A	2.0	B375800
pH	pH	8.14	+/- 0.0807	N/A	N/A	N/A	B375799
Anions							
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	B375796
Alkalinity (Total as CaCO3)	mg/L	380	+/- 28	N/A	N/A	1.0	B375796
Bicarbonate (HCO3)	mg/L	460	+/- 7.2	N/A	N/A	1.0	B375796
Carbonate (CO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	B375796
Hydroxide (OH)	mg/L	<1.0	N/A	N/A	N/A	1.0	B375796
Chloride (Cl)	mg/L	24	+/- 2.3	N/A	N/A	1.0	B374043
Sulphate (SO4)	mg/L	220	+/- 14	N/A	N/A	5.0	B374043
Nutrients							
Nitrite (N)	mg/L	<0.010	N/A	N/A	N/A	0.010	B373950
Nitrate plus Nitrite (N)	mg/L	<0.010	N/A	N/A	N/A	0.010	B373950
Lab Filtered Elements							
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B374016
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	N/A	N/A	0.00060	B374016
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B374016
Dissolved Barium (Ba)	mg/L	0.016	+/- <RDL	0.013	+/- <RDL	0.010	B374026

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR025		CNR025			
Sampling Date		2024/05/15 14:55		2024/05/15 14:55			
COC Number		1/1		1/1			
	UNITS	RMW 16-23-14	MU	RMW 16-23-14 Lab-Dup	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B374016
Dissolved Boron (B)	mg/L	0.060	+/- <RDL	0.057	+/- <RDL	0.020	B374026
Dissolved Calcium (Ca)	mg/L	93	+/- 9.3	91	+/- 9.2	0.30	B374026
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B374016
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	N/A	N/A	0.00030	B374016
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B374016
Dissolved Iron (Fe)	mg/L	<0.060	N/A	<0.060	N/A	0.060	B374026
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B374016
Dissolved Lithium (Li)	mg/L	0.034	+/- <RDL	0.039	+/- <RDL	0.020	B374026
Dissolved Magnesium (Mg)	mg/L	37	+/- 2.4	36	+/- 2.3	0.20	B374026
Dissolved Manganese (Mn)	mg/L	0.12	+/- 0.0083	0.12	+/- 0.0081	0.0040	B374026
Dissolved Molybdenum (Mo)	mg/L	0.0011	+/- 0.00037	N/A	N/A	0.00020	B374016
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	N/A	N/A	0.00050	B374016
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	<0.10	N/A	0.10	B374026
Dissolved Potassium (K)	mg/L	4.5	+/- <RDL	4.4	+/- <RDL	0.30	B374026
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B374016
Dissolved Silicon (Si)	mg/L	4.2	+/- 0.81	4.1	+/- 0.78	0.50	B374026
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	N/A	N/A	0.00010	B374016
Dissolved Sodium (Na)	mg/L	120	+/- 12	120	+/- 12	0.50	B374026
Dissolved Strontium (Sr)	mg/L	0.96	+/- 0.094	0.95	+/- 0.093	0.020	B374026
Dissolved Sulphur (S)	mg/L	72	+/- 4.8	70	+/- 4.7	0.20	B374026
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B374016
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B374016
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B374016
Dissolved Uranium (U)	mg/L	0.00044	+/- <RDL	N/A	N/A	0.00010	B374016
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B374016
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B374016

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR026		CNR026			
Sampling Date		2024/05/15 15:27		2024/05/15 15:27			
COC Number		1/1		1/1			
	UNITS	RMW 16-23-32	MU	RMW 16-23-32 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	13	N/A	N/A	N/A	N/A	B372033
Cation Sum	meq/L	14	N/A	N/A	N/A	N/A	B372033
Hardness (CaCO3)	mg/L	71	N/A	N/A	N/A	0.50	B372005
Ion Balance (% Difference)	%	2.7	N/A	N/A	N/A	N/A	B372007
Nitrate (N)	mg/L	<0.010	N/A	N/A	N/A	0.010	B371968
Nitrate (NO3)	mg/L	<0.044	N/A	N/A	N/A	0.044	B372872
Nitrite (NO2)	mg/L	<0.033	N/A	N/A	N/A	0.033	B372872
Calculated Total Dissolved Solids	mg/L	730	N/A	N/A	N/A	10	B372015
Elements							
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	N/A	N/A	0.020	B371896
Misc. Inorganics							
Conductivity	uS/cm	1200	+/- 31	N/A	N/A	2.0	B375800
pH	pH	8.40	+/- 0.0833	N/A	N/A	N/A	B375799
Anions							
Alkalinity (PP as CaCO3)	mg/L	3.9	+/- <RDL	N/A	N/A	1.0	B375796
Alkalinity (Total as CaCO3)	mg/L	540	+/- 40	N/A	N/A	1.0	B375796
Bicarbonate (HCO3)	mg/L	650	+/- 9.9	N/A	N/A	1.0	B375796
Carbonate (CO3)	mg/L	4.7	N/A	N/A	N/A	1.0	B375796
Hydroxide (OH)	mg/L	<1.0	N/A	N/A	N/A	1.0	B375796
Chloride (Cl)	mg/L	<1.0	N/A	<1.0	N/A	1.0	B374048
Sulphate (SO4)	mg/L	100	+/- 6.7	95	+/- 6.4	1.0	B374048
Nutrients							
Nitrite (N)	mg/L	<0.010	N/A	N/A	N/A	0.010	B373950
Nitrate plus Nitrite (N)	mg/L	<0.010	N/A	N/A	N/A	0.010	B373950
Lab Filtered Elements							
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B374016
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	N/A	N/A	0.00060	B374016
Dissolved Arsenic (As)	mg/L	0.00046	+/- <RDL	N/A	N/A	0.00020	B374016
Dissolved Barium (Ba)	mg/L	0.020	+/- <RDL	N/A	N/A	0.010	B374001

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR026		CNR026			
Sampling Date		2024/05/15 15:27		2024/05/15 15:27			
COC Number		1/1		1/1			
	UNITS	RMW 16-23-32	MU	RMW 16-23-32 Lab-Dup	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B374016
Dissolved Boron (B)	mg/L	0.083	+/- <RDL	N/A	N/A	0.020	B374001
Dissolved Calcium (Ca)	mg/L	19	+/- 1.9	N/A	N/A	0.30	B374001
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B374016
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	N/A	N/A	0.00030	B374016
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B374016
Dissolved Iron (Fe)	mg/L	<0.060	N/A	N/A	N/A	0.060	B374001
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B374016
Dissolved Lithium (Li)	mg/L	0.063	+/- <RDL	N/A	N/A	0.020	B374001
Dissolved Magnesium (Mg)	mg/L	5.8	+/- 0.38	N/A	N/A	0.20	B374001
Dissolved Manganese (Mn)	mg/L	0.021	+/- <RDL	N/A	N/A	0.0040	B374001
Dissolved Molybdenum (Mo)	mg/L	0.0017	+/- 0.00049	N/A	N/A	0.00020	B374016
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	N/A	N/A	0.00050	B374016
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	N/A	N/A	0.10	B374001
Dissolved Potassium (K)	mg/L	2.8	+/- <RDL	N/A	N/A	0.30	B374001
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B374016
Dissolved Silicon (Si)	mg/L	3.4	+/- 0.65	N/A	N/A	0.50	B374001
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	N/A	N/A	0.00010	B374016
Dissolved Sodium (Na)	mg/L	280	+/- 27	N/A	N/A	0.50	B374001
Dissolved Strontium (Sr)	mg/L	0.33	+/- 0.032	N/A	N/A	0.020	B374001
Dissolved Sulphur (S)	mg/L	37	+/- 2.5	N/A	N/A	0.20	B374001
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B374016
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B374016
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B374016
Dissolved Uranium (U)	mg/L	0.00014	+/- <RDL	N/A	N/A	0.00010	B374016
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B374016
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B374016

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR027				CNR028			
Sampling Date		2024/05/15 15:45				2024/05/15 16:01			
COC Number		1/1				1/1			
	UNITS	SR24-02	MU	RDL	QC Batch	SR24-03	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	15	N/A	N/A	B372033	13	N/A	N/A	B372033
Cation Sum	meq/L	16	N/A	N/A	B372033	13	N/A	N/A	B372033
Hardness (CaCO3)	mg/L	480	N/A	0.50	B372005	69	N/A	0.50	B372005
Ion Balance (% Difference)	%	2.2	N/A	N/A	B372007	1.7	N/A	N/A	B372069
Nitrate (N)	mg/L	11	N/A	0.25	B371968	<0.010	N/A	0.010	B371968
Nitrate (NO3)	mg/L	47	N/A	1.1	B372872	<0.044	N/A	0.044	B372872
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B372872	<0.033	N/A	0.033	B372872
Calculated Total Dissolved Solids	mg/L	840	N/A	10	B372015	720	N/A	10	B372015
Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	B371896	<0.020	N/A	0.020	B371896
Misc. Inorganics									
Conductivity	uS/cm	1300	+/- 35	2.0	B375800	1200	+/- 31	2.0	B375800
pH	pH	8.01	+/- 0.0794	N/A	B375799	8.41	+/- 0.0834	N/A	B375799
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B375796	4.8	+/- <RDL	1.0	B375796
Alkalinity (Total as CaCO3)	mg/L	420	+/- 31	1.0	B375796	530	+/- 40	1.0	B375796
Bicarbonate (HCO3)	mg/L	520	+/- 8.0	1.0	B375796	640	+/- 9.8	1.0	B375796
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B375796	5.8	N/A	1.0	B375796
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B375796	<1.0	N/A	1.0	B375796
Chloride (Cl)	mg/L	84	+/- 6.5	1.0	B374048	<1.0	N/A	1.0	B374043
Sulphate (SO4)	mg/L	160	+/- 10	5.0	B374048	100	+/- 6.9	1.0	B374043
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B373950	<0.010	N/A	0.010	B373950
Nitrate plus Nitrite (N)	mg/L	11	+/- 0.90	0.25	B373950	<0.010	N/A	0.010	B373950
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B374016	<0.0030	N/A	0.0030	B374016
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B374016	<0.00060	N/A	0.00060	B374016
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	0.00020	B374016	0.00051	+/- <RDL	0.00020	B374016
Dissolved Barium (Ba)	mg/L	0.026	+/- <RDL	0.010	B374026	0.017	+/- <RDL	0.010	B374001

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR027				CNR028			
Sampling Date		2024/05/15 15:45				2024/05/15 16:01			
COC Number		1/1				1/1			
	UNITS	SR24-02	MU	RDL	QC Batch	SR24-03	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Boron (B)	mg/L	0.14	+/- <RDL	0.020	B374026	0.081	+/- <RDL	0.020	B374001
Dissolved Calcium (Ca)	mg/L	100	+/- 10	0.30	B374026	18	+/- 1.9	0.30	B374001
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	B374016	<0.00030	N/A	0.00030	B374016
Dissolved Copper (Cu)	mg/L	0.0045	+/- 0.0013	0.0010	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B374026	<0.060	N/A	0.060	B374001
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B374016	<0.00020	N/A	0.00020	B374016
Dissolved Lithium (Li)	mg/L	0.047	+/- <RDL	0.020	B374026	0.064	+/- <RDL	0.020	B374001
Dissolved Magnesium (Mg)	mg/L	56	+/- 3.6	0.20	B374026	5.6	+/- 0.37	0.20	B374001
Dissolved Manganese (Mn)	mg/L	<0.0040	N/A	0.0040	B374026	0.021	+/- <RDL	0.0040	B374001
Dissolved Molybdenum (Mo)	mg/L	0.0042	+/- 0.0011	0.00020	B374016	0.0016	+/- 0.00046	0.00020	B374016
Dissolved Nickel (Ni)	mg/L	0.00057	+/- <RDL	0.00050	B374016	<0.00050	N/A	0.00050	B374016
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B374026	<0.10	N/A	0.10	B374001
Dissolved Potassium (K)	mg/L	2.3	+/- <RDL	0.30	B374026	2.7	+/- <RDL	0.30	B374001
Dissolved Selenium (Se)	mg/L	0.0026	+/- 0.00024	0.00020	B374016	<0.00020	N/A	0.00020	B374016
Dissolved Silicon (Si)	mg/L	3.4	+/- 0.65	0.50	B374026	3.4	+/- 0.65	0.50	B374001
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B374016	<0.00010	N/A	0.00010	B374016
Dissolved Sodium (Na)	mg/L	140	+/- 13	0.50	B374026	270	+/- 26	0.50	B374001
Dissolved Strontium (Sr)	mg/L	1.3	+/- 0.13	0.020	B374026	0.32	+/- 0.031	0.020	B374001
Dissolved Sulphur (S)	mg/L	48	+/- 3.2	0.20	B374026	37	+/- 2.5	0.20	B374001
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B374016	<0.00020	N/A	0.00020	B374016
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Uranium (U)	mg/L	0.0032	+/- 0.00030	0.00010	B374016	0.00013	+/- <RDL	0.00010	B374016
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B374016	<0.0010	N/A	0.0010	B374016
Dissolved Zinc (Zn)	mg/L	0.0089	+/- <RDL	0.0030	B374016	<0.0030	N/A	0.0030	B374016

RDL = Reportable Detection Limit
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N/A = Not Applicable

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TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CNR021			CNR022			CNR023			
Sampling Date		2024/05/15 08:02			2024/05/15 08:49			2024/05/15 09:37			
COC Number		1/1			1/1			1/1			
	UNITS	MW 16-26	MU	RDL	RMW 16-5-12	MU	RDL	MW 16-4-22	MU	RDL	QC Batch
Calculated Parameters											
Total Kjeldahl Nitrogen (Calc)	mg/L	4.6	N/A	2.0	0.72	N/A	0.20	1.22	N/A	0.050	B372871
Nutrients											
Total Nitrogen (N)	mg/L	4.6	+/- <RDL	2.0	0.72 (1)	+/- <RDL	0.20	1.2	+/- 0.18	0.020	B376211

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CNR024		CNR025		CNR026			
Sampling Date		2024/05/15 15:16		2024/05/15 14:55		2024/05/15 15:27			
COC Number		1/1		1/1		1/1			
	UNITS	RMW 16-23-7	MU	RMW 16-23-14	MU	RMW 16-23-32	MU	RDL	QC Batch
Calculated Parameters									
Total Kjeldahl Nitrogen (Calc)	mg/L	0.133	N/A	0.769	N/A	0.880	N/A	0.020	B372871
Nutrients									
Total Nitrogen (N)	mg/L	0.13	+/- 0.041	0.77	+/- 0.12	0.88	+/- 0.14	0.020	B376211

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CNR027			CNR028			
Sampling Date		2024/05/15 15:45			2024/05/15 16:01			
COC Number		1/1			1/1			
	UNITS	SR24-02	MU	RDL	SR24-03	MU	RDL	QC Batch
Calculated Parameters								
Total Kjeldahl Nitrogen (Calc)	mg/L	<0.25	N/A	0.25	0.891	N/A	0.020	B372871
Nutrients								
Total Nitrogen (N)	mg/L	10 (1)	+/- 1.5	0.20	0.89	+/- 0.14	0.020	B376211

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Nitrogen < Nitrate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNR021			CNR022			
Sampling Date		2024/05/15 08:02			2024/05/15 08:49			
COC Number		1/1			1/1			
	UNITS	MW 16-26	MU	QC Batch	RMW 16-5-12	MU	RDL	QC Batch
Lab Filtered Inorganics								
Dissolved Organic Carbon (C)	mg/L	4.0	+/- 0.61	B377007	1.3	+/- <RDL	0.50	B377007
Microbiological Param.								
E.Coli DST	MPN/100mL	<100 (1)	N/A	B371950	<100 (2)	N/A	100	B371950
Fecal Coliforms	MPN/100mL	<100 (3)	N/A	B371985	<100 (2)	N/A	100	B371985
Heterotrophic DST	MPN/100mL	2400 (4)	N/A	B372018	4800 (4)	N/A	2.0	B372018
Total Coliforms DST	MPN/100mL	<100 (5)	N/A	B371950	<100 (2)	N/A	100	B371950
Nutrients								
Total Ammonia (N)	mg/L	0.20	+/- 0.025	B374942	0.18	+/- 0.022	0.015	B374942
Orthophosphate (P)	mg/L	0.0043	+/- 0.0035	B373647	0.0038	+/- 0.0034	0.0030	B373647
Lab Filtered Nutrients								
Dissolved Phosphorus (P)	mg/L	<0.0030 (6)	N/A	B375529	<0.0030 (6)	N/A	0.0030	B375524

RDL = Reportable Detection Limit

MU = Measurement Uncertainty

N/A = Not Applicable

(1) Sample analyzed over hold time. Sample analysis is recommended within 30 hours of sampling. Detection limit raised due to matrix interference.

(2) Detection limit raised due to matrix interference.

(3) Detection limit raised due to matrix interference. Sample analyzed over hold time. Sample analysis is recommended within 30 hours of sampling. Detection limit raised due to matrix interference.

(4) Sample analyzed 3 hours over hold time. Sample analysis is recommended within 30 hours of sampling. Detection limit raised due to matrix interference.

(5) Sample analyzed 1 hour over hold time. Sample analysis is recommended within 30 hours of sampling. Detection limit raised due to matrix interference.

(6) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNR023				CNR024			
Sampling Date		2024/05/15 09:37				2024/05/15 15:16			
COC Number		1/1				1/1			
	UNITS	MW 16-4-22	MU	RDL	QC Batch	RMW 16-23-7	MU	RDL	QC Batch
Lab Filtered Inorganics									
Dissolved Organic Carbon (C)	mg/L	5.5	+/- 0.75	0.50	B377007	1.4	+/- <RDL	0.50	B377007
Microbiological Param.									
E.Coli DST	MPN/100mL	<1.0	N/A	1.0	B371950	<2.0 (1)	N/A	2.0	B371950
Fecal Coliforms	MPN/100mL	<1.0	N/A	1.0	B371985	<2.0 (1)	N/A	2.0	B371985
Heterotrophic DST	MPN/100mL	21 (2)	N/A	1.0	B372018	>2400	N/A	1.0	B372018
Total Coliforms DST	MPN/100mL	5.2	N/A	1.0	B371950	<2.0 (1)	N/A	2.0	B371950
Nutrients									
Total Ammonia (N)	mg/L	1.1	+/- 0.12	0.015	B374942	0.042	+/- <RDL	0.015	B377014
Orthophosphate (P)	mg/L	<0.0030	N/A	0.0030	B373647	<0.0030	N/A	0.0030	B373647
Lab Filtered Nutrients									
Dissolved Phosphorus (P)	mg/L	<0.0030	N/A	0.0030	B375529	<0.0030	N/A	0.0030	B375529

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limit raised due to matrix interference.
(2) Sample analyzed 2 hours over hold time. Sample analysis is recommended within 30 hours of sampling.

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNR025			CNR026			
Sampling Date		2024/05/15 14:55			2024/05/15 15:27			
COC Number		1/1			1/1			
	UNITS	RMW 16-23-14	MU	QC Batch	RMW 16-23-32	MU	RDL	QC Batch
Lab Filtered Inorganics								
Dissolved Organic Carbon (C)	mg/L	1.3	+/- <RDL	B377007	1.5	+/- <RDL	0.50	B376272
Microbiological Param.								
E.Coli DST	MPN/100mL	<1.0	N/A	B371950	<1.0	N/A	1.0	B371950
Fecal Coliforms	MPN/100mL	<1.0	N/A	B371985	<1.0	N/A	1.0	B371985
Heterotrophic DST	MPN/100mL	330	N/A	B372018	11	N/A	1.0	B372018
Total Coliforms DST	MPN/100mL	<1.0	N/A	B371950	<1.0	N/A	1.0	B371950
Nutrients								
Total Ammonia (N)	mg/L	0.48	+/- 0.053	B374679	0.81	+/- 0.089	0.015	B374679
Orthophosphate (P)	mg/L	<0.0030	N/A	B373647	0.0074	+/- 0.0036	0.0030	B373647
Lab Filtered Nutrients								
Dissolved Phosphorus (P)	mg/L	<0.0030	N/A	B375524	0.0061 (1)	+/- 0.0048	0.0030	B375529

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNR027		CNR027			CNR028			
Sampling Date		2024/05/15 15:45		2024/05/15 15:45			2024/05/15 16:01			
COC Number		1/1		1/1			1/1			
	UNITS	SR24-02	MU	SR24-02 Lab-Dup	MU	QC Batch	SR24-03	MU	RDL	QC Batch
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	2.4	+/- <RDL	N/A	N/A	B376272	1.2	+/- <RDL	0.50	B377007
Microbiological Param.										
E.Coli DST	MPN/100mL	<1.0	N/A	N/A	N/A	B371950	<1.0	N/A	1.0	B371950
Fecal Coliforms	MPN/100mL	<1.0	N/A	<1.0	N/A	B371985	<1.0	N/A	1.0	B371985
Heterotrophic DST	MPN/100mL	36	N/A	N/A	N/A	B372018	5.2	N/A	1.0	B372018
Total Coliforms DST	MPN/100mL	<1.0	N/A	N/A	N/A	B371950	3.0	N/A	1.0	B371950
Nutrients										
Total Ammonia (N)	mg/L	<0.015	N/A	N/A	N/A	B374679	0.81	+/- 0.088	0.015	B374679
Orthophosphate (P)	mg/L	<0.0030	N/A	N/A	N/A	B373647	0.0083	+/- 0.0036	0.0030	B373647
Lab Filtered Nutrients										
Dissolved Phosphorus (P)	mg/L	<0.0030	N/A	N/A	N/A	B375706	0.0056 (1)	+/- 0.0048	0.0030	B375706

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Bureau Veritas ID		CNR028			
Sampling Date		2024/05/15 16:01			
COC Number		1/1			
	UNITS	SR24-03 Lab-Dup	MU	RDL	QC Batch
Microbiological Param.					
E.Coli DST	MPN/100mL	<1.0	N/A	1.0	B371950
Total Coliforms DST	MPN/100mL	2.0	N/A	1.0	B371950
Nutrients					
Orthophosphate (P)	mg/L	0.0079	+/- 0.0036	0.0030	B373647

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID		CNR021		CNR021			CNR022			
Sampling Date		2024/05/15 08:02		2024/05/15 08:02			2024/05/15 08:49			
COC Number		1/1		1/1			1/1			
	UNITS	MW 16-26	MU	MW 16-26 Lab-Dup	MU	RDL	RMW 16-5-12	MU	RDL	QC Batch
Elements										
Total Mercury (Hg)	ug/L	0.27 (1)	+/- <RDL	N/A	N/A	0.19	0.122 (1)	+/- 0.021	0.019	B372318
Lab Filtered Elements										
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	<0.0019	N/A	0.0019	<0.0019	N/A	0.0019	B375663

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CNR023		CNR024			CNR025			
Sampling Date		2024/05/15 09:37		2024/05/15 15:16			2024/05/15 14:55			
COC Number		1/1		1/1			1/1			
	UNITS	MW 16-4-22	MU	RMW 16-23-7	MU	QC Batch	RMW 16-23-14	MU	RDL	QC Batch
Elements										
Total Mercury (Hg)	ug/L	0.0039	+/- 0.0019	0.0149	+/- 0.0031	B372318	<0.0019	N/A	0.0019	B372318
Lab Filtered Elements										
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	<0.0019	N/A	B375657	<0.0019	N/A	0.0019	B375653

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CNR026			CNR027		CNR028			
Sampling Date		2024/05/15 15:27			2024/05/15 15:45		2024/05/15 16:01			
COC Number		1/1			1/1		1/1			
	UNITS	RMW 16-23-32	MU	QC Batch	SR24-02	MU	SR24-03	MU	RDL	QC Batch
Elements										
Total Mercury (Hg)	ug/L	<0.0019	N/A	B372318	<0.0019	N/A	<0.0019	N/A	0.0019	B372318
Lab Filtered Elements										
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	B375657	<0.0019	N/A	<0.0019	N/A	0.0019	B375653

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	8.0°C
Package 2	9.0°C

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Sample CNR021, Chloride/Sulphate by Auto Colourimetry: Test repeated.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B371950	SOG	Method Blank	E.Coli DST	2024/05/17	<1.0		mpn/100mL	
			Total Coliforms DST	2024/05/17	<1.0		mpn/100mL	
B371950	SOG	RPD [CNR028-10]	E.Coli DST	2024/05/17	NC		%	N/A
			Total Coliforms DST	2024/05/17	40		%	N/A
B371985	YYL	Method Blank	Fecal Coliforms	2024/05/17	<1.0		MPN/100mL	
B371985	YYL	RPD [CNR027-10]	Fecal Coliforms	2024/05/17	NC		%	N/A
B372018	SOG	Method Blank	Heterotrophic DST	2024/05/18	<1.0		mpn/100mL	
B372018	SOG	RPD	Heterotrophic DST	2024/05/18	44		%	N/A
B372318	MPK	Matrix Spike [CNR028-07]	Total Mercury (Hg)	2024/05/21		96	%	80 - 120
B372318	MPK	Spiked Blank	Total Mercury (Hg)	2024/05/21		97	%	80 - 120
B372318	MPK	Method Blank	Total Mercury (Hg)	2024/05/21	<0.0019		ug/L	
B372318	MPK	RPD	Total Mercury (Hg)	2024/05/21	NC		%	20
B372547	RIL	Matrix Spike	1,4-Difluorobenzene (sur.)	2024/05/18		96	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/18		97	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/18		102	%	50 - 140
			Benzene	2024/05/18		99	%	50 - 140
			Toluene	2024/05/18		98	%	50 - 140
			Ethylbenzene	2024/05/18		100	%	50 - 140
			m & p-Xylene	2024/05/18		95	%	50 - 140
			o-Xylene	2024/05/18		96	%	50 - 140
			F1 (C6-C10)	2024/05/18		98	%	60 - 140
B372547	RIL	Spiked Blank	1,4-Difluorobenzene (sur.)	2024/05/18		97	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/18		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/18		100	%	50 - 140
			Benzene	2024/05/18		101	%	60 - 130
			Toluene	2024/05/18		98	%	60 - 130
			Ethylbenzene	2024/05/18		102	%	60 - 130
			m & p-Xylene	2024/05/18		96	%	60 - 130
			o-Xylene	2024/05/18		98	%	60 - 130
			F1 (C6-C10)	2024/05/18		103	%	60 - 140
B372547	RIL	Method Blank	1,4-Difluorobenzene (sur.)	2024/05/18		104	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/18		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/18		102	%	50 - 140
			Benzene	2024/05/18	<0.00040		mg/L	
			Toluene	2024/05/18	<0.00040		mg/L	
			Ethylbenzene	2024/05/18	<0.00040		mg/L	
			m & p-Xylene	2024/05/18	<0.00080		mg/L	
			o-Xylene	2024/05/18	<0.00040		mg/L	
			F1 (C6-C10)	2024/05/18	<0.10		mg/L	
B372547	RIL	RPD	Benzene	2024/05/18	NC		%	30
			Toluene	2024/05/18	NC		%	30
			Ethylbenzene	2024/05/18	NC		%	30
			m & p-Xylene	2024/05/18	NC		%	30
			o-Xylene	2024/05/18	NC		%	30
			F1 (C6-C10)	2024/05/18	NC		%	30
B373412	BQU	Matrix Spike	O-TERPHENYL (sur.)	2024/05/22		98	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/22		97	%	60 - 140
B373412	BQU	Spiked Blank	O-TERPHENYL (sur.)	2024/05/22		94	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/22		99	%	60 - 140
B373412	BQU	Method Blank	O-TERPHENYL (sur.)	2024/05/21		102	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/21	<0.10		mg/L	
B373647	CTU	Matrix Spike [CNR028-01]	Orthophosphate (P)	2024/05/17		98	%	80 - 120
B373647	CTU	Spiked Blank	Orthophosphate (P)	2024/05/17		97	%	80 - 120
B373647	CTU	Method Blank	Orthophosphate (P)	2024/05/17	<0.0030		mg/L	
B373647	CTU	RPD [CNR028-01]	Orthophosphate (P)	2024/05/17	4.4		%	20

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B373950	ISW	Matrix Spike	Nitrite (N)	2024/05/19		45 (1)	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/19		NC	%	80 - 120
B373950	ISW	Spiked Blank	Nitrite (N)	2024/05/18		94	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/18		105	%	80 - 120
B373950	ISW	Method Blank	Nitrite (N)	2024/05/18	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/18	<0.010		mg/L	
B373950	ISW	RPD	Nitrite (N)	2024/05/19	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/19	2.8		%	20
B374001	VSC	Matrix Spike	Dissolved Barium (Ba)	2024/05/19		99	%	80 - 120
			Dissolved Boron (B)	2024/05/19		99	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/19		102	%	80 - 120
			Dissolved Iron (Fe)	2024/05/19		109	%	80 - 120
			Dissolved Lithium (Li)	2024/05/19		96	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/19		101	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/19		104	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/19		109	%	80 - 120
			Dissolved Potassium (K)	2024/05/19		102	%	80 - 120
			Dissolved Silicon (Si)	2024/05/19		112	%	80 - 120
			Dissolved Sodium (Na)	2024/05/19		NC	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/19		99	%	80 - 120
			Dissolved Sulphur (S)	2024/05/19		110	%	80 - 120
B374001	VSC	Spiked Blank	Dissolved Barium (Ba)	2024/05/19		97	%	80 - 120
			Dissolved Boron (B)	2024/05/19		99	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/19		96	%	80 - 120
			Dissolved Iron (Fe)	2024/05/19		100	%	80 - 120
			Dissolved Lithium (Li)	2024/05/19		94	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/19		95	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/19		98	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/19		100	%	80 - 120
			Dissolved Potassium (K)	2024/05/19		97	%	80 - 120
			Dissolved Silicon (Si)	2024/05/19		94	%	80 - 120
			Dissolved Sodium (Na)	2024/05/19		97	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/19		95	%	80 - 120
			Dissolved Sulphur (S)	2024/05/19		98	%	80 - 120
B374001	VSC	Method Blank	Dissolved Barium (Ba)	2024/05/19	<0.010		mg/L	
			Dissolved Boron (B)	2024/05/19	<0.020		mg/L	
			Dissolved Calcium (Ca)	2024/05/19	<0.30		mg/L	
			Dissolved Iron (Fe)	2024/05/19	<0.060		mg/L	
			Dissolved Lithium (Li)	2024/05/19	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2024/05/19	<0.20		mg/L	
			Dissolved Manganese (Mn)	2024/05/19	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2024/05/19	<0.10		mg/L	
			Dissolved Potassium (K)	2024/05/19	<0.30		mg/L	
			Dissolved Silicon (Si)	2024/05/19	<0.50		mg/L	
			Dissolved Sodium (Na)	2024/05/19	<0.50		mg/L	
			Dissolved Strontium (Sr)	2024/05/19	<0.020		mg/L	
			Dissolved Sulphur (S)	2024/05/19	<0.20		mg/L	
B374001	VSC	RPD	Dissolved Calcium (Ca)	2024/05/19	0.36		%	20
			Dissolved Iron (Fe)	2024/05/19	4.4		%	20
			Dissolved Magnesium (Mg)	2024/05/19	3.0		%	20
			Dissolved Manganese (Mn)	2024/05/19	3.3		%	20
			Dissolved Potassium (K)	2024/05/19	0.88		%	20
			Dissolved Sodium (Na)	2024/05/19	0.51		%	20
B374016	JAB	Matrix Spike	Dissolved Aluminum (Al)	2024/05/19		99	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/19		95	%	80 - 120

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			Dissolved Arsenic (As)	2024/05/19		97	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/19		104	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/19		90	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/19		92	%	80 - 120
			Dissolved Copper (Cu)	2024/05/19		89	%	80 - 120
			Dissolved Lead (Pb)	2024/05/19		93	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/19		108	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/19		90	%	80 - 120
			Dissolved Selenium (Se)	2024/05/19		111	%	80 - 120
			Dissolved Silver (Ag)	2024/05/19		94	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/19		94	%	80 - 120
			Dissolved Tin (Sn)	2024/05/19		101	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/19		89	%	80 - 120
			Dissolved Uranium (U)	2024/05/19		NC	%	80 - 120
			Dissolved Vanadium (V)	2024/05/19		95	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/19		88	%	80 - 120
B374016	JAB	Spiked Blank	Dissolved Aluminum (Al)	2024/05/19		92	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/19		88	%	80 - 120
			Dissolved Arsenic (As)	2024/05/19		85	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/19		100	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/19		85	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/19		88	%	80 - 120
			Dissolved Copper (Cu)	2024/05/19		87	%	80 - 120
			Dissolved Lead (Pb)	2024/05/19		91	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/19		94	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/19		87	%	80 - 120
			Dissolved Selenium (Se)	2024/05/19		94	%	80 - 120
			Dissolved Silver (Ag)	2024/05/19		91	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/19		89	%	80 - 120
			Dissolved Tin (Sn)	2024/05/19		90	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/19		84	%	80 - 120
			Dissolved Uranium (U)	2024/05/19		91	%	80 - 120
			Dissolved Vanadium (V)	2024/05/19		88	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/19		84	%	80 - 120
B374016	JAB	Method Blank	Dissolved Aluminum (Al)	2024/05/19	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2024/05/19	<0.00060		mg/L	
			Dissolved Arsenic (As)	2024/05/19	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2024/05/19	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2024/05/19	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2024/05/19	<0.00030		mg/L	
			Dissolved Copper (Cu)	2024/05/19	<0.0010		mg/L	
			Dissolved Lead (Pb)	2024/05/19	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2024/05/19	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2024/05/19	<0.00050		mg/L	
			Dissolved Selenium (Se)	2024/05/19	<0.00020		mg/L	
			Dissolved Silver (Ag)	2024/05/19	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2024/05/19	<0.00020		mg/L	
			Dissolved Tin (Sn)	2024/05/19	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2024/05/19	<0.0010		mg/L	
			Dissolved Uranium (U)	2024/05/19	<0.00010		mg/L	
			Dissolved Vanadium (V)	2024/05/19	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2024/05/19	<0.0030		mg/L	
B374016	JAB	RPD	Dissolved Aluminum (Al)	2024/05/19	NC		%	20
			Dissolved Antimony (Sb)	2024/05/19	NC		%	20
			Dissolved Arsenic (As)	2024/05/19	15		%	20

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			Dissolved Beryllium (Be)	2024/05/19	NC		%	20
			Dissolved Chromium (Cr)	2024/05/19	NC		%	20
			Dissolved Cobalt (Co)	2024/05/19	NC		%	20
			Dissolved Copper (Cu)	2024/05/19	8.7		%	20
			Dissolved Lead (Pb)	2024/05/19	NC		%	20
			Dissolved Molybdenum (Mo)	2024/05/19	2.1		%	20
			Dissolved Nickel (Ni)	2024/05/19	0.63		%	20
			Dissolved Selenium (Se)	2024/05/19	3.9 (2)		%	20
			Dissolved Silver (Ag)	2024/05/19	NC		%	20
			Dissolved Thallium (Tl)	2024/05/19	NC		%	20
			Dissolved Tin (Sn)	2024/05/19	NC		%	20
			Dissolved Titanium (Ti)	2024/05/19	NC		%	20
			Dissolved Uranium (U)	2024/05/19	4.8		%	20
			Dissolved Vanadium (V)	2024/05/19	NC		%	20
			Dissolved Zinc (Zn)	2024/05/19	NC		%	20
B374026	VSC	Matrix Spike [CNR025-01]	Dissolved Barium (Ba)	2024/05/19		101	%	80 - 120
			Dissolved Boron (B)	2024/05/19		104	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/19		99	%	80 - 120
			Dissolved Iron (Fe)	2024/05/19		108	%	80 - 120
			Dissolved Lithium (Li)	2024/05/19		99	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/19		100	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/19		106	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/19		111	%	80 - 120
			Dissolved Potassium (K)	2024/05/19		104	%	80 - 120
			Dissolved Silicon (Si)	2024/05/19		101	%	80 - 120
			Dissolved Sodium (Na)	2024/05/19		NC	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/19		95	%	80 - 120
			Dissolved Sulphur (S)	2024/05/19		NC	%	80 - 120
B374026	VSC	Spiked Blank	Dissolved Barium (Ba)	2024/05/19		99	%	80 - 120
			Dissolved Boron (B)	2024/05/19		101	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/19		98	%	80 - 120
			Dissolved Iron (Fe)	2024/05/19		102	%	80 - 120
			Dissolved Lithium (Li)	2024/05/19		96	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/19		99	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/19		100	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/19		103	%	80 - 120
			Dissolved Potassium (K)	2024/05/19		99	%	80 - 120
			Dissolved Silicon (Si)	2024/05/19		97	%	80 - 120
			Dissolved Sodium (Na)	2024/05/19		96	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/19		98	%	80 - 120
			Dissolved Sulphur (S)	2024/05/19		100	%	80 - 120
B374026	VSC	Method Blank	Dissolved Barium (Ba)	2024/05/19	<0.010		mg/L	
			Dissolved Boron (B)	2024/05/19	<0.020		mg/L	
			Dissolved Calcium (Ca)	2024/05/19	<0.30		mg/L	
			Dissolved Iron (Fe)	2024/05/19	<0.060		mg/L	
			Dissolved Lithium (Li)	2024/05/19	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2024/05/19	<0.20		mg/L	
			Dissolved Manganese (Mn)	2024/05/19	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2024/05/19	<0.10		mg/L	
			Dissolved Potassium (K)	2024/05/19	<0.30		mg/L	
			Dissolved Silicon (Si)	2024/05/19	<0.50		mg/L	
			Dissolved Sodium (Na)	2024/05/19	<0.50		mg/L	
			Dissolved Strontium (Sr)	2024/05/19	<0.020		mg/L	
			Dissolved Sulphur (S)	2024/05/19	<0.20		mg/L	
B374026	VSC	RPD [CNR025-01]	Dissolved Barium (Ba)	2024/05/19	NC		%	20

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			Dissolved Boron (B)	2024/05/19	4.4		%	20
			Dissolved Calcium (Ca)	2024/05/19	1.8		%	20
			Dissolved Iron (Fe)	2024/05/19	NC		%	20
			Dissolved Lithium (Li)	2024/05/19	14		%	20
			Dissolved Magnesium (Mg)	2024/05/19	2.6		%	20
			Dissolved Manganese (Mn)	2024/05/19	2.9		%	20
			Dissolved Phosphorus (P)	2024/05/19	NC		%	20
			Dissolved Potassium (K)	2024/05/19	2.4		%	20
			Dissolved Silicon (Si)	2024/05/19	3.1		%	20
			Dissolved Sodium (Na)	2024/05/19	1.6		%	20
			Dissolved Strontium (Sr)	2024/05/19	1.2		%	20
			Dissolved Sulphur (S)	2024/05/19	2.1		%	20
B374043	AFI	Matrix Spike	Chloride (Cl)	2024/05/19		103	%	80 - 120
			Sulphate (SO4)	2024/05/19		79 (1)	%	80 - 120
B374043	AFI	Spiked Blank	Chloride (Cl)	2024/05/19		101	%	80 - 120
			Sulphate (SO4)	2024/05/19		97	%	80 - 120
B374043	AFI	Method Blank	Chloride (Cl)	2024/05/19	<1.0		mg/L	
			Sulphate (SO4)	2024/05/19	<1.0		mg/L	
B374043	AFI	RPD	Chloride (Cl)	2024/05/19	NC		%	20
			Sulphate (SO4)	2024/05/19	3.4		%	20
B374048	AFI	Matrix Spike [CNR026-01]	Chloride (Cl)	2024/05/19		102	%	80 - 120
			Sulphate (SO4)	2024/05/19		NC	%	80 - 120
B374048	AFI	Spiked Blank	Chloride (Cl)	2024/05/19		100	%	80 - 120
			Sulphate (SO4)	2024/05/19		99	%	80 - 120
B374048	AFI	Method Blank	Chloride (Cl)	2024/05/19	<1.0		mg/L	
			Sulphate (SO4)	2024/05/19	<1.0		mg/L	
B374048	AFI	RPD [CNR026-01]	Chloride (Cl)	2024/05/19	NC		%	20
			Sulphate (SO4)	2024/05/19	5.9		%	20
B374679	AFI	Matrix Spike	Total Ammonia (N)	2024/05/21		111	%	80 - 120
B374679	AFI	Spiked Blank	Total Ammonia (N)	2024/05/21		108	%	80 - 120
B374679	AFI	Method Blank	Total Ammonia (N)	2024/05/21	<0.015		mg/L	
B374679	AFI	RPD	Total Ammonia (N)	2024/05/21	NC		%	20
B374942	AFI	Matrix Spike	Total Ammonia (N)	2024/05/21		112	%	80 - 120
B374942	AFI	Spiked Blank	Total Ammonia (N)	2024/05/21		103	%	80 - 120
B374942	AFI	Method Blank	Total Ammonia (N)	2024/05/21	<0.015		mg/L	
B374942	AFI	RPD	Total Ammonia (N)	2024/05/21	NC		%	20
B375524	CTU	Matrix Spike	Dissolved Phosphorus (P)	2024/05/22		97	%	80 - 120
B375524	CTU	QC Standard	Dissolved Phosphorus (P)	2024/05/22		92	%	80 - 120
B375524	CTU	Spiked Blank	Dissolved Phosphorus (P)	2024/05/22		97	%	80 - 120
B375524	CTU	Method Blank	Dissolved Phosphorus (P)	2024/05/22	<0.0030		mg/L	
B375524	CTU	RPD	Dissolved Phosphorus (P)	2024/05/22	NC		%	20
B375529	CTU	Matrix Spike	Dissolved Phosphorus (P)	2024/05/22		104	%	80 - 120
B375529	CTU	QC Standard	Dissolved Phosphorus (P)	2024/05/22		91	%	80 - 120
B375529	CTU	Spiked Blank	Dissolved Phosphorus (P)	2024/05/22		96	%	80 - 120
B375529	CTU	Method Blank	Dissolved Phosphorus (P)	2024/05/22	<0.0030		mg/L	
B375529	CTU	RPD	Dissolved Phosphorus (P)	2024/05/22	6.4		%	20
B375653	KHU	Matrix Spike	Dissolved Mercury (Hg)	2024/05/22		97	%	80 - 120
B375653	KHU	Spiked Blank	Dissolved Mercury (Hg)	2024/05/22		102	%	80 - 120
B375653	KHU	Method Blank	Dissolved Mercury (Hg)	2024/05/22	<0.0019		ug/L	
B375653	KHU	RPD	Dissolved Mercury (Hg)	2024/05/22	NC		%	20
B375657	KHU	Matrix Spike	Dissolved Mercury (Hg)	2024/05/22		94	%	80 - 120
B375657	KHU	Spiked Blank	Dissolved Mercury (Hg)	2024/05/22		98	%	80 - 120
B375657	KHU	Method Blank	Dissolved Mercury (Hg)	2024/05/22	<0.0019		ug/L	
B375657	KHU	RPD	Dissolved Mercury (Hg)	2024/05/22	NC		%	20
B375663	KHU	Matrix Spike [CNR022-06]	Dissolved Mercury (Hg)	2024/05/22		96	%	80 - 120

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B375663	KHU	Spiked Blank	Dissolved Mercury (Hg)	2024/05/22		98	%	80 - 120
B375663	KHU	Method Blank	Dissolved Mercury (Hg)	2024/05/22	<0.0019		ug/L	
B375663	KHU	RPD [CNR021-06]	Dissolved Mercury (Hg)	2024/05/22	NC		%	20
B375706	CTU	Matrix Spike	Dissolved Phosphorus (P)	2024/05/22		92	%	80 - 120
B375706	CTU	QC Standard	Dissolved Phosphorus (P)	2024/05/22		93	%	80 - 120
B375706	CTU	Spiked Blank	Dissolved Phosphorus (P)	2024/05/22		96	%	80 - 120
B375706	CTU	Method Blank	Dissolved Phosphorus (P)	2024/05/22	<0.0030		mg/L	
B375706	CTU	RPD	Dissolved Phosphorus (P)	2024/05/22	NC		%	20
B375796	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/23		94	%	80 - 120
B375796	JVM	Method Blank	Alkalinity (PP as CaCO3)	2024/05/23	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/23	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/23	<1.0		mg/L	
			Carbonate (CO3)	2024/05/23	<1.0		mg/L	
			Hydroxide (OH)	2024/05/23	<1.0		mg/L	
B375796	JVM	RPD	Alkalinity (PP as CaCO3)	2024/05/23	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/23	1.7		%	20
			Bicarbonate (HCO3)	2024/05/23	1.7		%	20
			Carbonate (CO3)	2024/05/23	NC		%	20
			Hydroxide (OH)	2024/05/23	NC		%	20
B375799	JVM	Spiked Blank	pH	2024/05/23		100	%	97 - 103
B375799	JVM	RPD	pH	2024/05/23	0.46		%	N/A
B375800	JVM	Spiked Blank	Conductivity	2024/05/23		100	%	90 - 110
B375800	JVM	Method Blank	Conductivity	2024/05/23	<2.0		uS/cm	
B375800	JVM	RPD	Conductivity	2024/05/23	0		%	10
B376211	CTU	Matrix Spike	Total Nitrogen (N)	2024/05/22		105	%	80 - 120
B376211	CTU	QC Standard	Total Nitrogen (N)	2024/05/22		106	%	80 - 120
B376211	CTU	Spiked Blank	Total Nitrogen (N)	2024/05/22		104	%	80 - 120
B376211	CTU	Method Blank	Total Nitrogen (N)	2024/05/22	<0.020		mg/L	
B376211	CTU	RPD	Total Nitrogen (N)	2024/05/22	5.1		%	20
B376272	MDO	Matrix Spike	Dissolved Organic Carbon (C)	2024/05/22		NC	%	80 - 120
B376272	MDO	Spiked Blank	Dissolved Organic Carbon (C)	2024/05/22		105	%	80 - 120
B376272	MDO	Method Blank	Dissolved Organic Carbon (C)	2024/05/22	<0.50		mg/L	
B376272	MDO	RPD	Dissolved Organic Carbon (C)	2024/05/22	1.9		%	20
B377007	MDO	Matrix Spike	Dissolved Organic Carbon (C)	2024/05/23		99	%	80 - 120
B377007	MDO	Spiked Blank	Dissolved Organic Carbon (C)	2024/05/23		108	%	80 - 120
B377007	MDO	Method Blank	Dissolved Organic Carbon (C)	2024/05/23	<0.50		mg/L	
B377007	MDO	RPD	Dissolved Organic Carbon (C)	2024/05/23	2.0		%	20
B377014	ISW	Matrix Spike	Total Ammonia (N)	2024/05/23		113	%	80 - 120
B377014	ISW	Spiked Blank	Total Ammonia (N)	2024/05/23		105	%	80 - 120
B377014	ISW	Method Blank	Total Ammonia (N)	2024/05/23	<0.015		mg/L	
B377014	ISW	RPD	Total Ammonia (N)	2024/05/23	0.13		%	20
B377868	SKM	Matrix Spike	Sulphate (SO4)	2024/05/23		NC	%	80 - 120
B377868	SKM	Spiked Blank	Sulphate (SO4)	2024/05/23		104	%	80 - 120
B377868	SKM	Method Blank	Sulphate (SO4)	2024/05/23	<1.0		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B377868	SKM	RPD	Sulphate (SO4)	2024/05/23	5.9		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

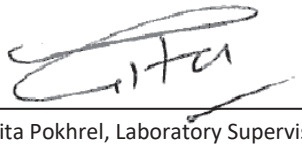
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(2) Detection limits raised due to matrix interference.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Gita Pokhrel, Laboratory Supervisor



Rahul Suryawanshi, Senior Analyst



Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

MCAL-2024-05-919

2/2

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- ☐ Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Quotation #:	
Company:	Stantec	Company:		P.O. #/ AFE#:	
Contact Name:	Dylan King	Contact Name:		Project #:	110773396
Street Address:	10220 103 Ave NW # 300	Street Address:		Site #:	
City:	Edmonton Prov: AB Postal Code: T5J 3H4	City: Prov: Postal Code:		Site Location:	
Phone:	780 962 2223	Phone:		Site Location Province:	AB
Email:	dylan.king@stantec.com	Email:		Sampled By:	WT/TH
Copies:		Copies:			

LAB USE ONLY - PLACE STICKER HERE

Rush Confirmation #:

Regulatory Criteria

☑ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba ☐ Saskatchewan ☐ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT): ☑ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply: ☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	FIELD FILTERED	FIELD PRESERVED	LAB FILTRATION REQUIRED	BTEX F1	VOCs	BTEX F1-F2	BTEX F3-F4	Routine water	Regulated metals - total	Regulated metals - dissolved	Mercury - total	Mercury - dissolved	Salinity DOC	Sieve (75 micron) TKN	Texture (% sand, silt, clay)	Basic class II landfill	Dissolved Phosphorus	Phosphate	Ammonia	Bacteriological	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	Comments
1	MW16-2-6	24	05	15	08	02	Water						X		X		X	X	X	X	X			X	X	X	X	11		
2	RMW16-5-12	24	05	15	08	42	Water						X		X		✓	✓	✓	✓	✓			X	X	X	✓	11		
3	MW16-4-22	24	05	15	09	37	Water						✓		X		X	✓	X	X	X			X	X	X	✓	11		
4	RMW16-23-7	24	05	15	15	16	Water						X		X		X	X	X	X	X			X	X	X	X	11		
5	RMW16-23-14	24	05	15	14	55	Water						X		X		X	X	X	X	X			X	X	X	X	11		
6	RMW16-23-32	24	05	15	15	27	Water						X		X		X	X	X	X	X			X	X	X	X	11		
7	SR24-02	24	05	15	15	45	Water						X		✓		X	X	X	X	X			X	X	X	X	11		
8	SR24-03	24	05	15	16	01	Water						X		X		X	X	X	X	X			X	X	X	X	11		
9																														
10																														
11																														
12																														

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY.

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		✓				
Seal intact		✓				
Cooling media present	✓			8	8	8

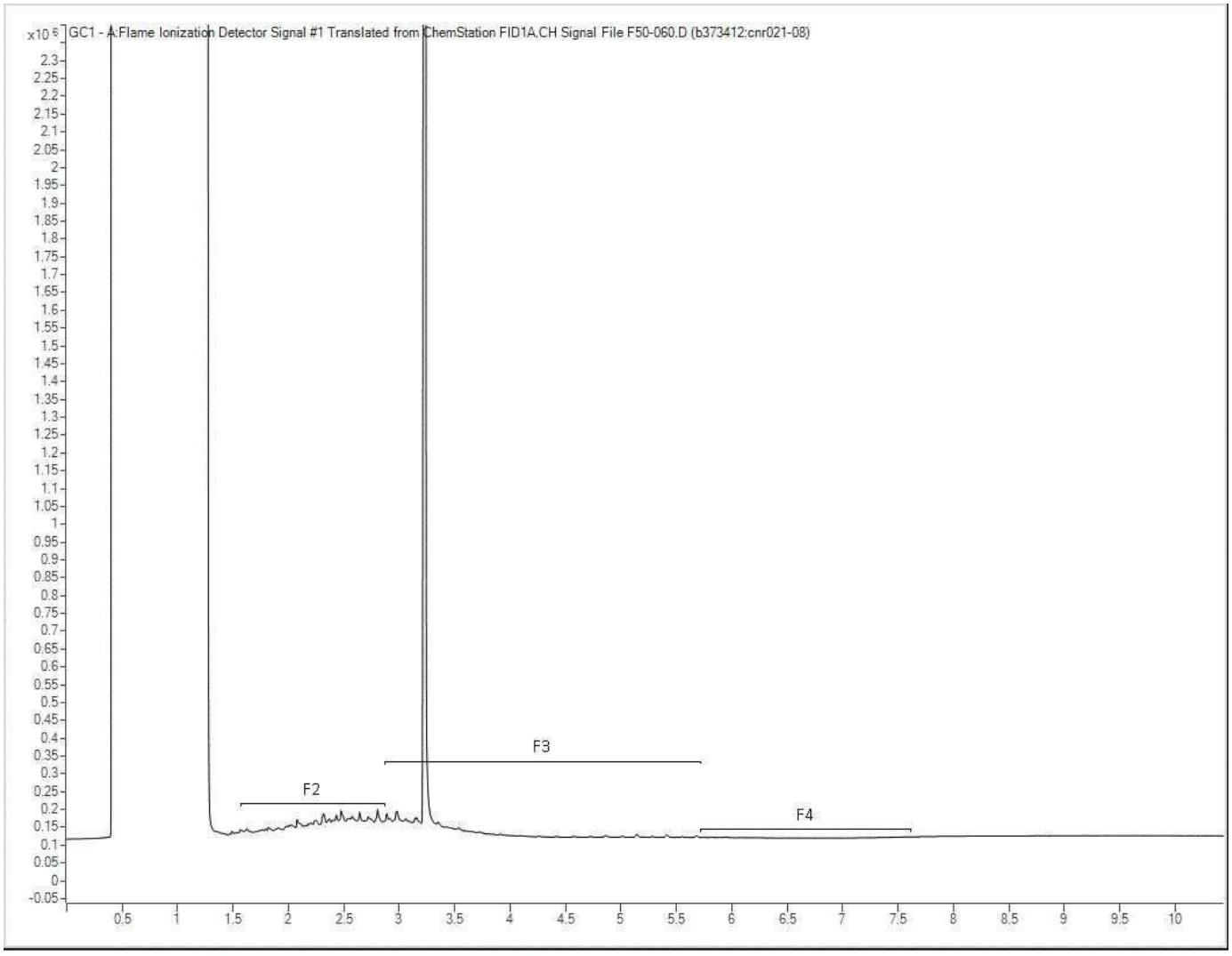
LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		✓				
Seal intact		✓				
Cooling media present	✓			10	10	7

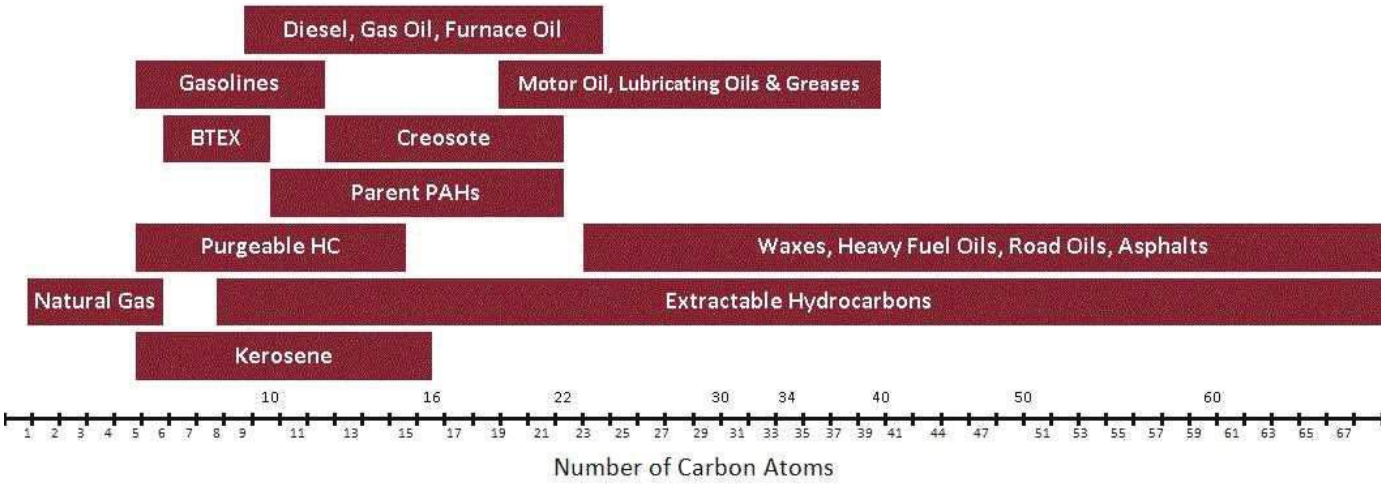
LAB USE ONLY	Yes	No	°C	1	2	3	Temperature reading by:
Seal present							
Seal intact							
Cooling media present							

	Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special Instructions
1	Taylor Harris	2024	05	15	17	10	OLA OLA OLATUNJI	24	05	15	17	15	* Total coliforms, ** Coli fecal coliforms. heterotrophic plate counts
2							2						

Dissolved parameters not field filtered - please lab filter

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

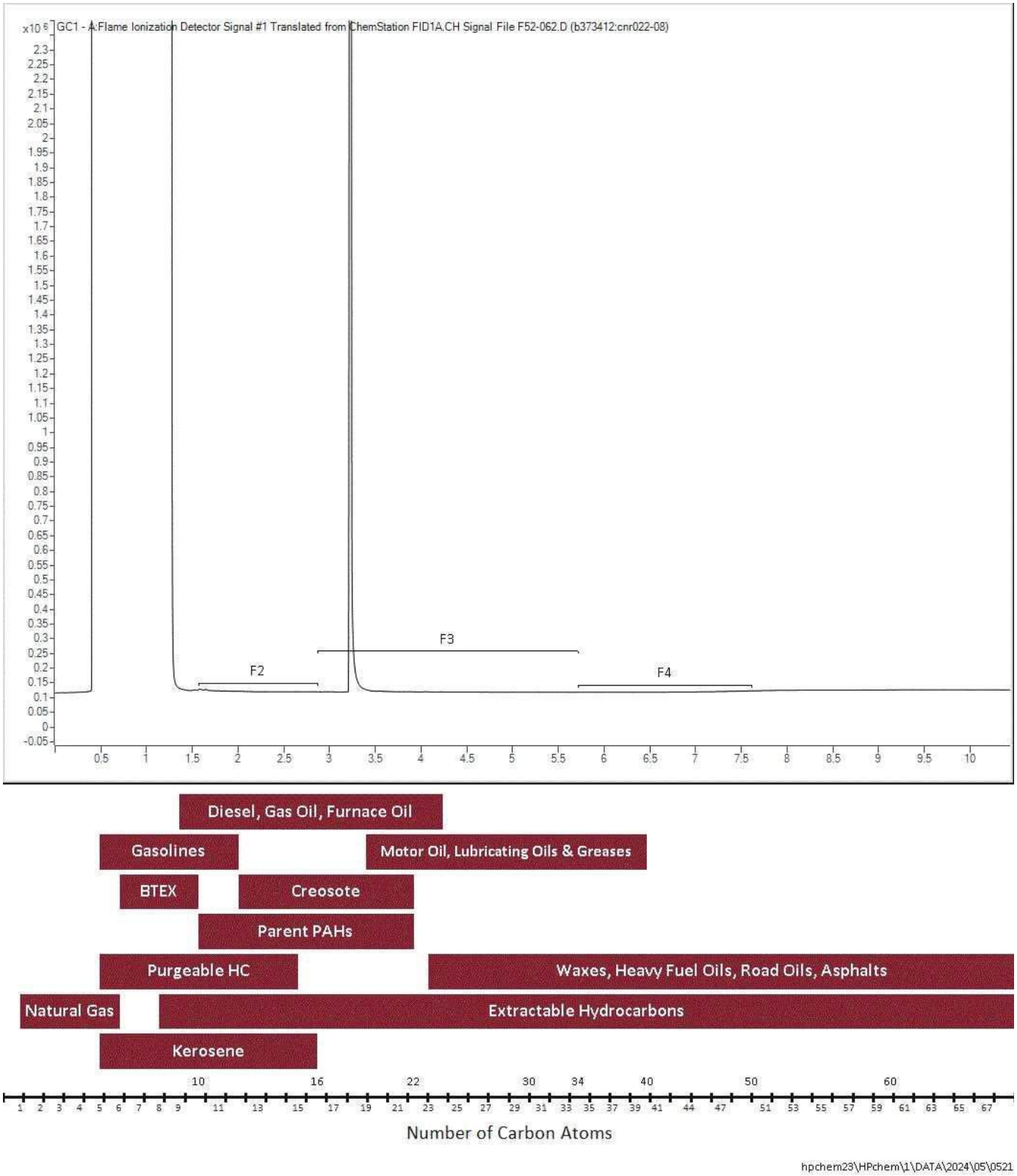




hpchem23\HPchem\1\DATA\2024\05\0521

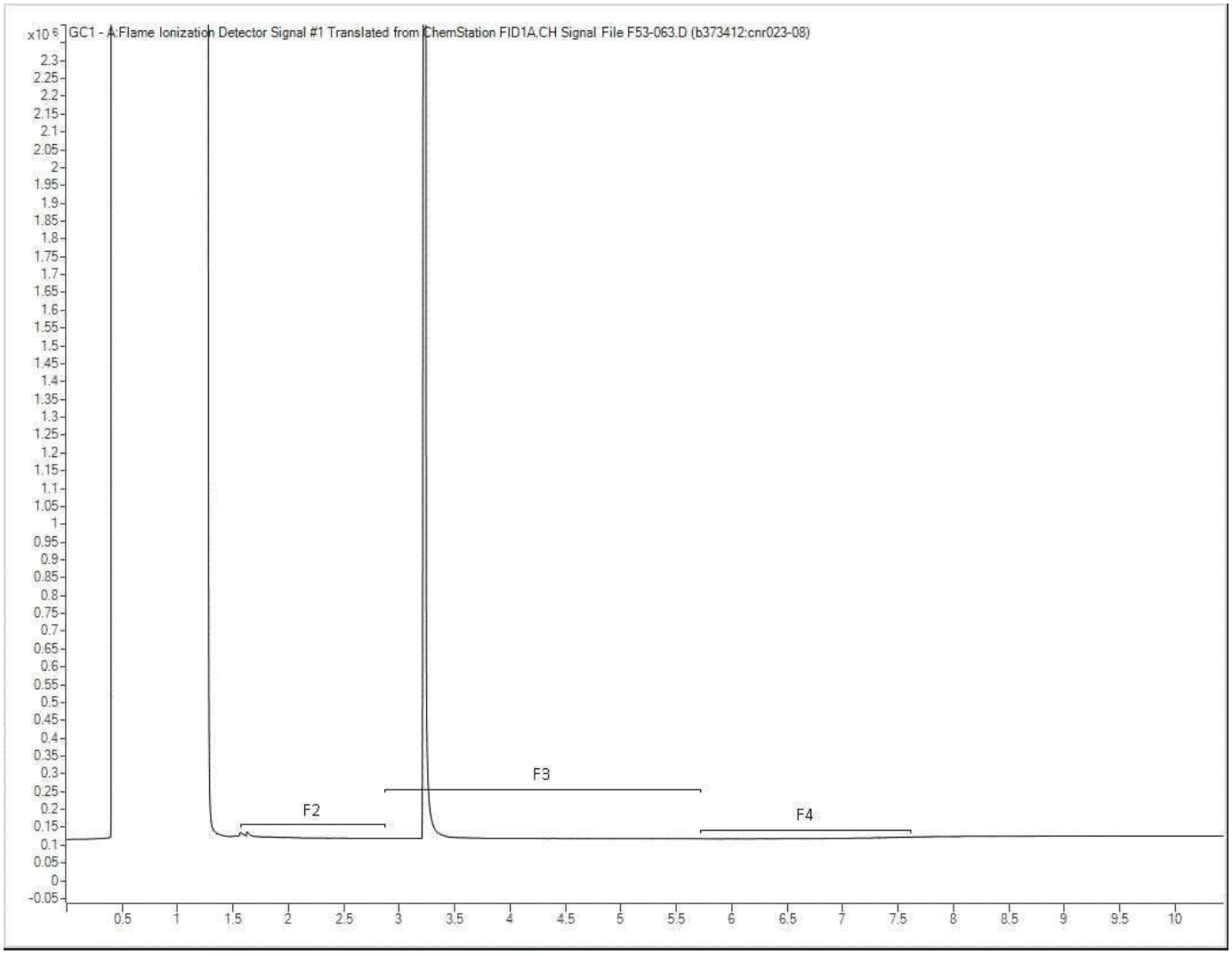
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

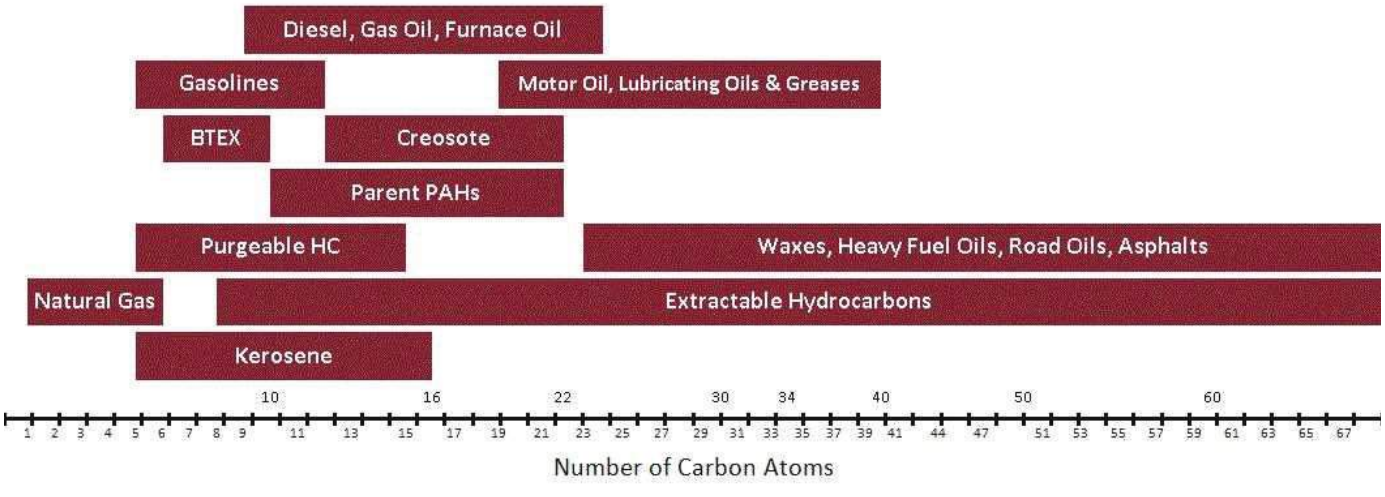
CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

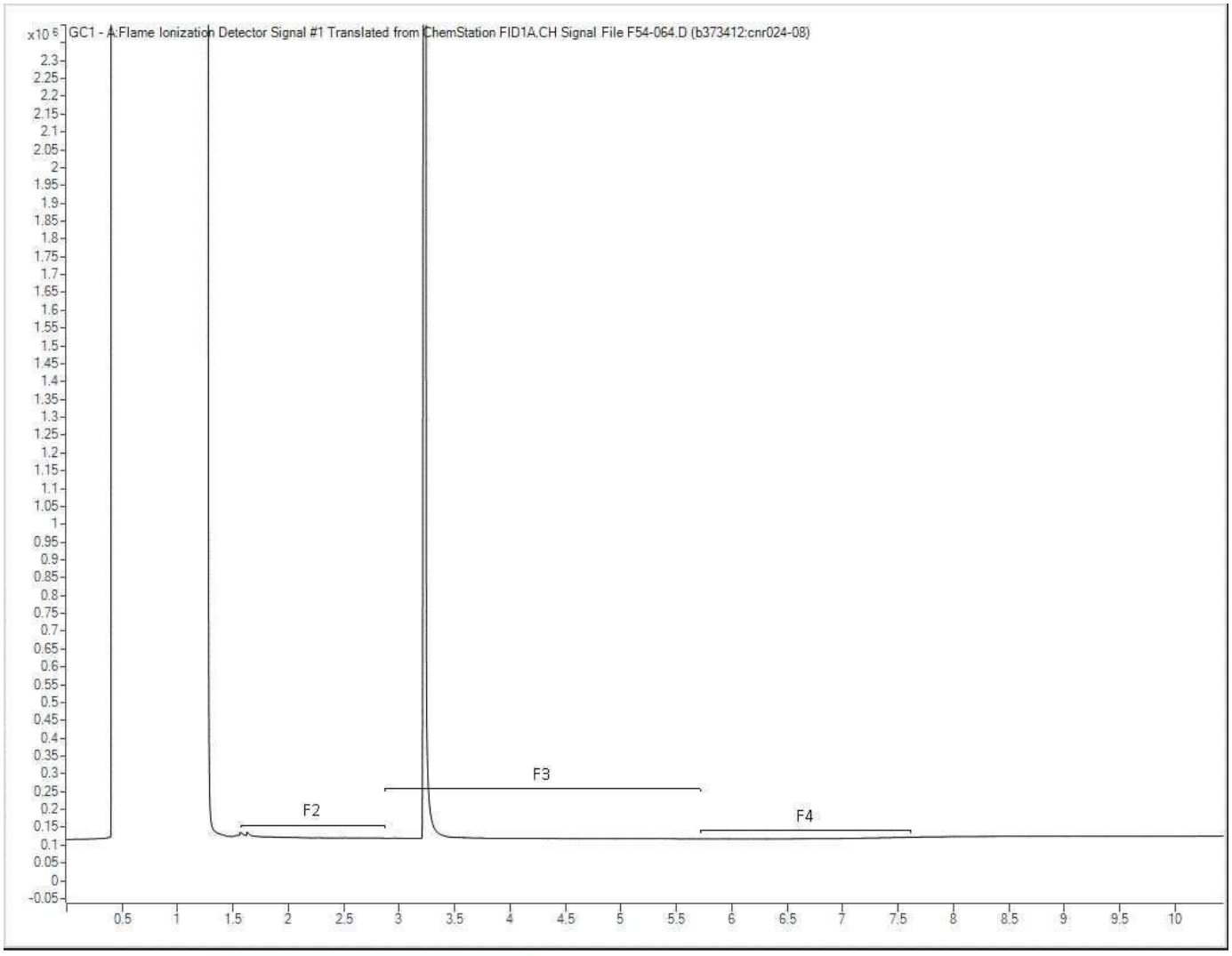


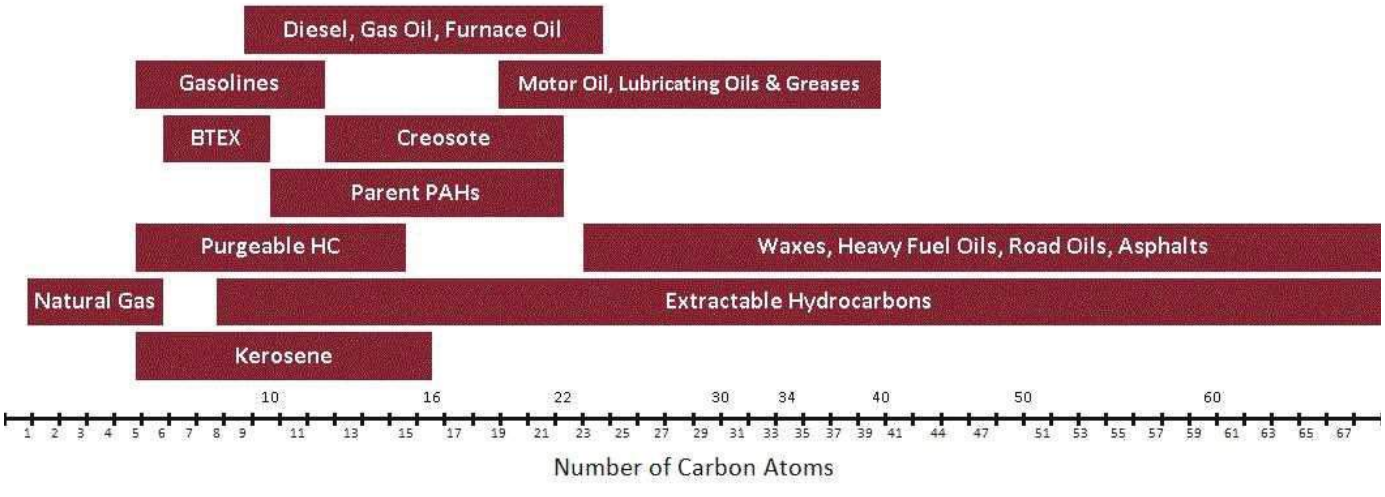


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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

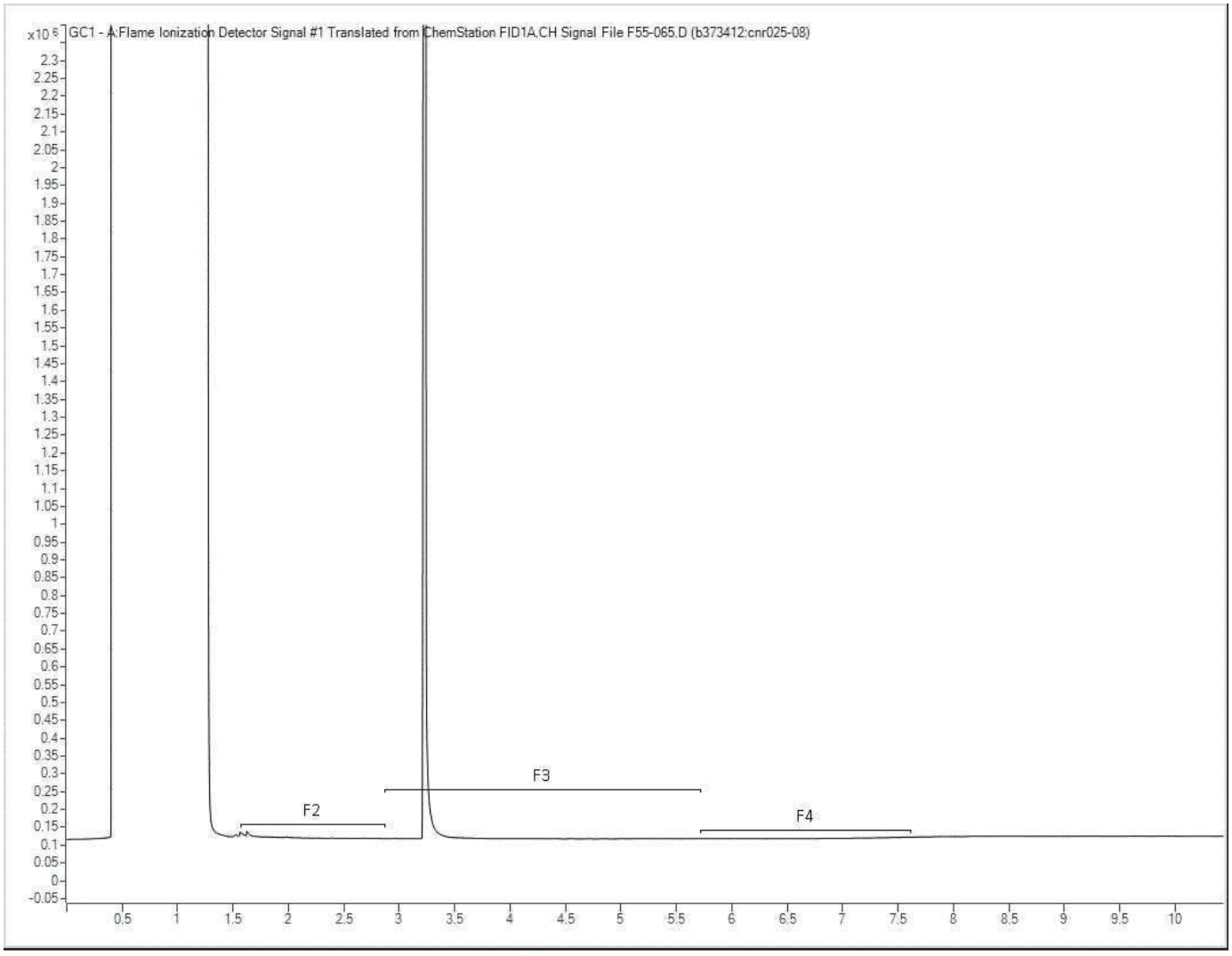


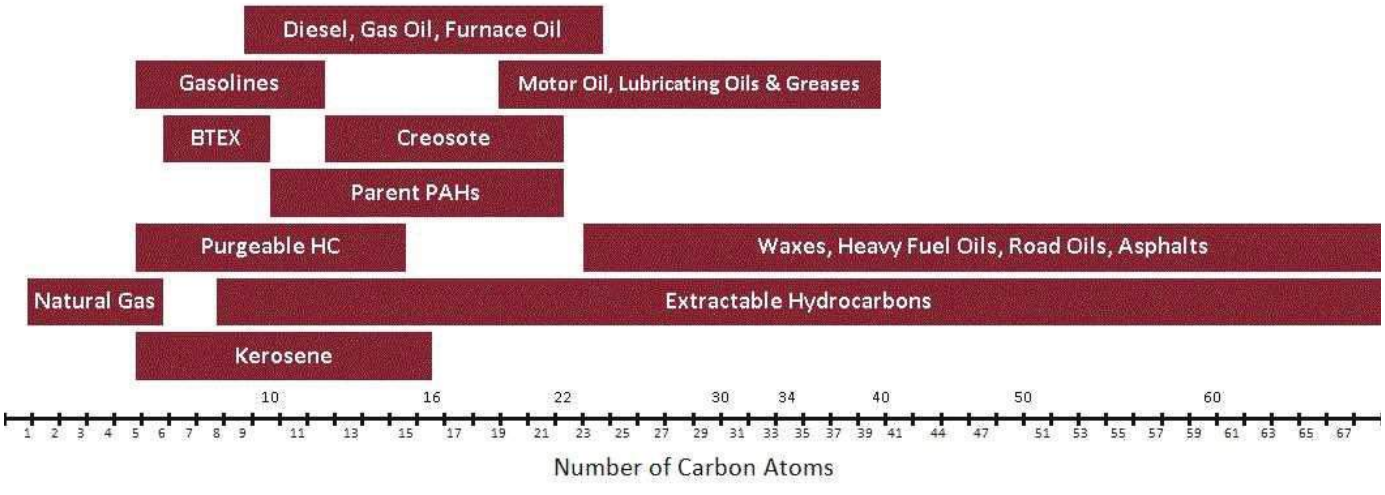


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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

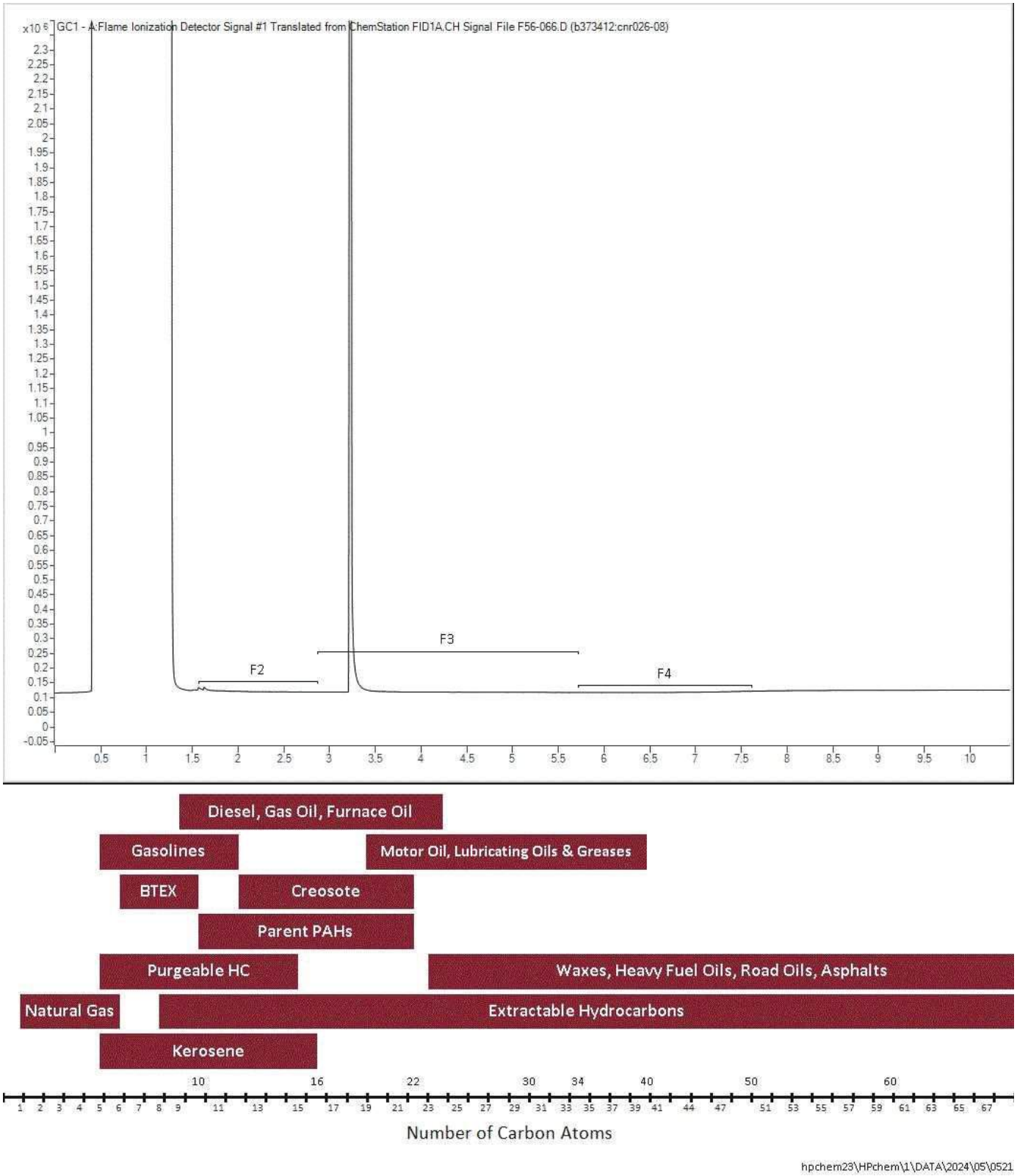




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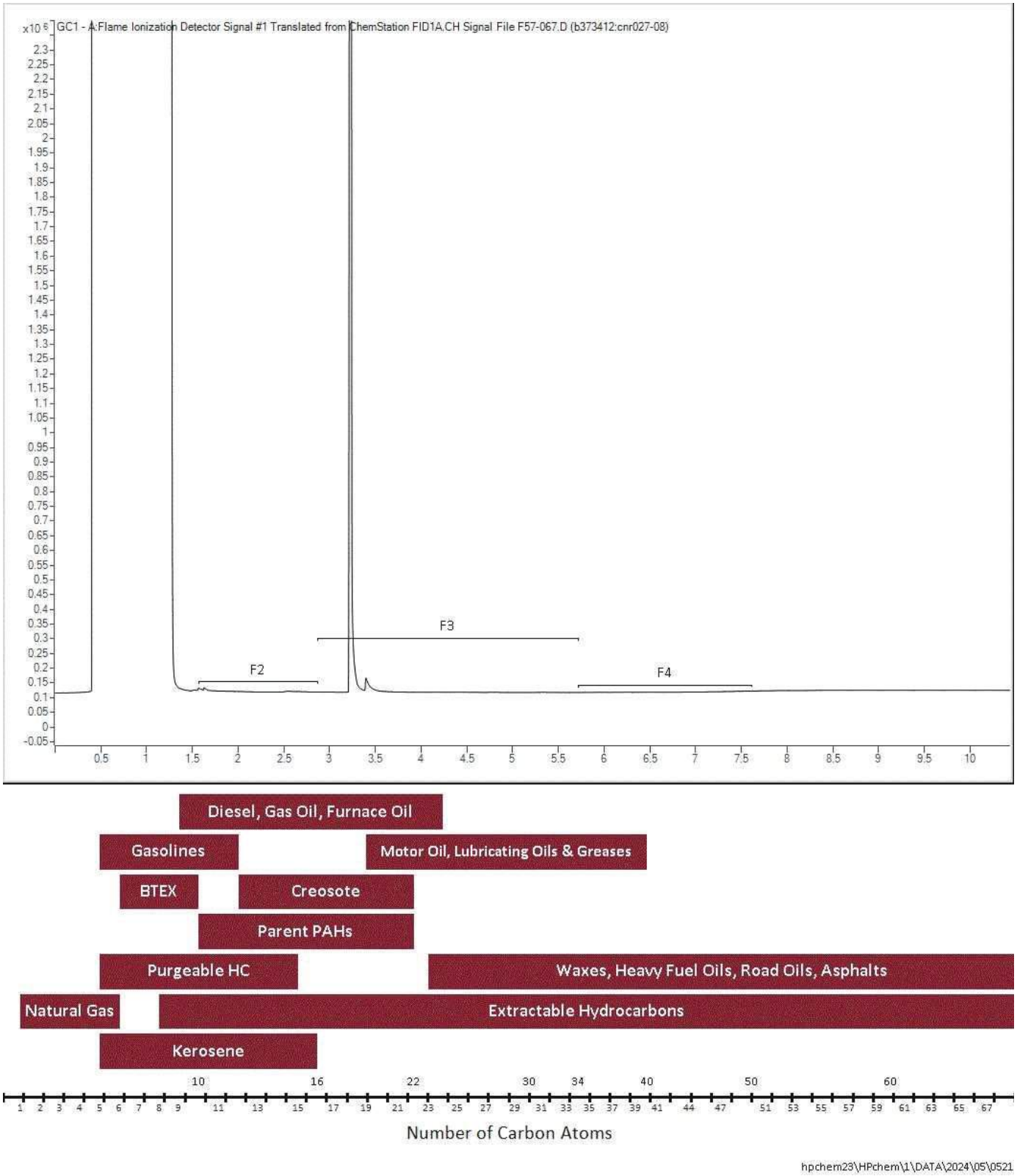
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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



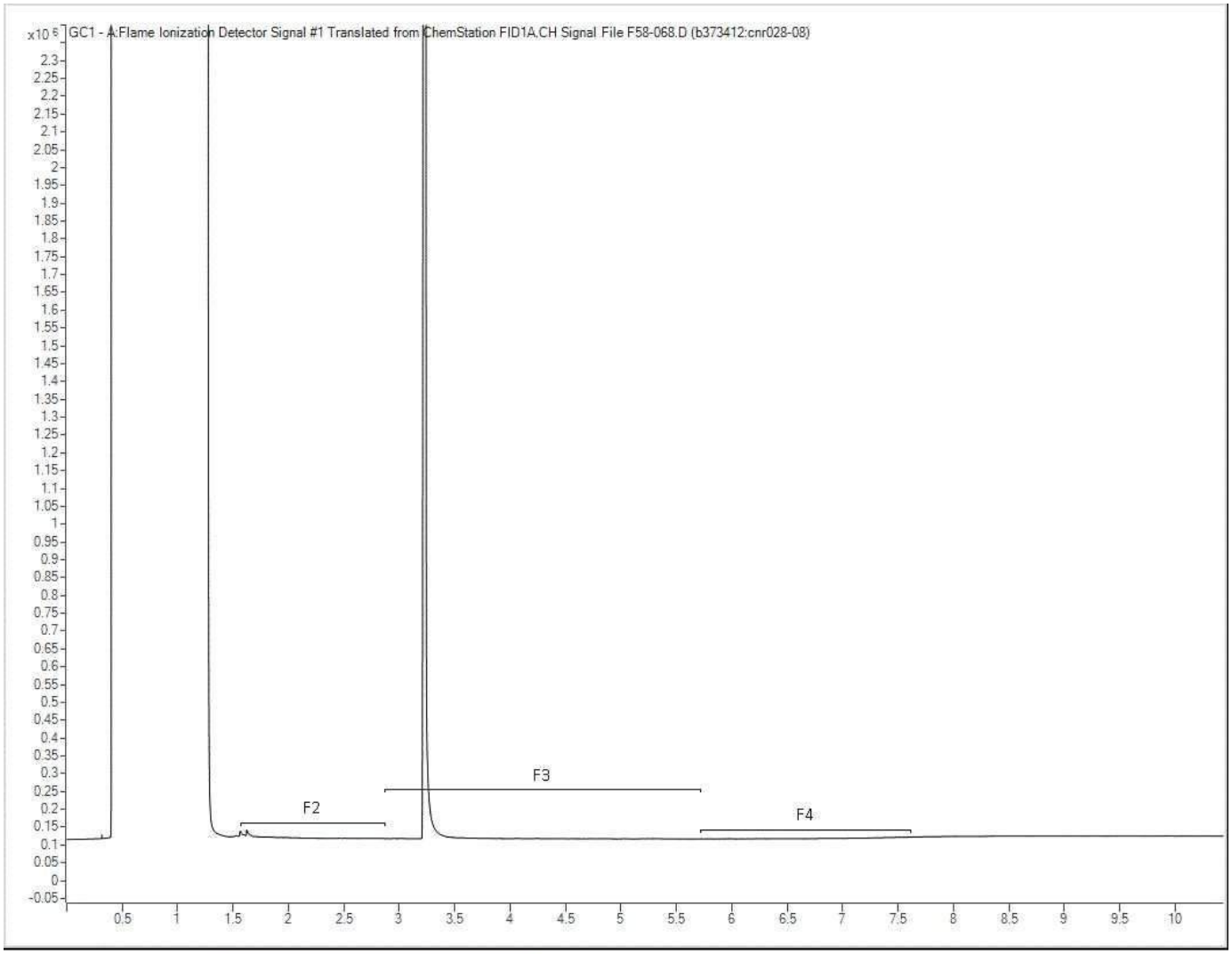
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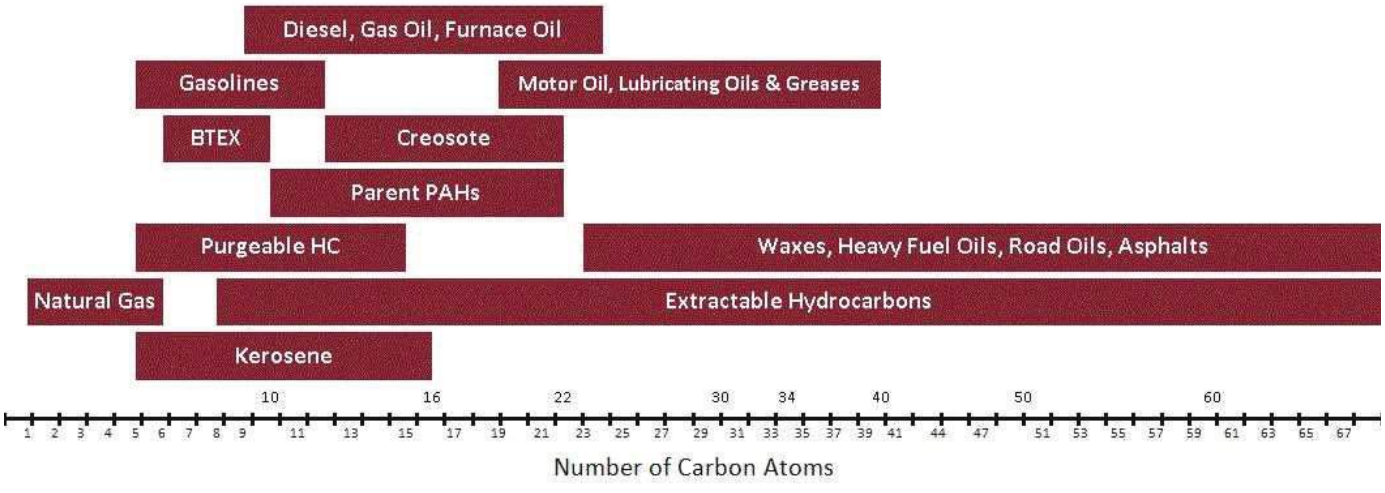
CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





hpchem23\HPchem\1\DATA\2024\05\0521

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 110773396
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/27
Report #: R3505084
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C435132
Received: 2024/05/16, 16:12

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	4	N/A	2024/05/23	AB SOP-00005	SM 24 2320 B m
Alkalinity @25C (pp, total), CO3,HCO3,OH	4	N/A	2024/05/24	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	8	N/A	2024/05/22	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	8	N/A	2024/05/22		Auto Calc
Cadmium - low level CCME - Dissolved	8	N/A	2024/05/23		Auto Calc
Chloride/Sulphate by Auto Colourimetry	8	N/A	2024/05/22	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	8	2024/05/17	2024/05/18	AB SOP-00089	SM 24 9223 A,B m
Heterotrophic Plate Count Quant	8	2024/05/17	2024/05/19	CAL SOP-00012	SM 24 9215 A, E m
Total Coliforms and E.Coli	8	2024/05/17	2024/05/18	AB SOP-00089	SM 24 9223 A,B m
Carbon (DOC) -Lab Filtered (1)	8	N/A	2024/05/24	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	4	N/A	2024/05/22	AB SOP-00005	SM 24 2510 B m
Conductivity @25C	4	N/A	2024/05/24	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	8	2024/05/21	2024/05/21	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	8	N/A	2024/05/23		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	8	2024/05/22	2024/05/22	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	7	2024/05/17	2024/05/21	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	1	2024/05/27	2024/05/27	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (3)	7	N/A	2024/05/22	AB SOP-00042	EPA 6010d R5 m
Elements by ICP-Dissolved-Lab Filtered (3)	1	N/A	2024/05/23	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	8	N/A	2024/05/23	AB SOP-00043	EPA 6020b R2 m
Ion Balance	4	N/A	2024/05/23		Auto Calc
Ion Balance	4	N/A	2024/05/26		Auto Calc
Sum of cations, anions	8	N/A	2024/05/23		Auto Calc
Ammonia-N (Total)	8	N/A	2024/05/21	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	8	N/A	2024/05/22		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	6	N/A	2024/05/21	AB SOP-00091	SM 24 4500 NO3m
NO2 (N); NO2 (N) + NO3 (N) in Water	2	N/A	2024/05/22	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	8	2024/05/16	2024/05/22		Auto Calc
pH @25°C (5)	4	N/A	2024/05/23	AB SOP-00005	SM 24 4500-H+B m
pH @25°C (5)	4	N/A	2024/05/24	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (6)	6	N/A	2024/05/22	AB SOP-00025	SM 24 4500-P A,F m

Your Project #: 110773396
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/27
Report #: R3505084
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C435132
Received: 2024/05/16, 16:12

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Orthophosphate by Automated Analyzer (6)	2	N/A	2024/05/25	AB SOP-00025	SM 24 4500-P A,F m
Total Dissolved Solids (Calculated)	4	N/A	2024/05/24		Auto Calc
Total Dissolved Solids (Calculated)	4	N/A	2024/05/26		Auto Calc
Total Kjeldahl Nitrogen (Total)	1	N/A	2024/05/23	BBY WI-00033	Auto Calc
Total Kjeldahl Nitrogen (Total)	7	N/A	2024/05/24	BBY WI-00033	Auto Calc
Nitrogen (Total)	8	2024/05/23	2024/05/23	AB SOP-00093	SM 24 4500-N C m
Total Phosphorus-Dissolved-Lab Filtered (7)	6	2024/05/23	2024/05/23	AB SOP-00024	SM 24 4500-P A,B,F m
Total Phosphorus-Dissolved-Lab Filtered (7)	2	2024/05/27	2024/05/27	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
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Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.

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Your Project #: 110773396
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/27
Report #: R3505084
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C435132

Received: 2024/05/16, 16:12

(4) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(7) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Encryption Key



Bureau Veritas
27 May 2024 17:28:50

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (403) 291-3077

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AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CNR324		CNR325		CNR326		CNR327			
Sampling Date		2024/05/16 08:25		2024/05/16 08:18		2024/05/16 10:58		2024/05/16 12:16			
COC Number		1/1		1/1		1/1		1/1			
	UNITS	MW21-6-7	MU	MW21-6-12	MU	MW21-3-15	MU	RMW16-18-5	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B373441
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372608
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372608
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372608
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B372608
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372608
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B372002
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B372002
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B372608
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	100	N/A	99	N/A	101	N/A	102	N/A	N/A	B372608
4-Bromofluorobenzene (sur.)	%	101	N/A	105	N/A	102	N/A	106	N/A	N/A	B372608
D4-1,2-Dichloroethane (sur.)	%	96	N/A	94	N/A	94	N/A	95	N/A	N/A	B372608
O-TERPHENYL (sur.)	%	93	N/A	96	N/A	95	N/A	97	N/A	N/A	B373441

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CNR328		CNR329		CNR330		CNR331			
Sampling Date		2024/05/16 12:12		2024/05/16 13:09		2024/05/16 13:16		2024/05/16 14:24			
COC Number		1/1		1/1		1/1		1/1			
	UNITS	RMW16-18-13	MU	RMW16-19-10	MU	RMW16-19-19	MU	MW16-22-26	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B373441
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372608
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372608
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372608
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B372608
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B372608
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B372002
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B372002
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B372608
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	100	N/A	98	N/A	99	N/A	100	N/A	N/A	B372608
4-Bromofluorobenzene (sur.)	%	108	N/A	101	N/A	99	N/A	103	N/A	N/A	B372608
D4-1,2-Dichloroethane (sur.)	%	98	N/A	93	N/A	94	N/A	96	N/A	N/A	B372608
O-TERPHENYL (sur.)	%	99	N/A	103	N/A	100	N/A	95	N/A	N/A	B373441

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR324			CNR325			
Sampling Date		2024/05/16 08:25			2024/05/16 08:18			
COC Number		1/1			1/1			
	UNITS	MW21-6-7	MU	QC Batch	MW21-6-12	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	16	N/A	B372033	18	N/A	N/A	B372033
Cation Sum	meq/L	20	N/A	B372033	20	N/A	N/A	B372033
Hardness (CaCO3)	mg/L	410	N/A	B372113	410	N/A	0.50	B372113
Ion Balance (% Difference)	%	9.5	N/A	B372069	6.3	N/A	N/A	B372069
Nitrate (N)	mg/L	0.094	N/A	B371968	0.017	N/A	0.010	B371968
Nitrate (NO3)	mg/L	0.42	N/A	B372876	0.074	N/A	0.044	B372876
Nitrite (NO2)	mg/L	<0.033	N/A	B372876	<0.033	N/A	0.033	B372876
Calculated Total Dissolved Solids	mg/L	1000	N/A	B372015	1100	N/A	10	B372015
Elements								
Dissolved Cadmium (Cd)	ug/L	0.021	+/- <RDL	B371896	<0.020	N/A	0.020	B371896
Misc. Inorganics								
Conductivity	uS/cm	1600	+/- 42	B375909	1600	+/- 43	2.0	B375900
pH	pH	8.15	+/- 0.0808	B375907	7.96	+/- 0.0789	N/A	B375899
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	B375905	<1.0	N/A	1.0	B375893
Alkalinity (Total as CaCO3)	mg/L	470	+/- 35	B375905	530	+/- 40	1.0	B375893
Bicarbonate (HCO3)	mg/L	570	+/- 8.8	B375905	650	+/- 9.9	1.0	B375893
Carbonate (CO3)	mg/L	<1.0	N/A	B375905	<1.0	N/A	1.0	B375893
Hydroxide (OH)	mg/L	<1.0	N/A	B375905	<1.0	N/A	1.0	B375893
Chloride (Cl)	mg/L	48	+/- 3.9	B375986	61	+/- 4.8	1.0	B375762
Sulphate (SO4)	mg/L	260	+/- 17	B375986	270	+/- 17	5.0	B375762
Nutrients								
Nitrite (N)	mg/L	<0.010	N/A	B375220	<0.010	N/A	0.010	B375216
Nitrate plus Nitrite (N)	mg/L	0.094	+/- 0.015	B375220	0.017	+/- 0.012	0.010	B375216
Lab Filtered Elements								
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	B375737	<0.0030	N/A	0.0030	B375737
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	B375737	<0.00060	N/A	0.00060	B375737
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	B375737	0.00065	+/- <RDL	0.00020	B375737
Dissolved Barium (Ba)	mg/L	0.025	+/- <RDL	B375614	0.014	+/- <RDL	0.010	B375614
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Boron (B)	mg/L	0.19	+/- 0.021	B375614	0.21	+/- 0.022	0.020	B375614

RDL = Reportable Detection Limit
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR324			CNR325			
Sampling Date		2024/05/16 08:25			2024/05/16 08:18			
COC Number		1/1			1/1			
	UNITS	MW21-6-7	MU	QC Batch	MW21-6-12	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	110	+/- 11	B375614	110	+/- 11	0.30	B375614
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	B375737	0.00030	+/- <RDL	0.00030	B375737
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Iron (Fe)	mg/L	<0.060	N/A	B375614	<0.060	N/A	0.060	B375614
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	B375737	<0.00020	N/A	0.00020	B375737
Dissolved Lithium (Li)	mg/L	0.037	+/- <RDL	B375614	0.051	+/- <RDL	0.020	B375614
Dissolved Magnesium (Mg)	mg/L	32	+/- 2.1	B375614	34	+/- 2.2	0.20	B375614
Dissolved Manganese (Mn)	mg/L	0.0079	+/- <RDL	B375614	0.076	+/- 0.0053	0.0040	B375614
Dissolved Molybdenum (Mo)	mg/L	0.0019	+/- 0.00054	B375737	0.0019	+/- 0.00053	0.00020	B375737
Dissolved Nickel (Ni)	mg/L	0.0011	+/- <RDL	B375737	0.0014	+/- <RDL	0.00050	B375737
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	B375614	<0.10	N/A	0.10	B375614
Dissolved Potassium (K)	mg/L	4.7	+/- <RDL	B375614	4.9	+/- <RDL	0.30	B375614
Dissolved Selenium (Se)	mg/L	0.00037	+/- <RDL	B375737	<0.00020	N/A	0.00020	B375737
Dissolved Silicon (Si)	mg/L	4.4	+/- 0.84	B375614	4.4	+/- 0.83	0.50	B375614
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	B375737	<0.00010	N/A	0.00010	B375737
Dissolved Sodium (Na)	mg/L	260	+/- 26	B375614	280	+/- 27	0.50	B375614
Dissolved Strontium (Sr)	mg/L	1.2	+/- 0.11	B375614	1.7	+/- 0.17	0.020	B375614
Dissolved Sulphur (S)	mg/L	81	+/- 5.4	B375614	89	+/- 6.0	0.20	B375614
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	B375737	<0.00020	N/A	0.00020	B375737
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Uranium (U)	mg/L	0.0073	+/- 0.00066	B375737	0.0070	+/- 0.00063	0.00010	B375737
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	B375737	<0.0030	N/A	0.0030	B375737

RDL = Reportable Detection Limit
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR326				CNR327			
Sampling Date		2024/05/16 10:58				2024/05/16 12:16			
COC Number		1/1				1/1			
	UNITS	MW21-3-15	MU	RDL	QC Batch	RMW16-18-5	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	14	N/A	N/A	B372033	12	N/A	N/A	B372033
Cation Sum	meq/L	15	N/A	N/A	B372033	13	N/A	N/A	B372033
Hardness (CaCO3)	mg/L	43	N/A	0.50	B372113	270	N/A	0.50	B372113
Ion Balance (% Difference)	%	3.5	N/A	N/A	B372069	6.8	N/A	N/A	B372069
Nitrate (N)	mg/L	0.069	N/A	0.010	B371968	0.75	N/A	0.010	B371968
Nitrate (NO3)	mg/L	0.31	N/A	0.044	B372876	3.3	N/A	0.044	B372876
Nitrite (NO2)	mg/L	0.22	N/A	0.033	B372876	<0.033	N/A	0.033	B372876
Calculated Total Dissolved Solids	mg/L	830	N/A	10	B372015	660	N/A	10	B372015
Elements									
Dissolved Cadmium (Cd)	ug/L	<0.40	N/A	0.40	B371896	<0.020	N/A	0.020	B371896
Misc. Inorganics									
Conductivity	uS/cm	1300	+/- 33	2.0	B375900	1100	+/- 29	2.0	B375909
pH	pH	8.51	+/- 0.0843	N/A	B375899	8.32	+/- 0.0825	N/A	B375907
Anions									
Alkalinity (PP as CaCO3)	mg/L	18	+/- 1.4	1.0	B375893	4.5	+/- <RDL	1.0	B375905
Alkalinity (Total as CaCO3)	mg/L	530	+/- 40	1.0	B375893	370	+/- 27	1.0	B375905
Bicarbonate (HCO3)	mg/L	610	+/- 9.3	1.0	B375893	440	+/- 6.8	1.0	B375905
Carbonate (CO3)	mg/L	21	N/A	1.0	B375893	5.4	N/A	1.0	B375905
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B375893	<1.0	N/A	1.0	B375905
Chloride (Cl)	mg/L	<1.0	N/A	1.0	B376027	92	+/- 7.1	1.0	B375762
Sulphate (SO4)	mg/L	160	+/- 11	5.0	B376027	72	+/- 4.9	1.0	B375762
Nutrients									
Nitrite (N)	mg/L	0.065	+/- <RDL	0.010	B375218	<0.010	N/A	0.010	B375216
Nitrate plus Nitrite (N)	mg/L	0.13	+/- 0.018	0.010	B375218	0.75	+/- 0.069	0.010	B375216
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	1.1	+/- 0.26	0.060	B375737	0.0038	+/- <RDL	0.0030	B375737
Dissolved Antimony (Sb)	mg/L	<0.012	N/A	0.012	B375737	<0.00060	N/A	0.00060	B375737
Dissolved Arsenic (As)	mg/L	<0.0040	N/A	0.0040	B375737	0.00025	+/- <RDL	0.00020	B375737
Dissolved Barium (Ba)	mg/L	0.19	+/- <RDL	0.10	B375614	0.057	+/- <RDL	0.010	B375614
Dissolved Beryllium (Be)	mg/L	<0.020	N/A	0.020	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Boron (B)	mg/L	0.20	+/- <RDL	0.20	B375614	0.10	+/- <RDL	0.020	B375614

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR326				CNR327			
Sampling Date		2024/05/16 10:58				2024/05/16 12:16			
COC Number		1/1				1/1			
	UNITS	MW21-3-15	MU	RDL	QC Batch	RMW16-18-5	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	17	+/- <RDL	3.0	B375614	54	+/- 5.4	0.30	B375614
Dissolved Chromium (Cr)	mg/L	<0.020	N/A	0.020	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Cobalt (Co)	mg/L	<0.0060	N/A	0.0060	B375737	<0.00030	N/A	0.00030	B375737
Dissolved Copper (Cu)	mg/L	<0.020	N/A	0.020	B375737	0.0011	+/- <RDL	0.0010	B375737
Dissolved Iron (Fe)	mg/L	0.70	+/- <RDL	0.60	B375614	<0.060	N/A	0.060	B375614
Dissolved Lead (Pb)	mg/L	0.0044	+/- <RDL	0.0040	B375737	<0.00020	N/A	0.00020	B375737
Dissolved Lithium (Li)	mg/L	<0.20	N/A	0.20	B375614	<0.020	N/A	0.020	B375614
Dissolved Magnesium (Mg)	mg/L	<2.0	N/A	2.0	B375614	33	+/- 2.1	0.20	B375614
Dissolved Manganese (Mn)	mg/L	0.12	+/- <RDL	0.040	B375614	<0.0040	N/A	0.0040	B375614
Dissolved Molybdenum (Mo)	mg/L	<0.0040	N/A	0.0040	B375737	0.0022	+/- 0.00061	0.00020	B375737
Dissolved Nickel (Ni)	mg/L	<0.010	N/A	0.010	B375737	<0.00050	N/A	0.00050	B375737
Dissolved Phosphorus (P)	mg/L	<1.0	N/A	1.0	B375614	<0.10	N/A	0.10	B375614
Dissolved Potassium (K)	mg/L	<3.0	N/A	3.0	B375614	2.4	+/- <RDL	0.30	B375614
Dissolved Selenium (Se)	mg/L	<0.0040	N/A	0.0040	B375737	0.0026	+/- 0.00024	0.00020	B375737
Dissolved Silicon (Si)	mg/L	<5.0	N/A	5.0	B375614	3.6	+/- 0.69	0.50	B375614
Dissolved Silver (Ag)	mg/L	<0.0020	N/A	0.0020	B375737	<0.00010	N/A	0.00010	B375737
Dissolved Sodium (Na)	mg/L	330	+/- 32	5.0	B375614	180	+/- 17	0.50	B375614
Dissolved Strontium (Sr)	mg/L	<0.20	N/A	0.20	B375614	0.40	+/- 0.039	0.020	B375614
Dissolved Sulphur (S)	mg/L	49	+/- 3.3	2.0	B375614	24	+/- 1.6	0.20	B375614
Dissolved Thallium (Tl)	mg/L	<0.0040	N/A	0.0040	B375737	<0.00020	N/A	0.00020	B375737
Dissolved Tin (Sn)	mg/L	<0.020	N/A	0.020	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Titanium (Ti)	mg/L	<0.020	N/A	0.020	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Uranium (U)	mg/L	<0.0020	N/A	0.0020	B375737	0.0066	+/- 0.00060	0.00010	B375737
Dissolved Vanadium (V)	mg/L	<0.020	N/A	0.020	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Zinc (Zn)	mg/L	1.1	+/- 0.10	0.060	B375737	<0.0030	N/A	0.0030	B375737

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR327			CNR328			
Sampling Date		2024/05/16 12:16			2024/05/16 12:12			
COC Number		1/1			1/1			
	UNITS	RMW16-18-5 Lab-Dup	MU	QC Batch	RMW16-18-13	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	N/A	N/A	B372033	12	N/A	N/A	B372033
Cation Sum	meq/L	N/A	N/A	B372033	14	N/A	N/A	B372033
Hardness (CaCO3)	mg/L	N/A	N/A	B372113	200	N/A	0.50	B372113
Ion Balance (% Difference)	%	N/A	N/A	B372069	7.0	N/A	N/A	B372069
Nitrate (N)	mg/L	N/A	N/A	B371968	0.52	N/A	0.010	B371968
Nitrate (NO3)	mg/L	N/A	N/A	B372876	2.3	N/A	0.044	B372876
Nitrite (NO2)	mg/L	N/A	N/A	B372876	<0.033	N/A	0.033	B372876
Calculated Total Dissolved Solids	mg/L	N/A	N/A	B372015	690	N/A	10	B372015
Elements								
Dissolved Cadmium (Cd)	ug/L	N/A	N/A	B371896	<0.020	N/A	0.020	B371896
Misc. Inorganics								
Conductivity	uS/cm	N/A	N/A	B375909	1100	+/- 30	2.0	B375909
pH	pH	N/A	N/A	B375907	8.42	+/- 0.0834	N/A	B375907
Anions								
Alkalinity (PP as CaCO3)	mg/L	N/A	N/A	B375905	8.6	+/- <RDL	1.0	B375905
Alkalinity (Total as CaCO3)	mg/L	N/A	N/A	B375905	400	+/- 30	1.0	B375905
Bicarbonate (HCO3)	mg/L	N/A	N/A	B375905	460	+/- 7.2	1.0	B375905
Carbonate (CO3)	mg/L	N/A	N/A	B375905	10	N/A	1.0	B375905
Hydroxide (OH)	mg/L	N/A	N/A	B375905	<1.0	N/A	1.0	B375905
Chloride (Cl)	mg/L	92	+/- 7.1	B375762	89	+/- 6.8	1.0	B375986
Sulphate (SO4)	mg/L	71	+/- 4.8	B375762	69	+/- 4.7	1.0	B375986
Nutrients								
Nitrite (N)	mg/L	N/A	N/A	B375216	<0.010	N/A	0.010	B375214
Nitrate plus Nitrite (N)	mg/L	N/A	N/A	B375216	0.52	+/- 0.049	0.010	B375214
Lab Filtered Elements								
Dissolved Aluminum (Al)	mg/L	N/A	N/A	B375737	0.0042	+/- <RDL	0.0030	B375737
Dissolved Antimony (Sb)	mg/L	N/A	N/A	B375737	<0.00060	N/A	0.00060	B375737
Dissolved Arsenic (As)	mg/L	N/A	N/A	B375737	0.00028	+/- <RDL	0.00020	B375737
Dissolved Barium (Ba)	mg/L	N/A	N/A	B375614	0.046	+/- <RDL	0.010	B375614
Dissolved Beryllium (Be)	mg/L	N/A	N/A	B375737	<0.0010	N/A	0.0010	B375737

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Lab-Dup = Laboratory Initiated Duplicate
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR327			CNR328			
Sampling Date		2024/05/16 12:16			2024/05/16 12:12			
COC Number		1/1			1/1			
	UNITS	RMW16-18-5 Lab-Dup	MU	QC Batch	RMW16-18-13	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	N/A	N/A	B375614	0.12	+/- <RDL	0.020	B375614
Dissolved Calcium (Ca)	mg/L	N/A	N/A	B375614	41	+/- 4.2	0.30	B375614
Dissolved Chromium (Cr)	mg/L	N/A	N/A	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Cobalt (Co)	mg/L	N/A	N/A	B375737	<0.00030	N/A	0.00030	B375737
Dissolved Copper (Cu)	mg/L	N/A	N/A	B375737	0.015	+/- 0.0042	0.0010	B375737
Dissolved Iron (Fe)	mg/L	N/A	N/A	B375614	<0.060	N/A	0.060	B375614
Dissolved Lead (Pb)	mg/L	N/A	N/A	B375737	0.00075	+/- <RDL	0.00020	B375737
Dissolved Lithium (Li)	mg/L	N/A	N/A	B375614	<0.020	N/A	0.020	B375614
Dissolved Magnesium (Mg)	mg/L	N/A	N/A	B375614	23	+/- 1.5	0.20	B375614
Dissolved Manganese (Mn)	mg/L	N/A	N/A	B375614	0.12	+/- 0.0085	0.0040	B375614
Dissolved Molybdenum (Mo)	mg/L	N/A	N/A	B375737	0.0043	+/- 0.0011	0.00020	B375737
Dissolved Nickel (Ni)	mg/L	N/A	N/A	B375737	<0.00050	N/A	0.00050	B375737
Dissolved Phosphorus (P)	mg/L	N/A	N/A	B375614	<0.10	N/A	0.10	B375614
Dissolved Potassium (K)	mg/L	N/A	N/A	B375614	1.4	+/- <RDL	0.30	B375614
Dissolved Selenium (Se)	mg/L	N/A	N/A	B375737	0.0010	+/- <RDL	0.00020	B375737
Dissolved Silicon (Si)	mg/L	N/A	N/A	B375614	3.1	+/- 0.59	0.50	B375614
Dissolved Silver (Ag)	mg/L	N/A	N/A	B375737	<0.00010	N/A	0.00010	B375737
Dissolved Sodium (Na)	mg/L	N/A	N/A	B375614	220	+/- 22	0.50	B375614
Dissolved Strontium (Sr)	mg/L	N/A	N/A	B375614	0.28	+/- 0.027	0.020	B375614
Dissolved Sulphur (S)	mg/L	N/A	N/A	B375614	22	+/- 1.5	0.20	B375614
Dissolved Thallium (Tl)	mg/L	N/A	N/A	B375737	<0.00020	N/A	0.00020	B375737
Dissolved Tin (Sn)	mg/L	N/A	N/A	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Titanium (Ti)	mg/L	N/A	N/A	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Uranium (U)	mg/L	N/A	N/A	B375737	0.0057	+/- 0.00052	0.00010	B375737
Dissolved Vanadium (V)	mg/L	N/A	N/A	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Zinc (Zn)	mg/L	N/A	N/A	B375737	0.0091	+/- <RDL	0.0030	B375737

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR329				CNR330			
Sampling Date		2024/05/16 13:09				2024/05/16 13:16			
COC Number		1/1				1/1			
	UNITS	RMW16-19-10	MU	RDL	QC Batch	RMW16-19-19	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	38	N/A	N/A	B372033	35	N/A	N/A	B372033
Cation Sum	meq/L	39	N/A	N/A	B372033	36	N/A	N/A	B372033
Hardness (CaCO3)	mg/L	1100	N/A	0.50	B372113	550	N/A	0.50	B372113
Ion Balance (% Difference)	%	0.49	N/A	N/A	B372069	0.47	N/A	N/A	B372069
Nitrate (N)	mg/L	0.015	N/A	0.010	B371968	<0.010	N/A	0.010	B371968
Nitrate (NO3)	mg/L	0.068	N/A	0.044	B372876	<0.044	N/A	0.044	B372876
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B372876	<0.033	N/A	0.033	B372876
Calculated Total Dissolved Solids	mg/L	2400	N/A	25	B372015	2200	N/A	25	B372015
Elements									
Dissolved Cadmium (Cd)	ug/L	0.12	+/- 0.051	0.020	B371896	<0.020	N/A	0.020	B371896
Misc. Inorganics									
Conductivity	uS/cm	3000	+/- 79	2.0	B375900	2900	+/- 75	2.0	B375900
pH	pH	7.85	+/- 0.0778	N/A	B375899	7.90	+/- 0.0783	N/A	B375899
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B375893	<1.0	N/A	1.0	B375893
Alkalinity (Total as CaCO3)	mg/L	500	+/- 37	1.0	B375893	580	+/- 43	1.0	B375893
Bicarbonate (HCO3)	mg/L	610	+/- 9.4	1.0	B375893	710	+/- 11	1.0	B375893
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B375893	<1.0	N/A	1.0	B375893
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B375893	<1.0	N/A	1.0	B375893
Chloride (Cl)	mg/L	1.8	+/- 1.2	1.0	B375802	<1.0	N/A	1.0	B375986
Sulphate (SO4)	mg/L	1400	+/- 86	25	B375802	1100	+/- 72	25	B375986
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B375217	<0.010	N/A	0.010	B375217
Nitrate plus Nitrite (N)	mg/L	0.015	+/- 0.012	0.010	B375217	<0.010	N/A	0.010	B375217
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B375737	<0.0030	N/A	0.0030	B375737
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B375737	<0.00060	N/A	0.00060	B375737
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	0.00020	B375737	<0.00020	N/A	0.00020	B375737
Dissolved Barium (Ba)	mg/L	<0.010	N/A	0.010	B375614	<0.010	N/A	0.010	B375614
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Boron (B)	mg/L	0.12	+/- <RDL	0.020	B375614	0.13	+/- <RDL	0.020	B375614

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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR329				CNR330			
Sampling Date		2024/05/16 13:09				2024/05/16 13:16			
COC Number		1/1				1/1			
	UNITS	RMW16-19-10	MU	RDL	QC Batch	RMW16-19-19	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	260	+/- 27	0.30	B375614	130	+/- 13	0.30	B375614
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Cobalt (Co)	mg/L	0.00046	+/- <RDL	0.00030	B375737	<0.00030	N/A	0.00030	B375737
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B375614	<0.060	N/A	0.060	B375614
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B375737	<0.00020	N/A	0.00020	B375737
Dissolved Lithium (Li)	mg/L	0.026	+/- <RDL	0.020	B375614	0.062	+/- <RDL	0.020	B375614
Dissolved Magnesium (Mg)	mg/L	96	+/- 6.1	0.20	B375614	55	+/- 3.5	0.20	B375614
Dissolved Manganese (Mn)	mg/L	0.62	+/- 0.041	0.0040	B375614	0.31	+/- 0.021	0.0040	B375614
Dissolved Molybdenum (Mo)	mg/L	0.00087	+/- 0.00032	0.00020	B375737	0.0011	+/- 0.00037	0.00020	B375737
Dissolved Nickel (Ni)	mg/L	0.0016	+/- <RDL	0.00050	B375737	<0.00050	N/A	0.00050	B375737
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B375614	<0.10	N/A	0.10	B375614
Dissolved Potassium (K)	mg/L	6.5	+/- 0.34	0.30	B375614	5.4	+/- <RDL	0.30	B375614
Dissolved Selenium (Se)	mg/L	0.0012	+/- <RDL	0.00020	B375737	<0.00020	N/A	0.00020	B375737
Dissolved Silicon (Si)	mg/L	3.8	+/- 0.73	0.50	B375614	3.2	+/- 0.62	0.50	B375614
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B375737	<0.00010	N/A	0.00010	B375737
Dissolved Sodium (Na)	mg/L	400	+/- 39	0.50	B375614	560	+/- 55	2.5	B375614
Dissolved Strontium (Sr)	mg/L	1.8	+/- 0.18	0.020	B375614	1.8	+/- 0.18	0.020	B375614
Dissolved Sulphur (S)	mg/L	400	+/- 27	0.20	B375614	310	+/- 20	0.20	B375614
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B375737	<0.00020	N/A	0.00020	B375737
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Uranium (U)	mg/L	0.011	+/- 0.00099	0.00010	B375737	0.00080	+/- <RDL	0.00010	B375737
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B375737	<0.0030	N/A	0.0030	B375737

RDL = Reportable Detection Limit
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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR331			
Sampling Date		2024/05/16 14:24			
COC Number		1/1			
	UNITS	MW16-22-26	MU	RDL	QC Batch
Calculated Parameters					
Anion Sum	meq/L	25	N/A	N/A	B372033
Cation Sum	meq/L	25	N/A	N/A	B372033
Hardness (CaCO3)	mg/L	720	N/A	0.50	B372113
Ion Balance (% Difference)	%	1.0	N/A	N/A	B372069
Nitrate (N)	mg/L	0.040	N/A	0.010	B371968
Nitrate (NO3)	mg/L	0.18	N/A	0.044	B372876
Nitrite (NO2)	mg/L	0.12	N/A	0.033	B372876
Calculated Total Dissolved Solids	mg/L	1600	N/A	25	B372160
Elements					
Dissolved Cadmium (Cd)	ug/L	0.057	+/- 0.027	0.020	B371896
Misc. Inorganics					
Conductivity	uS/cm	2000	+/- 52	2.0	B375909
pH	pH	8.28	+/- 0.0820	N/A	B375907
Anions					
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B375905
Alkalinity (Total as CaCO3)	mg/L	180	+/- 13	1.0	B375905
Bicarbonate (HCO3)	mg/L	220	+/- 3.6	1.0	B375905
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B375905
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B375905
Chloride (Cl)	mg/L	1.9	+/- 1.2	1.0	B375986
Sulphate (SO4)	mg/L	1000	+/- 66	25	B375986
Nutrients					
Nitrite (N)	mg/L	0.035	+/- <RDL	0.010	B375220
Nitrate plus Nitrite (N)	mg/L	0.076	+/- 0.014	0.010	B375220
Lab Filtered Elements					
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B375737
Dissolved Antimony (Sb)	mg/L	0.00096	+/- <RDL	0.00060	B375737
Dissolved Arsenic (As)	mg/L	0.00048	+/- <RDL	0.00020	B375737
Dissolved Barium (Ba)	mg/L	0.020	+/- <RDL	0.010	B375614
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B375737
Dissolved Boron (B)	mg/L	0.12	+/- <RDL	0.020	B375614

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNR331			
Sampling Date		2024/05/16 14:24			
COC Number		1/1			
	UNITS	MW16-22-26	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	180	+/- 19	0.30	B375614
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B375737
Dissolved Cobalt (Co)	mg/L	0.00053	+/- <RDL	0.00030	B375737
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B375737
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B375614
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B375737
Dissolved Lithium (Li)	mg/L	0.052	+/- <RDL	0.020	B375614
Dissolved Magnesium (Mg)	mg/L	64	+/- 4.1	0.20	B375614
Dissolved Manganese (Mn)	mg/L	0.39	+/- 0.027	0.0040	B375614
Dissolved Molybdenum (Mo)	mg/L	0.0045	+/- 0.0011	0.00020	B375737
Dissolved Nickel (Ni)	mg/L	0.0010	+/- <RDL	0.00050	B375737
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B375614
Dissolved Potassium (K)	mg/L	7.2	+/- 0.38	0.30	B375614
Dissolved Selenium (Se)	mg/L	0.00034	+/- <RDL	0.00020	B375737
Dissolved Silicon (Si)	mg/L	3.5	+/- 0.68	0.50	B375614
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B375737
Dissolved Sodium (Na)	mg/L	230	+/- 23	0.50	B375614
Dissolved Strontium (Sr)	mg/L	3.0	+/- 0.29	0.020	B375614
Dissolved Sulphur (S)	mg/L	280	+/- 19	0.20	B375614
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B375737
Dissolved Tin (Sn)	mg/L	0.0048	+/- 0.0013	0.0010	B375737
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B375737
Dissolved Uranium (U)	mg/L	0.0017	+/- 0.00017	0.00010	B375737
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B375737
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B375737

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N/A = Not Applicable

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TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CNR324			CNR325			CNR326			
Sampling Date		2024/05/16 08:25			2024/05/16 08:18			2024/05/16 10:58			
COC Number		1/1			1/1			1/1			
	UNITS	MW21-6-7	MU	RDL	MW21-6-12	MU	RDL	MW21-3-15	MU	RDL	QC Batch
Calculated Parameters											
Total Kjeldahl Nitrogen (Calc)	mg/L	1.16	N/A	0.20	0.291	N/A	0.020	0.95	N/A	0.20	B372874
Nutrients											
Total Nitrogen (N)	mg/L	1.3	+/- <RDL	0.20	0.31	+/- 0.059	0.020	1.1	+/- <RDL	0.20	B377068

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CNR327				CNR328			
Sampling Date		2024/05/16 12:16				2024/05/16 12:12			
COC Number		1/1				1/1			
	UNITS	RMW16-18-5	MU	RDL	QC Batch	RMW16-18-13	MU	RDL	QC Batch
Calculated Parameters									
Total Kjeldahl Nitrogen (Calc)	mg/L	0.94	N/A	0.20	B372874	0.281	N/A	0.020	B372874
Nutrients									
Total Nitrogen (N)	mg/L	1.7	+/- 0.25	0.20	B377068	0.80	+/- 0.12	0.020	B376911

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas ID		CNR329		CNR330		CNR331			
Sampling Date		2024/05/16 13:09		2024/05/16 13:16		2024/05/16 14:24			
COC Number		1/1		1/1		1/1			
	UNITS	RMW16-19-10	MU	RMW16-19-19	MU	MW16-22-26	MU	RDL	QC Batch
Calculated Parameters									
Total Kjeldahl Nitrogen (Calc)	mg/L	0.422	N/A	1.28	N/A	0.973	N/A	0.020	B372874
Nutrients									
Total Nitrogen (N)	mg/L	0.44	+/- 0.075	1.3	+/- 0.19	1.0	+/- 0.16	0.020	B377068

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C435132
Report Date: 2024/05/27

STANTEC CONSULTING LTD
Client Project #: 110773396
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNR324				CNR325		CNR325			
Sampling Date		2024/05/16 08:25				2024/05/16 08:18		2024/05/16 08:18			
COC Number		1/1				1/1		1/1			
	UNITS	MW21-6-7	MU	RDL	QC Batch	MW21-6-12	MU	MW21-6-12 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Inorganics											
Dissolved Organic Carbon (C)	mg/L	2.9 (1)	+/- 0.51	0.50	B378347	2.5 (1)	+/- <RDL	N/A	N/A	0.50	B378347
Microbiological Param.											
E.Coli DST	MPN/100mL	<100 (2)	N/A	100	B372875	<1.0	N/A	N/A	N/A	1.0	B372875
Fecal Coliforms	MPN/100mL	<100 (2)	N/A	100	B373420	<1.0	N/A	N/A	N/A	1.0	B373420
Heterotrophic DST	MPN/100mL	>24000 (3)	N/A	10	B373437	73 (4)	N/A	74	N/A	1.0	B373437
Total Coliforms DST	MPN/100mL	<100 (2)	N/A	100	B372875	<1.0	N/A	N/A	N/A	1.0	B372875
Nutrients											
Total Ammonia (N)	mg/L	0.039	+/- <RDL	0.015	B374577	0.13	+/- 0.018	N/A	N/A	0.015	B374577
Orthophosphate (P)	mg/L	<0.0030	N/A	0.0030	B375918	0.0043	+/- 0.0035	N/A	N/A	0.0030	B375925
Lab Filtered Nutrients											
Dissolved Phosphorus (P)	mg/L	<0.0030 (1)	N/A	0.0030	B376821	<0.0030 (5)	N/A	N/A	N/A	0.0030	B376822

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Sample filtered and preserved past method specified hold time
(2) Detection limit raised due to matrix interference.
(3) Sample analyzed 1 hour over hold time. Sample analysis is recommended within 30 hours of sampling. Detection limit raised due to matrix interference.
(4) Sample analyzed 1 hour over hold time. Sample analysis is recommended within 30 hours of sampling.
(5) Sample filtered and preserved past method specified hold time Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C435132
Report Date: 2024/05/27

STANTEC CONSULTING LTD
Client Project #: 110773396
Sampler Initials: WT

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNR326		CNR326			CNR327			
Sampling Date		2024/05/16 10:58		2024/05/16 10:58			2024/05/16 12:16			
COC Number		1/1		1/1			1/1			
	UNITS	MW21-3-15	MU	MW21-3-15 Lab-Dup	MU	QC Batch	RMW16-18-5	MU	RDL	QC Batch
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	2.5 (1)	+/- <RDL	N/A	N/A	B378347	2.0 (1)	+/- <RDL	0.50	B378347
Microbiological Param.										
E.Coli DST	MPN/100mL	<100 (2)	N/A	N/A	N/A	B372875	<100 (2)	N/A	100	B372875
Fecal Coliforms	MPN/100mL	<100 (2)	N/A	N/A	N/A	B373420	<100 (2)	N/A	100	B373420
Heterotrophic DST	MPN/100mL	>24000 (2)	N/A	N/A	N/A	B373437	4400 (2)	N/A	10	B373437
Total Coliforms DST	MPN/100mL	<100 (2)	N/A	N/A	N/A	B372875	<100 (2)	N/A	100	B372875
Nutrients										
Total Ammonia (N)	mg/L	0.48	+/- 0.054	N/A	N/A	B374577	0.032	+/- <RDL	0.015	B374577
Orthophosphate (P)	mg/L	0.041	+/- 0.0060	0.040	+/- 0.0059	B379503	<0.0030	N/A	0.0030	B375918
Lab Filtered Nutrients										
Dissolved Phosphorus (P)	mg/L	0.021 (1)	+/- 0.0052	N/A	N/A	B380560	<0.0030 (1)	N/A	0.0030	B376822

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Sample filtered and preserved past method specified hold time
(2) Detection limit raised due to matrix interference.

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNR327				CNR328			
Sampling Date		2024/05/16 12:16				2024/05/16 12:12			
COC Number		1/1				1/1			
	UNITS	RMW16-18-5 Lab-Dup	MU	RDL	QC Batch	RMW16-18-13	MU	RDL	QC Batch
Lab Filtered Inorganics									
Dissolved Organic Carbon (C)	mg/L	2.0	+/- <RDL	0.50	B378347	1.6 (1)	+/- <RDL	0.50	B378347
Microbiological Param.									
E.Coli DST	MPN/100mL	N/A	N/A	100	B372875	<1.0	N/A	1.0	B372875
Fecal Coliforms	MPN/100mL	N/A	N/A	100	B373420	<1.0	N/A	1.0	B373420
Heterotrophic DST	MPN/100mL	N/A	N/A	10	B373437	>2400	N/A	1.0	B373437
Total Coliforms DST	MPN/100mL	N/A	N/A	100	B372875	5.2	N/A	1.0	B372875
Nutrients									
Total Ammonia (N)	mg/L	N/A	N/A	0.015	B374577	<0.015	N/A	0.015	B374577
Orthophosphate (P)	mg/L	N/A	N/A	0.0030	B375918	<0.0030	N/A	0.0030	B375918
Lab Filtered Nutrients									
Dissolved Phosphorus (P)	mg/L	N/A	N/A	0.0030	B376822	<0.0030 (1)	N/A	0.0030	B376821

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Sample filtered and preserved past method specified hold time

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNR328				CNR329			
Sampling Date		2024/05/16 12:12				2024/05/16 13:09			
COC Number		1/1				1/1			
	UNITS	RMW16-18-13 Lab-Dup	MU	RDL	QC Batch	RMW16-19-10	MU	RDL	QC Batch
Lab Filtered Inorganics									
Dissolved Organic Carbon (C)	mg/L	N/A	N/A	0.50	B378347	4.3 (1)	+/- 0.63	0.50	B378347
Microbiological Param.									
E.Coli DST	MPN/100mL	N/A	N/A	1.0	B372875	<100 (2)	N/A	100	B372875
Fecal Coliforms	MPN/100mL	<1.0	N/A	1.0	B373420	<100 (2)	N/A	100	B373420
Heterotrophic DST	MPN/100mL	N/A	N/A	1.0	B373437	>24000 (2)	N/A	10	B373437
Total Coliforms DST	MPN/100mL	N/A	N/A	1.0	B372875	<100 (2)	N/A	100	B372875
Nutrients									
Total Ammonia (N)	mg/L	N/A	N/A	0.015	B374577	0.089	+/- <RDL	0.015	B374577
Orthophosphate (P)	mg/L	N/A	N/A	0.0030	B375918	<0.0030	N/A	0.0030	B375925
Lab Filtered Nutrients									
Dissolved Phosphorus (P)	mg/L	<0.0030	N/A	0.0030	B376821	<0.0030 (1)	N/A	0.0030	B376822

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Sample filtered and preserved past method specified hold time
(2) Detection limit raised due to matrix interference.

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNR330		CNR330			
Sampling Date		2024/05/16 13:16		2024/05/16 13:16			
COC Number		1/1		1/1			
	UNITS	RMW16-19-19	MU	RMW16-19-19 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Inorganics							
Dissolved Organic Carbon (C)	mg/L	3.3 (1)	+/- 0.54	N/A	N/A	0.50	B378347
Microbiological Param.							
E.Coli DST	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B372875
Fecal Coliforms	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B373420
Heterotrophic DST	MPN/100mL	21	N/A	N/A	N/A	1.0	B373437
Total Coliforms DST	MPN/100mL	1.0	N/A	N/A	N/A	1.0	B372875
Nutrients							
Total Ammonia (N)	mg/L	1.0	+/- 0.11	1.1	+/- 0.12	0.015	B374577
Orthophosphate (P)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B375925
Lab Filtered Nutrients							
Dissolved Phosphorus (P)	mg/L	<0.0030 (1)	N/A	N/A	N/A	0.0030	B376822

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Sample filtered and preserved past method specified hold time

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNR331		CNR331			
Sampling Date		2024/05/16 14:24		2024/05/16 14:24			
COC Number		1/1		1/1			
	UNITS	MW16-22-26	MU	MW16-22-26 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Inorganics							
Dissolved Organic Carbon (C)	mg/L	1.2 (1)	+/- <RDL	N/A	N/A	0.50	B378347
Microbiological Param.							
E.Coli DST	MPN/100mL	<2.0 (2)	N/A	N/A	N/A	2.0	B372875
Fecal Coliforms	MPN/100mL	<2.0 (2)	N/A	N/A	N/A	2.0	B373420
Heterotrophic DST	MPN/100mL	>4800 (2)	N/A	N/A	N/A	2.0	B373437
Total Coliforms DST	MPN/100mL	4.0 (2)	N/A	N/A	N/A	2.0	B372875
Nutrients							
Total Ammonia (N)	mg/L	0.57	+/- 0.063	N/A	N/A	0.015	B374577
Orthophosphate (P)	mg/L	0.0050	+/- 0.0035	N/A	N/A	0.0030	B379503
Lab Filtered Nutrients							
Dissolved Phosphorus (P)	mg/L	<0.0030 (3)	N/A	<0.0030	N/A	0.0030	B380560

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Sample filtered and preserved past method specified hold time
(2) Detection limit raised due to matrix interference.
(3) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent. Sample filtered and preserved past method specified hold time

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MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID		CNR324				CNR325			
Sampling Date		2024/05/16 08:25				2024/05/16 08:18			
COC Number		1/1				1/1			
	UNITS	MW21-6-7	MU	RDL	QC Batch	MW21-6-12	MU	RDL	QC Batch
Elements									
Total Mercury (Hg)	ug/L	0.75 (1)	+/- <RDL	0.19	B380678	0.0020	+/- <RDL	0.0019	B372318
Lab Filtered Elements									
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	B375657	<0.0019	N/A	0.0019	B375657

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CNR326			CNR327			CNR328			
Sampling Date		2024/05/16 10:58			2024/05/16 12:16			2024/05/16 12:12			
COC Number		1/1			1/1			1/1			
	UNITS	MW21-3-15	MU	QC Batch	RMW16-18-5	MU	RDL	RMW16-18-13	MU	RDL	QC Batch
Elements											
Total Mercury (Hg)	ug/L	0.216 (1)	+/- 0.037	B372318	0.558 (1)	+/- 0.095	0.019	0.0288	+/- 0.0052	0.0019	B372318
Lab Filtered Elements											
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	B375663	<0.0019	N/A	0.0019	<0.0019	N/A	0.0019	B375657

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CNR329				CNR330			
Sampling Date		2024/05/16 13:09				2024/05/16 13:16			
COC Number		1/1				1/1			
	UNITS	RMW16-19-10	MU	RDL	QC Batch	RMW16-19-19	MU	RDL	QC Batch
Elements									
Total Mercury (Hg)	ug/L	0.398 (1)	+/- 0.068	0.019	B372318	<0.0019	N/A	0.0019	B372318
Lab Filtered Elements									
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	B375663	<0.0019	N/A	0.0019	B375657

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

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MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID		CNR331			
Sampling Date		2024/05/16 14:24			
COC Number		1/1			
	UNITS	MW16-22-26	MU	RDL	QC Batch
Elements					
Total Mercury (Hg)	ug/L	0.054 (1)	+/- <RDL	0.019	B372318
Lab Filtered Elements					
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	B375663

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	8.2°C
Package 2	6.8°C
Package 3	6.4°C

Sample CNR324 [MW21-6-7] : Sample was analyzed past method specified hold time for NO2 (N); NO2 (N) + NO3 (N) in Water. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Sample was analyzed past method specified hold time for Orthophosphate by Automated Analyzer.

Sample CNR325 [MW21-6-12] : NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes. Sample was analyzed past method specified hold time for Orthophosphate by Automated Analyzer. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample CNR326 [MW21-3-15] : NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes. Sample was analyzed past method specified hold time for Orthophosphate by Automated Analyzer. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample CNR327 [RMW16-18-5] : NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes. Sample was analyzed past method specified hold time for Orthophosphate by Automated Analyzer. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample CNR328 [RMW16-18-13] : NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes. Sample was analyzed past method specified hold time for Orthophosphate by Automated Analyzer. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample CNR329 [RMW16-19-10] : NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes. Sample was analyzed past method specified hold time for Orthophosphate by Automated Analyzer. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample CNR330 [RMW16-19-19] : NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes. Sample was analyzed past method specified hold time for Orthophosphate by Automated Analyzer. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample CNR331 [MW16-22-26] : Sample was analyzed past method specified hold time for NO2 (N); NO2 (N) + NO3 (N) in Water. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Sample was analyzed past method specified hold time for Orthophosphate by Automated Analyzer.

ROUTINE + DISS. REG. METALS – LAB FILT (WATER) Comments

Sample CNR324 [MW21-6-7] NO2 (N); NO2 (N) + NO3 (N) in Water: Sample was originally processed within hold time. Data quality required investigation. Re-analysis was completed past recommended hold time.
Sample CNR326 [MW21-3-15] Elements by ICPMS-Dissolved-Lab Filtered: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
Sample CNR326 [MW21-3-15] Elements by ICP-Dissolved-Lab Filtered: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
Sample CNR331 [MW16-22-26] NO2 (N); NO2 (N) + NO3 (N) in Water: Sample was originally processed within hold time. Data quality required investigation. Re-analysis was completed past recommended hold time.

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B372318	MPK	Matrix Spike	Total Mercury (Hg)	2024/05/21		96	%	80 - 120
B372318	MPK	Spiked Blank	Total Mercury (Hg)	2024/05/21		97	%	80 - 120
B372318	MPK	Method Blank	Total Mercury (Hg)	2024/05/21	<0.0019		ug/L	
B372318	MPK	RPD	Total Mercury (Hg)	2024/05/21	NC		%	20
B372608	DO1	Matrix Spike	1,4-Difluorobenzene (sur.)	2024/05/22		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/22		104	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/22		98	%	50 - 140
			Benzene	2024/05/22		82	%	50 - 140
			Toluene	2024/05/22		81	%	50 - 140
			Ethylbenzene	2024/05/22		87	%	50 - 140
			m & p-Xylene	2024/05/22		86	%	50 - 140
			o-Xylene	2024/05/22		87	%	50 - 140
			F1 (C6-C10)	2024/05/22		67	%	60 - 140
B372608	DO1	Spiked Blank	1,4-Difluorobenzene (sur.)	2024/05/22		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/22		106	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/22		94	%	50 - 140
			Benzene	2024/05/22		81	%	60 - 130
			Toluene	2024/05/22		82	%	60 - 130
			Ethylbenzene	2024/05/22		88	%	60 - 130
			m & p-Xylene	2024/05/22		88	%	60 - 130
			o-Xylene	2024/05/22		88	%	60 - 130
			F1 (C6-C10)	2024/05/22		93	%	60 - 140
B372608	DO1	Method Blank	1,4-Difluorobenzene (sur.)	2024/05/22		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/22		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/22		95	%	50 - 140
			Benzene	2024/05/22	<0.00040		mg/L	
			Toluene	2024/05/22	<0.00040		mg/L	
			Ethylbenzene	2024/05/22	<0.00040		mg/L	
			m & p-Xylene	2024/05/22	<0.00080		mg/L	
			o-Xylene	2024/05/22	<0.00040		mg/L	
			F1 (C6-C10)	2024/05/22	<0.10		mg/L	
B372608	DO1	RPD	Benzene	2024/05/22	NC		%	30
			Toluene	2024/05/22	NC		%	30
			Ethylbenzene	2024/05/22	NC		%	30
			m & p-Xylene	2024/05/22	NC		%	30
			o-Xylene	2024/05/22	NC		%	30
			F1 (C6-C10)	2024/05/22	NC		%	30
B372875	SOG	Method Blank	E.Coli DST	2024/05/18	<1.0		mpn/100mL	
			Total Coliforms DST	2024/05/18	<1.0		mpn/100mL	
B372875	SOG	RPD	E.Coli DST	2024/05/18	NC		%	N/A
			Total Coliforms DST	2024/05/18	NC		%	N/A
B373420	SOG	Method Blank	Fecal Coliforms	2024/05/18	<1.0		MPN/100mL	
B373420	SOG	RPD [CNR328-05]	Fecal Coliforms	2024/05/18	NC		%	N/A
B373437	YYL	Method Blank	Heterotrophic DST	2024/05/19	<1.0		mpn/100mL	
B373437	YYL	RPD [CNR325-06]	Heterotrophic DST	2024/05/19	NC		%	N/A
B373441	BQU	Spiked Blank	O-TERPHENYL (sur.)	2024/05/21		94	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/21		91	%	60 - 140
B373441	BQU	Method Blank	O-TERPHENYL (sur.)	2024/05/21		97	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/21	<0.10		mg/L	
B374577	AFI	Matrix Spike [CNR330-09]	Total Ammonia (N)	2024/05/21		NC	%	80 - 120
B374577	AFI	Spiked Blank	Total Ammonia (N)	2024/05/21		105	%	80 - 120
B374577	AFI	Method Blank	Total Ammonia (N)	2024/05/21	<0.015		mg/L	
B374577	AFI	RPD [CNR330-09]	Total Ammonia (N)	2024/05/21	2.3		%	20
B375214	AFI	Matrix Spike	Nitrite (N)	2024/05/21		98	%	80 - 120

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			Nitrate plus Nitrite (N)	2024/05/21		NC	%	80 - 120
B375214	AFI	Spiked Blank	Nitrite (N)	2024/05/21		101	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/21		97	%	80 - 120
B375214	AFI	Method Blank	Nitrite (N)	2024/05/21	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/21	<0.010		mg/L	
B375214	AFI	RPD	Nitrite (N)	2024/05/21	0.14		%	20
			Nitrate plus Nitrite (N)	2024/05/21	4.7		%	20
B375216	AFI	Matrix Spike	Nitrite (N)	2024/05/21		108	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/21		131 (1)	%	80 - 120
B375216	AFI	Spiked Blank	Nitrite (N)	2024/05/21		102	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/21		99	%	80 - 120
B375216	AFI	Method Blank	Nitrite (N)	2024/05/21	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/21	<0.010		mg/L	
B375216	AFI	RPD	Nitrite (N)	2024/05/21	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/21	NC		%	20
B375217	AFI	Matrix Spike	Nitrite (N)	2024/05/21		103	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/21		113	%	80 - 120
B375217	AFI	Spiked Blank	Nitrite (N)	2024/05/21		101	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/21		102	%	80 - 120
B375217	AFI	Method Blank	Nitrite (N)	2024/05/21	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/21	<0.010		mg/L	
B375217	AFI	RPD	Nitrite (N)	2024/05/21	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/21	7.8		%	20
B375218	AFI	Matrix Spike	Nitrite (N)	2024/05/21		107	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/21		135 (1)	%	80 - 120
B375218	AFI	Spiked Blank	Nitrite (N)	2024/05/21		101	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/21		104	%	80 - 120
B375218	AFI	Method Blank	Nitrite (N)	2024/05/21	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/21	<0.010		mg/L	
B375218	AFI	RPD	Nitrite (N)	2024/05/21	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/21	4.1		%	20
B375220	AFI	Matrix Spike	Nitrite (N)	2024/05/21		104	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/21		130 (1)	%	80 - 120
B375220	AFI	Spiked Blank	Nitrite (N)	2024/05/21		100	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/21		103	%	80 - 120
B375220	AFI	Method Blank	Nitrite (N)	2024/05/21	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/21	<0.010		mg/L	
B375220	AFI	RPD	Nitrite (N)	2024/05/21	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/21	NC		%	20
B375614	HQV	Matrix Spike	Dissolved Barium (Ba)	2024/05/22		80	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/22		NC	%	80 - 120
			Dissolved Iron (Fe)	2024/05/22		69 (1)	%	80 - 120
			Dissolved Lithium (Li)	2024/05/22		96	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/22		NC	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/22		91	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/22		90	%	80 - 120
			Dissolved Potassium (K)	2024/05/22		101	%	80 - 120
			Dissolved Sodium (Na)	2024/05/22		NC	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/22		NC	%	80 - 120
			Dissolved Sulphur (S)	2024/05/22		NC	%	80 - 120
B375614	HQV	Spiked Blank	Dissolved Barium (Ba)	2024/05/22		94	%	80 - 120
			Dissolved Boron (B)	2024/05/22		100	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/22		97	%	80 - 120
			Dissolved Iron (Fe)	2024/05/22		103	%	80 - 120

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			Dissolved Lithium (Li)	2024/05/22		94	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/22		97	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/22		103	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/22		96	%	80 - 120
			Dissolved Potassium (K)	2024/05/22		99	%	80 - 120
			Dissolved Silicon (Si)	2024/05/22		97	%	80 - 120
			Dissolved Sodium (Na)	2024/05/22		98	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/22		92	%	80 - 120
			Dissolved Sulphur (S)	2024/05/22		97	%	80 - 120
B375614	HQV	Method Blank	Dissolved Barium (Ba)	2024/05/22	<0.010		mg/L	
			Dissolved Boron (B)	2024/05/22	<0.020		mg/L	
			Dissolved Calcium (Ca)	2024/05/22	<0.30		mg/L	
			Dissolved Iron (Fe)	2024/05/22	<0.060		mg/L	
			Dissolved Lithium (Li)	2024/05/22	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2024/05/22	<0.20		mg/L	
			Dissolved Manganese (Mn)	2024/05/22	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2024/05/22	<0.10		mg/L	
			Dissolved Potassium (K)	2024/05/22	<0.30		mg/L	
			Dissolved Silicon (Si)	2024/05/22	<0.50		mg/L	
			Dissolved Sodium (Na)	2024/05/22	<0.50		mg/L	
			Dissolved Strontium (Sr)	2024/05/22	<0.020		mg/L	
			Dissolved Sulphur (S)	2024/05/22	<0.20		mg/L	
B375614	HQV	RPD	Dissolved Calcium (Ca)	2024/05/23	1.0		%	20
			Dissolved Iron (Fe)	2024/05/23	NC		%	20
			Dissolved Magnesium (Mg)	2024/05/23	1.7		%	20
			Dissolved Manganese (Mn)	2024/05/23	NC		%	20
			Dissolved Potassium (K)	2024/05/23	2.1		%	20
			Dissolved Sodium (Na)	2024/05/23	1.8		%	20
B375657	KHU	Matrix Spike	Dissolved Mercury (Hg)	2024/05/22		94	%	80 - 120
B375657	KHU	Spiked Blank	Dissolved Mercury (Hg)	2024/05/22		98	%	80 - 120
B375657	KHU	Method Blank	Dissolved Mercury (Hg)	2024/05/22	<0.0019		ug/L	
B375657	KHU	RPD	Dissolved Mercury (Hg)	2024/05/22	NC		%	20
B375663	KHU	Matrix Spike	Dissolved Mercury (Hg)	2024/05/22		96	%	80 - 120
B375663	KHU	Spiked Blank	Dissolved Mercury (Hg)	2024/05/22		98	%	80 - 120
B375663	KHU	Method Blank	Dissolved Mercury (Hg)	2024/05/22	<0.0019		ug/L	
B375663	KHU	RPD	Dissolved Mercury (Hg)	2024/05/22	NC		%	20
B375737	KKC	Matrix Spike	Dissolved Aluminum (Al)	2024/05/23		123 (1)	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/23		116	%	80 - 120
			Dissolved Arsenic (As)	2024/05/23		119	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/23		119	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/23		102	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/23		102	%	80 - 120
			Dissolved Copper (Cu)	2024/05/23		99	%	80 - 120
			Dissolved Lead (Pb)	2024/05/23		119	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/23		86	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/23		115	%	80 - 120
			Dissolved Selenium (Se)	2024/05/23		116	%	80 - 120
			Dissolved Silver (Ag)	2024/05/23		120	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/23		119	%	80 - 120
			Dissolved Tin (Sn)	2024/05/23		118	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/23		120	%	80 - 120
			Dissolved Uranium (U)	2024/05/23		111	%	80 - 120
			Dissolved Vanadium (V)	2024/05/23		105	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/23		NC	%	80 - 120

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B375737	KKC	Spiked Blank	Dissolved Aluminum (Al)	2024/05/23		109	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/23		96	%	80 - 120
			Dissolved Arsenic (As)	2024/05/23		96	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/23		100	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/23		97	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/23		98	%	80 - 120
			Dissolved Copper (Cu)	2024/05/23		99	%	80 - 120
			Dissolved Lead (Pb)	2024/05/23		97	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/23		101	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/23		99	%	80 - 120
			Dissolved Selenium (Se)	2024/05/23		95	%	80 - 120
			Dissolved Silver (Ag)	2024/05/23		96	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/23		96	%	80 - 120
			Dissolved Tin (Sn)	2024/05/23		93	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/23		99	%	80 - 120
			Dissolved Uranium (U)	2024/05/23		94	%	80 - 120
			Dissolved Vanadium (V)	2024/05/23		98	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/23		97	%	80 - 120
B375737	KKC	Method Blank	Dissolved Aluminum (Al)	2024/05/23	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2024/05/23	<0.00060		mg/L	
			Dissolved Arsenic (As)	2024/05/23	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2024/05/23	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2024/05/23	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2024/05/23	<0.00030		mg/L	
			Dissolved Copper (Cu)	2024/05/23	<0.0010		mg/L	
			Dissolved Lead (Pb)	2024/05/23	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2024/05/23	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2024/05/23	<0.00050		mg/L	
			Dissolved Selenium (Se)	2024/05/23	<0.00020		mg/L	
			Dissolved Silver (Ag)	2024/05/23	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2024/05/23	<0.00020		mg/L	
			Dissolved Tin (Sn)	2024/05/23	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2024/05/23	<0.0010		mg/L	
			Dissolved Uranium (U)	2024/05/23	<0.00010		mg/L	
			Dissolved Vanadium (V)	2024/05/23	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2024/05/23	<0.0030		mg/L	
B375737	KKC	RPD	Dissolved Aluminum (Al)	2024/05/23	9.1		%	20
			Dissolved Arsenic (As)	2024/05/23	14		%	20
			Dissolved Chromium (Cr)	2024/05/23	NC		%	20
			Dissolved Copper (Cu)	2024/05/23	1.8		%	20
			Dissolved Lead (Pb)	2024/05/23	NC		%	20
			Dissolved Nickel (Ni)	2024/05/23	3.9		%	20
B375762	TOR	Matrix Spike [CNR327-01]	Chloride (Cl)	2024/05/22		NC	%	80 - 120
			Sulphate (SO4)	2024/05/22		NC	%	80 - 120
B375762	TOR	Spiked Blank	Chloride (Cl)	2024/05/22		105	%	80 - 120
			Sulphate (SO4)	2024/05/22		101	%	80 - 120
B375762	TOR	Method Blank	Chloride (Cl)	2024/05/22	<1.0		mg/L	
			Sulphate (SO4)	2024/05/22	<1.0		mg/L	
B375762	TOR	RPD [CNR327-01]	Chloride (Cl)	2024/05/22	0.071		%	20
			Sulphate (SO4)	2024/05/22	2.5		%	20
B375802	TOR	Matrix Spike	Chloride (Cl)	2024/05/22		105	%	80 - 120
			Sulphate (SO4)	2024/05/22		120	%	80 - 120
B375802	TOR	Spiked Blank	Chloride (Cl)	2024/05/22		98	%	80 - 120
			Sulphate (SO4)	2024/05/22		104	%	80 - 120

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B375802	TOR	Method Blank	Chloride (Cl)	2024/05/22	<1.0		mg/L	
			Sulphate (SO4)	2024/05/22	<1.0		mg/L	
B375802	TOR	RPD	Chloride (Cl)	2024/05/22	2.5		%	20
			Sulphate (SO4)	2024/05/22	4.9		%	20
B375893	A5S	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/24		98	%	80 - 120
B375893	A5S	Method Blank	Alkalinity (PP as CaCO3)	2024/05/24	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/24	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/24	<1.0		mg/L	
			Carbonate (CO3)	2024/05/24	<1.0		mg/L	
			Hydroxide (OH)	2024/05/24	<1.0		mg/L	
B375893	A5S	RPD	Alkalinity (PP as CaCO3)	2024/05/24	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/24	0.52		%	20
			Bicarbonate (HCO3)	2024/05/24	0.52		%	20
			Carbonate (CO3)	2024/05/24	NC		%	20
			Hydroxide (OH)	2024/05/24	NC		%	20
B375899	A5S	Spiked Blank	pH	2024/05/24		100	%	97 - 103
B375899	A5S	RPD	pH	2024/05/24	0.14		%	N/A
B375900	A5S	Spiked Blank	Conductivity	2024/05/24		101	%	90 - 110
B375900	A5S	Method Blank	Conductivity	2024/05/24	<2.0		uS/cm	
B375900	A5S	RPD	Conductivity	2024/05/24	0.42		%	10
B375905	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/22		100	%	80 - 120
B375905	JVM	Method Blank	Alkalinity (PP as CaCO3)	2024/05/22	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/22	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/22	<1.0		mg/L	
			Carbonate (CO3)	2024/05/22	<1.0		mg/L	
			Hydroxide (OH)	2024/05/22	<1.0		mg/L	
B375905	JVM	RPD	Alkalinity (PP as CaCO3)	2024/05/23	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/23	2.6		%	20
			Bicarbonate (HCO3)	2024/05/23	2.6		%	20
			Carbonate (CO3)	2024/05/23	NC		%	20
			Hydroxide (OH)	2024/05/23	NC		%	20
B375907	JVM	Spiked Blank	pH	2024/05/22		100	%	97 - 103
B375907	JVM	RPD	pH	2024/05/23	0.42		%	N/A
B375909	JVM	Spiked Blank	Conductivity	2024/05/22		100	%	90 - 110
B375909	JVM	Method Blank	Conductivity	2024/05/22	<2.0		uS/cm	
B375909	JVM	RPD	Conductivity	2024/05/22	0.48		%	10
B375918	YL7	Matrix Spike	Orthophosphate (P)	2024/05/22		104	%	80 - 120
B375918	YL7	Spiked Blank	Orthophosphate (P)	2024/05/22		93	%	80 - 120
B375918	YL7	Method Blank	Orthophosphate (P)	2024/05/22	<0.0030		mg/L	
B375918	YL7	RPD	Orthophosphate (P)	2024/05/22	NC		%	20
B375925	YL7	Matrix Spike	Orthophosphate (P)	2024/05/22		99	%	80 - 120
B375925	YL7	Spiked Blank	Orthophosphate (P)	2024/05/22		91	%	80 - 120
B375925	YL7	Method Blank	Orthophosphate (P)	2024/05/22	<0.0030		mg/L	
B375925	YL7	RPD	Orthophosphate (P)	2024/05/22	NC		%	20
B375986	TOR	Matrix Spike	Chloride (Cl)	2024/05/22		NC	%	80 - 120
			Sulphate (SO4)	2024/05/22		NC	%	80 - 120
B375986	TOR	Spiked Blank	Chloride (Cl)	2024/05/22		99	%	80 - 120
			Sulphate (SO4)	2024/05/22		101	%	80 - 120
B375986	TOR	Method Blank	Chloride (Cl)	2024/05/22	<1.0		mg/L	
			Sulphate (SO4)	2024/05/22	<1.0		mg/L	
B375986	TOR	RPD	Chloride (Cl)	2024/05/22	0.0027		%	20
			Sulphate (SO4)	2024/05/22	0.66		%	20
B376027	TOR	Matrix Spike	Chloride (Cl)	2024/05/22		102	%	80 - 120
			Sulphate (SO4)	2024/05/22		NC	%	80 - 120

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B376027	TOR	Spiked Blank	Chloride (Cl)	2024/05/22		98	%	80 - 120
			Sulphate (SO4)	2024/05/22		102	%	80 - 120
B376027	TOR	Method Blank	Chloride (Cl)	2024/05/22	<1.0		mg/L	
			Sulphate (SO4)	2024/05/22	<1.0		mg/L	
B376027	TOR	RPD	Chloride (Cl)	2024/05/22	9.6		%	20
			Sulphate (SO4)	2024/05/22	1.7		%	20
B376821	CTU	Matrix Spike	Dissolved Phosphorus (P)	2024/05/23		107	%	80 - 120
B376821	CTU	QC Standard	Dissolved Phosphorus (P)	2024/05/23		95	%	80 - 120
B376821	CTU	Spiked Blank	Dissolved Phosphorus (P)	2024/05/23		96	%	80 - 120
B376821	CTU	Method Blank	Dissolved Phosphorus (P)	2024/05/23	<0.0030		mg/L	
B376821	CTU	RPD [CNR328-01]	Dissolved Phosphorus (P)	2024/05/23	NC		%	20
B376822	CTU	Matrix Spike	Dissolved Phosphorus (P)	2024/05/23		101	%	80 - 120
B376822	CTU	QC Standard	Dissolved Phosphorus (P)	2024/05/23		90	%	80 - 120
B376822	CTU	Spiked Blank	Dissolved Phosphorus (P)	2024/05/23		94	%	80 - 120
B376822	CTU	Method Blank	Dissolved Phosphorus (P)	2024/05/23	<0.0030		mg/L	
B376822	CTU	RPD	Dissolved Phosphorus (P)	2024/05/23	1.4		%	20
B376911	CTU	Matrix Spike	Total Nitrogen (N)	2024/05/24		104	%	80 - 120
B376911	CTU	QC Standard	Total Nitrogen (N)	2024/05/23		106	%	N/A
B376911	CTU	Spiked Blank	Total Nitrogen (N)	2024/05/23		104	%	80 - 120
B376911	CTU	Method Blank	Total Nitrogen (N)	2024/05/23	<0.020		mg/L	
B376911	CTU	RPD	Total Nitrogen (N)	2024/05/24	6.3		%	20
B377068	CTU	Matrix Spike	Total Nitrogen (N)	2024/05/23		110	%	80 - 120
B377068	CTU	QC Standard	Total Nitrogen (N)	2024/05/23		108	%	80 - 120
B377068	CTU	Spiked Blank	Total Nitrogen (N)	2024/05/23		108	%	80 - 120
B377068	CTU	Method Blank	Total Nitrogen (N)	2024/05/23	<0.020		mg/L	
B377068	CTU	RPD	Total Nitrogen (N)	2024/05/23	2.6		%	20
B378347	MDO	Matrix Spike [CNR327-01]	Dissolved Organic Carbon (C)	2024/05/24		98	%	80 - 120
B378347	MDO	Spiked Blank	Dissolved Organic Carbon (C)	2024/05/24		99	%	80 - 120
B378347	MDO	Method Blank	Dissolved Organic Carbon (C)	2024/05/24	<0.50		mg/L	
B378347	MDO	RPD [CNR327-01]	Dissolved Organic Carbon (C)	2024/05/24	0.98		%	20
B379503	CTU	Matrix Spike [CNR326-01]	Orthophosphate (P)	2024/05/25		NC	%	80 - 120
B379503	CTU	Spiked Blank	Orthophosphate (P)	2024/05/25		92	%	80 - 120
B379503	CTU	Method Blank	Orthophosphate (P)	2024/05/25	<0.0030		mg/L	
B379503	CTU	RPD [CNR326-01]	Orthophosphate (P)	2024/05/25	2.9		%	20
B380560	MAP	Matrix Spike [CNR331-01]	Dissolved Phosphorus (P)	2024/05/27		98	%	80 - 120
B380560	MAP	QC Standard	Dissolved Phosphorus (P)	2024/05/27		92	%	80 - 120
B380560	MAP	Spiked Blank	Dissolved Phosphorus (P)	2024/05/27		96	%	80 - 120
B380560	MAP	Method Blank	Dissolved Phosphorus (P)	2024/05/27	<0.0030		mg/L	
B380560	MAP	RPD [CNR331-01]	Dissolved Phosphorus (P)	2024/05/27	NC		%	20
B380678	KHU	Matrix Spike	Total Mercury (Hg)	2024/05/27		113	%	80 - 120
B380678	KHU	Spiked Blank	Total Mercury (Hg)	2024/05/27		99	%	80 - 120
B380678	KHU	Method Blank	Total Mercury (Hg)	2024/05/27	<0.0019		ug/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B380678	KHU	RPD	Total Mercury (Hg)	2024/05/27	1.3		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

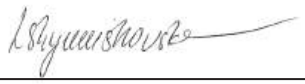
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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VALIDATION SIGNATURE PAGE

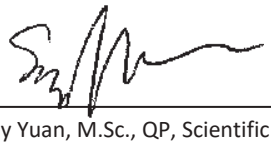
The analytical data and all QC contained in this report were reviewed and validated by:



Luba Shymushovska, B.Sc., QP, Senior Analyst, Organics



Rahul Suryawanshi, Senior Analyst



Sandy Yuan, M.Sc., QP, Scientific Specialist



Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Choose Location:
☒ Calgary, AB: 4000 19th St. NE, T2E 6P8 Toll Free (800) 386-7247
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☐ Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

www.BVNA.com

CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

16-May-24 16:12
Geraldlyn Gouthro
C435132

INS-0003

JJO

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Project Information	
Company:	Stantec	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	#300 10220 103 Ave NW	Street Address:		Project #:	110773396
City: Edmonton	Prov: AB Postal Code:	City:	Prov: Postal Code:	Site #:	
Phone:	780 969 2223	Phone:		Site Location:	
Email:	dylan.king@stantec.com	Email:		Site Location Province:	AB
Copies:		Copies:		Sampled By:	NT/TH

Regulatory Criteria

☐ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba
☐ Saskatchewan ☑ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)
☑ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply
☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

Comments

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F1-F2	7 BTEX F3-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 DOC	14 Sieve (Mineral) - TKN	15 Texture (% sand, silt, clay)	16 Basic class II landfill	17 Dissolved Phosphorus	18 Phosphate	19 Ammonia	Bacteriological *	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE
1	MW21-6-7	24	05	16	08	25	Water						X		X		X	X	X	X	X			X	X	X	X	11	
2	MW21-6-12	24	05	16	08	18	Water						X		X		X	X	X	X	X			X	X	X	X	11	
3	MW21-3-15	24	05	16	10	58	Water						X		X		X	X	X	X	X			X	X	X	X	11	
4	RMW116-18-5	24	05	16	12	16	Water						X		X		X	X	X	X	X			X	X	X	X	11	
5	RMW116-18-13	24	05	16	12	12	Water						X		X		X	X	X	X	X			X	X	X	X	11	
6	RMW116-19-10	24	05	16	13	09	Water						X		X		X	X	X	X	X			X	X	X	X	11	
7	RMW116-19-19	24	05	16	13	16	Water						X		X		X	X	X	X	X			X	X	X	X	11	
8	MW116-22-26	24	05	16	14	24	Water						X		X		X	X	X	X	X			X	X	X	X	11	
9																													
10																													
11																													
12																													

MCAL-2024-05-1180

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C			
Seal present		✓				
Seal intact		✓				
Cooling media present	✓		8.1 (1)	8.1 (2)	8.4 (3)	

LAB USE ONLY	Yes	No	°C			
Seal present		✓				
Seal intact		✓				
Cooling media present			6.9 (1)	6.8 (2)	6.8 (3)	

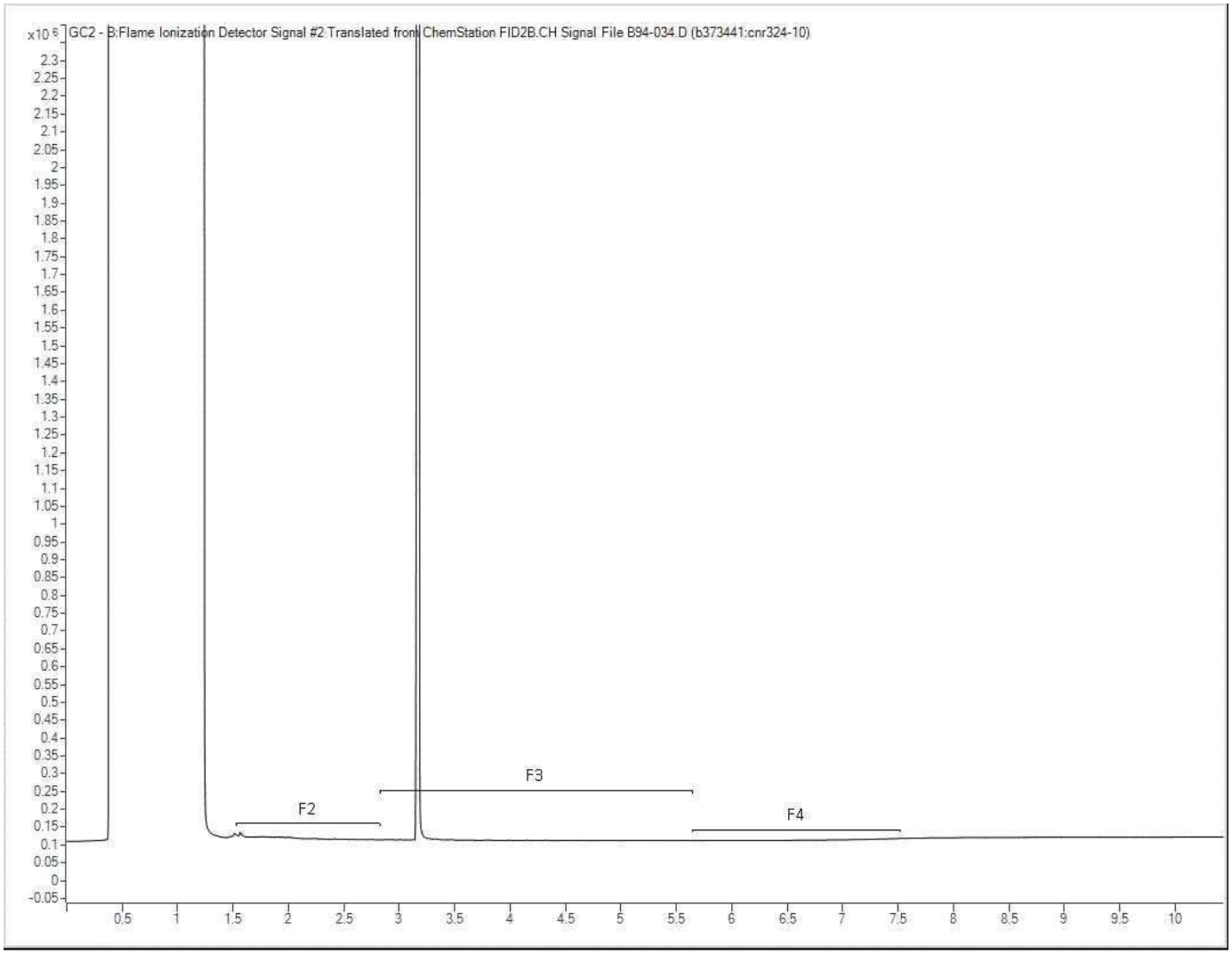
LAB USE ONLY	Yes	No	°C			
Seal present		✓				
Seal intact		✓				
Cooling media present	✓		5.6 (1)	6.8 (2)	6.8 (3)	

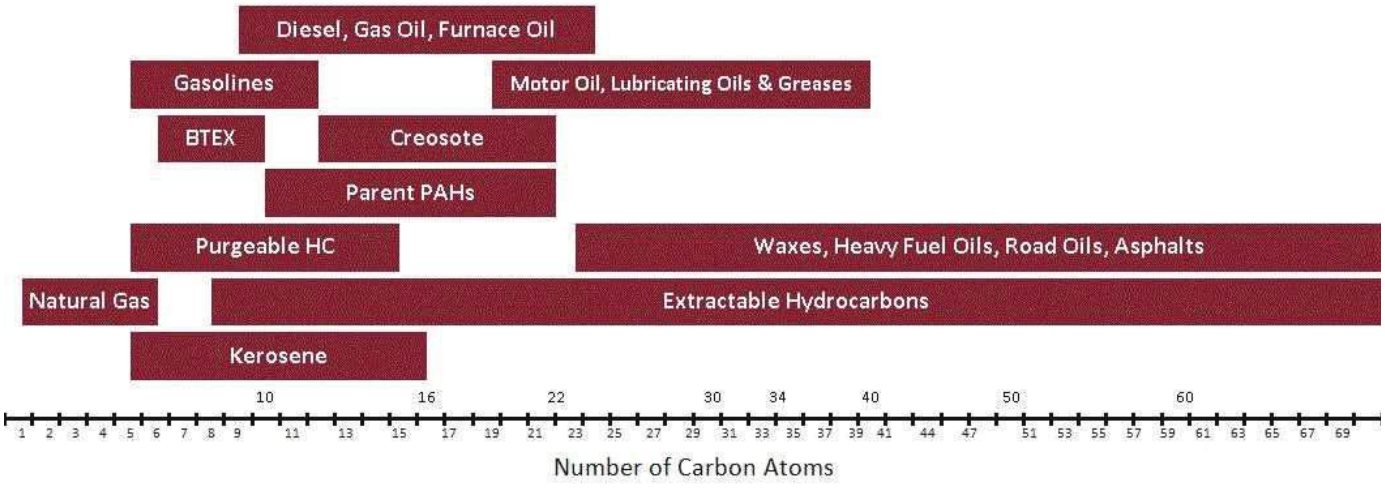
Temperature reading by:

Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special instructions
1 Wesley Tsen	24	05	16	16	10	1 ADRAUER Gill	2024	05	16	16	12	* Total coliforms, E.coli, fecal coliforms, heterotrophic plate count
2						2						

Dissolved parameters not field filtered - please lab filter

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

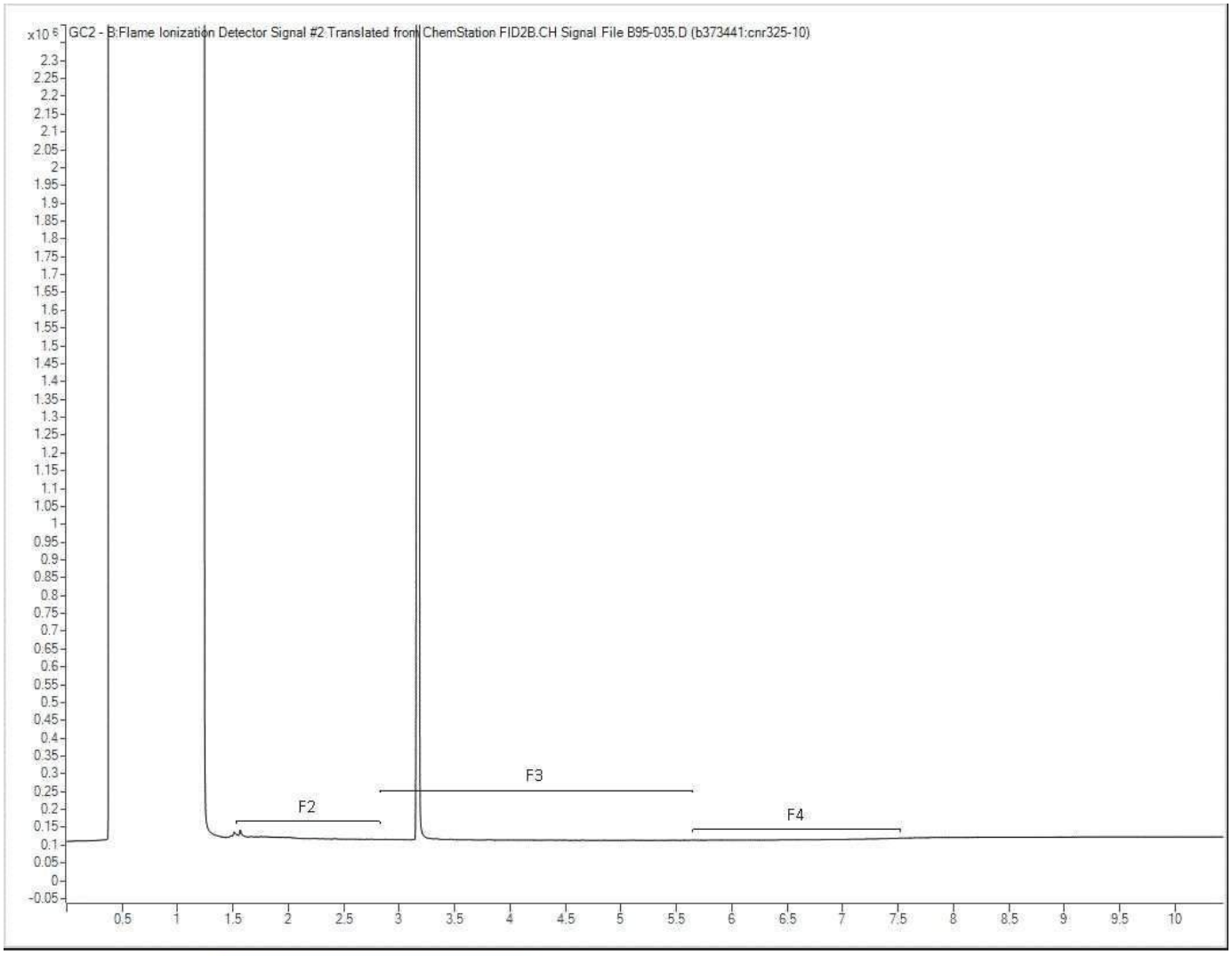


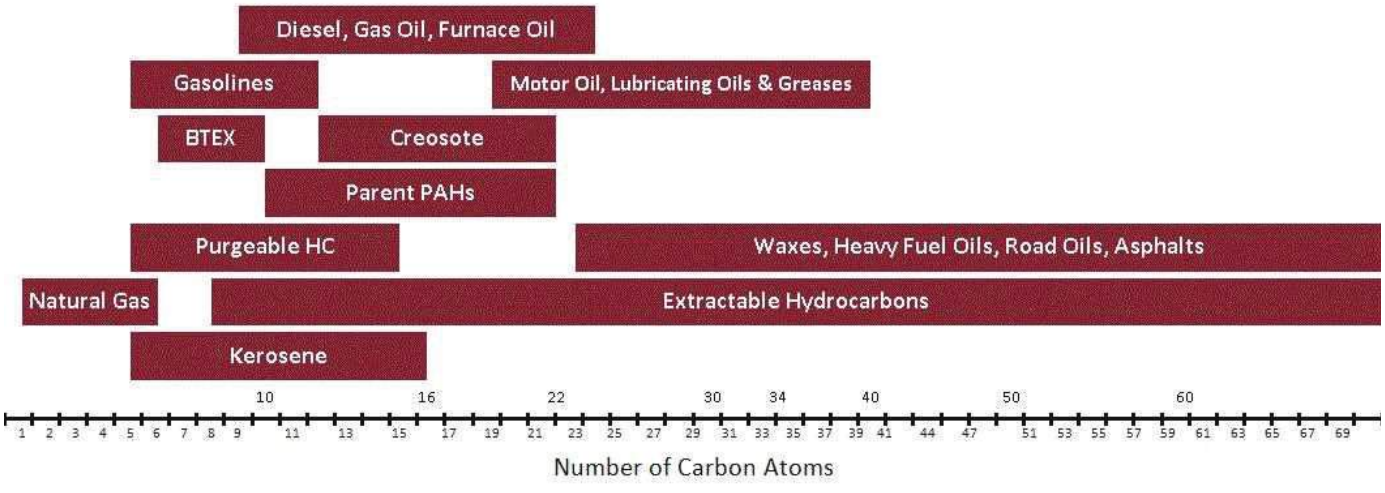


hpchem23\HPchem\1\DATA\2024\05\0521

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

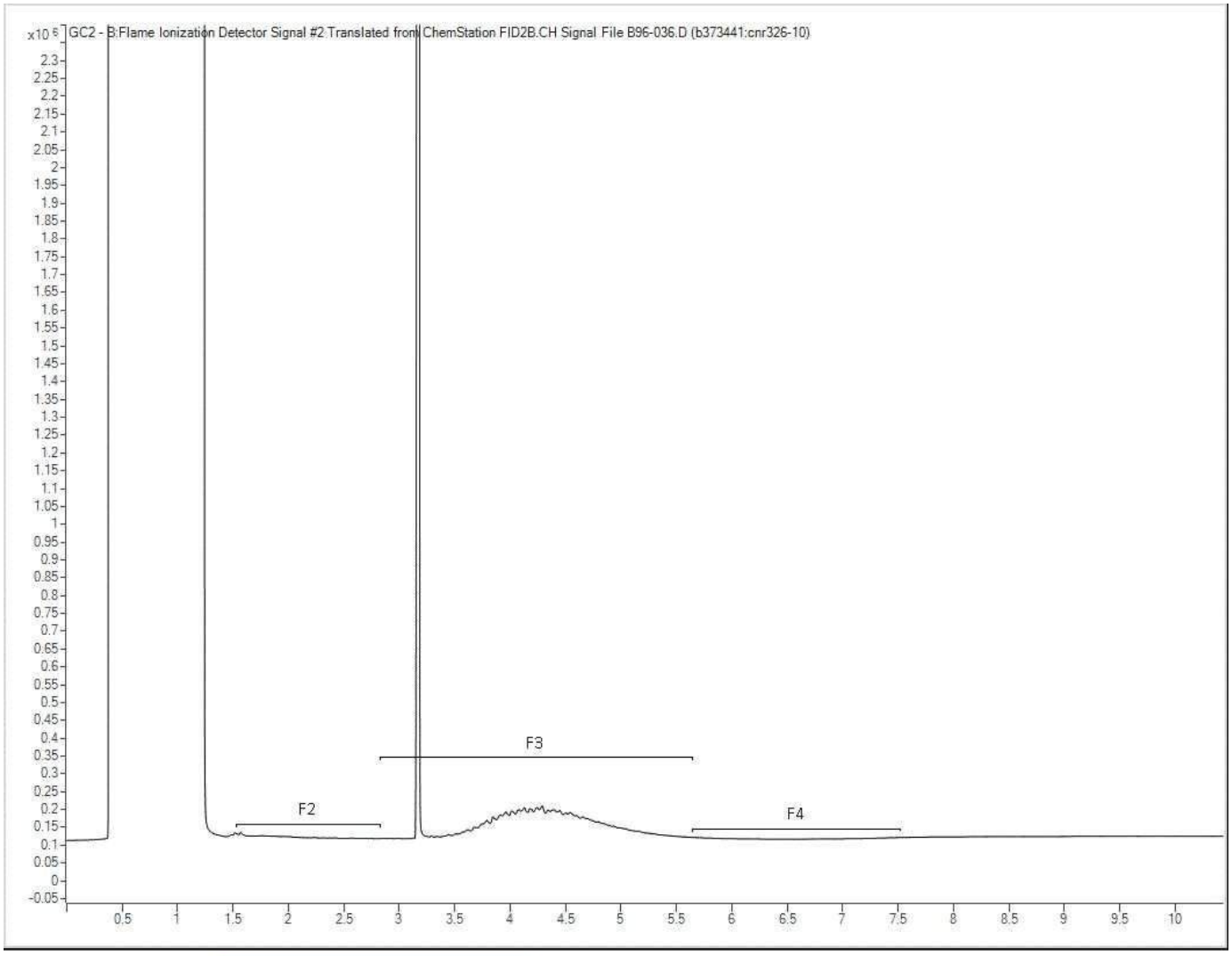


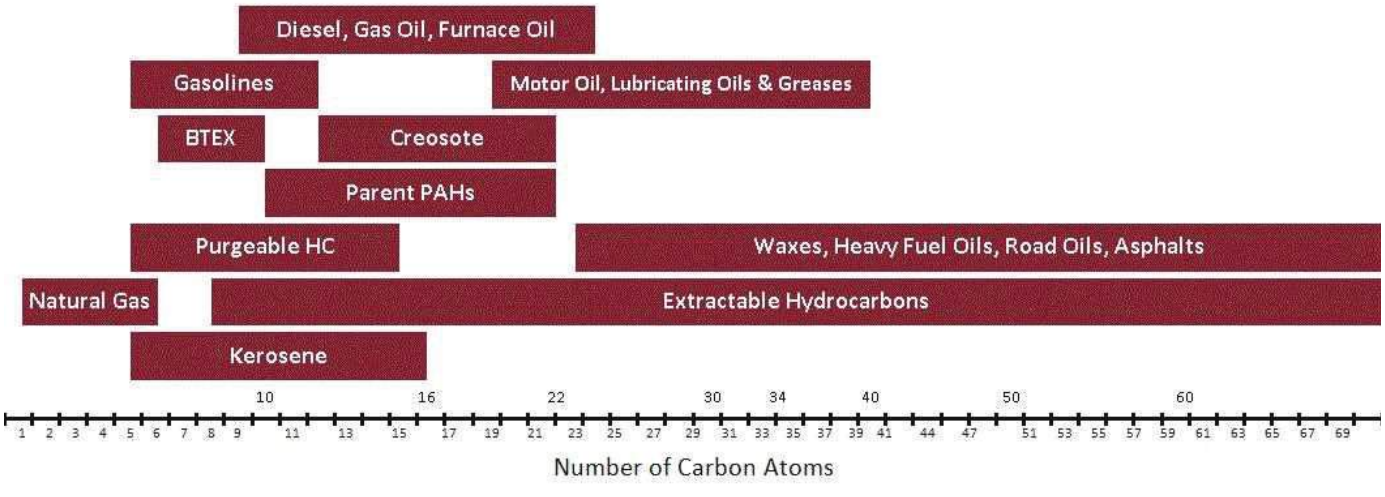


hpchem23\HPchem\1\DATA\2024\05\0521

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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





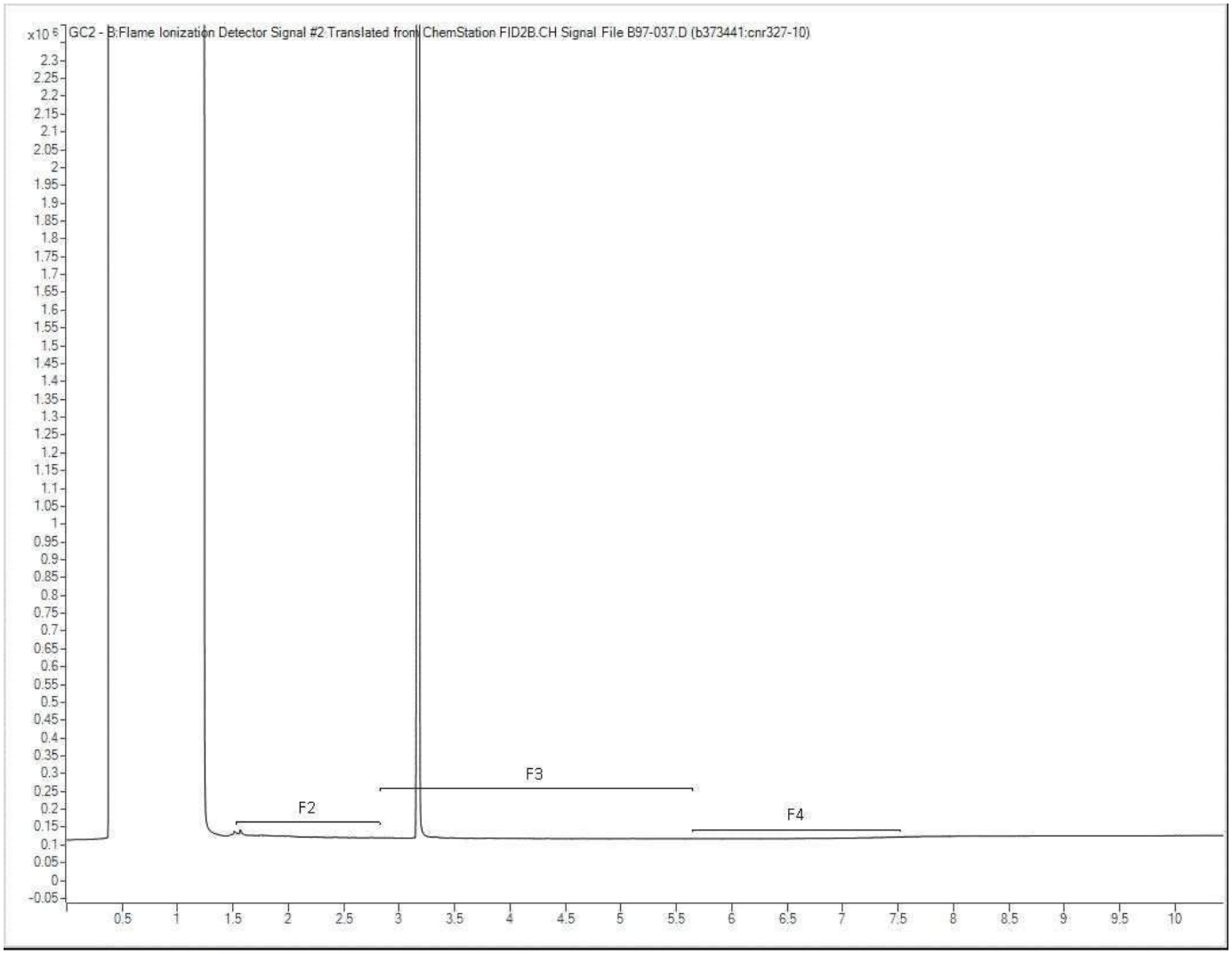
hpchem23\HPchem\1\DATA\2024\05\0521

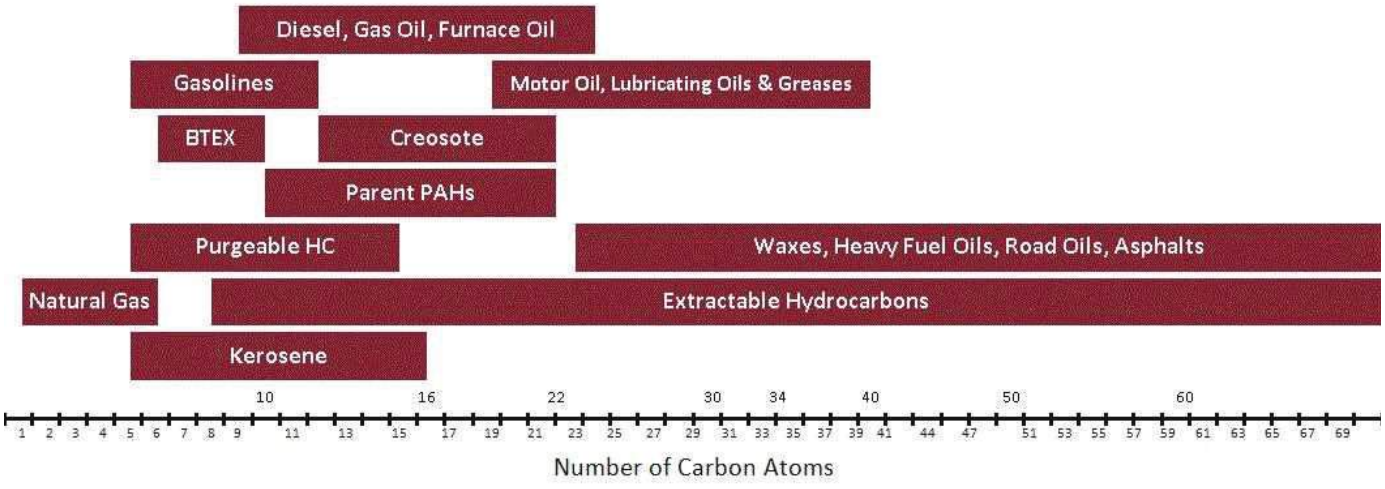
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C435132
Report Date: 2024/05/27
Bureau Veritas Sample: CNR327

STANTEC CONSULTING LTD
Client Project #: 110773396
Client ID: RMW16-18-5

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

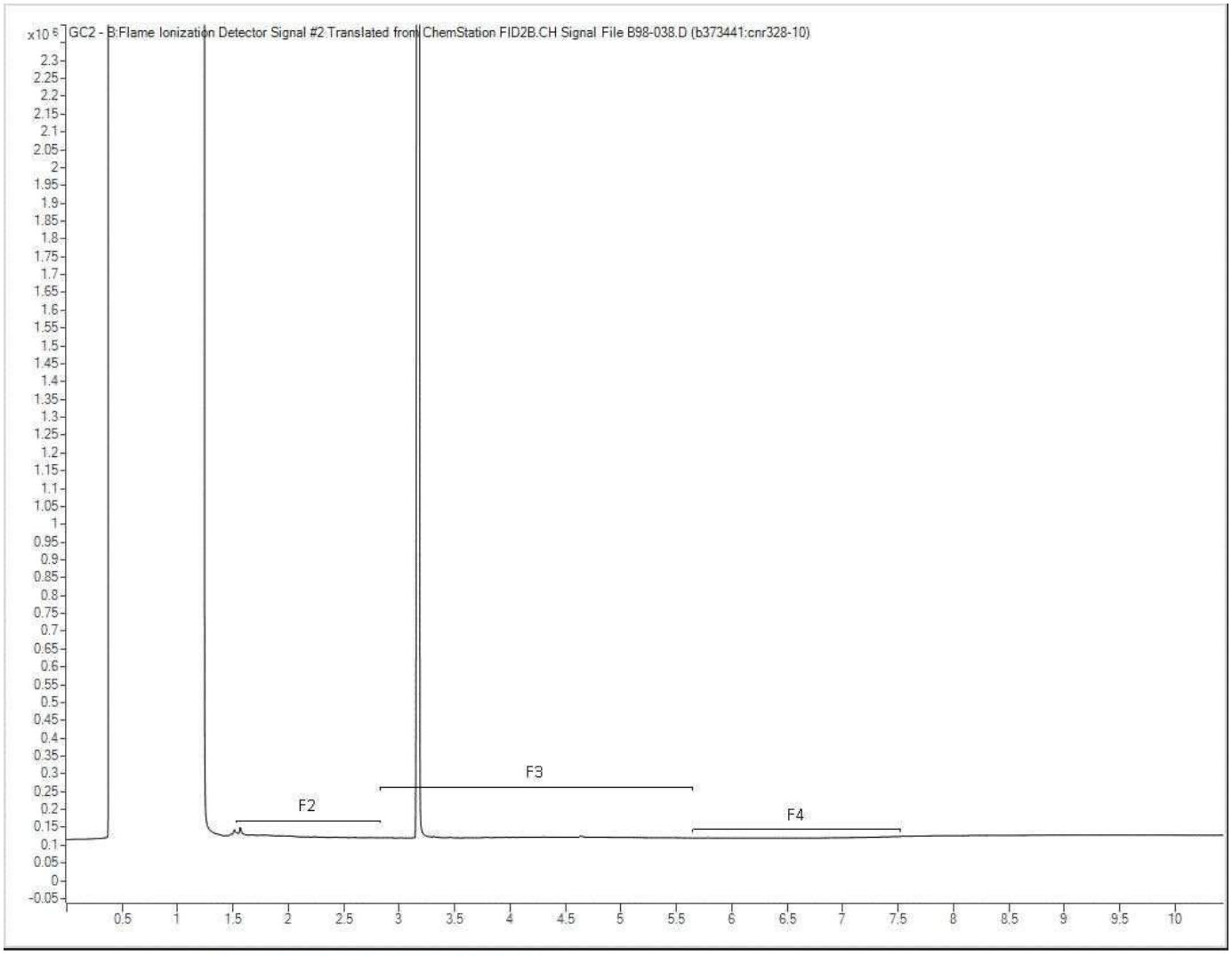


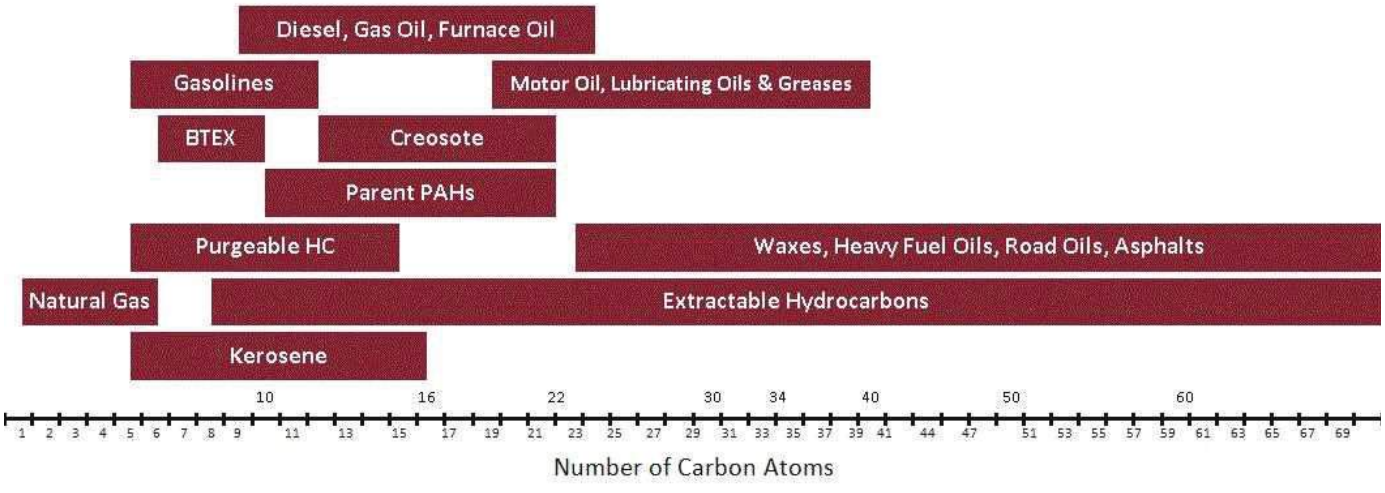


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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

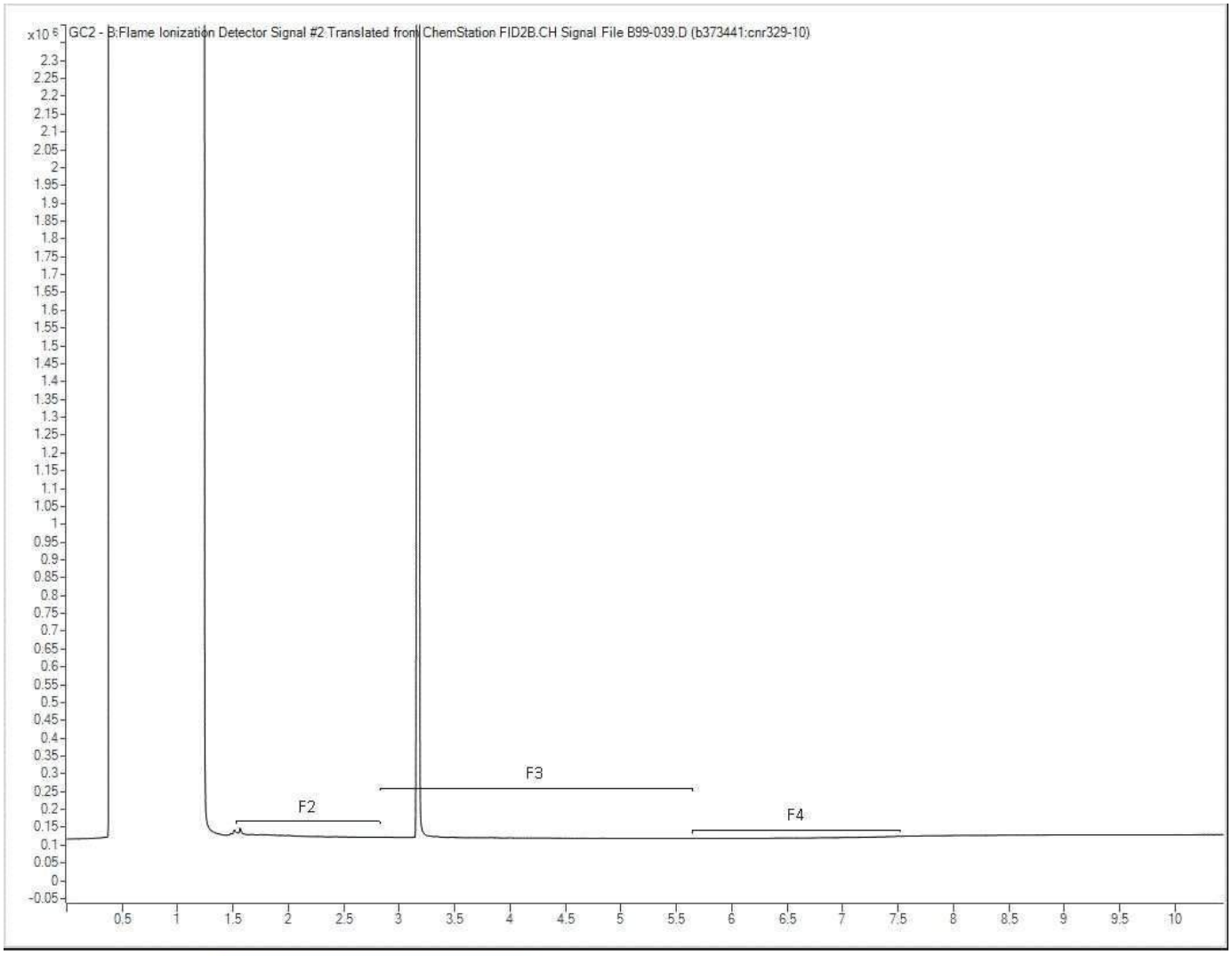


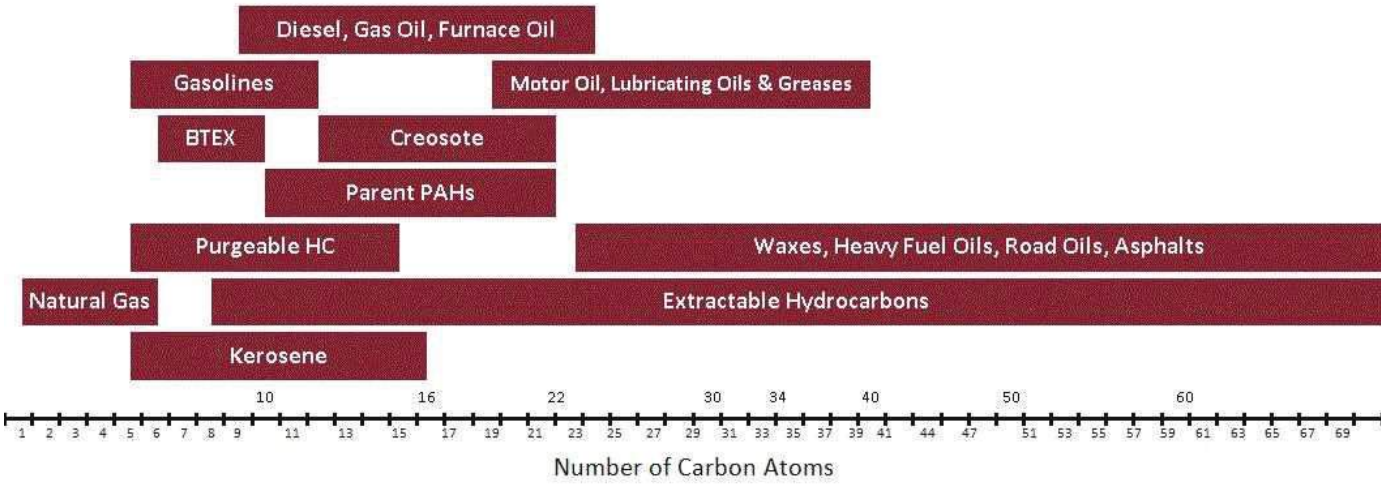


hpchem23\HPchem\1\DATA\2024\05\0521

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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

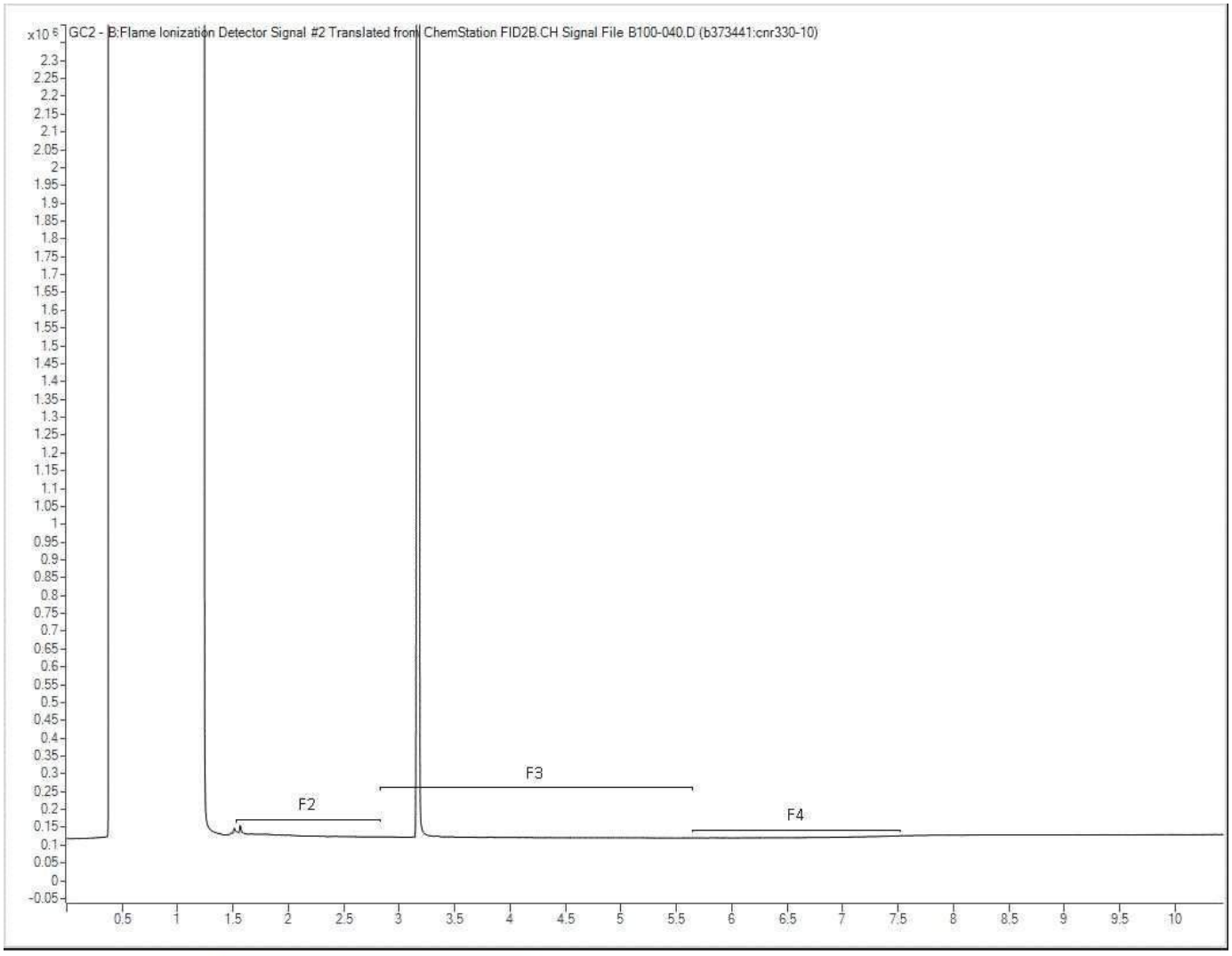


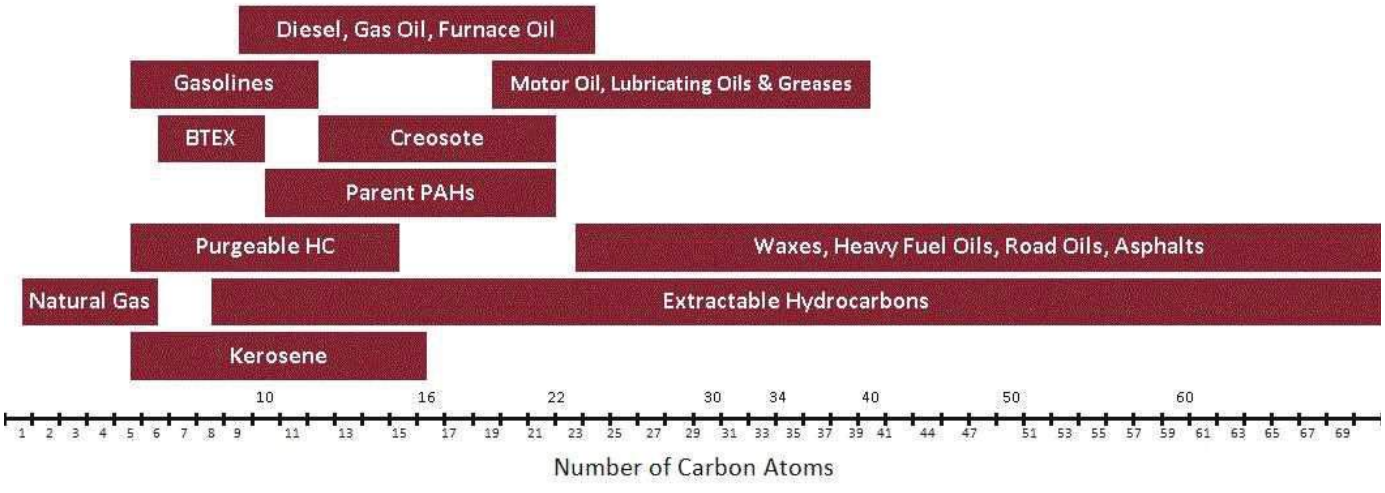


hpchem23\HPchem\1\DATA\2024\05\0521

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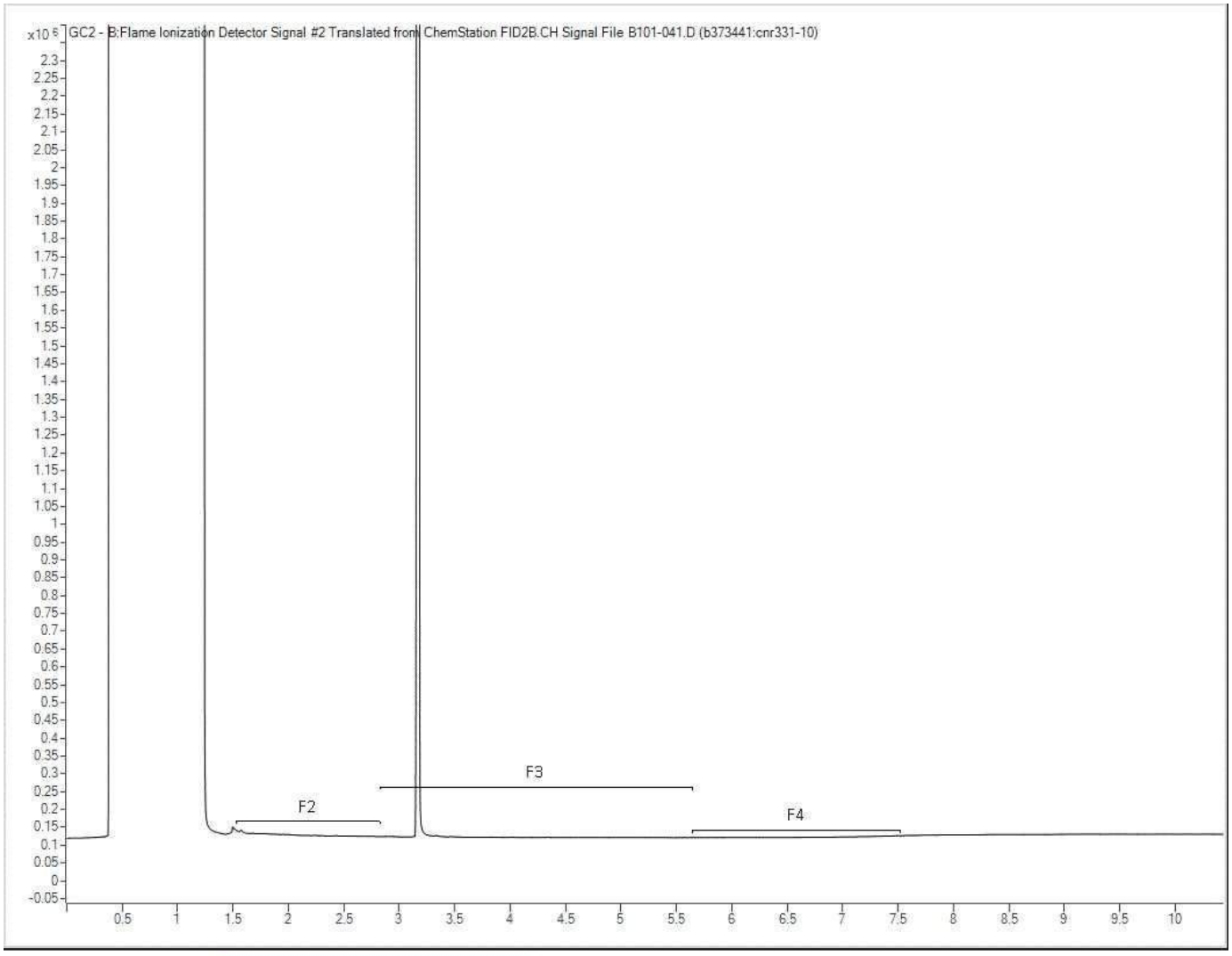


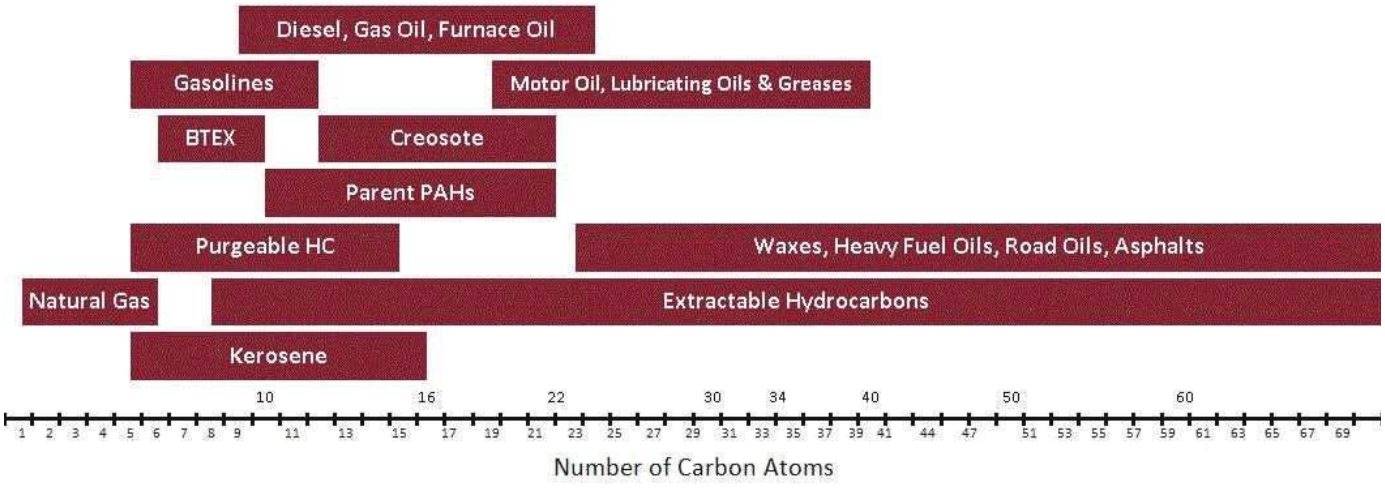


hpchem23\HPchem\1\DATA\2024\05\0521

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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





hpchem23\HPchem\1\DATA\2024\05\0521

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 110773396
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/28
Report #: R3505240
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C435151
Received: 2024/05/16, 16:12

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2024/05/24	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2024/05/22	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	1	N/A	2024/05/22		Auto Calc
Cadmium - low level CCME - Dissolved	1	N/A	2024/05/21		Auto Calc
Chloride/Sulphate by Auto Colourimetry	1	N/A	2024/05/19	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	1	2024/05/17	2024/05/18	AB SOP-00089	SM 24 9223 A,B m
Heterotrophic Plate Count Quant	1	2024/05/17	2024/05/19	CAL SOP-00012	SM 24 9215 A, E m
Total Coliforms and E.Coli	1	2024/05/17	2024/05/18	AB SOP-00089	SM 24 9223 A,B m
Carbon (DOC) -Lab Filtered (1)	1	N/A	2024/05/23	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	1	N/A	2024/05/24	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	1	2024/05/21	2024/05/21	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	1	N/A	2024/05/19		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	1	2024/05/22	2024/05/22	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	1	2024/05/22	2024/05/22	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (3)	1	N/A	2024/05/19	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	1	N/A	2024/05/21	AB SOP-00043	EPA 6020b R2 m
Ion Balance	1	N/A	2024/05/24		Auto Calc
Sum of cations, anions	1	N/A	2024/05/19		Auto Calc
Ammonia-N (Total)	1	N/A	2024/05/23	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	1	N/A	2024/05/19		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	1	N/A	2024/05/19	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	1	2024/05/17	2024/05/19		Auto Calc
pH @25°C (5)	1	N/A	2024/05/24	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (6)	1	N/A	2024/05/18	AB SOP-00025	SM 24 4500-P A,F m
Total Dissolved Solids (Calculated)	1	N/A	2024/05/24		Auto Calc
Total Kjeldahl Nitrogen (Total)	1	N/A	2024/05/23	BBY WI-00033	Auto Calc
Nitrogen (Total)	1	2024/05/24	2024/05/27	AB SOP-00093	SM 24 4500-N C m
Total Phosphorus-Dissolved-Lab Filtered (7)	1	2024/05/22	2024/05/22	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/28
Report #: R3505240
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C435151
Received: 2024/05/16, 16:12

Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(7) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

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Your Project #: 110773396
Your C.O.C. #: 1/1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/28
Report #: R3505240
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C435151
Received: 2024/05/16, 16:12

Encryption Key

Geraldlyn Gouthro
Key Account Specialist
28 May 2024 09:51:43

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (403) 291-3077

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

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AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID				CNR363			
Sampling Date				2024/05/16 09:34			
COC Number				1/1			
	UNITS	MAC	AO	SW35-R4-01	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	-	-	<0.10	N/A	0.10	B373444
Volatiles							
Benzene	mg/L	0.005	-	<0.00040	N/A	0.00040	B374012
Toluene	mg/L	0.06	0.024	<0.00040	N/A	0.00040	B374012
Ethylbenzene	mg/L	0.14	0.0016	<0.00040	N/A	0.00040	B374012
m & p-Xylene	mg/L	-	-	<0.00080	N/A	0.00080	B374012
o-Xylene	mg/L	-	-	<0.00040	N/A	0.00040	B374012
Xylenes (Total)	mg/L	0.09	0.02	<0.00089	N/A	0.00089	B372247
F1 (C6-C10) - BTEX	mg/L	-	-	<0.10	N/A	0.10	B372247
F1 (C6-C10)	mg/L	-	-	<0.10	N/A	0.10	B374012
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	-	-	104	N/A	N/A	B374012
4-Bromofluorobenzene (sur.)	%	-	-	101	N/A	N/A	B374012
D4-1,2-Dichloroethane (sur.)	%	-	-	93	N/A	N/A	B374012
O-TERPHENYL (sur.)	%	-	-	95	N/A	N/A	B373444

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID					CNR363		CNR363			
Sampling Date					2024/05/16 09:34		2024/05/16 09:34			
COC Number					1/1		1/1			
	UNITS	MAC	AO	OG	SW35-R4-01	MU	SW35-R4-01 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	-	-	-	16	N/A	N/A	N/A	N/A	B372242
Cation Sum	meq/L	-	-	-	16	N/A	N/A	N/A	N/A	B372242
Hardness (CaCO3)	mg/L	-	-	-	82	N/A	N/A	N/A	0.50	B372240
Ion Balance (% Difference)	%	-	-	-	1.8	N/A	N/A	N/A	N/A	B372241
Nitrate (N)	mg/L	10	-	-	1.3	N/A	N/A	N/A	0.050	B372243
Nitrate (NO3)	mg/L	45	-	-	5.8	N/A	N/A	N/A	0.22	B372876
Nitrite (NO2)	mg/L	3	-	-	<0.16	N/A	N/A	N/A	0.16	B372876
Calculated Total Dissolved Solids	mg/L	-	500	-	**900**	N/A	N/A	N/A	10	B372244
Elements										
Dissolved Cadmium (Cd)	ug/L	7	-	-	<0.020	N/A	N/A	N/A	0.020	B372237
Misc. Inorganics										
Conductivity	uS/cm	-	-	-	1400	+/- 37	N/A	N/A	2.0	B375948
pH	pH	-	-	7.0:10.5	8.15	+/- 0.0808	N/A	N/A	N/A	B375944
Anions										
Alkalinity (PP as CaCO3)	mg/L	-	-	-	<1.0	N/A	N/A	N/A	1.0	B375934
Alkalinity (Total as CaCO3)	mg/L	-	-	-	580	+/- 43	N/A	N/A	1.0	B375934
Bicarbonate (HCO3)	mg/L	-	-	-	710	+/- 11	N/A	N/A	1.0	B375934
Carbonate (CO3)	mg/L	-	-	-	<1.0	N/A	N/A	N/A	1.0	B375934
Hydroxide (OH)	mg/L	-	-	-	<1.0	N/A	N/A	N/A	1.0	B375934
Chloride (Cl)	mg/L	-	250	-	5.7	+/- 1.3	N/A	N/A	1.0	B374043
Sulphate (SO4)	mg/L	-	500	-	170	+/- 11	N/A	N/A	5.0	B374043
Nutrients										
Nitrite (N)	mg/L	1	-	-	<0.050 (1)	N/A	<0.050	N/A	0.050	B373950
Nitrate plus Nitrite (N)	mg/L	-	-	-	1.3	+/- 0.12	1.3	+/- 0.11	0.050	B373950
Lab Filtered Elements										
Dissolved Aluminum (Al)	mg/L	2.9	-	0.1	<0.0030	N/A	N/A	N/A	0.0030	B374332
Dissolved Antimony (Sb)	mg/L	0.006	-	-	<0.00060	N/A	N/A	N/A	0.00060	B374332
Dissolved Arsenic (As)	mg/L	0.01	-	-	0.00052	+/- <RDL	N/A	N/A	0.00020	B374332

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.
Matrix spike exceeds acceptance limits due to probable matrix interference.

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID					CNR363		CNR363			
Sampling Date					2024/05/16 09:34		2024/05/16 09:34			
COC Number					1/1		1/1			
	UNITS	MAC	AO	OG	SW35-R4-01	MU	SW35-R4-01 Lab-Dup	MU	RDL	QC Batch
Dissolved Barium (Ba)	mg/L	2	-	-	0.024	+/- <RDL	N/A	N/A	0.010	B374001
Dissolved Beryllium (Be)	mg/L	-	-	-	<0.0010	N/A	N/A	N/A	0.0010	B374332
Dissolved Boron (B)	mg/L	5	-	-	0.077	+/- <RDL	N/A	N/A	0.020	B374001
Dissolved Calcium (Ca)	mg/L	-	-	-	22	+/- 2.2	N/A	N/A	0.30	B374001
Dissolved Chromium (Cr)	mg/L	0.05	-	-	<0.0010	N/A	N/A	N/A	0.0010	B374332
Dissolved Cobalt (Co)	mg/L	-	-	-	<0.00030	N/A	N/A	N/A	0.00030	B374332
Dissolved Copper (Cu)	mg/L	2.0	1.0	-	0.0012	+/- <RDL	N/A	N/A	0.0010	B374332
Dissolved Iron (Fe)	mg/L	-	0.3	-	<0.060	N/A	N/A	N/A	0.060	B374001
Dissolved Lead (Pb)	mg/L	0.005	-	-	<0.00020	N/A	N/A	N/A	0.00020	B374332
Dissolved Lithium (Li)	mg/L	-	-	-	0.077	+/- <RDL	N/A	N/A	0.020	B374001
Dissolved Magnesium (Mg)	mg/L	-	-	-	6.9	+/- 0.45	N/A	N/A	0.20	B374001
Dissolved Manganese (Mn)	mg/L	0.12	0.02	-	0.013	+/- <RDL	N/A	N/A	0.0040	B374001
Dissolved Molybdenum (Mo)	mg/L	-	-	-	0.0035	+/- 0.00088	N/A	N/A	0.00020	B374332
Dissolved Nickel (Ni)	mg/L	-	-	-	<0.00050	N/A	N/A	N/A	0.00050	B374332
Dissolved Phosphorus (P)	mg/L	-	-	-	<0.10	N/A	N/A	N/A	0.10	B374001
Dissolved Potassium (K)	mg/L	-	-	-	2.9	+/- <RDL	N/A	N/A	0.30	B374001
Dissolved Selenium (Se)	mg/L	0.05	-	-	0.0014	+/- <RDL	N/A	N/A	0.00020	B374332
Dissolved Silicon (Si)	mg/L	-	-	-	3.0	+/- 0.57	N/A	N/A	0.50	B374001
Dissolved Silver (Ag)	mg/L	-	-	-	<0.00010	N/A	N/A	N/A	0.00010	B374332
Dissolved Sodium (Na)	mg/L	-	200	-	**330**	+/- 32	N/A	N/A	0.50	B374001
Dissolved Strontium (Sr)	mg/L	7	-	-	0.35	+/- 0.035	N/A	N/A	0.020	B374001
Dissolved Sulphur (S)	mg/L	-	-	-	54	+/- 3.6	N/A	N/A	0.20	B374001
Dissolved Thallium (Tl)	mg/L	-	-	-	<0.00020	N/A	N/A	N/A	0.00020	B374332
Dissolved Tin (Sn)	mg/L	-	-	-	<0.0010	N/A	N/A	N/A	0.0010	B374332
Dissolved Titanium (Ti)	mg/L	-	-	-	<0.0010	N/A	N/A	N/A	0.0010	B374332
Dissolved Uranium (U)	mg/L	0.02	-	-	0.00060	+/- <RDL	N/A	N/A	0.00010	B374332
Dissolved Vanadium (V)	mg/L	-	-	-	<0.0010	N/A	N/A	N/A	0.0010	B374332
Dissolved Zinc (Zn)	mg/L	-	5.0	-	0.015	+/- <RDL	N/A	N/A	0.0030	B374332

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable

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TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CNR363		CNR363			
Sampling Date		2024/05/16 09:34		2024/05/16 09:34			
COC Number		1/1		1/1			
	UNITS	SW35-R4-01	MU	SW35-R4-01 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters							
Total Kjeldahl Nitrogen (Calc)	mg/L	<0.20	N/A	N/A	N/A	0.20	B372874
Nutrients							
Total Nitrogen (N)	mg/L	1.1 (1)	+/- <RDL	1.1	+/- <RDL	0.20	B378943

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Nitrogen < Nitrate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID			CNR363		CNR363			
Sampling Date			2024/05/16 09:34		2024/05/16 09:34			
COC Number			1/1		1/1			
	UNITS	MAC	SW35-R4-01	MU	SW35-R4-01 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Inorganics								
Dissolved Organic Carbon (C)	mg/L	-	1.4	+/- <RDL	N/A	N/A	0.50	B377384
Microbiological Param.								
E.Coli DST	MPN/100mL	1	<1.0	N/A	<1.0	N/A	1.0	B372875
Fecal Coliforms	MPN/100mL	-	<1.0	N/A	N/A	N/A	1.0	B373420
Heterotrophic DST	MPN/100mL	-	65	N/A	N/A	N/A	1.0	B373437
Total Coliforms DST	MPN/100mL	1	<1.0	N/A	<1.0	N/A	1.0	B372875
Nutrients								
Total Ammonia (N)	mg/L	-	0.18	+/- 0.023	0.18	+/- 0.023	0.015	B376924
Orthophosphate (P)	mg/L	-	0.0090	+/- 0.0036	N/A	N/A	0.0030	B373936
Lab Filtered Nutrients								
Dissolved Phosphorus (P)	mg/L	-	0.0049 (1)	+/- 0.0048	N/A	N/A	0.0030	B375706

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Phosphorus < Orthophosphate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID			CNR363			
Sampling Date			2024/05/16 09:34			
COC Number			1/1			
	UNITS	MAC	SW35-R4-01	MU	RDL	QC Batch
Elements						
Total Mercury (Hg)	ug/L	1	<0.0019	N/A	0.0019	B375707
Lab Filtered Elements						
Dissolved Mercury (Hg)	ug/L	1	<0.0019	N/A	0.0019	B375657

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	8.2°C
Package 2	6.8°C
Package 3	6.4°C

Version 2: CDWG criteria included.
MAC,AO,OG: The guidelines that have been included in this report have been taken from the Canadian Drinking Water Quality Summary Table, September 2022.

Criteria A = Maximum Acceptable Concentration (MAC) / Criteria B = Aesthetic Objectives (AO) / Criteria C = Operational Guidance Values (OG)
It is recommended to consult these guidelines when interpreting your data since there are non-numerical guidelines that are not included on this report.

Turbidity Guidelines:
1. Chemically assisted filtration: less than or equal to 0.3 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 1.0 NTU at any time.
2. Slow sand / diatomaceous earth filtration: less than or equal to 1.0 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 3.0 NTU at any time.
3. Membrane filtration: less than or equal to 0.1 NTU in 99% of the measurements made or at least 99% of the time each calendar month. Shall not exceed 0.3 NTU at any time.
4. To ensure effectiveness of disinfection and for good operation of the distribution system, it is recommended that water entering the distribution system have turbidity levels of 1.0 NTU or less.
Measurement of Uncertainty has not been accounted for when stating conformity to the selected criteria, where applicable.
The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B372875	SOG	Method Blank	E.Coli DST	2024/05/18	<1.0		mpn/100mL	
			Total Coliforms DST	2024/05/18	<1.0		mpn/100mL	
B372875	SOG	RPD [CNR363-05]	E.Coli DST	2024/05/18	NC		%	N/A
			Total Coliforms DST	2024/05/18	NC		%	N/A
B373420	SOG	Method Blank	Fecal Coliforms	2024/05/18	<1.0		MPN/100mL	
B373420	SOG	RPD	Fecal Coliforms	2024/05/18	NC		%	N/A
B373437	YYL	Method Blank	Heterotrophic DST	2024/05/19	<1.0		mpn/100mL	
B373437	YYL	RPD	Heterotrophic DST	2024/05/19	NC		%	N/A
B373444	VP4	Spiked Blank	O-TERPHENYL (sur.)	2024/05/21		98	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/21		83	%	60 - 140
B373444	VP4	Method Blank	O-TERPHENYL (sur.)	2024/05/21		97	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/21	<0.10		mg/L	
B373936	CTU	Matrix Spike	Orthophosphate (P)	2024/05/18		94	%	80 - 120
B373936	CTU	Spiked Blank	Orthophosphate (P)	2024/05/18		101	%	80 - 120
B373936	CTU	Method Blank	Orthophosphate (P)	2024/05/18	<0.0030		mg/L	
B373936	CTU	RPD	Orthophosphate (P)	2024/05/18	8.5		%	20
B373950	ISW	Matrix Spike [CNR363-01]	Nitrite (N)	2024/05/19		45 (1)	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/19		NC	%	80 - 120
B373950	ISW	Spiked Blank	Nitrite (N)	2024/05/18		94	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/18		105	%	80 - 120
B373950	ISW	Method Blank	Nitrite (N)	2024/05/18	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/18	<0.010		mg/L	
B373950	ISW	RPD [CNR363-01]	Nitrite (N)	2024/05/19	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/19	2.8		%	20
B374001	VSC	Matrix Spike	Dissolved Barium (Ba)	2024/05/19		99	%	80 - 120
			Dissolved Boron (B)	2024/05/19		99	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/19		102	%	80 - 120
			Dissolved Iron (Fe)	2024/05/19		109	%	80 - 120
			Dissolved Lithium (Li)	2024/05/19		96	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/19		101	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/19		104	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/19		109	%	80 - 120
			Dissolved Potassium (K)	2024/05/19		102	%	80 - 120
			Dissolved Silicon (Si)	2024/05/19		112	%	80 - 120
			Dissolved Sodium (Na)	2024/05/19		NC	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/19		99	%	80 - 120
			Dissolved Sulphur (S)	2024/05/19		110	%	80 - 120
B374001	VSC	Spiked Blank	Dissolved Barium (Ba)	2024/05/19		97	%	80 - 120
			Dissolved Boron (B)	2024/05/19		99	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/19		96	%	80 - 120
			Dissolved Iron (Fe)	2024/05/19		100	%	80 - 120
			Dissolved Lithium (Li)	2024/05/19		94	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/19		95	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/19		98	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/19		100	%	80 - 120
			Dissolved Potassium (K)	2024/05/19		97	%	80 - 120
			Dissolved Silicon (Si)	2024/05/19		94	%	80 - 120
			Dissolved Sodium (Na)	2024/05/19		97	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/19		95	%	80 - 120
			Dissolved Sulphur (S)	2024/05/19		98	%	80 - 120
B374001	VSC	Method Blank	Dissolved Barium (Ba)	2024/05/19	<0.010		mg/L	
			Dissolved Boron (B)	2024/05/19	<0.020		mg/L	
			Dissolved Calcium (Ca)	2024/05/19	<0.30		mg/L	
			Dissolved Iron (Fe)	2024/05/19	<0.060		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Lithium (Li)	2024/05/19	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2024/05/19	<0.20		mg/L	
			Dissolved Manganese (Mn)	2024/05/19	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2024/05/19	<0.10		mg/L	
			Dissolved Potassium (K)	2024/05/19	<0.30		mg/L	
			Dissolved Silicon (Si)	2024/05/19	<0.50		mg/L	
			Dissolved Sodium (Na)	2024/05/19	<0.50		mg/L	
			Dissolved Strontium (Sr)	2024/05/19	<0.020		mg/L	
			Dissolved Sulphur (S)	2024/05/19	<0.20		mg/L	
B374001	VSC	RPD	Dissolved Calcium (Ca)	2024/05/19	0.36		%	20
			Dissolved Iron (Fe)	2024/05/19	4.4		%	20
			Dissolved Magnesium (Mg)	2024/05/19	3.0		%	20
			Dissolved Manganese (Mn)	2024/05/19	3.3		%	20
			Dissolved Potassium (K)	2024/05/19	0.88		%	20
			Dissolved Sodium (Na)	2024/05/19	0.51		%	20
B374012	SNA	Matrix Spike	1,4-Difluorobenzene (sur.)	2024/05/21		97	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/21		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/21		95	%	50 - 140
			Benzene	2024/05/21		97	%	50 - 140
			Toluene	2024/05/21		95	%	50 - 140
			Ethylbenzene	2024/05/21		95	%	50 - 140
			m & p-Xylene	2024/05/21		89	%	50 - 140
			o-Xylene	2024/05/21		95	%	50 - 140
			F1 (C6-C10)	2024/05/21		88	%	60 - 140
B374012	SNA	Spiked Blank	1,4-Difluorobenzene (sur.)	2024/05/21		97	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/21		95	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/21		93	%	50 - 140
			Benzene	2024/05/21		96	%	60 - 130
			Toluene	2024/05/21		95	%	60 - 130
			Ethylbenzene	2024/05/21		95	%	60 - 130
			m & p-Xylene	2024/05/21		87	%	60 - 130
			o-Xylene	2024/05/21		93	%	60 - 130
			F1 (C6-C10)	2024/05/21		103	%	60 - 140
B374012	SNA	Method Blank	1,4-Difluorobenzene (sur.)	2024/05/22		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/22		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/22		94	%	50 - 140
			Benzene	2024/05/22	<0.00040		mg/L	
			Toluene	2024/05/22	<0.00040		mg/L	
			Ethylbenzene	2024/05/22	<0.00040		mg/L	
			m & p-Xylene	2024/05/22	<0.00080		mg/L	
			o-Xylene	2024/05/22	<0.00040		mg/L	
			F1 (C6-C10)	2024/05/22	<0.10		mg/L	
B374012	SNA	RPD	Benzene	2024/05/22	NC		%	30
			Toluene	2024/05/22	NC		%	30
			Ethylbenzene	2024/05/22	NC		%	30
			m & p-Xylene	2024/05/22	NC		%	30
			o-Xylene	2024/05/22	NC		%	30
			F1 (C6-C10)	2024/05/22	NC		%	30
B374043	AFI	Matrix Spike	Chloride (Cl)	2024/05/19		103	%	80 - 120
			Sulphate (SO4)	2024/05/19		79 (1)	%	80 - 120
B374043	AFI	Spiked Blank	Chloride (Cl)	2024/05/19		101	%	80 - 120
			Sulphate (SO4)	2024/05/19		97	%	80 - 120
B374043	AFI	Method Blank	Chloride (Cl)	2024/05/19	<1.0		mg/L	
			Sulphate (SO4)	2024/05/19	<1.0		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B374043	AFI	RPD	Chloride (Cl)	2024/05/19	NC		%	20
			Sulphate (SO4)	2024/05/19	3.4		%	20
B374332	KH2	Matrix Spike	Dissolved Aluminum (Al)	2024/05/21		98	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/21		94	%	80 - 120
			Dissolved Arsenic (As)	2024/05/21		96	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/21		94	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/21		92	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/21		93	%	80 - 120
			Dissolved Copper (Cu)	2024/05/21		92	%	80 - 120
			Dissolved Lead (Pb)	2024/05/21		91	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/21		102	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/21		91	%	80 - 120
			Dissolved Selenium (Se)	2024/05/21		95	%	80 - 120
			Dissolved Silver (Ag)	2024/05/21		94	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/21		91	%	80 - 120
			Dissolved Tin (Sn)	2024/05/21		96	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/21		92	%	80 - 120
			Dissolved Uranium (U)	2024/05/21		95	%	80 - 120
			Dissolved Vanadium (V)	2024/05/21		95	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/21		94	%	80 - 120
B374332	KH2	Spiked Blank	Dissolved Aluminum (Al)	2024/05/21		109	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/21		96	%	80 - 120
			Dissolved Arsenic (As)	2024/05/21		96	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/21		100	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/21		97	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/21		100	%	80 - 120
			Dissolved Copper (Cu)	2024/05/21		99	%	80 - 120
			Dissolved Lead (Pb)	2024/05/21		98	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/21		101	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/21		99	%	80 - 120
			Dissolved Selenium (Se)	2024/05/21		97	%	80 - 120
			Dissolved Silver (Ag)	2024/05/21		99	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/21		96	%	80 - 120
			Dissolved Tin (Sn)	2024/05/21		97	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/21		98	%	80 - 120
			Dissolved Uranium (U)	2024/05/21		101	%	80 - 120
			Dissolved Vanadium (V)	2024/05/21		97	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/21		100	%	80 - 120
B374332	KH2	Method Blank	Dissolved Aluminum (Al)	2024/05/21	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2024/05/21	<0.00060		mg/L	
			Dissolved Arsenic (As)	2024/05/21	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2024/05/21	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2024/05/21	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2024/05/21	<0.00030		mg/L	
			Dissolved Copper (Cu)	2024/05/21	<0.0010		mg/L	
			Dissolved Lead (Pb)	2024/05/21	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2024/05/21	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2024/05/21	<0.00050		mg/L	
			Dissolved Selenium (Se)	2024/05/21	<0.00020		mg/L	
			Dissolved Silver (Ag)	2024/05/21	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2024/05/21	<0.00020		mg/L	
			Dissolved Tin (Sn)	2024/05/21	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2024/05/21	<0.0010		mg/L	
			Dissolved Uranium (U)	2024/05/21	<0.00010		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Vanadium (V)	2024/05/21	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2024/05/21	<0.0030		mg/L	
B374332	KH2	RPD	Dissolved Aluminum (Al)	2024/05/21	NC		%	20
			Dissolved Antimony (Sb)	2024/05/21	NC		%	20
			Dissolved Arsenic (As)	2024/05/21	NC		%	20
			Dissolved Beryllium (Be)	2024/05/21	NC		%	20
			Dissolved Chromium (Cr)	2024/05/21	NC		%	20
			Dissolved Cobalt (Co)	2024/05/21	NC		%	20
			Dissolved Copper (Cu)	2024/05/21	NC		%	20
			Dissolved Lead (Pb)	2024/05/21	NC		%	20
			Dissolved Molybdenum (Mo)	2024/05/21	NC		%	20
			Dissolved Nickel (Ni)	2024/05/21	4.6		%	20
			Dissolved Selenium (Se)	2024/05/21	4.0		%	20
			Dissolved Silver (Ag)	2024/05/21	NC		%	20
			Dissolved Thallium (Tl)	2024/05/21	NC		%	20
			Dissolved Tin (Sn)	2024/05/21	NC		%	20
			Dissolved Titanium (Ti)	2024/05/21	NC		%	20
			Dissolved Uranium (U)	2024/05/21	1.8		%	20
			Dissolved Vanadium (V)	2024/05/21	NC		%	20
			Dissolved Zinc (Zn)	2024/05/21	NC		%	20
B375657	KHU	Matrix Spike	Dissolved Mercury (Hg)	2024/05/22		94	%	80 - 120
B375657	KHU	Spiked Blank	Dissolved Mercury (Hg)	2024/05/22		98	%	80 - 120
B375657	KHU	Method Blank	Dissolved Mercury (Hg)	2024/05/22	<0.0019		ug/L	
B375657	KHU	RPD	Dissolved Mercury (Hg)	2024/05/22	NC		%	20
B375706	CTU	Matrix Spike	Dissolved Phosphorus (P)	2024/05/22		92	%	80 - 120
B375706	CTU	QC Standard	Dissolved Phosphorus (P)	2024/05/22		93	%	80 - 120
B375706	CTU	Spiked Blank	Dissolved Phosphorus (P)	2024/05/22		96	%	80 - 120
B375706	CTU	Method Blank	Dissolved Phosphorus (P)	2024/05/22	<0.0030		mg/L	
B375706	CTU	RPD	Dissolved Phosphorus (P)	2024/05/22	NC		%	20
B375707	KHU	Matrix Spike	Total Mercury (Hg)	2024/05/22		94	%	80 - 120
B375707	KHU	Spiked Blank	Total Mercury (Hg)	2024/05/22		99	%	80 - 120
B375707	KHU	Method Blank	Total Mercury (Hg)	2024/05/22	<0.0019		ug/L	
B375707	KHU	RPD	Total Mercury (Hg)	2024/05/22	NC		%	20
B375934	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/23		96	%	80 - 120
B375934	JVM	Method Blank	Alkalinity (PP as CaCO3)	2024/05/23	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/23	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/23	<1.0		mg/L	
			Carbonate (CO3)	2024/05/23	<1.0		mg/L	
			Hydroxide (OH)	2024/05/23	<1.0		mg/L	
B375934	JVM	RPD	Alkalinity (PP as CaCO3)	2024/05/23	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/23	0.76		%	20
			Bicarbonate (HCO3)	2024/05/23	0.76		%	20
			Carbonate (CO3)	2024/05/23	NC		%	20
			Hydroxide (OH)	2024/05/23	NC		%	20
B375944	JVM	Spiked Blank	pH	2024/05/23		100	%	97 - 103
B375944	JVM	RPD	pH	2024/05/23	0		%	N/A
B375948	JVM	Spiked Blank	Conductivity	2024/05/23		101	%	90 - 110
B375948	JVM	Method Blank	Conductivity	2024/05/23	<2.0		uS/cm	
B375948	JVM	RPD	Conductivity	2024/05/23	0.076		%	10
B376924	AFI	Matrix Spike [CNR363-09]	Total Ammonia (N)	2024/05/23		105	%	80 - 120
B376924	AFI	Spiked Blank	Total Ammonia (N)	2024/05/23		105	%	80 - 120
B376924	AFI	Method Blank	Total Ammonia (N)	2024/05/23	<0.015		mg/L	
B376924	AFI	RPD [CNR363-09]	Total Ammonia (N)	2024/05/23	1.0		%	20
B377384	MDO	Matrix Spike	Dissolved Organic Carbon (C)	2024/05/23		93	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B377384	MDO	Spiked Blank	Dissolved Organic Carbon (C)	2024/05/23		103	%	80 - 120
B377384	MDO	Method Blank	Dissolved Organic Carbon (C)	2024/05/23	<0.50		mg/L	
B377384	MDO	RPD	Dissolved Organic Carbon (C)	2024/05/23	0.27		%	20
B378943	YL7	Matrix Spike [CNR363-02]	Total Nitrogen (N)	2024/05/27		NC	%	80 - 120
B378943	YL7	QC Standard	Total Nitrogen (N)	2024/05/27		102	%	80 - 120
B378943	YL7	Spiked Blank	Total Nitrogen (N)	2024/05/27		104	%	80 - 120
B378943	YL7	Method Blank	Total Nitrogen (N)	2024/05/27	<0.020		mg/L	
B378943	YL7	RPD [CNR363-02]	Total Nitrogen (N)	2024/05/27	2.5		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

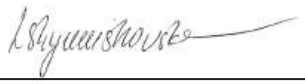
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

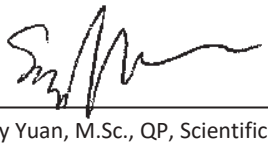
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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Luba Shymushovska, B.Sc., QP, Senior Analyst, Organics



Sandy Yuan, M.Sc., QP, Scientific Specialist



Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist



Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

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- ☐ Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Project Information	
Company:	Stantec	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	#300, 10220 103Ave NW	Street Address:		Project #:	110773396
City:	Edmonton Prov: AB Postal Code: T5J0K4	City: Prov: Postal Code:		Site #:	
Phone:	780 969 2223	Phone:		Site Location:	
Email:	dylan.King@stantec.com	Email:		Site Location Province:	AB
Copies:		Copies:		Sampled By:	WT/TH

LAB USE ONLY - PLACE STICKER HERE

Rush Confirmation #:

Regulatory Criteria

☐ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba
☐ Saskatchewan ☑ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)
☑ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply
☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F1-F2	7 BTEX F1-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 Salinity 4	14 Sieve (75 micron)	15 Nitrogen (Ammonia-N) TKN	16 Biological Oxygen Demand DOC	17 Dissolved phosphorus phosphorus	18	19 Ammonia	20 Bacteriological	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE
1	SW35-R4-01	24	05	16	09	34	water						X		X		X	X	X			X	X	X		X	X	11	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

16-May-24 16:12
Geraldlyn Gouthro
C435151
JJO INS-0003

MCAL-2024-05-1179

Comments

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C			
Seal present		✓				
Seal intact		✓				
Cooling media present	✓		8.1 (1)	8.1 (2)	8.4 (3)	

LAB USE ONLY	Yes	No	°C			
Seal present		✓				
Seal intact		✓				
Cooling media present	✓		6.9 (1)	6.8 (2)	6.8 (3)	

LAB USE ONLY	Yes	No	°C			
Seal present		✓				
Seal intact		✓				
Cooling media present	✓		5.6 (1)	6.8 (2)	6.8 (3)	

Temperature reading by:

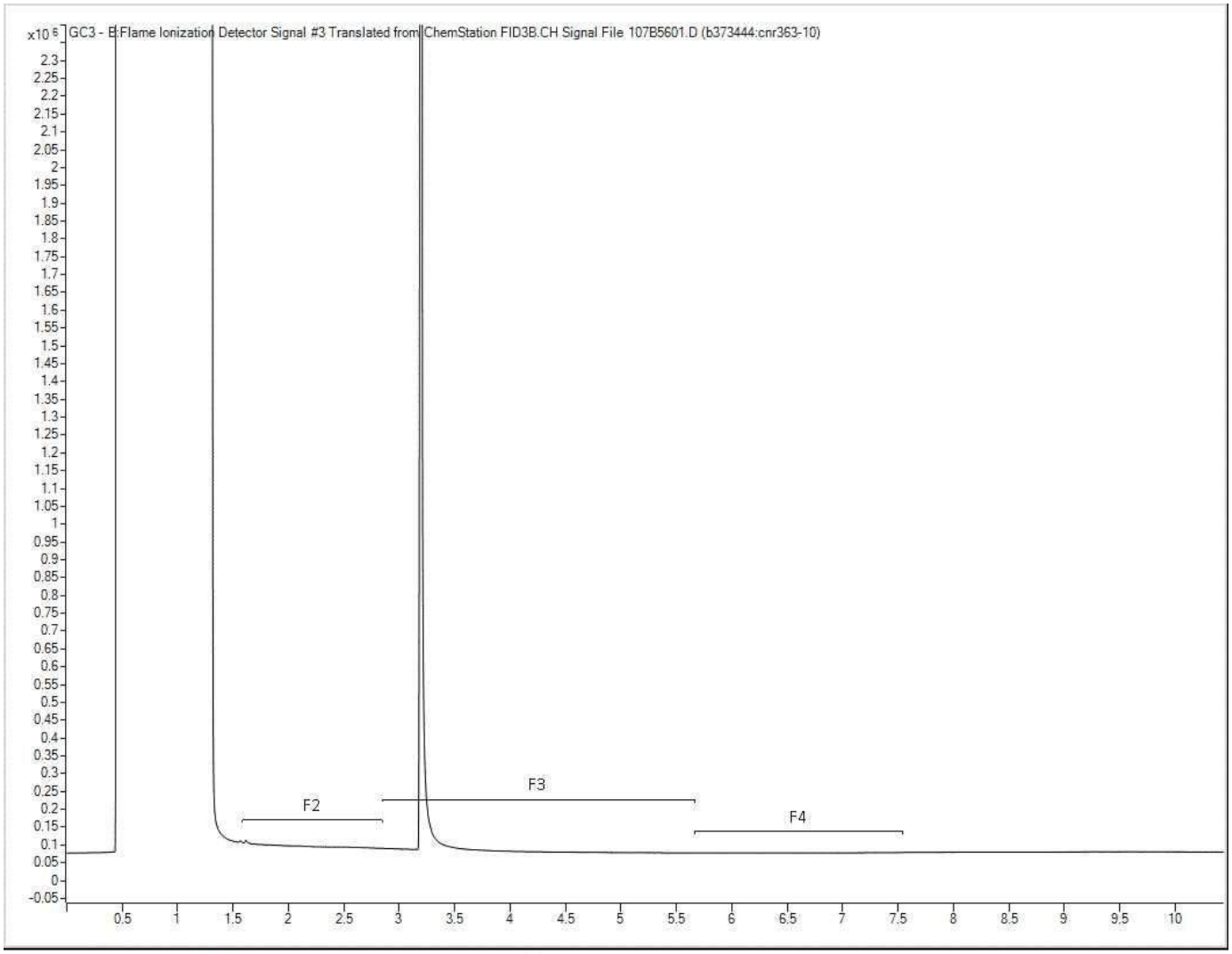
Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special instructions
1 Wesley Tsen	24	05	16	16	10	1 ATMAUSRCII	2024	05	16	16	12	A total coliforms, e.coli, fecal coliforms, heterotrophic plate count
2						2						

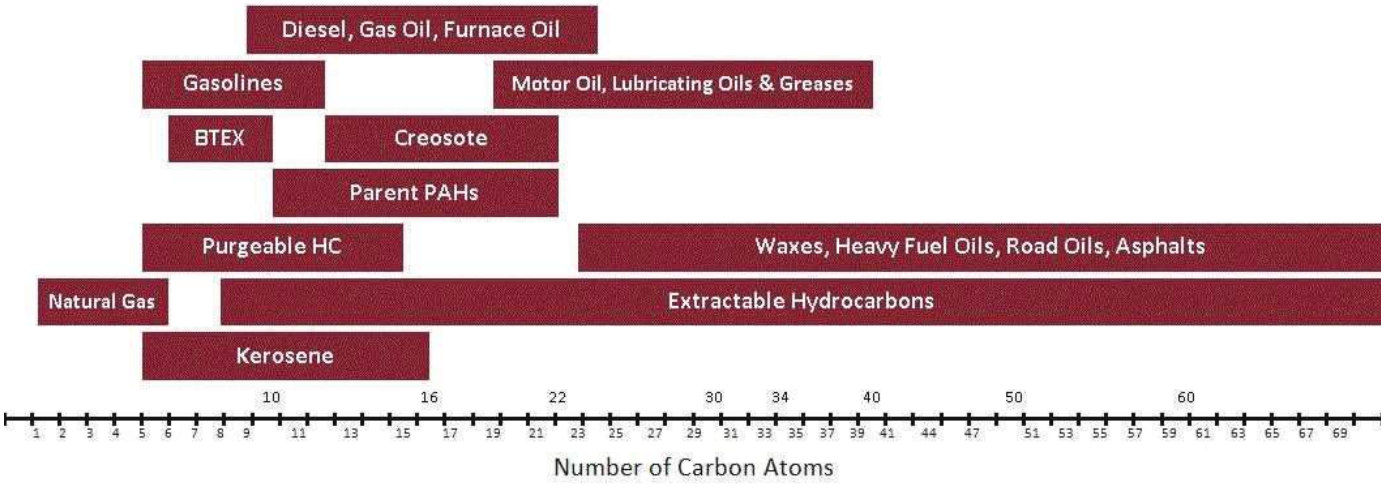
Dissolved parameters not field filtered - please lab filter

Bureau Veritas Job #: C435151
Report Date: 2024/05/28
Bureau Veritas Sample: CNR363

STANTEC CONSULTING LTD
Client Project #: 110773396
Client ID: SW35-R4-01

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





hpchem19\HPchem\1\DATA\2024\05\RUN0521

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 110773396
Your C.O.C. #: 1OF1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/27
Report #: R3504717
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C435488
Received: 2024/05/17, 13:20

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	6	N/A	2024/05/24	AB SOP-00005	SM 24 2320 B m
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2024/05/26	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	7	N/A	2024/05/23	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	7	N/A	2024/05/23		Auto Calc
Cadmium - low level CCME - Dissolved	7	N/A	2024/05/23		Auto Calc
Chloride/Sulphate by Auto Colourimetry	7	N/A	2024/05/22	AB SOP-00020	SM24-4500-Cl/SO4-E m
Fecal Coliforms (MPN/100mL)	7	2024/05/18	2024/05/19	AB SOP-00089	SM 24 9223 A,B m
Heterotrophic Plate Count Quant	7	2024/05/18	2024/05/20	CAL SOP-00012	SM 24 9215 A, E m
Total Coliforms and E.Coli	7	2024/05/18	2024/05/19	AB SOP-00089	SM 24 9223 A,B m
Carbon (DOC) -Lab Filtered (1)	7	N/A	2024/05/24	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	7	N/A	2024/05/24	AB SOP-00005	SM 24 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	7	2024/05/21	2024/05/22	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Hardness	5	N/A	2024/05/22		Auto Calc
Hardness	2	N/A	2024/05/23		Auto Calc
Mercury (Dissolved) by CV-Lab Filtered	7	2024/05/22	2024/05/22	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	7	2024/05/22	2024/05/22	AB SOP-00084	BCMOE BCLM Oct2013 m
Elements by ICP-Dissolved-Lab Filtered (3)	7	N/A	2024/05/22	AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS-Dissolved-Lab Filtered (4)	7	N/A	2024/05/23	AB SOP-00043	EPA 6020b R2 m
Ion Balance	5	N/A	2024/05/24		Auto Calc
Ion Balance	2	N/A	2024/05/26		Auto Calc
Sum of cations, anions	5	N/A	2024/05/22		Auto Calc
Sum of cations, anions	2	N/A	2024/05/23		Auto Calc
Ammonia-N (Total)	7	N/A	2024/05/23	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	7	N/A	2024/05/22		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	2	N/A	2024/05/21	AB SOP-00091	SM 24 4500 NO3m
NO2 (N); NO2 (N) + NO3 (N) in Water	4	N/A	2024/05/22	AB SOP-00091	SM 24 4500 NO3m
NO2 (N); NO2 (N) + NO3 (N) in Water	1	N/A	2024/05/25	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	7	2024/05/17	2024/05/22		Auto Calc
pH @25°C (5)	6	N/A	2024/05/24	AB SOP-00005	SM 24 4500-H+B m
pH @25°C (5)	1	N/A	2024/05/26	AB SOP-00005	SM 24 4500-H+B m
Orthophosphate by Automated Analyzer (6)	7	N/A	2024/05/22	AB SOP-00025	SM 24 4500-P A,F m

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Your C.O.C. #: 1OF1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2024/05/27
Report #: R3504717
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CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C435488
Received: 2024/05/17, 13:20

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Dissolved Solids (Calculated)	5	N/A	2024/05/24		Auto Calc
Total Dissolved Solids (Calculated)	2	N/A	2024/05/26		Auto Calc
Total Kjeldahl Nitrogen (Total)	5	N/A	2024/05/23	BBY WI-00033	Auto Calc
Total Kjeldahl Nitrogen (Total)	2	N/A	2024/05/24	BBY WI-00033	Auto Calc
Nitrogen (Total)	6	2024/05/23	2024/05/23	AB SOP-00093	SM 24 4500-N C m
Nitrogen (Total)	1	2024/05/23	2024/05/24	AB SOP-00093	SM 24 4500-N C m
Total Phosphorus-Dissolved-Lab Filtered (7)	7	2024/05/23	2024/05/23	AB SOP-00024	SM 24 4500-P A,B,F m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 110773396
Your C.O.C. #: 1OF1

Attention: DYLAN KING

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
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(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(7) Dissolved Phosphorus > Total Phosphorus Imbalance: When applicable, Dissolved Phosphorus and Total Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.

Encryption Key



Bureau Veritas
27 May 2024 10:28:41

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (403) 291-3077

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Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CNT049		CNT050		CNT051		CNT052			
Sampling Date		2024/05/17 09:17		2024/05/17 09:24		2024/05/17 11:23		2024/05/17 10:54			
COC Number		1OF1		1OF1		1OF1		1OF1			
	UNITS	MW16-8-8	MU	MW16-8-19	MU	MW16-6-11	MU	MW16-6-20	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B374177
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B373712
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B373712
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B373712
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B373712
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B373712
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B373231
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B373231
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B373712
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	101	N/A	102	N/A	102	N/A	101	N/A	N/A	B373712
4-Bromofluorobenzene (sur.)	%	108	N/A	97	N/A	97	N/A	97	N/A	N/A	B373712
D4-1,2-Dichloroethane (sur.)	%	81	N/A	83	N/A	84	N/A	83	N/A	N/A	B373712
O-TERPHENYL (sur.)	%	102	N/A	103	N/A	104	N/A	100	N/A	N/A	B374177

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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AT1 BTEX AND F1-F2 IN WATER (WATER)

Bureau Veritas ID		CNT053		CNT054		CNT055			
Sampling Date		2024/05/17 11:31		2024/05/17 11:42		2024/05/17 11:48			
COC Number		1OF1		1OF1		1OF1			
	UNITS	SR24-04	MU	SR24-05	MU	SR24-06	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B374177
Volatiles									
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B373712
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B373712
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B373712
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	B373712
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	B373712
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	B373231
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B373231
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	B373712
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	101	N/A	100	N/A	100	N/A	N/A	B373712
4-Bromofluorobenzene (sur.)	%	98	N/A	98	N/A	98	N/A	N/A	B373712
D4-1,2-Dichloroethane (sur.)	%	82	N/A	80	N/A	82	N/A	N/A	B373712
O-TERPHENYL (sur.)	%	104	N/A	103	N/A	106	N/A	N/A	B374177

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNT049		CNT049			
Sampling Date		2024/05/17 09:17		2024/05/17 09:17			
COC Number		1OF1		1OF1			
	UNITS	MW16-8-8	MU	MW16-8-8 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	14	N/A	N/A	N/A	N/A	B372963
Cation Sum	meq/L	15	N/A	N/A	N/A	N/A	B372963
Hardness (CaCO3)	mg/L	680	N/A	N/A	N/A	0.50	B373242
Ion Balance (% Difference)	%	4.2	N/A	N/A	N/A	N/A	B373244
Nitrate (N)	mg/L	0.59	N/A	N/A	N/A	0.010	B373160
Nitrate (NO3)	mg/L	2.6	N/A	N/A	N/A	0.044	B374869
Nitrite (NO2)	mg/L	<0.033	N/A	N/A	N/A	0.033	B374869
Calculated Total Dissolved Solids	mg/L	750	N/A	N/A	N/A	10	B372965
Elements							
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	N/A	N/A	0.020	B373232
Misc. Inorganics							
Conductivity	uS/cm	1200	+/- 31	N/A	N/A	2.0	B375948
pH	pH	7.73	+/- 0.0766	N/A	N/A	N/A	B375944
Anions							
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	B375934
Alkalinity (Total as CaCO3)	mg/L	420	+/- 31	N/A	N/A	1.0	B375934
Bicarbonate (HCO3)	mg/L	510	+/- 7.8	N/A	N/A	1.0	B375934
Carbonate (CO3)	mg/L	<1.0	N/A	N/A	N/A	1.0	B375934
Hydroxide (OH)	mg/L	<1.0	N/A	N/A	N/A	1.0	B375934
Chloride (Cl)	mg/L	25	+/- 2.3	25	+/- 2.3	1.0	B375658
Sulphate (SO4)	mg/L	220	+/- 14	230	+/- 15	5.0	B375658
Nutrients							
Nitrite (N)	mg/L	<0.010	N/A	N/A	N/A	0.010	B375753
Nitrate plus Nitrite (N)	mg/L	0.59	+/- 0.055	N/A	N/A	0.010	B375753
Lab Filtered Elements							
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B376819
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	N/A	N/A	0.00060	B376819
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B376819
Dissolved Barium (Ba)	mg/L	0.045	+/- <RDL	N/A	N/A	0.010	B375770
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B376819
Dissolved Boron (B)	mg/L	0.040	+/- <RDL	N/A	N/A	0.020	B375770

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNT049		CNT049			
Sampling Date		2024/05/17 09:17		2024/05/17 09:17			
COC Number		1OF1		1OF1			
	UNITS	MW16-8-8	MU	MW16-8-8 Lab-Dup	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	150	+/- 15	N/A	N/A	0.30	B375770
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B376819
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	N/A	N/A	0.00030	B376819
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B376819
Dissolved Iron (Fe)	mg/L	<0.060	N/A	N/A	N/A	0.060	B375770
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B376819
Dissolved Lithium (Li)	mg/L	<0.020	N/A	N/A	N/A	0.020	B375770
Dissolved Magnesium (Mg)	mg/L	77	+/- 5.0	N/A	N/A	0.20	B375770
Dissolved Manganese (Mn)	mg/L	0.0040	+/- <RDL	N/A	N/A	0.0040	B375770
Dissolved Molybdenum (Mo)	mg/L	0.0016	+/- 0.00046	N/A	N/A	0.00020	B376819
Dissolved Nickel (Ni)	mg/L	0.00073	+/- <RDL	N/A	N/A	0.00050	B376819
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	N/A	N/A	0.10	B375770
Dissolved Potassium (K)	mg/L	5.9	+/- 0.32	N/A	N/A	0.30	B375770
Dissolved Selenium (Se)	mg/L	0.0024	+/- 0.00023	N/A	N/A	0.00020	B376819
Dissolved Silicon (Si)	mg/L	4.1	+/- 0.78	N/A	N/A	0.50	B375770
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	N/A	N/A	0.00010	B376819
Dissolved Sodium (Na)	mg/L	26	+/- 2.6	N/A	N/A	0.50	B375770
Dissolved Strontium (Sr)	mg/L	1.2	+/- 0.12	N/A	N/A	0.020	B375770
Dissolved Sulphur (S)	mg/L	66	+/- 4.4	N/A	N/A	0.20	B375770
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	N/A	N/A	0.00020	B376819
Dissolved Tin (Sn)	mg/L	0.0039	+/- 0.0011	N/A	N/A	0.0010	B376819
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B376819
Dissolved Uranium (U)	mg/L	0.013	+/- 0.0012	N/A	N/A	0.00010	B376819
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	N/A	N/A	0.0010	B376819
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B376819

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNT050				CNT051			
Sampling Date		2024/05/17 09:24				2024/05/17 11:23			
COC Number		1OF1				1OF1			
	UNITS	MW16-8-19	MU	RDL	QC Batch	MW16-6-11	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	15	N/A	N/A	B373264	42	N/A	N/A	B373264
Cation Sum	meq/L	16	N/A	N/A	B373264	43	N/A	N/A	B373264
Hardness (CaCO3)	mg/L	680	N/A	0.50	B373242	1400	N/A	0.50	B373242
Ion Balance (% Difference)	%	5.1	N/A	N/A	B373244	1.4	N/A	N/A	B373244
Nitrate (N)	mg/L	0.47	N/A	0.010	B373160	0.018	N/A	0.010	B373160
Nitrate (NO3)	mg/L	2.1	N/A	0.044	B374869	0.079	N/A	0.044	B374871
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B374869	<0.033	N/A	0.033	B374871
Calculated Total Dissolved Solids	mg/L	790	N/A	10	B373265	2700	N/A	25	B373265
Elements									
Dissolved Cadmium (Cd)	ug/L	0.025	+/- <RDL	0.020	B373232	0.10	+/- 0.044	0.020	B373232
Misc. Inorganics									
Conductivity	uS/cm	1300	+/- 35	2.0	B375900	3300	+/- 86	2.0	B375900
pH	pH	7.85	+/- 0.0778	N/A	B375899	7.80	+/- 0.0773	N/A	B375899
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B375893	<1.0	N/A	1.0	B375893
Alkalinity (Total as CaCO3)	mg/L	470	+/- 35	1.0	B375893	370	+/- 28	1.0	B375893
Bicarbonate (HCO3)	mg/L	580	+/- 8.9	1.0	B375893	460	+/- 7.1	1.0	B375893
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B375893	<1.0	N/A	1.0	B375893
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B375893	<1.0	N/A	1.0	B375893
Chloride (Cl)	mg/L	120	+/- 8.8	1.0	B375762	12	+/- 1.5	1.0	B375743
Sulphate (SO4)	mg/L	92	+/- 6.2	1.0	B375762	1600	+/- 100	25	B375743
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B375216	<0.010	N/A	0.010	B375216
Nitrate plus Nitrite (N)	mg/L	0.47	+/- 0.046	0.010	B375216	0.018	+/- 0.012	0.010	B375216
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B375737	0.0064	+/- <RDL	0.0030	B375737
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B375737	<0.00060	N/A	0.00060	B375737
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	0.00020	B375737	0.00042	+/- <RDL	0.00020	B375737
Dissolved Barium (Ba)	mg/L	0.062	+/- <RDL	0.010	B375614	0.016	+/- <RDL	0.010	B375614
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Boron (B)	mg/L	0.047	+/- <RDL	0.020	B375614	0.13	+/- <RDL	0.020	B375614

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNT050				CNT051			
Sampling Date		2024/05/17 09:24				2024/05/17 11:23			
COC Number		1OF1				1OF1			
	UNITS	MW16-8-19	MU	RDL	QC Batch	MW16-6-11	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	160	+/- 16	0.30	B375614	320	+/- 32	0.30	B375614
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	B375737	0.0014	+/- <RDL	0.00030	B375737
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B375614	<0.060	N/A	0.060	B375614
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B375737	<0.00020	N/A	0.00020	B375737
Dissolved Lithium (Li)	mg/L	0.023	+/- <RDL	0.020	B375614	0.049	+/- <RDL	0.020	B375614
Dissolved Magnesium (Mg)	mg/L	71	+/- 4.6	0.20	B375614	140	+/- 8.8	0.20	B375614
Dissolved Manganese (Mn)	mg/L	<0.0040	N/A	0.0040	B375614	0.83	+/- 0.056	0.0040	B375614
Dissolved Molybdenum (Mo)	mg/L	0.0012	+/- 0.00039	0.00020	B375737	0.013	+/- 0.0032	0.00020	B375737
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	0.00050	B375737	0.0037	+/- <RDL	0.00050	B375737
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B375614	<0.10	N/A	0.10	B375614
Dissolved Potassium (K)	mg/L	6.5	+/- 0.34	0.30	B375614	7.7	+/- 0.40	0.30	B375614
Dissolved Selenium (Se)	mg/L	0.0066	+/- 0.00060	0.00020	B375737	0.00022	+/- <RDL	0.00020	B375737
Dissolved Silicon (Si)	mg/L	4.2	+/- 0.79	0.50	B375614	4.3	+/- 0.82	0.50	B375614
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B375737	<0.00010	N/A	0.00010	B375737
Dissolved Sodium (Na)	mg/L	58	+/- 5.7	0.50	B375614	360	+/- 35	0.50	B375614
Dissolved Strontium (Sr)	mg/L	1.5	+/- 0.15	0.020	B375614	2.8	+/- 0.27	0.020	B375614
Dissolved Sulphur (S)	mg/L	31	+/- 2.1	0.20	B375614	490	+/- 33	0.20	B375614
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B375737	<0.00020	N/A	0.00020	B375737
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Uranium (U)	mg/L	0.0053	+/- 0.00048	0.00010	B375737	0.0056	+/- 0.00051	0.00010	B375737
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B375737
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B375737	0.067	+/- 0.0060	0.0030	B375737

RDL = Reportable Detection Limit
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNT051				CNT052			
Sampling Date		2024/05/17 11:23				2024/05/17 10:54			
COC Number		1OF1				1OF1			
	UNITS	MW16-6-11 Lab-Dup	MU	RDL	QC Batch	MW16-6-20	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	N/A	N/A	N/A	B373264	25	N/A	N/A	B373264
Cation Sum	meq/L	N/A	N/A	N/A	B373264	24	N/A	N/A	B373264
Hardness (CaCO3)	mg/L	N/A	N/A	0.50	B373242	200	N/A	0.50	B373242
Ion Balance (% Difference)	%	N/A	N/A	N/A	B373244	2.3	N/A	N/A	B373244
Nitrate (N)	mg/L	N/A	N/A	0.010	B373160	<0.050	N/A	0.050	B373160
Nitrate (NO3)	mg/L	N/A	N/A	0.044	B374871	<0.22	N/A	0.22	B374871
Nitrite (NO2)	mg/L	N/A	N/A	0.033	B374871	<0.033	N/A	0.033	B374871
Calculated Total Dissolved Solids	mg/L	N/A	N/A	25	B373265	1600	N/A	25	B373265
Elements									
Dissolved Cadmium (Cd)	ug/L	N/A	N/A	0.020	B373232	<0.020	N/A	0.020	B373232
Misc. Inorganics									
Conductivity	uS/cm	N/A	N/A	2.0	B375900	2200	+/- 58	2.0	B375859
pH	pH	N/A	N/A	N/A	B375899	8.29	+/- 0.0821	N/A	B375858
Anions									
Alkalinity (PP as CaCO3)	mg/L	N/A	N/A	1.0	B375893	<1.0	N/A	1.0	B375856
Alkalinity (Total as CaCO3)	mg/L	N/A	N/A	1.0	B375893	290	+/- 21	1.0	B375856
Bicarbonate (HCO3)	mg/L	N/A	N/A	1.0	B375893	350	+/- 5.5	1.0	B375856
Carbonate (CO3)	mg/L	N/A	N/A	1.0	B375893	<1.0	N/A	1.0	B375856
Hydroxide (OH)	mg/L	N/A	N/A	1.0	B375893	<1.0	N/A	1.0	B375856
Chloride (Cl)	mg/L	11	+/- 1.5	1.0	B375743	<1.0	N/A	1.0	B375671
Sulphate (SO4)	mg/L	1700	+/- 110	25	B375743	940	+/- 59	25	B375671
Nutrients									
Nitrite (N)	mg/L	N/A	N/A	0.010	B375216	<0.010	N/A	0.010	B375753
Nitrate plus Nitrite (N)	mg/L	N/A	N/A	0.010	B375216	<0.050 (1)	N/A	0.050	B375753
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	N/A	N/A	0.0030	B375737	<0.0030	N/A	0.0030	B376819
Dissolved Antimony (Sb)	mg/L	N/A	N/A	0.00060	B375737	<0.00060	N/A	0.00060	B376819
Dissolved Arsenic (As)	mg/L	N/A	N/A	0.00020	B375737	<0.00020	N/A	0.00020	B376819
Dissolved Barium (Ba)	mg/L	N/A	N/A	0.010	B375614	<0.010	N/A	0.010	B375770
Dissolved Beryllium (Be)	mg/L	N/A	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B376819

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNT051				CNT052			
Sampling Date		2024/05/17 11:23				2024/05/17 10:54			
COC Number		1OF1				1OF1			
	UNITS	MW16-6-11 Lab-Dup	MU	RDL	QC Batch	MW16-6-20	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	N/A	N/A	0.020	B375614	0.12	+/- <RDL	0.020	B375770
Dissolved Calcium (Ca)	mg/L	N/A	N/A	0.30	B375614	53	+/- 5.4	0.30	B375770
Dissolved Chromium (Cr)	mg/L	N/A	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B376819
Dissolved Cobalt (Co)	mg/L	N/A	N/A	0.00030	B375737	<0.00030	N/A	0.00030	B376819
Dissolved Copper (Cu)	mg/L	N/A	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B376819
Dissolved Iron (Fe)	mg/L	N/A	N/A	0.060	B375614	<0.060	N/A	0.060	B375770
Dissolved Lead (Pb)	mg/L	N/A	N/A	0.00020	B375737	<0.00020	N/A	0.00020	B376819
Dissolved Lithium (Li)	mg/L	N/A	N/A	0.020	B375614	0.069	+/- <RDL	0.020	B375770
Dissolved Magnesium (Mg)	mg/L	N/A	N/A	0.20	B375614	17	+/- 1.1	0.20	B375770
Dissolved Manganese (Mn)	mg/L	N/A	N/A	0.0040	B375614	0.074	+/- 0.0052	0.0040	B375770
Dissolved Molybdenum (Mo)	mg/L	N/A	N/A	0.00020	B375737	0.0024	+/- 0.00064	0.00020	B376819
Dissolved Nickel (Ni)	mg/L	N/A	N/A	0.00050	B375737	<0.00050	N/A	0.00050	B376819
Dissolved Phosphorus (P)	mg/L	N/A	N/A	0.10	B375614	<0.10	N/A	0.10	B375770
Dissolved Potassium (K)	mg/L	N/A	N/A	0.30	B375614	4.0	+/- <RDL	0.30	B375770
Dissolved Selenium (Se)	mg/L	N/A	N/A	0.00020	B375737	<0.00020	N/A	0.00020	B376819
Dissolved Silicon (Si)	mg/L	N/A	N/A	0.50	B375614	3.2	+/- 0.60	0.50	B375770
Dissolved Silver (Ag)	mg/L	N/A	N/A	0.00010	B375737	<0.00010	N/A	0.00010	B376819
Dissolved Sodium (Na)	mg/L	N/A	N/A	0.50	B375614	460	+/- 45	0.50	B375770
Dissolved Strontium (Sr)	mg/L	N/A	N/A	0.020	B375614	1.0	+/- 0.098	0.020	B375770
Dissolved Sulphur (S)	mg/L	N/A	N/A	0.20	B375614	260	+/- 18	0.20	B375770
Dissolved Thallium (Tl)	mg/L	N/A	N/A	0.00020	B375737	<0.00020	N/A	0.00020	B376819
Dissolved Tin (Sn)	mg/L	N/A	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B376819
Dissolved Titanium (Ti)	mg/L	N/A	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B376819
Dissolved Uranium (U)	mg/L	N/A	N/A	0.00010	B375737	<0.00010	N/A	0.00010	B376819
Dissolved Vanadium (V)	mg/L	N/A	N/A	0.0010	B375737	<0.0010	N/A	0.0010	B376819
Dissolved Zinc (Zn)	mg/L	N/A	N/A	0.0030	B375737	<0.0030	N/A	0.0030	B376819

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNT053				CNT054			
Sampling Date		2024/05/17 11:31				2024/05/17 11:42			
COC Number		1OF1				1OF1			
	UNITS	SR24-04	MU	RDL	QC Batch	SR24-05	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	25	N/A	N/A	B373264	0.0000	N/A	N/A	B373264
Cation Sum	meq/L	24	N/A	N/A	B373264	0.0030	N/A	N/A	B373264
Hardness (CaCO3)	mg/L	200	N/A	0.50	B373242	<0.50	N/A	0.50	B373242
Ion Balance (% Difference)	%	2.6	N/A	N/A	B373244	NC	N/A	N/A	B373244
Nitrate (N)	mg/L	<0.050	N/A	0.050	B373160	<0.010	N/A	0.010	B373160
Nitrate (NO3)	mg/L	<0.22	N/A	0.22	B374871	<0.044	N/A	0.044	B374871
Nitrite (NO2)	mg/L	<0.033	N/A	0.033	B374871	<0.033	N/A	0.033	B374871
Calculated Total Dissolved Solids	mg/L	1600	N/A	25	B373265	<10	N/A	10	B373265
Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	B373232	<0.020	N/A	0.020	B373232
Misc. Inorganics									
Conductivity	uS/cm	2200	+/- 58	2.0	B375859	<2.0	N/A	2.0	B375948
pH	pH	8.30	+/- 0.0823	N/A	B375858	5.47	+/- 0.0543	N/A	B379768
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	B375856	<1.0	N/A	1.0	B379767
Alkalinity (Total as CaCO3)	mg/L	290	+/- 21	1.0	B375856	<1.0	N/A	1.0	B379767
Bicarbonate (HCO3)	mg/L	350	+/- 5.5	1.0	B375856	<1.0	N/A	1.0	B379767
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	B375856	<1.0	N/A	1.0	B379767
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	B375856	<1.0	N/A	1.0	B379767
Chloride (Cl)	mg/L	<1.0	N/A	1.0	B375671	<1.0	N/A	1.0	B375762
Sulphate (SO4)	mg/L	930	+/- 59	25	B375671	<1.0	N/A	1.0	B375762
Nutrients									
Nitrite (N)	mg/L	<0.010	N/A	0.010	B375753	<0.010	N/A	0.010	B375753
Nitrate plus Nitrite (N)	mg/L	<0.050 (1)	N/A	0.050	B375753	<0.010	N/A	0.010	B375753
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	B376819	<0.0030	N/A	0.0030	B376819
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	B376819	<0.00060	N/A	0.00060	B376819
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	0.00020	B376819	<0.00020	N/A	0.00020	B376819
Dissolved Barium (Ba)	mg/L	<0.010	N/A	0.010	B375770	<0.010	N/A	0.010	B375770
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	B376819	<0.0010	N/A	0.0010	B376819
Dissolved Boron (B)	mg/L	0.12	+/- <RDL	0.020	B375770	<0.020	N/A	0.020	B375770

RDL = Reportable Detection Limit
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(1) Detection limits raised due to matrix interference.

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNT053				CNT054			
Sampling Date		2024/05/17 11:31				2024/05/17 11:42			
COC Number		1OF1				1OF1			
	UNITS	SR24-04	MU	RDL	QC Batch	SR24-05	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	52	+/- 5.3	0.30	B375770	<0.30	N/A	0.30	B375770
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	B376819	<0.0010	N/A	0.0010	B376819
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	B376819	<0.00030	N/A	0.00030	B376819
Dissolved Copper (Cu)	mg/L	<0.0010	N/A	0.0010	B376819	<0.0010	N/A	0.0010	B376819
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	B375770	<0.060	N/A	0.060	B375770
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	B376819	<0.00020	N/A	0.00020	B376819
Dissolved Lithium (Li)	mg/L	0.064	+/- <RDL	0.020	B375770	<0.020	N/A	0.020	B375770
Dissolved Magnesium (Mg)	mg/L	16	+/- 1.1	0.20	B375770	<0.20	N/A	0.20	B375770
Dissolved Manganese (Mn)	mg/L	0.077	+/- 0.0054	0.0040	B375770	<0.0040	N/A	0.0040	B375770
Dissolved Molybdenum (Mo)	mg/L	0.0024	+/- 0.00064	0.00020	B376819	0.00032	+/- 0.00024	0.00020	B376819
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	0.00050	B376819	<0.00050	N/A	0.00050	B376819
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	B375770	<0.10	N/A	0.10	B375770
Dissolved Potassium (K)	mg/L	4.0	+/- <RDL	0.30	B375770	<0.30	N/A	0.30	B375770
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	B376819	<0.00020	N/A	0.00020	B376819
Dissolved Silicon (Si)	mg/L	3.2	+/- 0.62	0.50	B375770	<0.50	N/A	0.50	B375770
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	B376819	<0.00010	N/A	0.00010	B376819
Dissolved Sodium (Na)	mg/L	450	+/- 44	0.50	B375770	<0.50	N/A	0.50	B375770
Dissolved Strontium (Sr)	mg/L	1.0	+/- 0.098	0.020	B375770	<0.020	N/A	0.020	B375770
Dissolved Sulphur (S)	mg/L	270	+/- 18	0.20	B375770	<0.20	N/A	0.20	B375770
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	B376819	<0.00020	N/A	0.00020	B376819
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	B376819	<0.0010	N/A	0.0010	B376819
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	B376819	<0.0010	N/A	0.0010	B376819
Dissolved Uranium (U)	mg/L	<0.00010	N/A	0.00010	B376819	<0.00010	N/A	0.00010	B376819
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	B376819	<0.0010	N/A	0.0010	B376819
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	B376819	<0.0030	N/A	0.0030	B376819

RDL = Reportable Detection Limit
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N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNT054			CNT055		CNT055			
Sampling Date		2024/05/17 11:42			2024/05/17 11:48		2024/05/17 11:48			
COC Number		1OF1			1OF1		1OF1			
	UNITS	SR24-05 Lab-Dup	MU	QC Batch	SR24-06	MU	SR24-06 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	N/A	N/A	B373264	0.029	N/A	N/A	N/A	N/A	B373264
Cation Sum	meq/L	N/A	N/A	B373264	0.0010	N/A	N/A	N/A	N/A	B373264
Hardness (CaCO3)	mg/L	N/A	N/A	B373242	<0.50	N/A	N/A	N/A	0.50	B373242
Ion Balance (% Difference)	%	N/A	N/A	B373244	NC	N/A	N/A	N/A	N/A	B373244
Nitrate (N)	mg/L	N/A	N/A	B373160	0.011	N/A	N/A	N/A	0.010	B373160
Nitrate (NO3)	mg/L	N/A	N/A	B374871	0.047	N/A	N/A	N/A	0.044	B374871
Nitrite (NO2)	mg/L	N/A	N/A	B374871	<0.033	N/A	N/A	N/A	0.033	B374871
Calculated Total Dissolved Solids	mg/L	N/A	N/A	B373265	<10	N/A	N/A	N/A	10	B373265
Elements										
Dissolved Cadmium (Cd)	ug/L	N/A	N/A	B373232	<0.020	N/A	N/A	N/A	0.020	B373232
Misc. Inorganics										
Conductivity	uS/cm	N/A	N/A	B375948	<2.0	N/A	N/A	N/A	2.0	B375859
pH	pH	5.45	+/- 0.0540	B379768	6.17	+/- 0.0611	N/A	N/A	N/A	B375858
Anions										
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	B379767	<1.0	N/A	N/A	N/A	1.0	B375856
Alkalinity (Total as CaCO3)	mg/L	<1.0	N/A	B379767	1.4	+/- <RDL	N/A	N/A	1.0	B375856
Bicarbonate (HCO3)	mg/L	<1.0	N/A	B379767	1.8	+/- 1.0	N/A	N/A	1.0	B375856
Carbonate (CO3)	mg/L	<1.0	N/A	B379767	<1.0	N/A	N/A	N/A	1.0	B375856
Hydroxide (OH)	mg/L	<1.0	N/A	B379767	<1.0	N/A	N/A	N/A	1.0	B375856
Chloride (Cl)	mg/L	N/A	N/A	B375762	<1.0	N/A	N/A	N/A	1.0	B375671
Sulphate (SO4)	mg/L	N/A	N/A	B375762	<1.0	N/A	N/A	N/A	1.0	B375671
Nutrients										
Nitrite (N)	mg/L	N/A	N/A	B375753	<0.010	N/A	N/A	N/A	0.010	B379557
Nitrate plus Nitrite (N)	mg/L	N/A	N/A	B375753	0.011	+/- 0.012	N/A	N/A	0.010	B379557
Lab Filtered Elements										
Dissolved Aluminum (Al)	mg/L	N/A	N/A	B376819	<0.0030	N/A	<0.0030	N/A	0.0030	B376819
Dissolved Antimony (Sb)	mg/L	N/A	N/A	B376819	<0.00060	N/A	<0.00060	N/A	0.00060	B376819
Dissolved Arsenic (As)	mg/L	N/A	N/A	B376819	<0.00020	N/A	<0.00020	N/A	0.00020	B376819
Dissolved Barium (Ba)	mg/L	N/A	N/A	B375770	<0.010	N/A	N/A	N/A	0.010	B375770
Dissolved Beryllium (Be)	mg/L	N/A	N/A	B376819	<0.0010	N/A	<0.0010	N/A	0.0010	B376819
Dissolved Boron (B)	mg/L	N/A	N/A	B375770	<0.020	N/A	N/A	N/A	0.020	B375770

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MU = Measurement Uncertainty
N/A = Not Applicable

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ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Bureau Veritas ID		CNT054			CNT055		CNT055			
Sampling Date		2024/05/17 11:42			2024/05/17 11:48		2024/05/17 11:48			
COC Number		1OF1			1OF1		1OF1			
	UNITS	SR24-05 Lab-Dup	MU	QC Batch	SR24-06	MU	SR24-06 Lab-Dup	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	N/A	N/A	B375770	<0.30	N/A	N/A	N/A	0.30	B375770
Dissolved Chromium (Cr)	mg/L	N/A	N/A	B376819	<0.0010	N/A	<0.0010	N/A	0.0010	B376819
Dissolved Cobalt (Co)	mg/L	N/A	N/A	B376819	<0.00030	N/A	<0.00030	N/A	0.00030	B376819
Dissolved Copper (Cu)	mg/L	N/A	N/A	B376819	<0.0010	N/A	<0.0010	N/A	0.0010	B376819
Dissolved Iron (Fe)	mg/L	N/A	N/A	B375770	<0.060	N/A	N/A	N/A	0.060	B375770
Dissolved Lead (Pb)	mg/L	N/A	N/A	B376819	<0.00020	N/A	<0.00020	N/A	0.00020	B376819
Dissolved Lithium (Li)	mg/L	N/A	N/A	B375770	<0.020	N/A	N/A	N/A	0.020	B375770
Dissolved Magnesium (Mg)	mg/L	N/A	N/A	B375770	<0.20	N/A	N/A	N/A	0.20	B375770
Dissolved Manganese (Mn)	mg/L	N/A	N/A	B375770	<0.0040	N/A	N/A	N/A	0.0040	B375770
Dissolved Molybdenum (Mo)	mg/L	N/A	N/A	B376819	<0.00020	N/A	<0.00020	N/A	0.00020	B376819
Dissolved Nickel (Ni)	mg/L	N/A	N/A	B376819	<0.00050	N/A	<0.00050	N/A	0.00050	B376819
Dissolved Phosphorus (P)	mg/L	N/A	N/A	B375770	<0.10	N/A	N/A	N/A	0.10	B375770
Dissolved Potassium (K)	mg/L	N/A	N/A	B375770	<0.30	N/A	N/A	N/A	0.30	B375770
Dissolved Selenium (Se)	mg/L	N/A	N/A	B376819	<0.00020	N/A	<0.00020	N/A	0.00020	B376819
Dissolved Silicon (Si)	mg/L	N/A	N/A	B375770	<0.50	N/A	N/A	N/A	0.50	B375770
Dissolved Silver (Ag)	mg/L	N/A	N/A	B376819	<0.00010	N/A	<0.00010	N/A	0.00010	B376819
Dissolved Sodium (Na)	mg/L	N/A	N/A	B375770	<0.50	N/A	N/A	N/A	0.50	B375770
Dissolved Strontium (Sr)	mg/L	N/A	N/A	B375770	<0.020	N/A	N/A	N/A	0.020	B375770
Dissolved Sulphur (S)	mg/L	N/A	N/A	B375770	<0.20	N/A	N/A	N/A	0.20	B375770
Dissolved Thallium (Tl)	mg/L	N/A	N/A	B376819	<0.00020	N/A	<0.00020	N/A	0.00020	B376819
Dissolved Tin (Sn)	mg/L	N/A	N/A	B376819	<0.0010	N/A	<0.0010	N/A	0.0010	B376819
Dissolved Titanium (Ti)	mg/L	N/A	N/A	B376819	<0.0010	N/A	<0.0010	N/A	0.0010	B376819
Dissolved Uranium (U)	mg/L	N/A	N/A	B376819	<0.00010	N/A	<0.00010	N/A	0.00010	B376819
Dissolved Vanadium (V)	mg/L	N/A	N/A	B376819	<0.0010	N/A	<0.0010	N/A	0.0010	B376819
Dissolved Zinc (Zn)	mg/L	N/A	N/A	B376819	<0.0030	N/A	<0.0030	N/A	0.0030	B376819

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TOTAL KJELDAHL NITROGEN (TOTAL)

Bureau Veritas ID		CNT049				CNT050		CNT050			
Sampling Date		2024/05/17 09:17				2024/05/17 09:24		2024/05/17 09:24			
COC Number		1OF1				1OF1		1OF1			
	UNITS	MW16-8-8	MU	RDL	QC Batch	MW16-8-19	MU	MW16-8-19 Lab-Dup	MU	RDL	QC Batch
Calculated Parameters											
Total Kjeldahl Nitrogen (Calc)	mg/L	0.83	N/A	0.20	B374867	<0.020	N/A	N/A	N/A	0.020	B374867
Nutrients											
Total Nitrogen (N)	mg/L	1.4 (1)	+/- 0.21	0.20	B376665	0.49	+/- 0.082	0.50	+/- 0.084	0.020	B376660

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CNT051			CNT052			CNT053			
Sampling Date		2024/05/17 11:23			2024/05/17 10:54			2024/05/17 11:31			
COC Number		1OF1			1OF1			1OF1			
	UNITS	MW16-6-11	MU	RDL	MW16-6-20	MU	QC Batch	SR24-04	MU	RDL	QC Batch
Calculated Parameters											
Total Kjeldahl Nitrogen (Calc)	mg/L	1.42	N/A	0.20	1.22	N/A	B374867	1.27	N/A	0.050	B374867
Nutrients											
Total Nitrogen (N)	mg/L	1.4 (1)	+/- 0.22	0.20	1.2	+/- 0.18	B376665	1.3	+/- 0.19	0.020	B376660

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CNT054			CNT055			
Sampling Date		2024/05/17 11:42			2024/05/17 11:48			
COC Number		1OF1			1OF1			
	UNITS	SR24-05	MU	QC Batch	SR24-06	MU	RDL	QC Batch
Calculated Parameters								
Total Kjeldahl Nitrogen (Calc)	mg/L	<0.020	N/A	B374867	<0.020	N/A	0.020	B374872
Nutrients								
Total Nitrogen (N)	mg/L	<0.020	N/A	B376665	<0.020 (1)	N/A	0.020	B376665

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Nitrogen < Nitrate: Both values fall within the method uncertainty for duplicates and are likely equivalent.

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNT049				CNT050		CNT050			
Sampling Date		2024/05/17 09:17				2024/05/17 09:24		2024/05/17 09:24			
COC Number		1OF1				1OF1		1OF1			
	UNITS	MW16-8-8	MU	RDL	QC Batch	MW16-8-19	MU	MW16-8-19 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Inorganics											
Dissolved Organic Carbon (C)	mg/L	2.0 (1)	+/- <RDL	0.50	B378347	1.4 (1)	+/- <RDL	N/A	N/A	0.50	B378347
Microbiological Param.											
E.Coli DST	MPN/100mL	<100 (2)	N/A	100	B373722	<1.0	N/A	N/A	N/A	1.0	B373722
Fecal Coliforms	MPN/100mL	<100 (2)	N/A	100	B373948	<1.0	N/A	N/A	N/A	1.0	B373948
Heterotrophic DST	MPN/100mL	>12000 (2)	N/A	5.0	B373708	1200	N/A	1300	N/A	1.0	B373708
Total Coliforms DST	MPN/100mL	1900 (2)	N/A	100	B373722	<1.0	N/A	N/A	N/A	1.0	B373722
Nutrients											
Total Ammonia (N)	mg/L	<0.015	N/A	0.015	B376915	<0.015	N/A	N/A	N/A	0.015	B376915
Orthophosphate (P)	mg/L	<0.0030	N/A	0.0030	B375918	<0.0030	N/A	<0.0030	N/A	0.0030	B375925
Lab Filtered Nutrients											
Dissolved Phosphorus (P)	mg/L	<0.0030 (1)	N/A	0.0030	B376821	<0.0030 (1)	N/A	N/A	N/A	0.0030	B376822

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Sample filtered and preserved past method specified hold time
(2) Detection limit raised due to matrix interference.

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNT051			CNT052		CNT052			
Sampling Date		2024/05/17 11:23			2024/05/17 10:54		2024/05/17 10:54			
COC Number		1OF1			1OF1		1OF1			
	UNITS	MW16-6-11	MU	RDL	MW16-6-20	MU	MW16-6-20 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	2.9 (1)	+/- 0.52	0.50	2.2 (1)	+/- <RDL	N/A	N/A	0.50	B378347
Microbiological Param.										
E.Coli DST	MPN/100mL	<100 (2)	N/A	100	<1.0	N/A	<1.0	N/A	1.0	B373722
Fecal Coliforms	MPN/100mL	<100 (2)	N/A	100	<1.0	N/A	N/A	N/A	1.0	B373948
Heterotrophic DST	MPN/100mL	>12000 (2)	N/A	5.0	1600	N/A	N/A	N/A	1.0	B373708
Total Coliforms DST	MPN/100mL	1500 (2)	N/A	100	<1.0	N/A	<1.0	N/A	1.0	B373722
Nutrients										
Total Ammonia (N)	mg/L	0.29	+/- 0.033	0.015	1.1	+/- 0.12	N/A	N/A	0.015	B376915
Orthophosphate (P)	mg/L	<0.0030	N/A	0.0030	<0.0030	N/A	<0.0030	N/A	0.0030	B375918
Lab Filtered Nutrients										
Dissolved Phosphorus (P)	mg/L	<0.0030 (1)	N/A	0.0030	<0.0030 (1)	N/A	N/A	N/A	0.0030	B376822

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Sample filtered and preserved past method specified hold time
(2) Detection limit raised due to matrix interference.

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNT053		CNT053		CNT054			
Sampling Date		2024/05/17 11:31		2024/05/17 11:31		2024/05/17 11:42			
COC Number		1OF1		1OF1		1OF1			
	UNITS	SR24-04	MU	SR24-04 Lab-Dup	MU	SR24-05	MU	RDL	QC Batch
Lab Filtered Inorganics									
Dissolved Organic Carbon (C)	mg/L	2.2 (1)	+/- <RDL	N/A	N/A	<0.50 (1)	N/A	0.50	B378347
Microbiological Param.									
E.Coli DST	MPN/100mL	<1.0	N/A	N/A	N/A	<1.0	N/A	1.0	B373722
Fecal Coliforms	MPN/100mL	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	B373948
Heterotrophic DST	MPN/100mL	1700	N/A	N/A	N/A	<1.0	N/A	1.0	B373708
Total Coliforms DST	MPN/100mL	<1.0	N/A	N/A	N/A	<1.0	N/A	1.0	B373722
Nutrients									
Total Ammonia (N)	mg/L	1.1	+/- 0.12	N/A	N/A	<0.015	N/A	0.015	B376915
Orthophosphate (P)	mg/L	<0.0030	N/A	N/A	N/A	<0.0030	N/A	0.0030	B375918
Lab Filtered Nutrients									
Dissolved Phosphorus (P)	mg/L	<0.0030 (1)	N/A	N/A	N/A	<0.0030 (1)	N/A	0.0030	B376821

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Sample filtered and preserved past method specified hold time

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		CNT055		CNT055			
Sampling Date		2024/05/17 11:48		2024/05/17 11:48			
COC Number		1OF1		1OF1			
	UNITS	SR24-06	MU	SR24-06 Lab-Dup	MU	RDL	QC Batch
Lab Filtered Inorganics							
Dissolved Organic Carbon (C)	mg/L	<0.50 (1)	N/A	N/A	N/A	0.50	B378347
Microbiological Param.							
E.Coli DST	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B373722
Fecal Coliforms	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B373948
Heterotrophic DST	MPN/100mL	>2400	N/A	N/A	N/A	1.0	B373708
Total Coliforms DST	MPN/100mL	<1.0	N/A	N/A	N/A	1.0	B373722
Nutrients							
Total Ammonia (N)	mg/L	<0.015	N/A	<0.015	N/A	0.015	B376915
Orthophosphate (P)	mg/L	<0.0030	N/A	N/A	N/A	0.0030	B375918
Lab Filtered Nutrients							
Dissolved Phosphorus (P)	mg/L	<0.0030 (1)	N/A	N/A	N/A	0.0030	B376822

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Sample filtered and preserved past method specified hold time

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MERCURY BY COLD VAPOR (WATER)

Bureau Veritas ID		CNT049			CNT050		CNT050			
Sampling Date		2024/05/17 09:17			2024/05/17 09:24		2024/05/17 09:24			
COC Number		1OF1			1OF1		1OF1			
	UNITS	MW16-8-8	MU	RDL	MW16-8-19	MU	MW16-8-19 Lab-Dup	MU	RDL	QC Batch
Elements										
Total Mercury (Hg)	ug/L	0.289 (1)	+/- 0.049	0.019	<0.0019	N/A	N/A	N/A	0.0019	B375532
Lab Filtered Elements										
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	<0.0019	N/A	<0.0019	N/A	0.0019	B375657

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CNT051			CNT052			CNT053			
Sampling Date		2024/05/17 11:23			2024/05/17 10:54			2024/05/17 11:31			
COC Number		1OF1			1OF1			1OF1			
	UNITS	MW16-6-11	MU	RDL	MW16-6-20	MU	QC Batch	SR24-04	MU	RDL	QC Batch
Elements											
Total Mercury (Hg)	ug/L	0.30 (1)	+/- <RDL	0.19	<0.0019	N/A	B375532	<0.0019	N/A	0.0019	B375582
Lab Filtered Elements											
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	0.0019	<0.0019	N/A	B375657	<0.0019	N/A	0.0019	B375657

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas ID		CNT054			CNT055			
Sampling Date		2024/05/17 11:42			2024/05/17 11:48			
COC Number		1OF1			1OF1			
	UNITS	SR24-05	MU	QC Batch	SR24-06	MU	RDL	QC Batch
Elements								
Total Mercury (Hg)	ug/L	<0.0019	N/A	B375532	<0.0019	N/A	0.0019	B375582
Lab Filtered Elements								
Dissolved Mercury (Hg)	ug/L	<0.0019	N/A	B375657	<0.0019	N/A	0.0019	B375657

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	3.5°C
Package 2	2.3°C

Sample CNT049 [MW16-8-8] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes. NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CNT050 [MW16-8-19] : NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes. Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CNT051 [MW16-6-11] : NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes. Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CNT052 [MW16-6-20] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes. NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CNT053 [SR24-04] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes. NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CNT054 [SR24-05] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes. NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes.

Sample CNT055 [SR24-06] : Orthophosphate by Automated Analyzer completed within five days of sampling. Data is satisfactory for compliance purposes. NO2 (N); NO2 (N) + NO3 (N) in Water completed within five days of sampling. Data is satisfactory for compliance purposes. Sample was analyzed past method specified hold time for NO2 (N); NO2 (N) + NO3 (N) in Water. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

ROUTINE + DISS. REG. METALS – LAB FILT (WATER) Comments

Sample CNT055 [SR24-06] NO2 (N); NO2 (N) + NO3 (N) in Water: Sample was originally processed within hold time. Data quality required investigation. Re-analysis was completed past recommended hold time.

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B373708	SOG	Method Blank	Heterotrophic DST	2024/05/20	<1.0		mpn/100mL	
B373708	SOG	RPD [CNT050-01]	Heterotrophic DST	2024/05/20	7.7		%	N/A
B373712	RSA	Matrix Spike	1,4-Difluorobenzene (sur.)	2024/05/22		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/22		95	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/22		81	%	50 - 140
			Benzene	2024/05/22		83	%	50 - 140
			Toluene	2024/05/22		86	%	50 - 140
			Ethylbenzene	2024/05/22		87	%	50 - 140
			m & p-Xylene	2024/05/22		83	%	50 - 140
			o-Xylene	2024/05/22		85	%	50 - 140
			F1 (C6-C10)	2024/05/22		92	%	60 - 140
B373712	RSA	Spiked Blank	1,4-Difluorobenzene (sur.)	2024/05/22		95	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/22		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/22		83	%	50 - 140
			Benzene	2024/05/22		86	%	60 - 130
			Toluene	2024/05/22		87	%	60 - 130
			Ethylbenzene	2024/05/22		90	%	60 - 130
			m & p-Xylene	2024/05/22		86	%	60 - 130
			o-Xylene	2024/05/22		87	%	60 - 130
			F1 (C6-C10)	2024/05/22		102	%	60 - 140
B373712	RSA	Method Blank	1,4-Difluorobenzene (sur.)	2024/05/22		94	%	50 - 140
			4-Bromofluorobenzene (sur.)	2024/05/22		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2024/05/22		74	%	50 - 140
			Benzene	2024/05/22	<0.00040		mg/L	
			Toluene	2024/05/22	<0.00040		mg/L	
			Ethylbenzene	2024/05/22	<0.00040		mg/L	
			m & p-Xylene	2024/05/22	<0.00080		mg/L	
			o-Xylene	2024/05/22	<0.00040		mg/L	
			F1 (C6-C10)	2024/05/22	<0.10		mg/L	
B373712	RSA	RPD	Benzene	2024/05/22	NC		%	30
			Toluene	2024/05/22	NC		%	30
			Ethylbenzene	2024/05/22	NC		%	30
			m & p-Xylene	2024/05/22	NC		%	30
			o-Xylene	2024/05/22	NC		%	30
			F1 (C6-C10)	2024/05/22	NC		%	30
B373722	SOG	Method Blank	E.Coli DST	2024/05/19	<1.0		mpn/100mL	
			Total Coliforms DST	2024/05/19	<1.0		mpn/100mL	
B373722	SOG	RPD [CNT052-01]	E.Coli DST	2024/05/19	NC		%	N/A
			Total Coliforms DST	2024/05/19	NC		%	N/A
B373948	SOG	Method Blank	Fecal Coliforms	2024/05/19	<1.0		MPN/100mL	
B373948	SOG	RPD [CNT053-01]	Fecal Coliforms	2024/05/19	NC		%	N/A
B374177	GG3	Spiked Blank	O-TERPHENYL (sur.)	2024/05/21		102	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/21		99	%	60 - 140
B374177	GG3	Method Blank	O-TERPHENYL (sur.)	2024/05/22		105	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2024/05/22	<0.10		mg/L	
B375216	AFI	Matrix Spike	Nitrite (N)	2024/05/21		108	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/21		131 (1)	%	80 - 120
B375216	AFI	Spiked Blank	Nitrite (N)	2024/05/21		102	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/21		99	%	80 - 120
B375216	AFI	Method Blank	Nitrite (N)	2024/05/21	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/21	<0.010		mg/L	
B375216	AFI	RPD	Nitrite (N)	2024/05/21	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/21	NC		%	20
B375532	KHU	Matrix Spike	Total Mercury (Hg)	2024/05/22		89	%	80 - 120
B375532	KHU	Spiked Blank	Total Mercury (Hg)	2024/05/22		99	%	80 - 120

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B375532	KHU	Method Blank	Total Mercury (Hg)	2024/05/22	<0.0019		ug/L	
B375532	KHU	RPD	Total Mercury (Hg)	2024/05/22	NC		%	20
B375582	KHU	Matrix Spike	Total Mercury (Hg)	2024/05/22		98	%	80 - 120
B375582	KHU	Spiked Blank	Total Mercury (Hg)	2024/05/22		100	%	80 - 120
B375582	KHU	Method Blank	Total Mercury (Hg)	2024/05/22	<0.0019		ug/L	
B375582	KHU	RPD	Total Mercury (Hg)	2024/05/22	NC		%	20
B375614	HQV	Matrix Spike	Dissolved Barium (Ba)	2024/05/22		80	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/22		NC	%	80 - 120
			Dissolved Iron (Fe)	2024/05/22		69 (1)	%	80 - 120
			Dissolved Lithium (Li)	2024/05/22		96	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/22		NC	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/22		91	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/22		90	%	80 - 120
			Dissolved Potassium (K)	2024/05/22		101	%	80 - 120
			Dissolved Sodium (Na)	2024/05/22		NC	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/22		NC	%	80 - 120
			Dissolved Sulphur (S)	2024/05/22		NC	%	80 - 120
B375614	HQV	Spiked Blank	Dissolved Barium (Ba)	2024/05/22		94	%	80 - 120
			Dissolved Boron (B)	2024/05/22		100	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/22		97	%	80 - 120
			Dissolved Iron (Fe)	2024/05/22		103	%	80 - 120
			Dissolved Lithium (Li)	2024/05/22		94	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/22		97	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/22		103	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/22		96	%	80 - 120
			Dissolved Potassium (K)	2024/05/22		99	%	80 - 120
			Dissolved Silicon (Si)	2024/05/22		97	%	80 - 120
			Dissolved Sodium (Na)	2024/05/22		98	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/22		92	%	80 - 120
			Dissolved Sulphur (S)	2024/05/22		97	%	80 - 120
B375614	HQV	Method Blank	Dissolved Barium (Ba)	2024/05/22	<0.010		mg/L	
			Dissolved Boron (B)	2024/05/22	<0.020		mg/L	
			Dissolved Calcium (Ca)	2024/05/22	<0.30		mg/L	
			Dissolved Iron (Fe)	2024/05/22	<0.060		mg/L	
			Dissolved Lithium (Li)	2024/05/22	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2024/05/22	<0.20		mg/L	
			Dissolved Manganese (Mn)	2024/05/22	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2024/05/22	<0.10		mg/L	
			Dissolved Potassium (K)	2024/05/22	<0.30		mg/L	
			Dissolved Silicon (Si)	2024/05/22	<0.50		mg/L	
			Dissolved Sodium (Na)	2024/05/22	<0.50		mg/L	
			Dissolved Strontium (Sr)	2024/05/22	<0.020		mg/L	
			Dissolved Sulphur (S)	2024/05/22	<0.20		mg/L	
B375614	HQV	RPD	Dissolved Calcium (Ca)	2024/05/23	1.0		%	20
			Dissolved Iron (Fe)	2024/05/23	NC		%	20
			Dissolved Magnesium (Mg)	2024/05/23	1.7		%	20
			Dissolved Manganese (Mn)	2024/05/23	NC		%	20
			Dissolved Potassium (K)	2024/05/23	2.1		%	20
			Dissolved Sodium (Na)	2024/05/23	1.8		%	20
B375657	KHU	Matrix Spike [CNT051-06]	Dissolved Mercury (Hg)	2024/05/22		94	%	80 - 120
B375657	KHU	Spiked Blank	Dissolved Mercury (Hg)	2024/05/22		98	%	80 - 120
B375657	KHU	Method Blank	Dissolved Mercury (Hg)	2024/05/22	<0.0019		ug/L	
B375657	KHU	RPD [CNT050-06]	Dissolved Mercury (Hg)	2024/05/22	NC		%	20
B375658	TOR	Matrix Spike [CNT049-10]	Chloride (Cl)	2024/05/22		100	%	80 - 120
			Sulphate (SO4)	2024/05/22		NC	%	80 - 120

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B375658	TOR	Spiked Blank	Chloride (Cl)	2024/05/22		100	%	80 - 120
			Sulphate (SO4)	2024/05/22		104	%	80 - 120
B375658	TOR	Method Blank	Chloride (Cl)	2024/05/22	<1.0		mg/L	
			Sulphate (SO4)	2024/05/22	<1.0		mg/L	
B375658	TOR	RPD [CNT049-10]	Chloride (Cl)	2024/05/22	0.066		%	20
			Sulphate (SO4)	2024/05/22	1.8		%	20
B375671	TOR	Matrix Spike	Chloride (Cl)	2024/05/22		102	%	80 - 120
			Sulphate (SO4)	2024/05/22		107	%	80 - 120
B375671	TOR	Spiked Blank	Chloride (Cl)	2024/05/22		100	%	80 - 120
			Sulphate (SO4)	2024/05/22		103	%	80 - 120
B375671	TOR	Method Blank	Chloride (Cl)	2024/05/22	<1.0		mg/L	
			Sulphate (SO4)	2024/05/22	<1.0		mg/L	
B375671	TOR	RPD	Chloride (Cl)	2024/05/22	0.27		%	20
			Sulphate (SO4)	2024/05/22	1.7		%	20
B375737	KKC	Matrix Spike	Dissolved Aluminum (Al)	2024/05/23		123 (1)	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/23		116	%	80 - 120
			Dissolved Arsenic (As)	2024/05/23		119	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/23		119	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/23		102	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/23		102	%	80 - 120
			Dissolved Copper (Cu)	2024/05/23		99	%	80 - 120
			Dissolved Lead (Pb)	2024/05/23		119	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/23		86	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/23		115	%	80 - 120
			Dissolved Selenium (Se)	2024/05/23		116	%	80 - 120
			Dissolved Silver (Ag)	2024/05/23		120	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/23		119	%	80 - 120
			Dissolved Tin (Sn)	2024/05/23		118	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/23		120	%	80 - 120
			Dissolved Uranium (U)	2024/05/23		111	%	80 - 120
			Dissolved Vanadium (V)	2024/05/23		105	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/23		NC	%	80 - 120
B375737	KKC	Spiked Blank	Dissolved Aluminum (Al)	2024/05/23		109	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/23		96	%	80 - 120
			Dissolved Arsenic (As)	2024/05/23		96	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/23		100	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/23		97	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/23		98	%	80 - 120
			Dissolved Copper (Cu)	2024/05/23		99	%	80 - 120
			Dissolved Lead (Pb)	2024/05/23		97	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/23		101	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/23		99	%	80 - 120
			Dissolved Selenium (Se)	2024/05/23		95	%	80 - 120
			Dissolved Silver (Ag)	2024/05/23		96	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/23		96	%	80 - 120
			Dissolved Tin (Sn)	2024/05/23		93	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/23		99	%	80 - 120
			Dissolved Uranium (U)	2024/05/23		94	%	80 - 120
			Dissolved Vanadium (V)	2024/05/23		98	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/23		97	%	80 - 120
B375737	KKC	Method Blank	Dissolved Aluminum (Al)	2024/05/23	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2024/05/23	<0.00060		mg/L	
			Dissolved Arsenic (As)	2024/05/23	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2024/05/23	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2024/05/23	<0.0010		mg/L	

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			Dissolved Cobalt (Co)	2024/05/23	<0.00030		mg/L	
			Dissolved Copper (Cu)	2024/05/23	<0.0010		mg/L	
			Dissolved Lead (Pb)	2024/05/23	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2024/05/23	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2024/05/23	<0.00050		mg/L	
			Dissolved Selenium (Se)	2024/05/23	<0.00020		mg/L	
			Dissolved Silver (Ag)	2024/05/23	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2024/05/23	<0.00020		mg/L	
			Dissolved Tin (Sn)	2024/05/23	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2024/05/23	<0.0010		mg/L	
			Dissolved Uranium (U)	2024/05/23	<0.00010		mg/L	
			Dissolved Vanadium (V)	2024/05/23	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2024/05/23	<0.0030		mg/L	
B375737	KKC	RPD	Dissolved Aluminum (Al)	2024/05/23	9.1		%	20
			Dissolved Arsenic (As)	2024/05/23	14		%	20
			Dissolved Chromium (Cr)	2024/05/23	NC		%	20
			Dissolved Copper (Cu)	2024/05/23	1.8		%	20
			Dissolved Lead (Pb)	2024/05/23	NC		%	20
			Dissolved Nickel (Ni)	2024/05/23	3.9		%	20
B375743	TOR	Matrix Spike [CNT051-10]	Chloride (Cl)	2024/05/22		100	%	80 - 120
			Sulphate (SO4)	2024/05/22		NC	%	80 - 120
B375743	TOR	Spiked Blank	Chloride (Cl)	2024/05/22		104	%	80 - 120
			Sulphate (SO4)	2024/05/22		98	%	80 - 120
B375743	TOR	Method Blank	Chloride (Cl)	2024/05/22	<1.0		mg/L	
			Sulphate (SO4)	2024/05/22	<1.0		mg/L	
B375743	TOR	RPD [CNT051-10]	Chloride (Cl)	2024/05/22	2.3		%	20
			Sulphate (SO4)	2024/05/22	2.0		%	20
B375753	AFI	Matrix Spike	Nitrite (N)	2024/05/22		97	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/22		115	%	80 - 120
B375753	AFI	Spiked Blank	Nitrite (N)	2024/05/22		99	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/22		98	%	80 - 120
B375753	AFI	Method Blank	Nitrite (N)	2024/05/22	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/22	<0.010		mg/L	
B375753	AFI	RPD	Nitrite (N)	2024/05/22	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/22	3.6		%	20
B375762	TOR	Matrix Spike	Chloride (Cl)	2024/05/22		NC	%	80 - 120
			Sulphate (SO4)	2024/05/22		NC	%	80 - 120
B375762	TOR	Spiked Blank	Chloride (Cl)	2024/05/22		105	%	80 - 120
			Sulphate (SO4)	2024/05/22		101	%	80 - 120
B375762	TOR	Method Blank	Chloride (Cl)	2024/05/22	<1.0		mg/L	
			Sulphate (SO4)	2024/05/22	<1.0		mg/L	
B375762	TOR	RPD	Chloride (Cl)	2024/05/22	0.071		%	20
			Sulphate (SO4)	2024/05/22	2.5		%	20
B375770	HQV	Matrix Spike	Dissolved Barium (Ba)	2024/05/22		103	%	80 - 120
			Dissolved Boron (B)	2024/05/22		102	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/22		104	%	80 - 120
			Dissolved Iron (Fe)	2024/05/22		97	%	80 - 120
			Dissolved Lithium (Li)	2024/05/22		104	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/22		107	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/22		100	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/22		96	%	80 - 120
			Dissolved Potassium (K)	2024/05/22		110	%	80 - 120
			Dissolved Silicon (Si)	2024/05/22		88	%	80 - 120
			Dissolved Sodium (Na)	2024/05/22		109	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/22		100	%	80 - 120

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			Dissolved Sulphur (S)	2024/05/22		93	%	80 - 120
B375770	HQV	Spiked Blank	Dissolved Barium (Ba)	2024/05/22		94	%	80 - 120
			Dissolved Boron (B)	2024/05/22		100	%	80 - 120
			Dissolved Calcium (Ca)	2024/05/22		95	%	80 - 120
			Dissolved Iron (Fe)	2024/05/22		106	%	80 - 120
			Dissolved Lithium (Li)	2024/05/22		93	%	80 - 120
			Dissolved Magnesium (Mg)	2024/05/22		95	%	80 - 120
			Dissolved Manganese (Mn)	2024/05/22		101	%	80 - 120
			Dissolved Phosphorus (P)	2024/05/22		95	%	80 - 120
			Dissolved Potassium (K)	2024/05/22		98	%	80 - 120
			Dissolved Silicon (Si)	2024/05/22		95	%	80 - 120
			Dissolved Sodium (Na)	2024/05/22		96	%	80 - 120
			Dissolved Strontium (Sr)	2024/05/22		93	%	80 - 120
			Dissolved Sulphur (S)	2024/05/22		95	%	80 - 120
B375770	HQV	Method Blank	Dissolved Barium (Ba)	2024/05/22	<0.010		mg/L	
			Dissolved Boron (B)	2024/05/22	<0.020		mg/L	
			Dissolved Calcium (Ca)	2024/05/22	<0.30		mg/L	
			Dissolved Iron (Fe)	2024/05/22	<0.060		mg/L	
			Dissolved Lithium (Li)	2024/05/22	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2024/05/22	<0.20		mg/L	
			Dissolved Manganese (Mn)	2024/05/22	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2024/05/22	<0.10		mg/L	
			Dissolved Potassium (K)	2024/05/22	<0.30		mg/L	
			Dissolved Silicon (Si)	2024/05/22	<0.50		mg/L	
			Dissolved Sodium (Na)	2024/05/22	<0.50		mg/L	
			Dissolved Strontium (Sr)	2024/05/22	<0.020		mg/L	
			Dissolved Sulphur (S)	2024/05/22	<0.20		mg/L	
B375770	HQV	RPD	Dissolved Barium (Ba)	2024/05/22	2.2		%	20
			Dissolved Boron (B)	2024/05/22	NC		%	20
			Dissolved Calcium (Ca)	2024/05/22	1.5		%	20
			Dissolved Iron (Fe)	2024/05/22	NC		%	20
			Dissolved Lithium (Li)	2024/05/22	NC		%	20
			Dissolved Magnesium (Mg)	2024/05/22	2.1		%	20
			Dissolved Manganese (Mn)	2024/05/22	NC		%	20
			Dissolved Phosphorus (P)	2024/05/22	NC		%	20
			Dissolved Potassium (K)	2024/05/22	4.1		%	20
			Dissolved Silicon (Si)	2024/05/22	4.7		%	20
			Dissolved Sodium (Na)	2024/05/22	1.2		%	20
			Dissolved Strontium (Sr)	2024/05/22	3.0		%	20
			Dissolved Sulphur (S)	2024/05/22	2.5		%	20
B375856	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/24		97	%	80 - 120
B375856	JVM	Method Blank	Alkalinity (PP as CaCO3)	2024/05/24	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/24	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/24	<1.0		mg/L	
			Carbonate (CO3)	2024/05/24	<1.0		mg/L	
			Hydroxide (OH)	2024/05/24	<1.0		mg/L	
B375856	JVM	RPD	Alkalinity (PP as CaCO3)	2024/05/24	10		%	20
			Alkalinity (Total as CaCO3)	2024/05/24	2.9		%	20
			Bicarbonate (HCO3)	2024/05/24	3.1		%	20
			Carbonate (CO3)	2024/05/24	10		%	20
			Hydroxide (OH)	2024/05/24	NC		%	20
B375858	JVM	Spiked Blank	pH	2024/05/24		100	%	97 - 103
B375858	JVM	RPD	pH	2024/05/24	0.11		%	N/A
B375859	JVM	Spiked Blank	Conductivity	2024/05/24		102	%	90 - 110
B375859	JVM	Method Blank	Conductivity	2024/05/24	<2.0		uS/cm	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B375859	JVM	RPD	Conductivity	2024/05/24	0.12		%	10
B375893	A5S	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/24		98	%	80 - 120
B375893	A5S	Method Blank	Alkalinity (PP as CaCO3)	2024/05/24	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/24	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/24	<1.0		mg/L	
			Carbonate (CO3)	2024/05/24	<1.0		mg/L	
			Hydroxide (OH)	2024/05/24	<1.0		mg/L	
B375893	A5S	RPD	Alkalinity (PP as CaCO3)	2024/05/24	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/24	0.52		%	20
			Bicarbonate (HCO3)	2024/05/24	0.52		%	20
			Carbonate (CO3)	2024/05/24	NC		%	20
			Hydroxide (OH)	2024/05/24	NC		%	20
B375899	A5S	Spiked Blank	pH	2024/05/24		100	%	97 - 103
B375899	A5S	RPD	pH	2024/05/24	0.14		%	N/A
B375900	A5S	Spiked Blank	Conductivity	2024/05/24		101	%	90 - 110
B375900	A5S	Method Blank	Conductivity	2024/05/24	<2.0		uS/cm	
B375900	A5S	RPD	Conductivity	2024/05/24	0.42		%	10
B375918	YL7	Matrix Spike [CNT052-10]	Orthophosphate (P)	2024/05/22		104	%	80 - 120
B375918	YL7	Spiked Blank	Orthophosphate (P)	2024/05/22		93	%	80 - 120
B375918	YL7	Method Blank	Orthophosphate (P)	2024/05/22	<0.0030		mg/L	
B375918	YL7	RPD [CNT052-10]	Orthophosphate (P)	2024/05/22	NC		%	20
B375925	YL7	Matrix Spike [CNT050-10]	Orthophosphate (P)	2024/05/22		99	%	80 - 120
B375925	YL7	Spiked Blank	Orthophosphate (P)	2024/05/22		91	%	80 - 120
B375925	YL7	Method Blank	Orthophosphate (P)	2024/05/22	<0.0030		mg/L	
B375925	YL7	RPD [CNT050-10]	Orthophosphate (P)	2024/05/22	NC		%	20
B375934	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/23		96	%	80 - 120
B375934	JVM	Method Blank	Alkalinity (PP as CaCO3)	2024/05/23	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/23	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/23	<1.0		mg/L	
			Carbonate (CO3)	2024/05/23	<1.0		mg/L	
			Hydroxide (OH)	2024/05/23	<1.0		mg/L	
B375934	JVM	RPD	Alkalinity (PP as CaCO3)	2024/05/23	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/23	0.76		%	20
			Bicarbonate (HCO3)	2024/05/23	0.76		%	20
			Carbonate (CO3)	2024/05/23	NC		%	20
			Hydroxide (OH)	2024/05/23	NC		%	20
B375944	JVM	Spiked Blank	pH	2024/05/23		100	%	97 - 103
B375944	JVM	RPD	pH	2024/05/23	0		%	N/A
B375948	JVM	Spiked Blank	Conductivity	2024/05/23		101	%	90 - 110
B375948	JVM	Method Blank	Conductivity	2024/05/23	<2.0		uS/cm	
B375948	JVM	RPD	Conductivity	2024/05/23	0.076		%	10
B376660	CTU	Matrix Spike [CNT050-02]	Total Nitrogen (N)	2024/05/24		108	%	80 - 120
B376660	CTU	QC Standard	Total Nitrogen (N)	2024/05/23		106	%	80 - 120
B376660	CTU	Spiked Blank	Total Nitrogen (N)	2024/05/23		106	%	80 - 120
B376660	CTU	Method Blank	Total Nitrogen (N)	2024/05/23	<0.020		mg/L	
B376660	CTU	RPD [CNT050-02]	Total Nitrogen (N)	2024/05/24	3.1		%	20
B376665	CTU	Matrix Spike	Total Nitrogen (N)	2024/05/23		107	%	80 - 120
B376665	CTU	QC Standard	Total Nitrogen (N)	2024/05/23		106	%	80 - 120
B376665	CTU	Spiked Blank	Total Nitrogen (N)	2024/05/23		107	%	80 - 120
B376665	CTU	Method Blank	Total Nitrogen (N)	2024/05/23	<0.020		mg/L	
B376665	CTU	RPD	Total Nitrogen (N)	2024/05/23	0.016		%	20
B376819	KKC	Matrix Spike [CNT055-10]	Dissolved Aluminum (Al)	2024/05/23		104	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/23		94	%	80 - 120
			Dissolved Arsenic (As)	2024/05/23		98	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/23		99	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Chromium (Cr)	2024/05/23		96	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/23		98	%	80 - 120
			Dissolved Copper (Cu)	2024/05/23		98	%	80 - 120
			Dissolved Lead (Pb)	2024/05/23		95	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/23		102	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/23		98	%	80 - 120
			Dissolved Selenium (Se)	2024/05/23		96	%	80 - 120
			Dissolved Silver (Ag)	2024/05/23		96	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/23		95	%	80 - 120
			Dissolved Tin (Sn)	2024/05/23		95	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/23		101	%	80 - 120
			Dissolved Uranium (U)	2024/05/23		95	%	80 - 120
			Dissolved Vanadium (V)	2024/05/23		98	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/23		99	%	80 - 120
B376819	KKC	Spiked Blank	Dissolved Aluminum (Al)	2024/05/23		103	%	80 - 120
			Dissolved Antimony (Sb)	2024/05/23		92	%	80 - 120
			Dissolved Arsenic (As)	2024/05/23		94	%	80 - 120
			Dissolved Beryllium (Be)	2024/05/23		97	%	80 - 120
			Dissolved Chromium (Cr)	2024/05/23		95	%	80 - 120
			Dissolved Cobalt (Co)	2024/05/23		96	%	80 - 120
			Dissolved Copper (Cu)	2024/05/23		96	%	80 - 120
			Dissolved Lead (Pb)	2024/05/23		94	%	80 - 120
			Dissolved Molybdenum (Mo)	2024/05/23		116	%	80 - 120
			Dissolved Nickel (Ni)	2024/05/23		95	%	80 - 120
			Dissolved Selenium (Se)	2024/05/23		94	%	80 - 120
			Dissolved Silver (Ag)	2024/05/23		94	%	80 - 120
			Dissolved Thallium (Tl)	2024/05/23		92	%	80 - 120
			Dissolved Tin (Sn)	2024/05/23		93	%	80 - 120
			Dissolved Titanium (Ti)	2024/05/23		95	%	80 - 120
			Dissolved Uranium (U)	2024/05/23		93	%	80 - 120
			Dissolved Vanadium (V)	2024/05/23		94	%	80 - 120
			Dissolved Zinc (Zn)	2024/05/23		96	%	80 - 120
B376819	KKC	Method Blank	Dissolved Aluminum (Al)	2024/05/23	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2024/05/23	<0.00060		mg/L	
			Dissolved Arsenic (As)	2024/05/23	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2024/05/23	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2024/05/23	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2024/05/23	<0.00030		mg/L	
			Dissolved Copper (Cu)	2024/05/23	<0.0010		mg/L	
			Dissolved Lead (Pb)	2024/05/23	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2024/05/23	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2024/05/23	<0.00050		mg/L	
			Dissolved Selenium (Se)	2024/05/23	<0.00020		mg/L	
			Dissolved Silver (Ag)	2024/05/23	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2024/05/23	<0.00020		mg/L	
			Dissolved Tin (Sn)	2024/05/23	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2024/05/23	<0.0010		mg/L	
			Dissolved Uranium (U)	2024/05/23	<0.00010		mg/L	
			Dissolved Vanadium (V)	2024/05/23	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2024/05/23	<0.0030		mg/L	
B376819	KKC	RPD [CNT055-10]	Dissolved Aluminum (Al)	2024/05/23	NC		%	20
			Dissolved Antimony (Sb)	2024/05/23	NC		%	20
			Dissolved Arsenic (As)	2024/05/23	NC		%	20
			Dissolved Beryllium (Be)	2024/05/23	NC		%	20
			Dissolved Chromium (Cr)	2024/05/23	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Cobalt (Co)	2024/05/23	NC		%	20
			Dissolved Copper (Cu)	2024/05/23	NC		%	20
			Dissolved Lead (Pb)	2024/05/23	NC		%	20
			Dissolved Molybdenum (Mo)	2024/05/23	NC		%	20
			Dissolved Nickel (Ni)	2024/05/23	NC		%	20
			Dissolved Selenium (Se)	2024/05/23	NC		%	20
			Dissolved Silver (Ag)	2024/05/23	NC		%	20
			Dissolved Thallium (Tl)	2024/05/23	NC		%	20
			Dissolved Tin (Sn)	2024/05/23	NC		%	20
			Dissolved Titanium (Ti)	2024/05/23	NC		%	20
			Dissolved Uranium (U)	2024/05/23	NC		%	20
			Dissolved Vanadium (V)	2024/05/23	NC		%	20
			Dissolved Zinc (Zn)	2024/05/23	NC		%	20
B376821	CTU	Matrix Spike	Dissolved Phosphorus (P)	2024/05/23		107	%	80 - 120
B376821	CTU	QC Standard	Dissolved Phosphorus (P)	2024/05/23		95	%	80 - 120
B376821	CTU	Spiked Blank	Dissolved Phosphorus (P)	2024/05/23		96	%	80 - 120
B376821	CTU	Method Blank	Dissolved Phosphorus (P)	2024/05/23	<0.0030		mg/L	
B376821	CTU	RPD	Dissolved Phosphorus (P)	2024/05/23	NC		%	20
B376822	CTU	Matrix Spike	Dissolved Phosphorus (P)	2024/05/23		101	%	80 - 120
B376822	CTU	QC Standard	Dissolved Phosphorus (P)	2024/05/23		90	%	80 - 120
B376822	CTU	Spiked Blank	Dissolved Phosphorus (P)	2024/05/23		94	%	80 - 120
B376822	CTU	Method Blank	Dissolved Phosphorus (P)	2024/05/23	<0.0030		mg/L	
B376822	CTU	RPD	Dissolved Phosphorus (P)	2024/05/23	1.4		%	20
B376915	AFI	Matrix Spike [CNT055-08]	Total Ammonia (N)	2024/05/23		115	%	80 - 120
B376915	AFI	Spiked Blank	Total Ammonia (N)	2024/05/23		104	%	80 - 120
B376915	AFI	Method Blank	Total Ammonia (N)	2024/05/23	<0.015		mg/L	
B376915	AFI	RPD [CNT055-08]	Total Ammonia (N)	2024/05/23	NC		%	20
B378347	MDO	Matrix Spike	Dissolved Organic Carbon (C)	2024/05/24		98	%	80 - 120
B378347	MDO	Spiked Blank	Dissolved Organic Carbon (C)	2024/05/24		99	%	80 - 120
B378347	MDO	Method Blank	Dissolved Organic Carbon (C)	2024/05/24	<0.50		mg/L	
B378347	MDO	RPD	Dissolved Organic Carbon (C)	2024/05/24	0.98		%	20
B379557	ISW	Matrix Spike	Nitrite (N)	2024/05/25		89	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/25		85	%	80 - 120
B379557	ISW	Spiked Blank	Nitrite (N)	2024/05/25		100	%	80 - 120
			Nitrate plus Nitrite (N)	2024/05/25		100	%	80 - 120
B379557	ISW	Method Blank	Nitrite (N)	2024/05/25	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2024/05/25	<0.010		mg/L	
B379557	ISW	RPD	Nitrite (N)	2024/05/25	NC		%	20
			Nitrate plus Nitrite (N)	2024/05/25	NC		%	20
B379767	A5S	Spiked Blank	Alkalinity (Total as CaCO3)	2024/05/26		100	%	80 - 120
B379767	A5S	Method Blank	Alkalinity (PP as CaCO3)	2024/05/26	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2024/05/26	<1.0		mg/L	
			Bicarbonate (HCO3)	2024/05/26	<1.0		mg/L	
			Carbonate (CO3)	2024/05/26	<1.0		mg/L	
			Hydroxide (OH)	2024/05/26	<1.0		mg/L	
B379767	A5S	RPD [CNT054-10]	Alkalinity (PP as CaCO3)	2024/05/26	NC		%	20
			Alkalinity (Total as CaCO3)	2024/05/26	NC		%	20
			Bicarbonate (HCO3)	2024/05/26	NC		%	20
			Carbonate (CO3)	2024/05/26	NC		%	20
			Hydroxide (OH)	2024/05/26	NC		%	20
B379768	A5S	Spiked Blank	pH	2024/05/26		101	%	97 - 103

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B379768	A5S	RPD [CNT054-10]	pH	2024/05/26	0.43		%	N/A

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Gita Pokhrel, Laboratory Supervisor

Janet Gao, B.Sc., QP, Supervisor, Organics

Sandy Yuan, M.Sc., QP, Scientific Specialist

Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist

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CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

MCAL -2024-05-1 | 98

Invoice Information	Invoice to (requires report) ☑	Report Information (if differs from invoice)		Project Information	
Company:	Stantec	Company:		Quotation #:	
Contact Name:	Dylan King	Contact Name:		P.O. #/ AFE#:	
Street Address:	#300, 10220 103 Ave NW	Street Address:		Project #:	110773396
City:	Edmonton	Prov: AB	Postal Code: T5J0K4	City: Prov: Postal Code:	Site #:
Phone:	780 969 2223	Phone:		Site Location:	
Email:	dylan.king@stantec.com	Email:		Site Location Province:	AB
Copies:		Copies:		Sampled By:	WITH

Regulatory Criteria

- [x] AT1
- [ ] CCME
- [ ] Drinking Water - Canada
- [ ] Drinking Water - Manitoba
- [ ] Saskatchewan
- [ ] Drinking Water - Alberta
- [ ] Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)
- [x] 5 to 7 Day
- [ ] 10 Day

Rush Turnaround Time (TAT) Surcharges apply
- [ ] Same Day
- [ ] 1 Day
- [ ] 2 Day
- [ ] 3 Day
- [ ] 4 Day

Date Required: YY MM DD

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F3-F2	7 BTEX F1-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 Salinity 4	14 Sieve (75 micron)	15 TKN	16 DOC	17 dissolved phosphorus	18 phosphate	19 ammonia	20 bacteriological	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE	Comments
1	MW16-8-8	24	05	17	09	17	water						X		X		X	X	X			X	X	X	X	X	X	11		
2	MW16-8-19	24	05	17	09	29							X		X		X	X	X			X	X	X	X	X	X	11		
3	MW16-6-11	24	05	17	11	23							X		X		X	X	X			X	X	X	X	X	X	11		
4	MW16-6-20	24	05	17	10	54							X		X		X	X	X			X	X	X	X	X	X	11		
5	SR24-04	24	05	17	11	31							X		X		X	X	X			X	X	X	X	X	X	11		
6	SR24-05	24	05	17	11	42							X		X		X	X	X			X	X	X	X	X	X	11		
7	SR24-06	24	05	17	11	48							X		X		X	X	X			X	X	X	X	X	X	11		
8																														
9																														
10																														
11																														
12																														

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		=				
Seal intact		=				
Cooling media present	✓			2.3	4.1	4.1

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		=				
Seal intact		=				
Cooling media present	✓			2.2	2.2	2.4

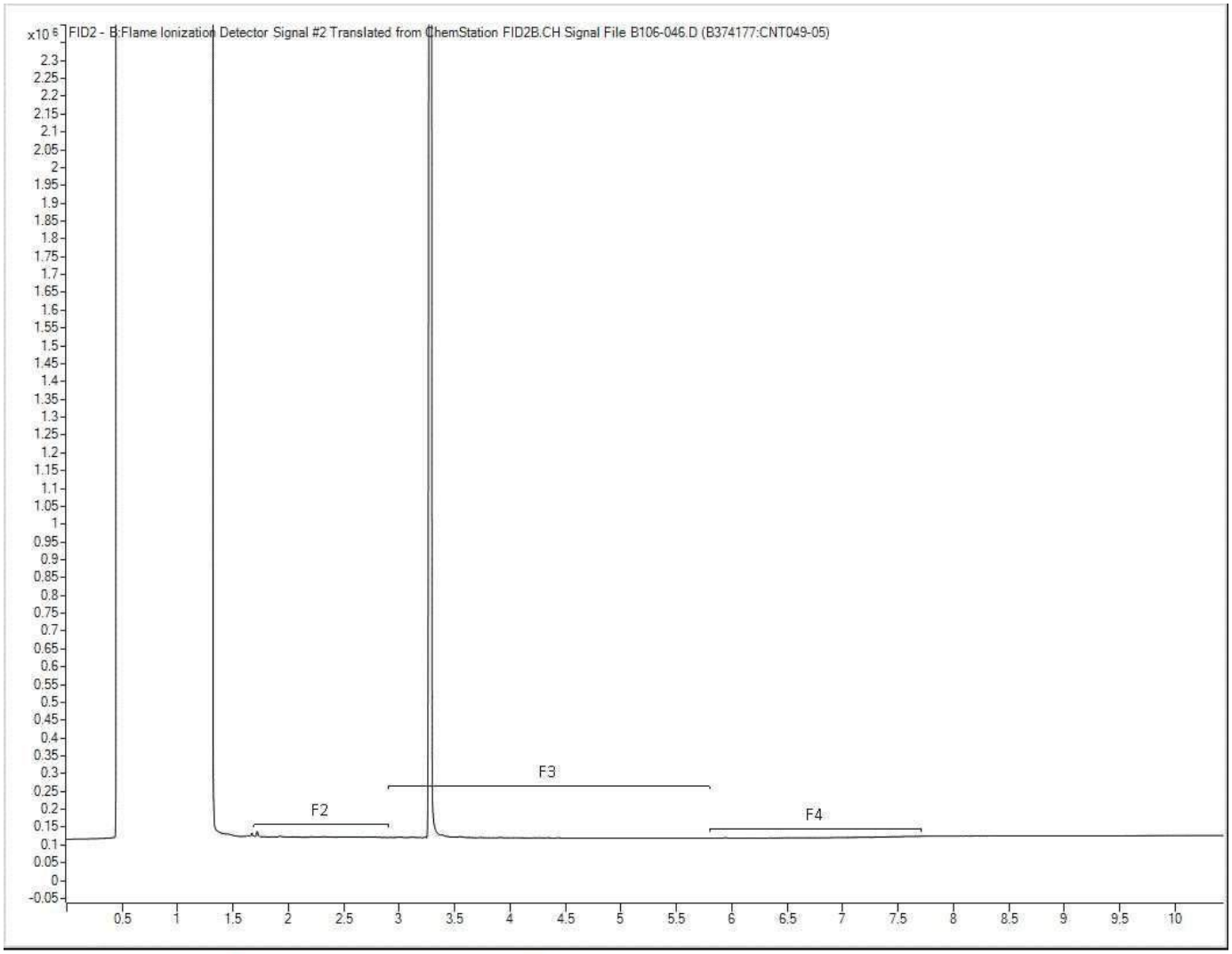
LAB USE ONLY	Yes	No	°C	1	2	3
Seal present						
Seal intact						
Cooling media present						

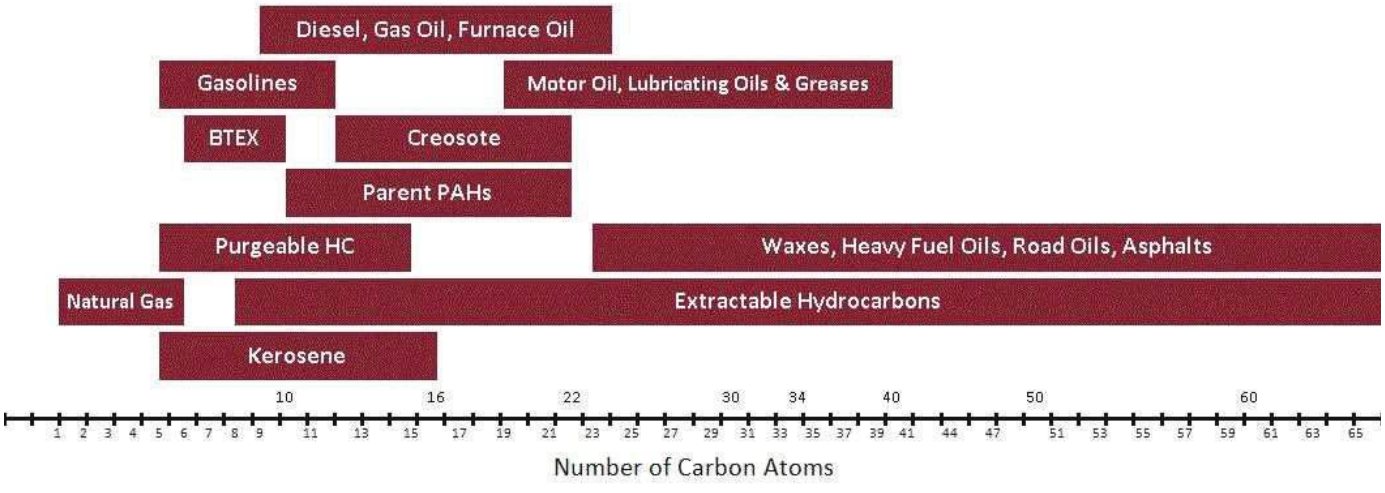
Temperature reading by:

Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special Instructions
1 Wesley Tsan	24	05	17	13	00	1 A TRAVERCI II	2024	05	17	13	20	* total coliforms, ecoli fecal coliforms, heterotrophic plate count
2						2						

Dissolved parameters are not field filtered Please do not filter

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

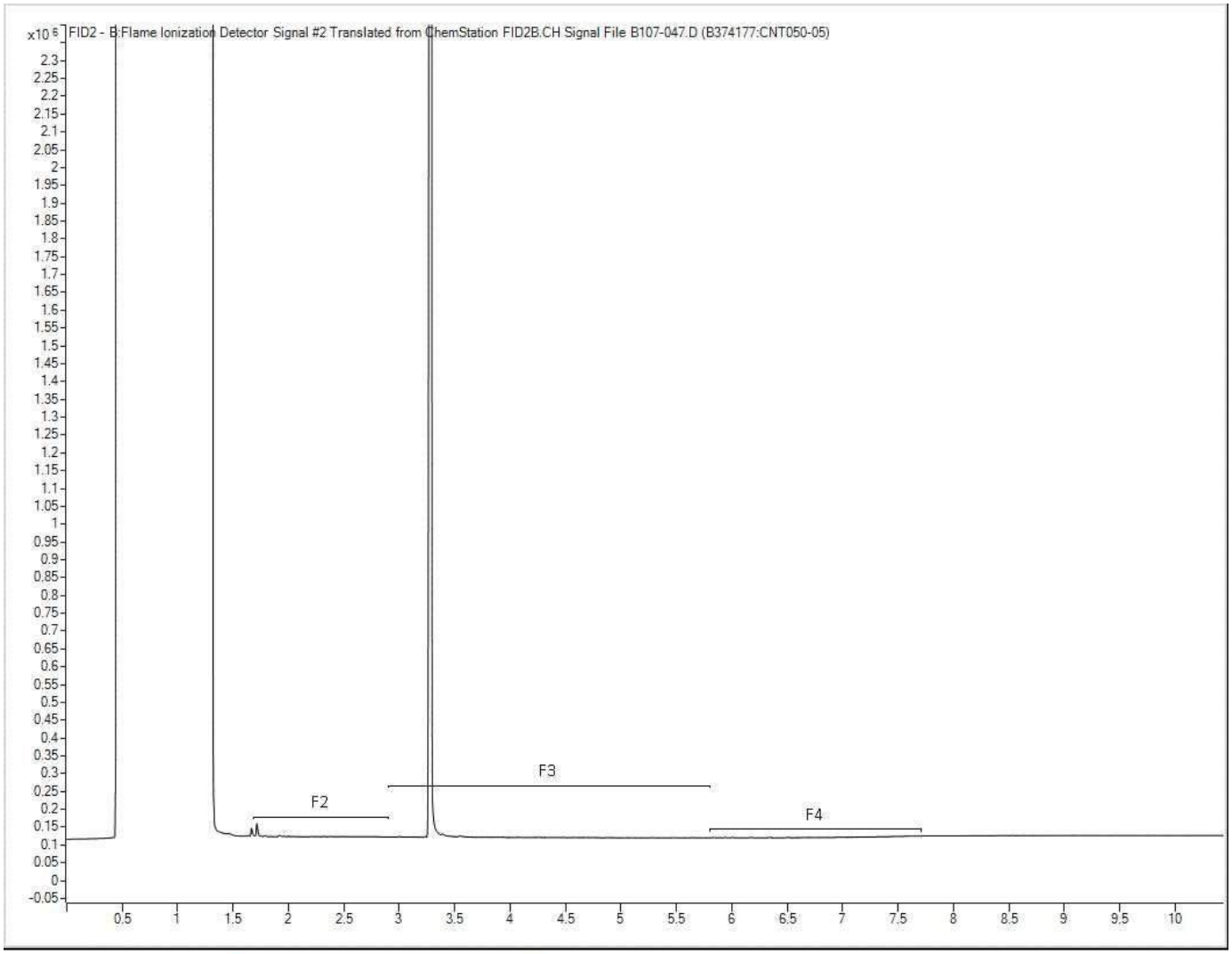


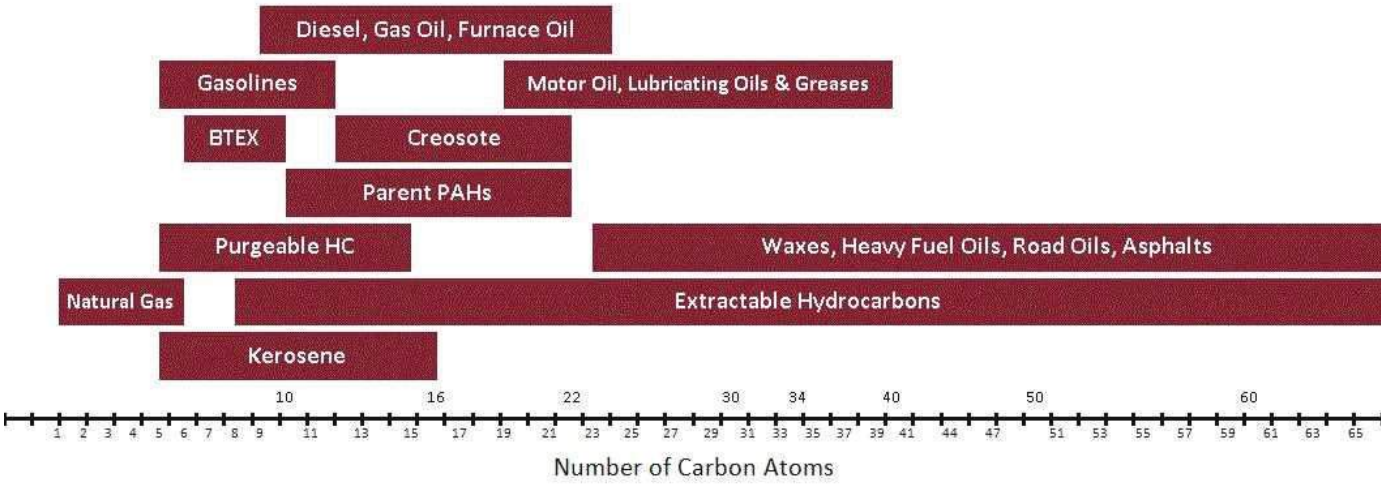


HPChem24\HPChem\1\Data\2024\05\0521

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

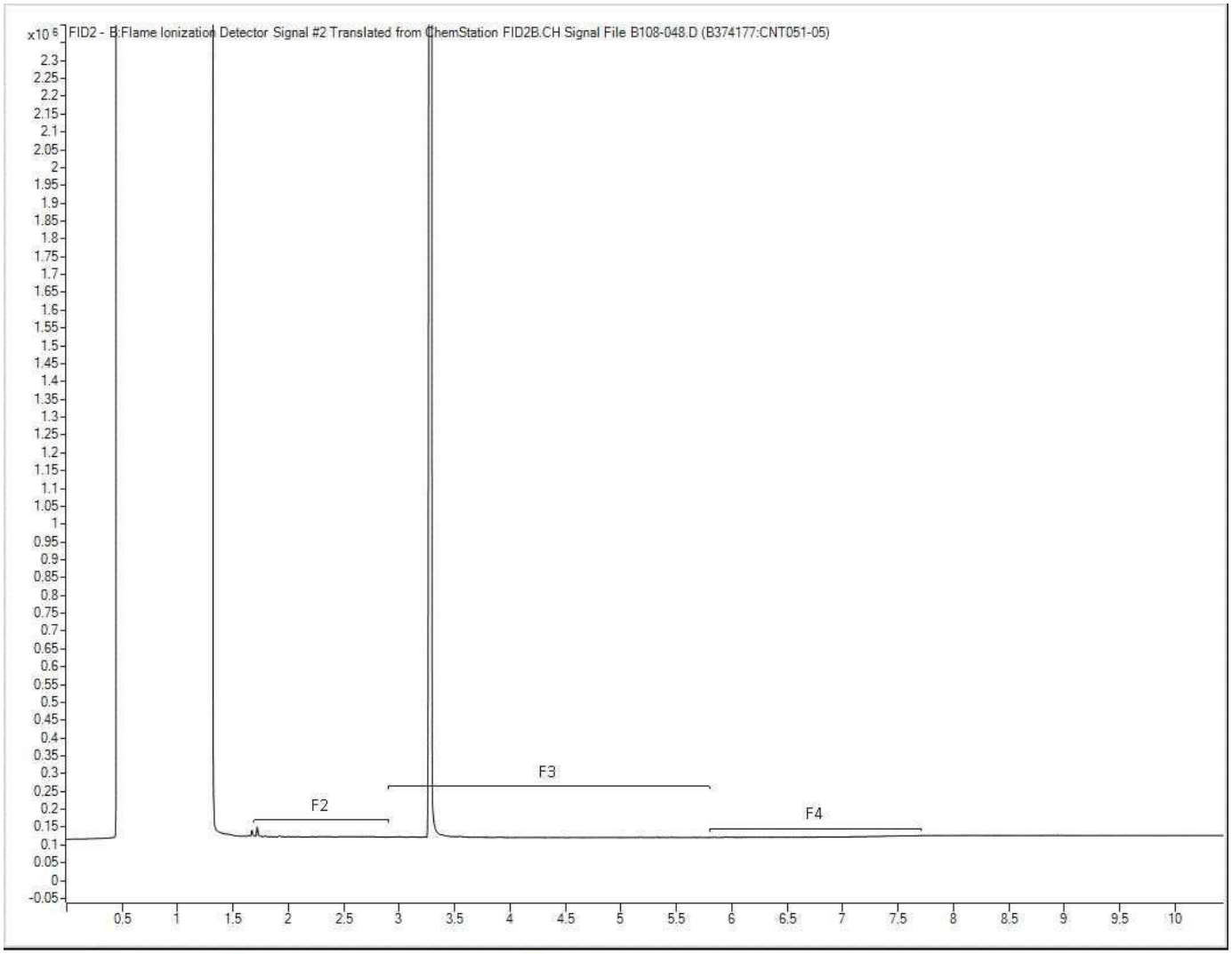


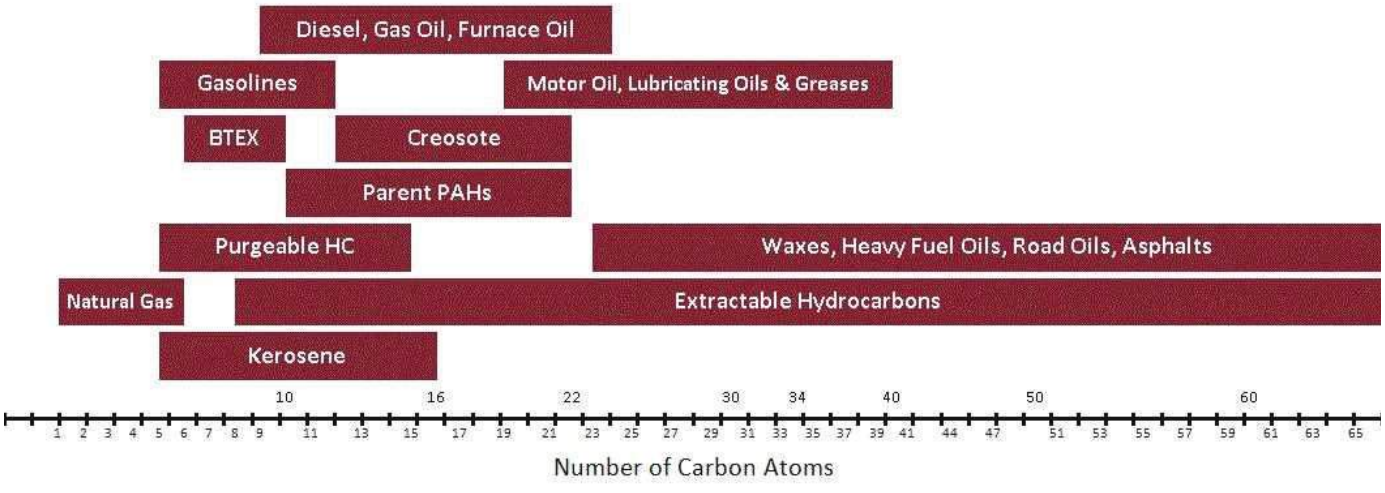


HPChem24\HPChem\1\Data\2024\05\0521

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

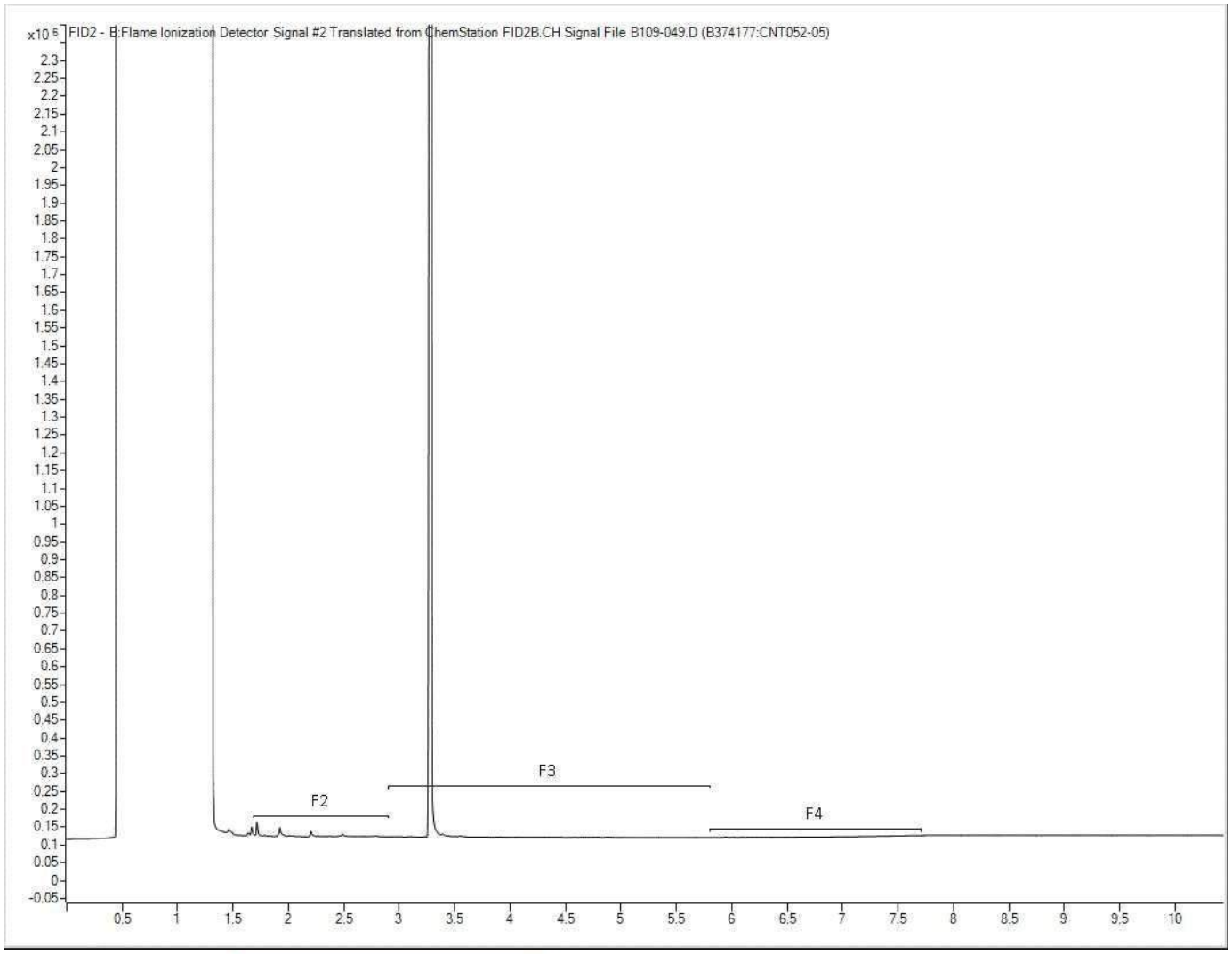


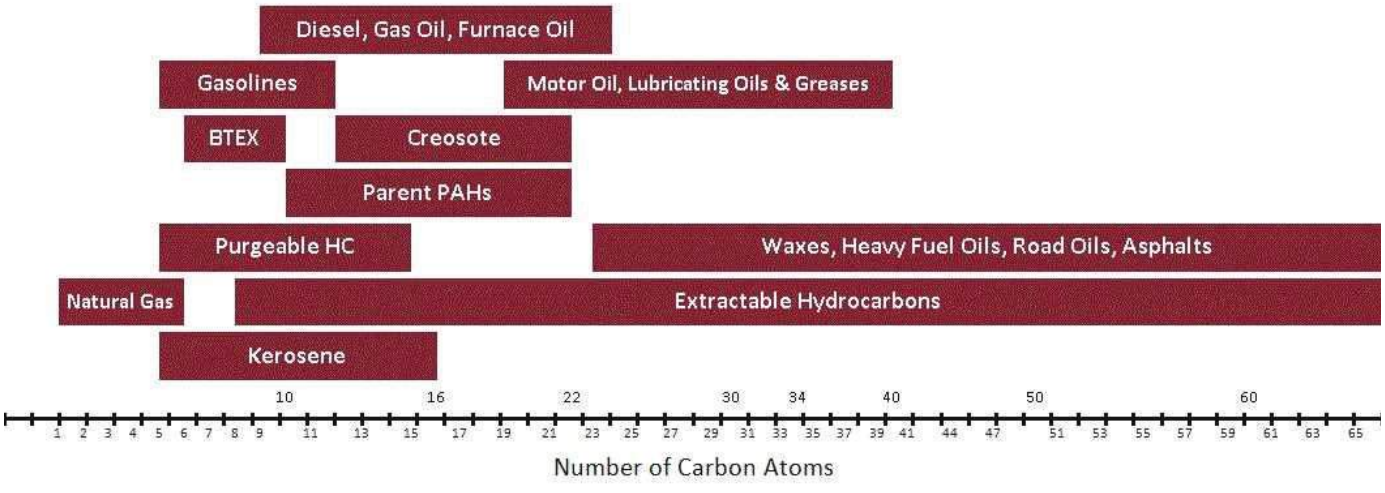


HPChem24\HPChem\1\Data\2024\05\0521

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

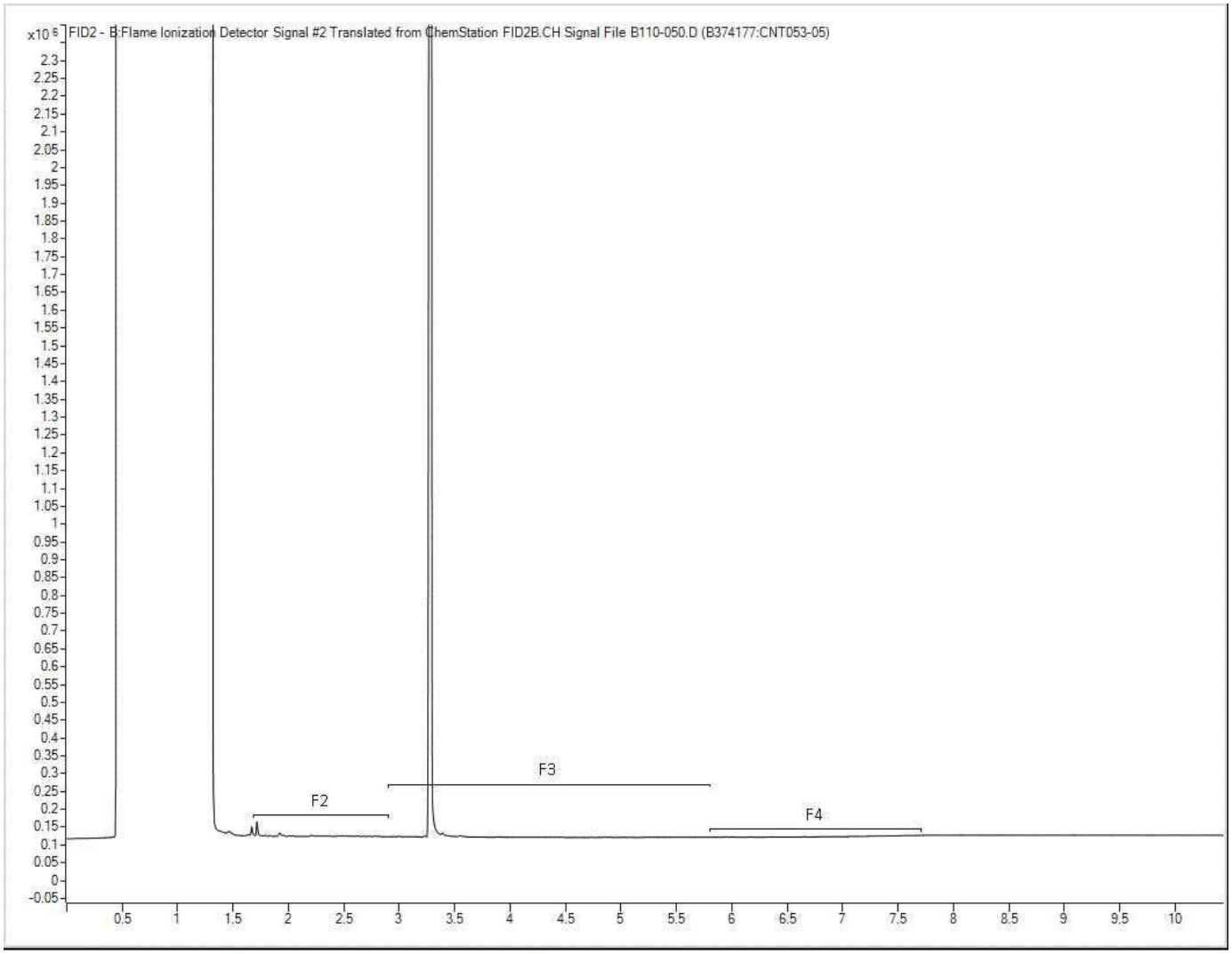


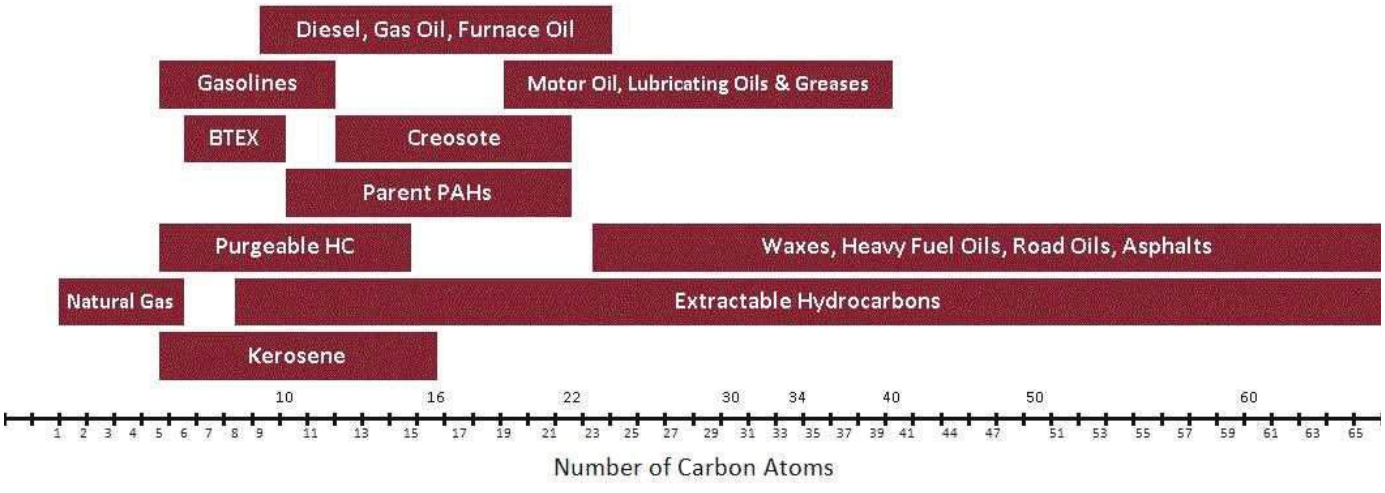


HPChem24\HPChem\1\Data\2024\05\0521

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

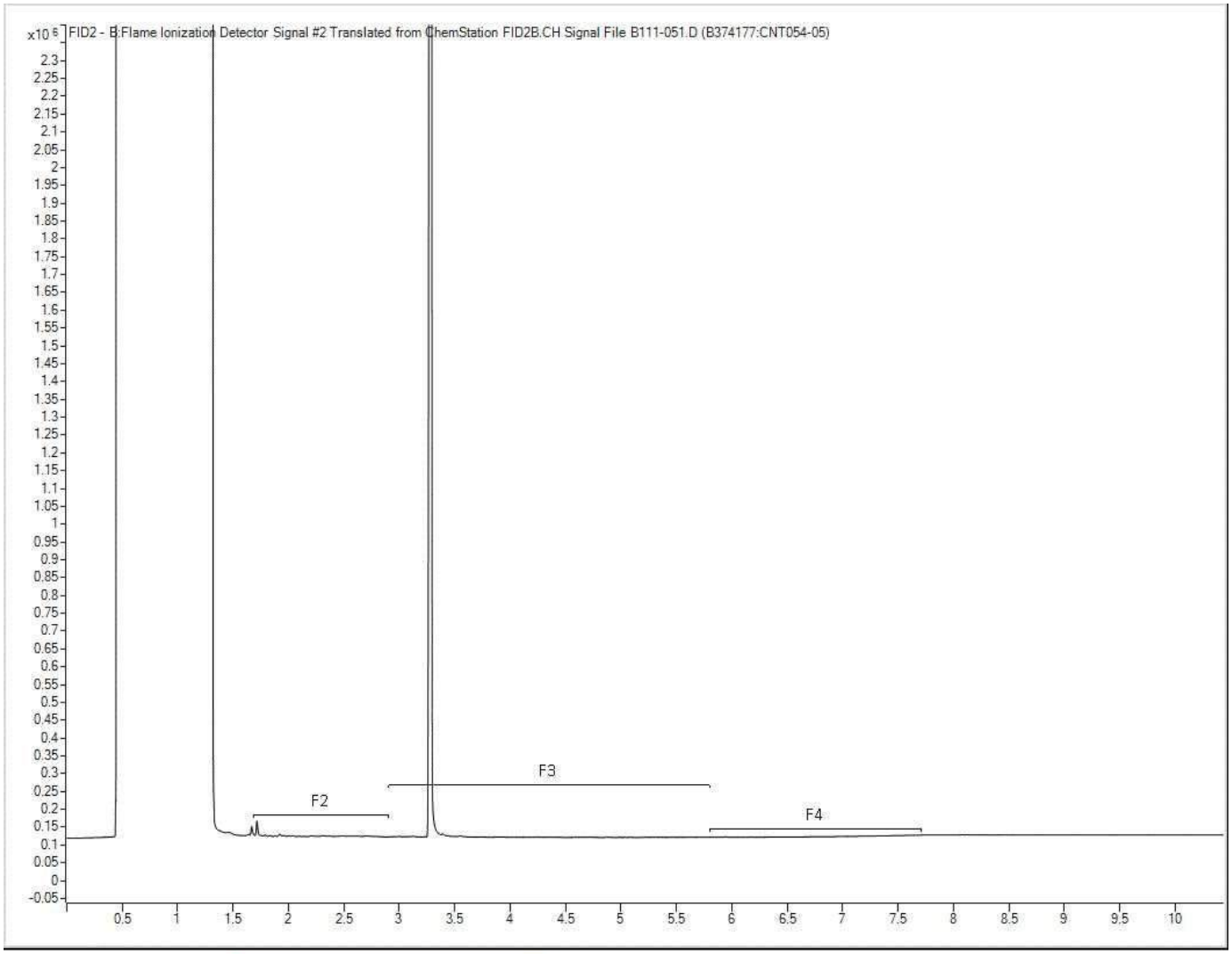


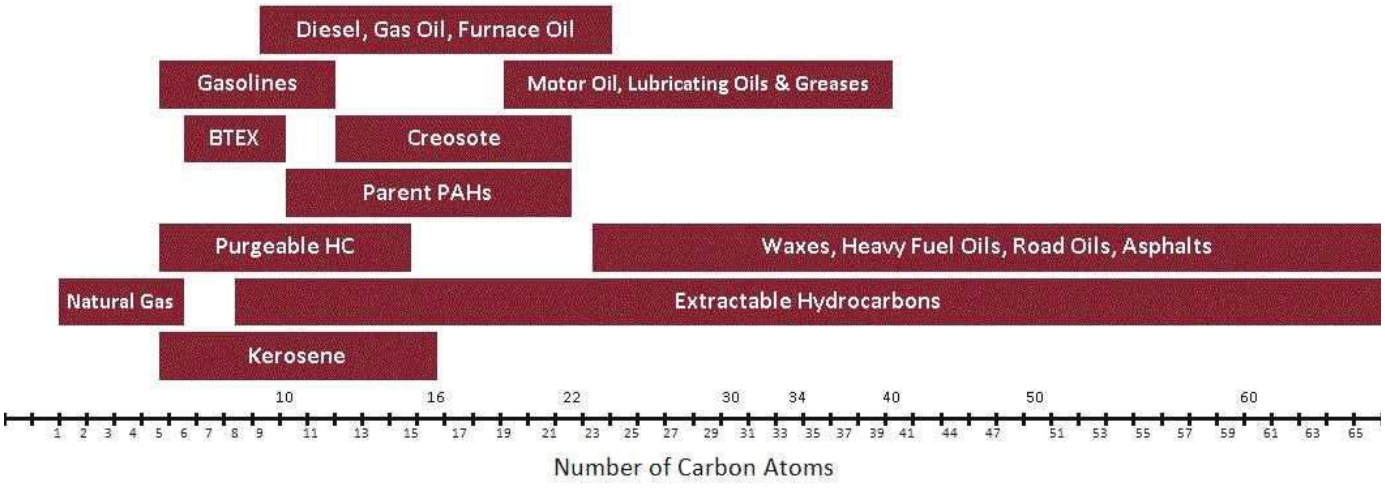


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Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

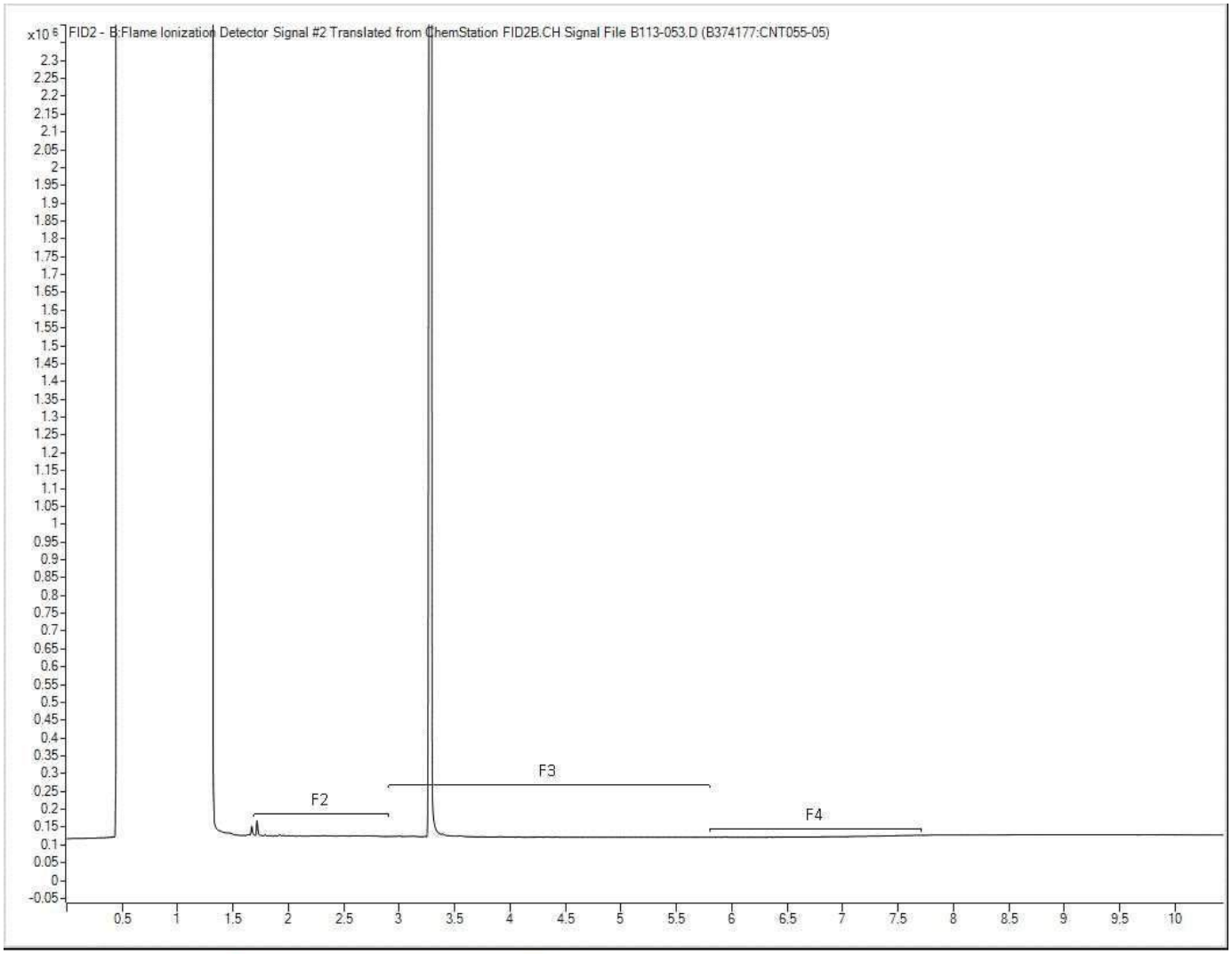


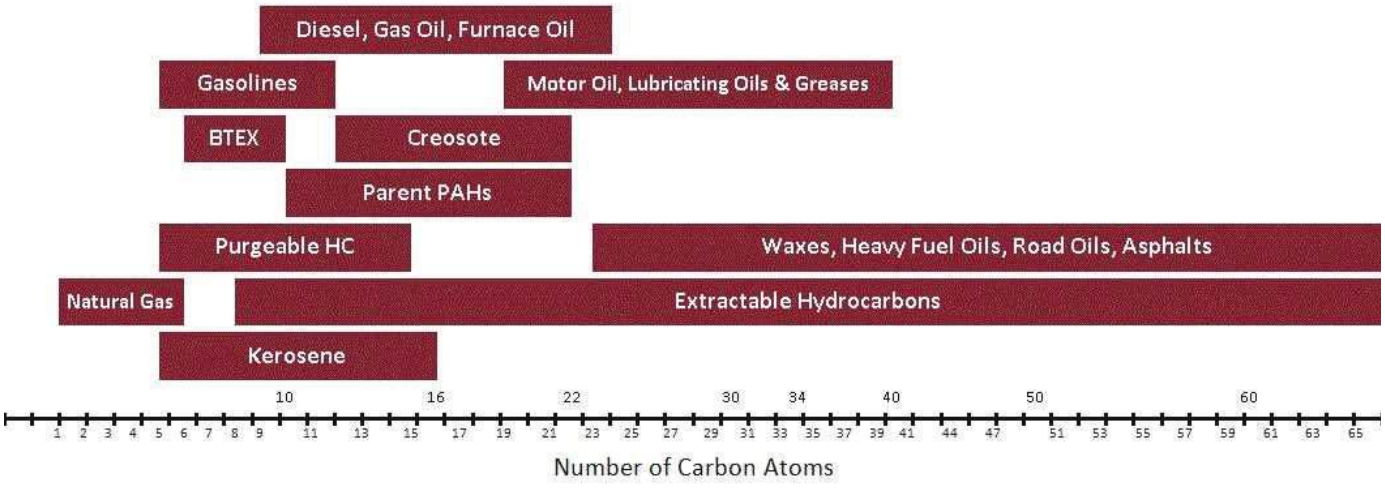


HPChem24\HPChem\1\Data\2024\05\0521

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram





HPChem24\HPChem\1\Data\2024\05\0521

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

B.3
Air Quality
Figures and Tables

Table B.3.1 Summary Statistics of the Measured 1-Hour Average Concentrations of Nitrogen Dioxide at the Springbank Air Quality Monitoring Station and Regional Stations for the July 2023 to June 2024 Period

	Nitrogen Dioxide (NO_2) Concentrations (ppb) [a]							
	SR1	AEPA	CRAZ					
Statistic	AQMS [b]	Airdrie	Calgary-Central (Inglewood)	Calgary-Northwest (Varsity)	Calgary-Southeast	High River Splash Park [c]	AAAQO [d]	CAAQS [e]
Minimum (Non-Zero)	1.00	0.100	0.100	0.00700	0.700	0.100	159	
Annual Average of 1-hour Averages	4.26	6.07	15.2	9.90	13.9	2.90	24	17
Median	3.00	3.40	10.2	6.74	10.1	2.00	159	—
Maximum	50.0	58.5	76.3	68.3	89.2	28.3	159	—
Standard Deviation	4.47	7.17	13.2	9.68	11.4	3.17		
98th Percentile of the D1HM	29.2	44.0	55.6	49.5	58.7	20.7	—	60
Number Observations	8,067	8,256	8,320	8,313	8,314	3,393		
Expected Observations [f]	8,784	8,784	8,784	8,784	8,784	3,623		
% Complete [g]	91.8%	94.0%	94.7%	94.6%	94.6%	93.7%		
Hours above 1-h Average AAAQO	0	0	0	0	0	0		

Notes:

[a] ppb is the volume of the substance (parts) per billion volumes of air.

[b] Springbank Air Quality Monitoring Station started monitoring on July 7, 2023.

[c] High River Spray Park Station was removed by the Calgary Regional Air Zone (CRAZ) on November 27, 2023.

[d] AAAQO (AEPA, 2024)).

[e] CAAQS (CCME, 2021) for 2020).

[f] Values are based on the number of hours the station was deployed during the year.

[g] Completeness is calculated based on the number of valid observations over the deployment period. The annual average for the High River Splash Park is not valid as the station was removed during the July 2023 to June 2024 period.

Figure B.3.1 Timeseries of the 1-hour Average Nitrogen Dioxide Concentrations Measured at the Springbank Air Quality Monitoring Station (AQMS) – July 2023 to June 2024

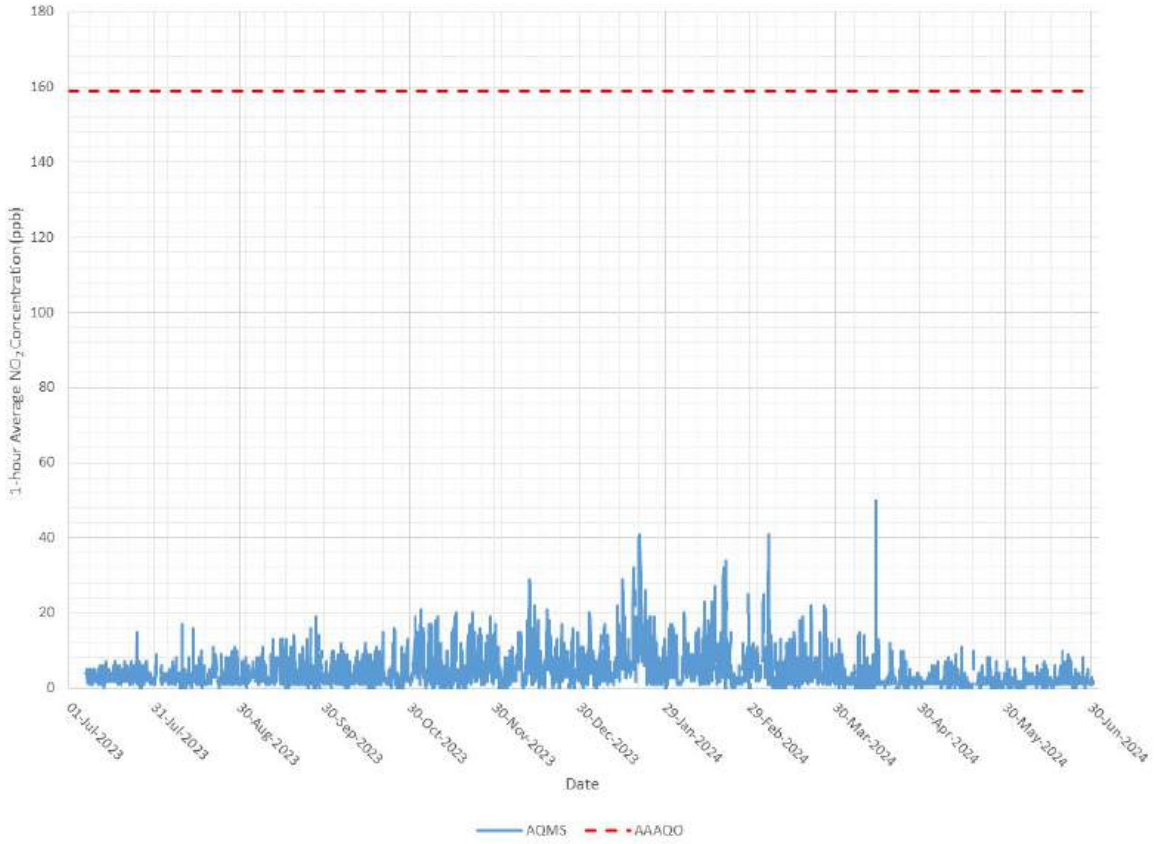


Figure B.3.2 Timeseries of the 1-hour Average Nitrogen Dioxide Concentrations Measured at the Springbank Air Quality Monitoring Station (AQMS) and Regional Air Quality Monitoring Stations – July 2023 to June 2024

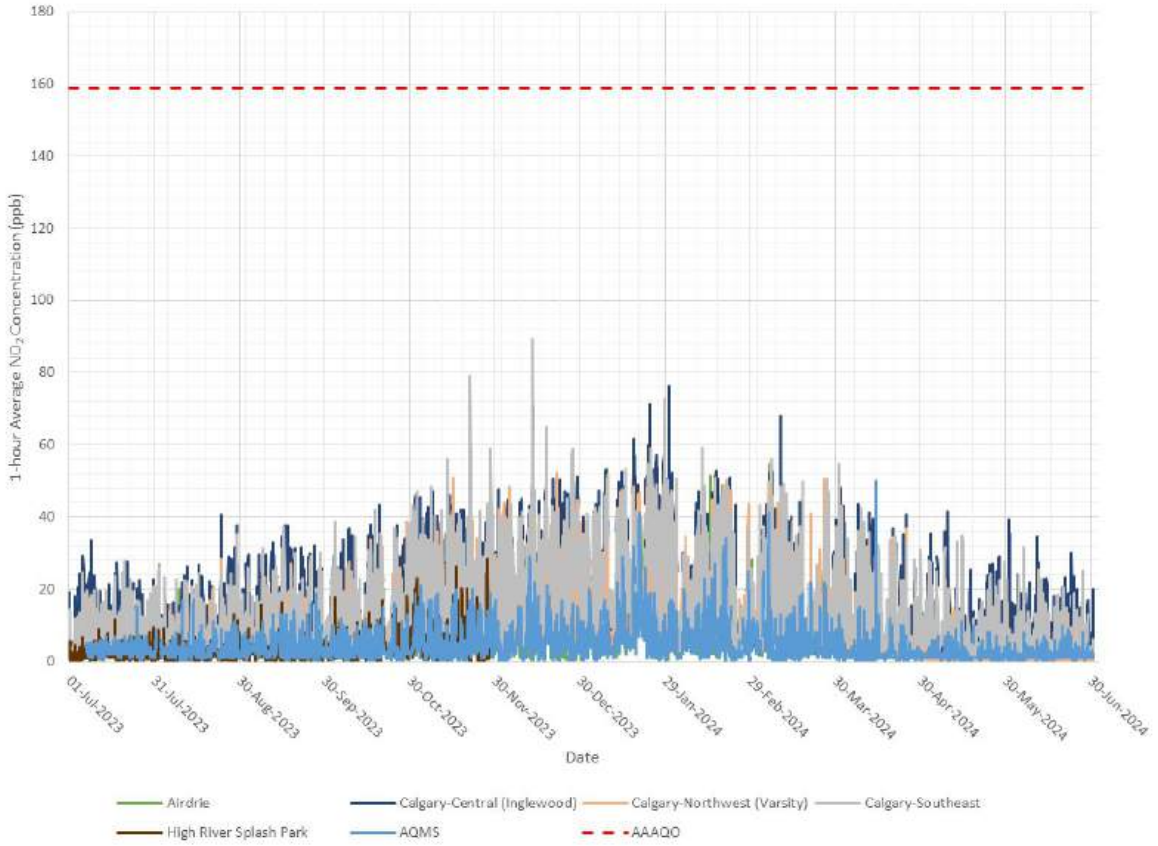


Figure B.3.3 Box-Whisker Plot of the 1-hour Average Nitrogen Dioxide Concentrations Measured at the Springbank Air Quality Monitoring Station (AQMS) and Regional Air Quality Monitoring Stations

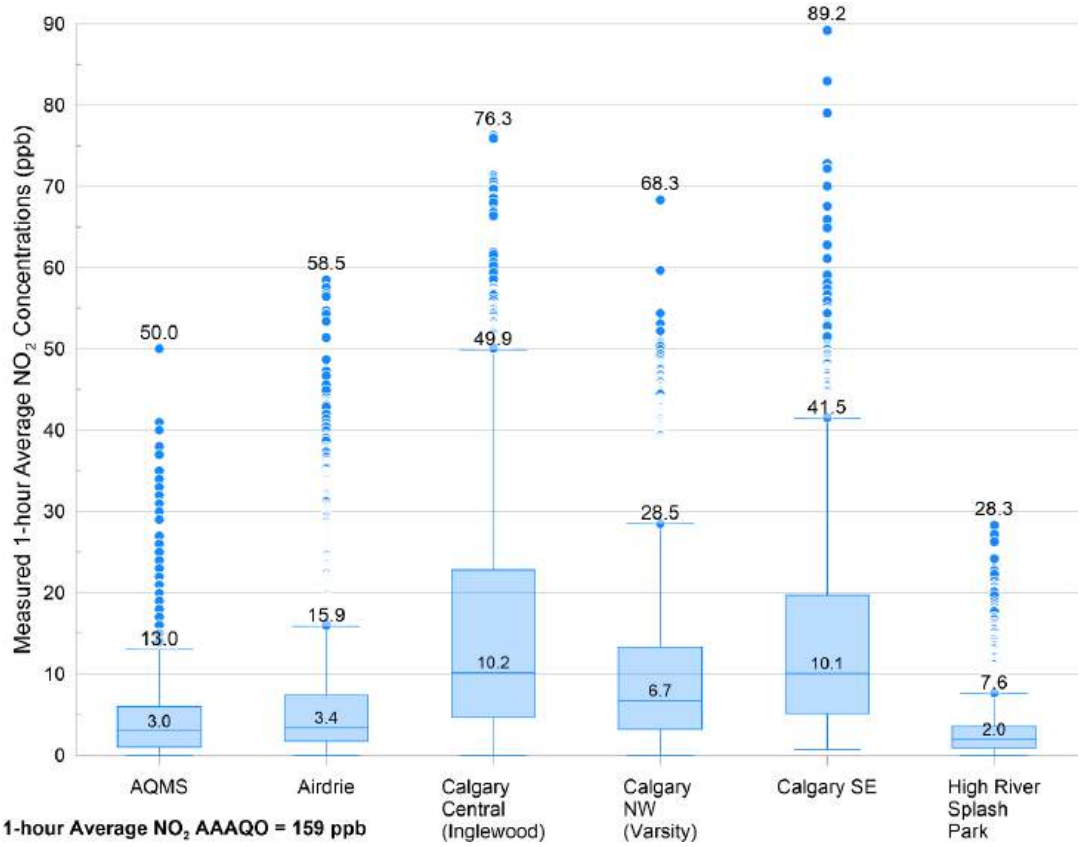


Table B.3.2 Summary Statistics of the Measured 1-Hour Average Concentrations of Fine Particulate Matter at the Springbank Project Air Quality Monitoring Stations – July 2023 to June 2024

Statistic	Fine Particulate Matter ($PM_{2.5}$) Concentrations ($\mu g/m^3$) [a]					
	SR1 Stations					
	Site 1	Site 2	Site 3	Calaway Park [b]	AQMS [c]	AAAQG [d,e]
Minimum (Non-Zero)	1.00	1.00	1.00	1.00	1.00	80
Annual Average of 1-hour Averages	7.04	6.86	6.94	9.23	9.31	—
Median	4.00	4.00	4.00	5.00	5.00	80
Maximum	**136**	**132**	**125**	**141**	**202**	80
Standard Deviation	10.9	11.1	11.0	14.2	15.6	—
Number Observations	8,315	7,853	8,293	3,137	8,517	
Expected Observations [f]	8,784	8,784	8,784	3,933	8,784	
% Complete [g]	94.7%	89.4%	94.4%	79.8%	97.0%	
Hours above 1-h Average AAAQG	40	41	43	29	97	

Notes:

[a] $\mu g/m^3$ is the mass of the substance in micrograms per cubic meter of air.

[b] Calaway Park was operational from May 2, 2023, to October 12, 2023, and May 2, 2024, and is planned to be decommissioned in October 2024 at the end of the park's operational season.

[c] Springbank Air Quality Monitoring Station started monitoring on July 7, 2023.

[d] AAAQG (AEPA, 2024), **BOLD** values indicate measured concentrations above the AAAQG.

[e] Guideline values are used for planning, management, general performance indicators, and to assess local concerns but not for regulatory enforcement.

[f] Values are based on the number of hours the station was deployed during the year.

[g] Completeness is calculated based on the number of valid observations over the deployment period. The annual average for the Calaway Park Station is not valid as the station was removed during the off-season (October – April) during July 2023 to June 2024 period.

Figure B.3.4 Timeseries of the 1-hour Average Fine Particulate Matter Concentrations Measured at the Springbank Project Air Quality Monitoring Stations – July 2023 to June 2024

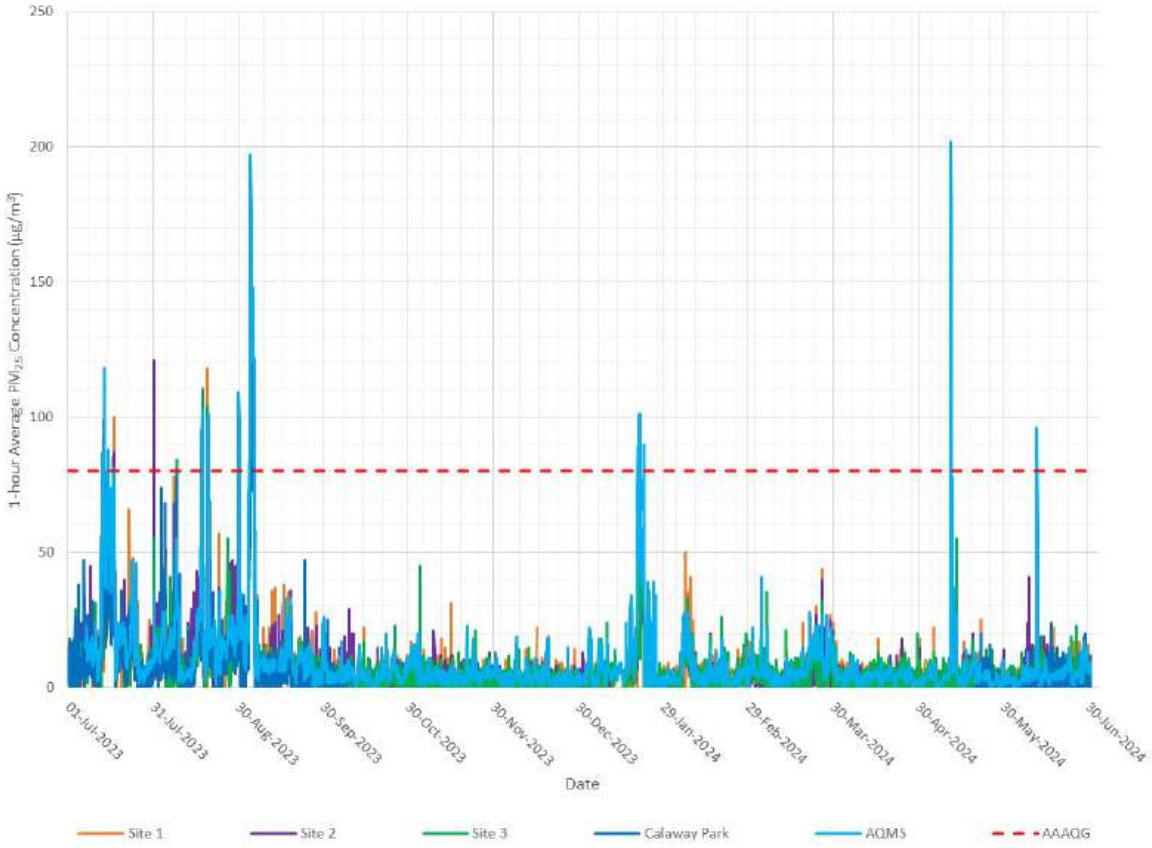


Table B.3.3 Summary Statistics of the Measured 1-Hour Average Concentrations of Fine Particulate Matter at the Regional AEPA and CRAZ Air Quality Monitoring Stations – July 2023 to June 2024

Statistic	Fine Particulate Matter ($PM_{2.5}$) Concentrations ($\mu g/m^3$) [a]					
	AEPA	CRAZ				
	Airdrie	Calgary-Central (Inglewood)	Calgary-Northwest (Varsity)	Calgary-Southeast	High River Splash Park [b]	AAAQG [c,d]
Minimum (Non-Zero)	0.00200	0.0390	0.00700	0.150	0.00200	80
Annual Average of 1-hour Averages	7.81	11.9	9.27	11.3	9.15	—
Median	4.30	7.71	5.34	7.20	5.55	80
Maximum	**197**	**235**	**215**	**198**	**96.7**	80
Standard Deviation	12.4	14.8	14.3	15.0	12.7	—
Number Observations	8,717	8,723	8,732	8,749	3,588	
Expected Observations [e]	8,784	8,784	8,784	8,784	3,623	
% Complete [f]	99.2%	99.3%	99.4%	99.6%	99.0%	
Hours above 1-h Average AAAQG	59	73	70	94	28	

Notes:

[a] $\mu g/m^3$ is the mass of the substance in micrograms per cubic meter of air.

[b] High River Spray Park Station was removed by the CRAZ on November 27, 2023.

[c] AAAQG (AEPA, 2024), **BOLD** values indicate measured concentrations above the AAAQG.

[d] Guideline values are used for planning, management, general performance indicators, and to assess local concerns but not for regulatory enforcement.

[e] Values are based on the number of hours the station was deployed during the year.

[f] Completeness is calculated based on the number of valid observations over the deployment period. The annual average for the High River Splash Park is not valid as the station was removed during the July 2023 to June 2024 period.

Figure B.3.5 Timeseries of the 1-hour Average Fine Particulate Matter Concentrations Measured at the Springbank Project Air Quality Monitoring Stations and the Regional Air Quality Monitoring Stations – July 2023 to June 2024

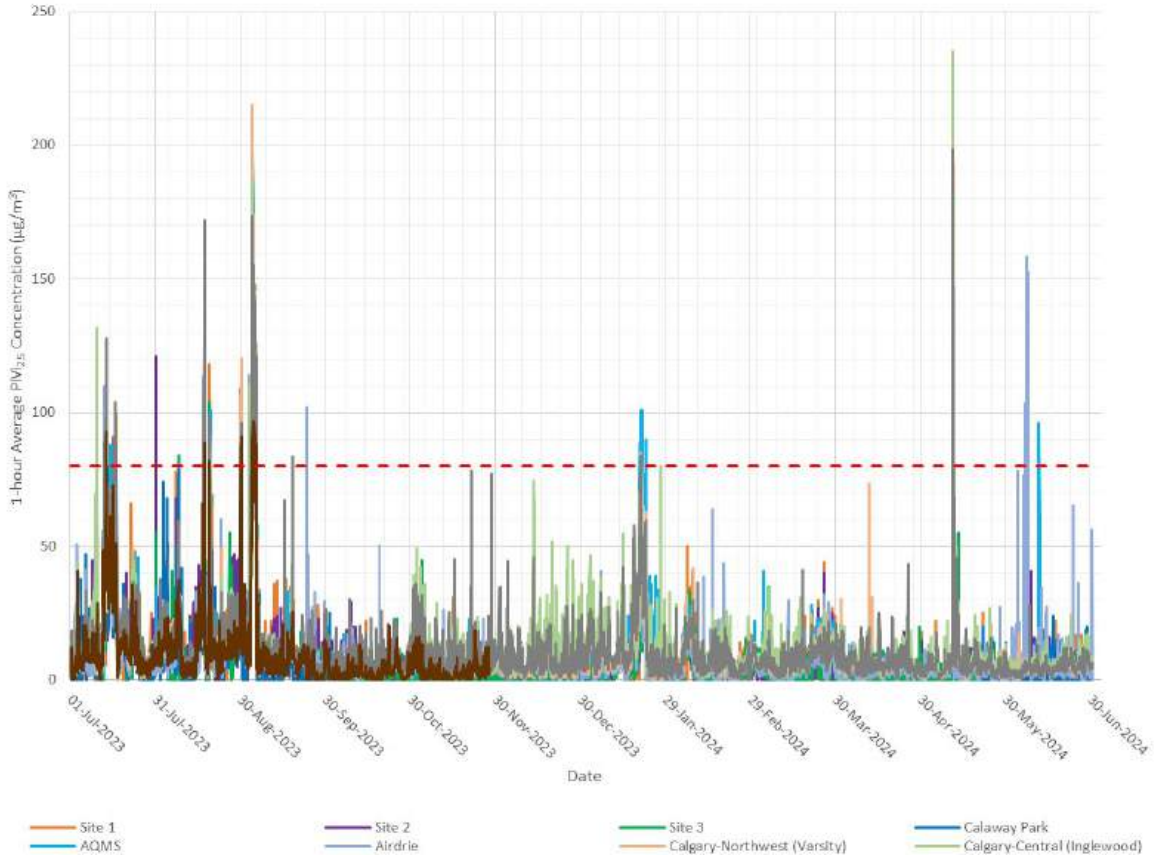


Figure B.3.6 Box-Whisker Plot of the 1-hour Average Fine Particulate Matter Concentrations Measured the Springbank Project Air Quality Monitoring Stations and the Regional Air Quality Monitoring Stations

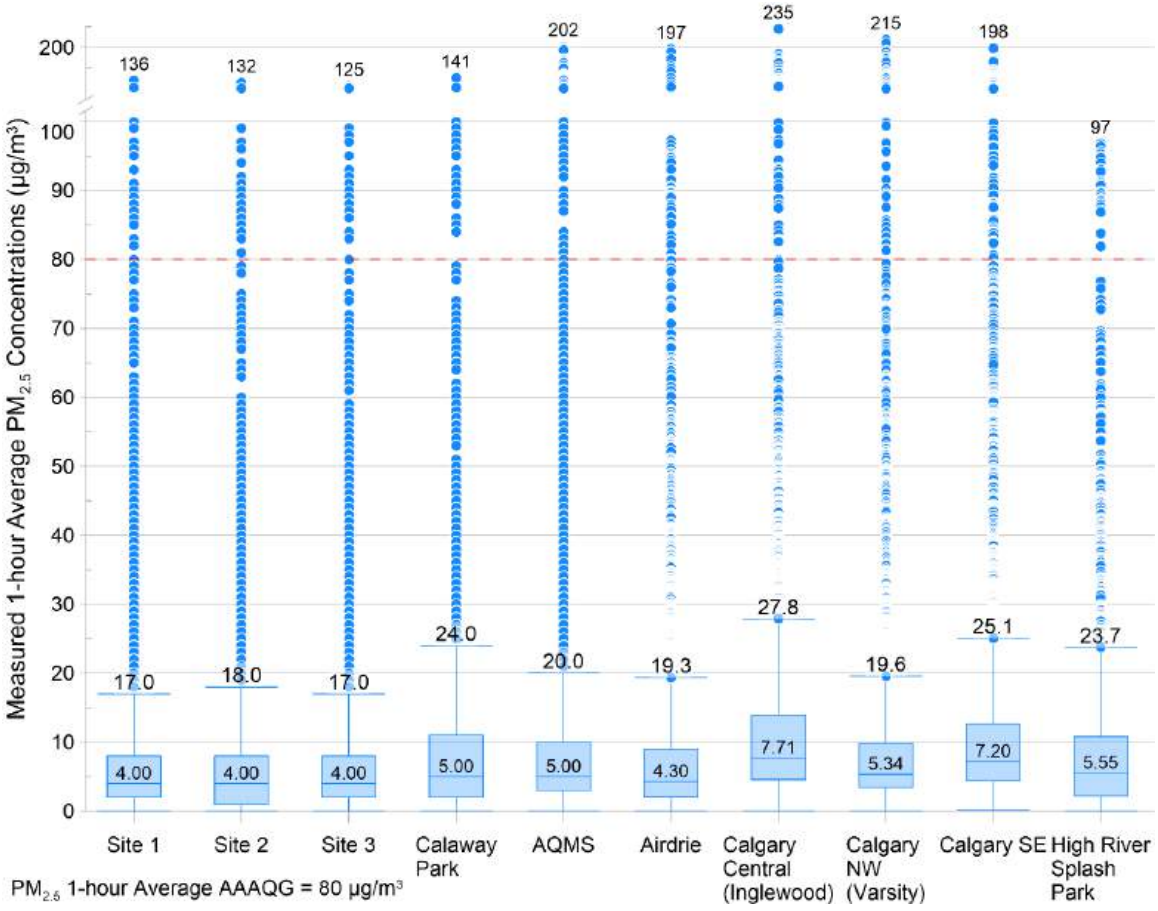


Table B.3.4 Summary Statistics of the Measured 24-Hour Average Concentrations of Fine Particulate Matter at the Springbank Project Air Quality Monitoring Stations – July 2023 – June 2024

Statistic	Fine Particulate Matter ($PM_{2.5}$) Concentrations ($\mu g/m^3$) [a]						
	SR1 Stations						
	Site 1	Site 2	Site 3	Calaway Park [b]	AQMS [c]	AAAQO [d]	CAAQS [e]
Minimum (Non-Zero)	1.09	0.667	1.05	0.591	0.625	29	—
Annual Average of 24-hour Averages	6.88	6.70	6.76	*9.25*	*9.18*	—	8.8
Median	4.00	3.76	3.78	5.31	5.11	29	—
Maximum	**86.6**	**87.3**	**88.5**	**92.3**	**141**	29	—
Standard Deviation	8.65	8.83	8.68	12.4	13.0	—	—
98th Percentile 24-hour Average	*37.4*	*38.0*	*36.5*	*47.3*	*51.2*	—	27
Number Observations	355	328	351	130	356		
Expected Observations [f]	366	366	366	164	366		
% Complete [g]	97.0%	89.6%	95.9%	79.3%	97.3%		
Hours above 1-h Average AAAQO	11	11	11	10	16		

Notes:

[a] $\mu g/m^3$ is the mass of the substance in micrograms per cubic meter of air.

[b] Calaway Park was operational from May 2, 2023, to October 12, 2023, and May 2, 2024, and is planned to be decommissioned in October 2024 at the end of the park's operational season.

[c] Springbank Air Quality Monitoring Station started monitoring on July 7, 2023.

[d] AAAQO (AEPA, 2024), **BOLD** values indicate measured concentrations above the AAAQO.

[e] CAAQS (CCME, 2021) for 2020. *Italicized* values indicate measured concentrations are above the CAAQS.

[f] Values are based on the number of hours the station was deployed during the year.

[g] Completeness is calculated based on the number of valid observations over the deployment period. The annual average for the Calaway Park Station is not valid as the station was removed during the off-season (October – April) during July 2023 to June 2024 period.

Figure B.3.7 Timeseries of the 24-hour Average Fine Particulate Matter Concentrations Measured at the Springbank Project Air Quality Monitoring Stations – July 2023 to June 2024

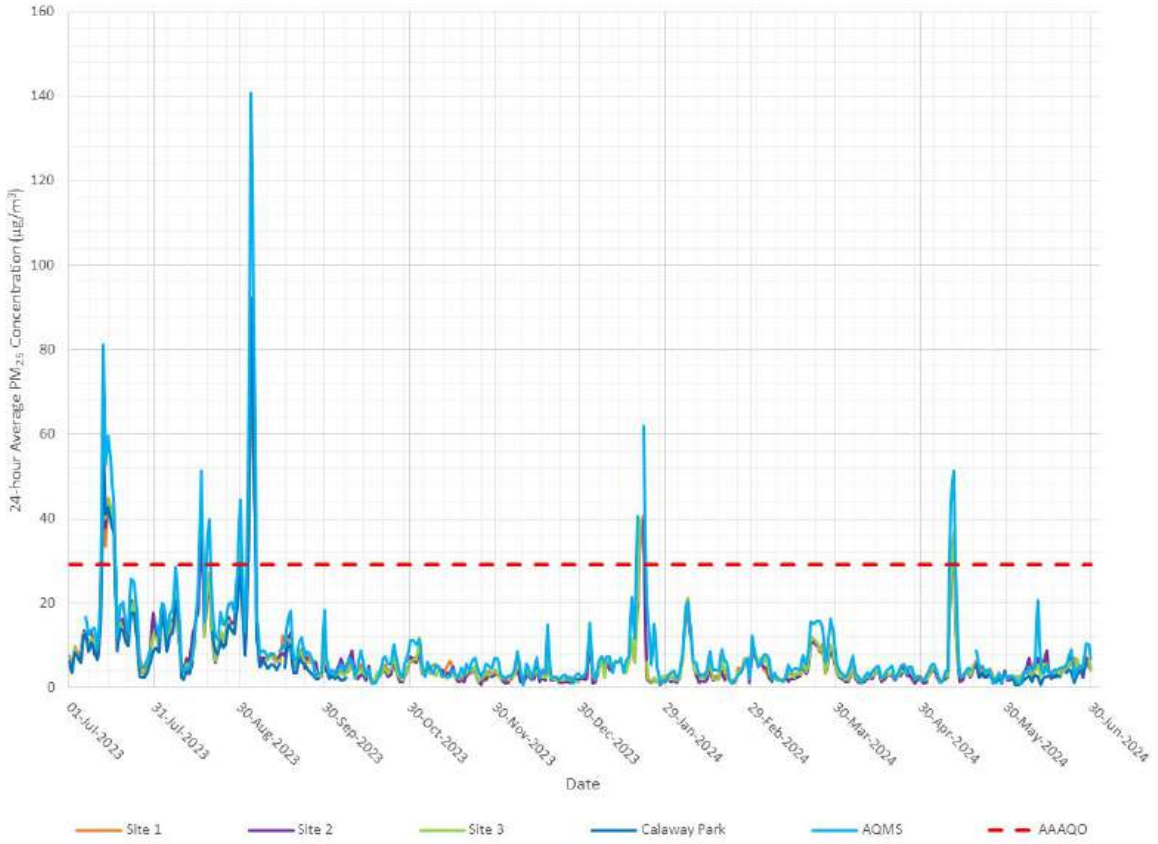


Table B.3.5 Summary Statistics of the Measured 24-Hour Average Concentrations of Fine Particulate Matter at the Regional AEPA and CRAZ Air Quality Monitoring Stations – July 2023 – June 2024

Statistic	Fine Particulate Matter ($PM_{2.5}$) Concentrations ($\mu g/m^3$) [a]						
	AEPA	CRAZ					
	Airdrie	Calgary-Central (Inglewood)	Calgary-Northwest (Varsity)	Calgary-Southeast	High River Splash Park [b]	AAAQO [c]	CAAQS [d]
Minimum (Non-Zero)	0.276	2.01	1.30	1.65	0.326	29	—
Annual Average of 24-hour Averages	7.83	*11.9*	*9.27*	*11.3*	*9.14*	—	8.8
Median	5.07	8.45	5.59	7.90	5.83	29	—
Maximum	**94.0**	**136**	**148**	**141**	**80.8**	29	—
Standard Deviation	9.67	12.2	12.3	12.8	11.0	—	—
98th Percentile 24-hour Average	*39.9*	*51.4*	*46.7*	*56.4*	*45.0*	—	27
Number Observations [e]	363	364	363	366	150		
Expected Observations	366	366	366	366	151		
% Complete [f]	99.2%	99.5%	99.2%	100.0%	99.3%		
Hours above 24-h Average AAAQO	15	21	16	17	9		

Notes:

[a] $\mu g/m^3$ is the mass of the substance in micrograms per cubic meter of air.

[b] High River Spray Park Station was removed by the CRAZ on November 28, 2023.

[c] AAAQO (AEPA, 2024), **BOLD** values indicate measured concentrations above the AAAQO.

[d] CAAQS (CCME, 2021) for 2020. *Italicized* values indicate measured concentrations are above the CAAQS.

[e] Values are based on the number of hours the station was deployed during the year.

[f] Completeness is calculated based on the number of valid observations over the deployment period. The annual average for the High River Splash Park is not valid as the station was removed during the July 2023 to June 2024 period.

Figure B.3.8 Timeseries of the 24-hour Average Fine Particulate Matter Concentrations Measured at the Springbank Project Air Quality Monitoring Stations and the Regional Air Quality Monitoring Stations – July 2023 to June 2024

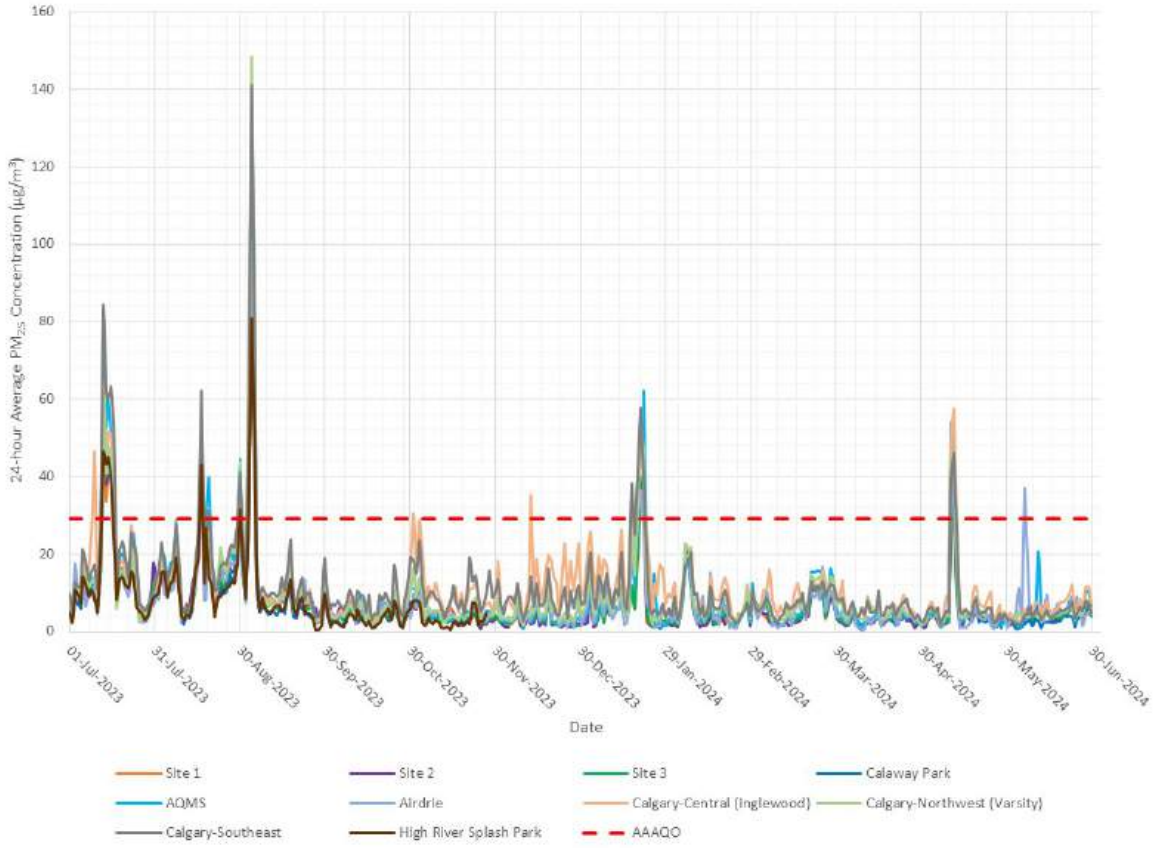


Figure B.3.9 Box-Whisker Plot of the 24-hour Average Fine Particulate Matter Concentrations Measured at the Springbank Project Air Quality Monitoring Stations and Regional Air Quality Monitoring Stations

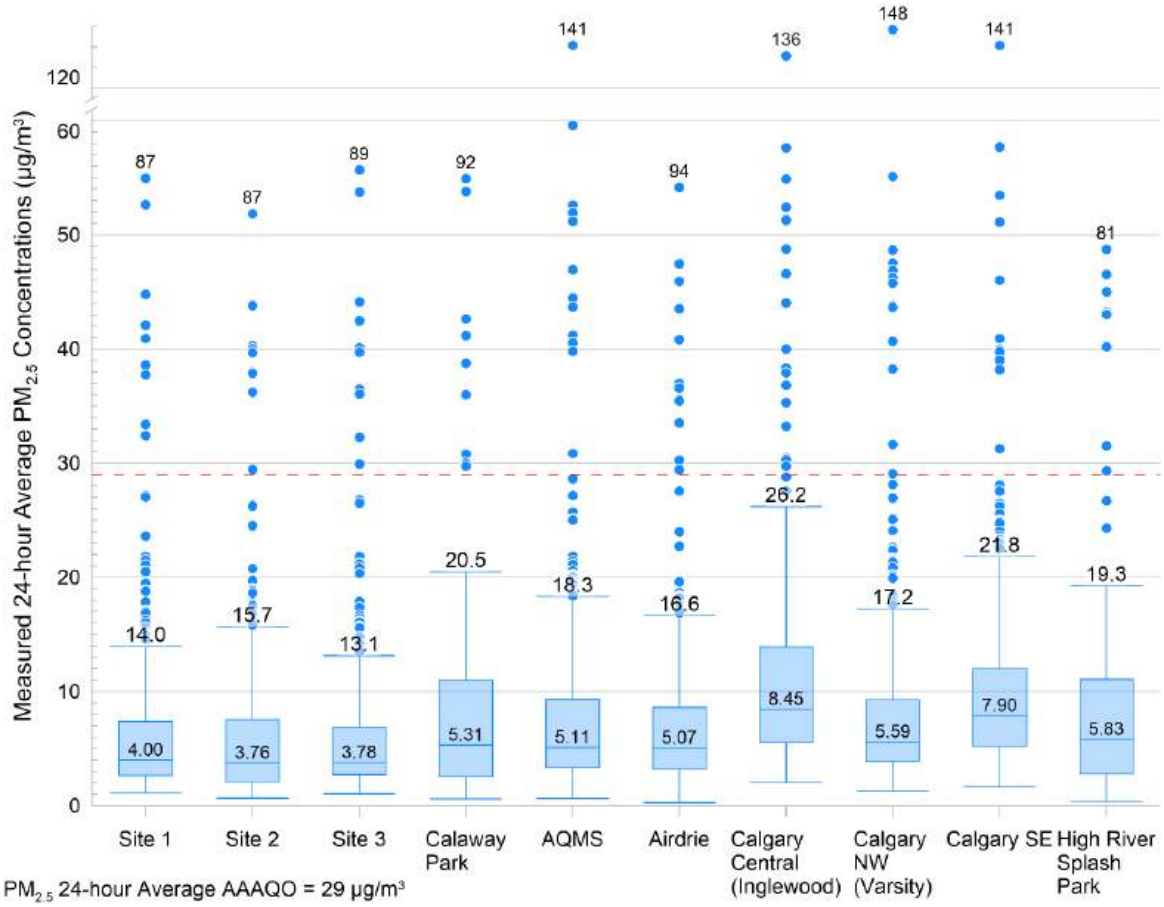


Table B.3.6 Summary Statistics of the Measured 24-Hour Average Concentrations of Coarse Particulate Matter at the Springbank Project Air Quality Monitoring Stations – July 2023 to June 2024

Statistic	Coarse Particulate Matter (PM_{10}) Concentrations ($\mu g/m^3$) [a]			
	SR1 Stations			
	Site 1	Site 2	Site 3	BC AQO [b]
Minimum (Non-Zero)	0.609	0.700	1.46	50
Annual Average of 24-hour Averages	17.1	24.5	13.1	—
Median	9.86	12.8	8.29	50
Maximum	**209**	**562**	**242**	50
Standard Deviation	21.8	49.8	19.3	—
Number Observations	353	338	353	
Expected Observations	366	366	366	
% Complete	96.4%	92.3%	96.4%	
Hours above 24-h Average BC AQO	21	32	11	

Notes:

[a] $\mu g/m^3$ is the mass of the substance in micrograms per cubic meter of air.

[b] BC AQO (BC ENV, 2019). **BOLD** values indicate measured concentrations above the BC AQO.

Figure B.3.10 Timeseries of the 24-hour Average Coarse Particulate Matter Concentrations Measured at the Springbank Project Air Quality Monitoring Stations – July 2023 to June 2024

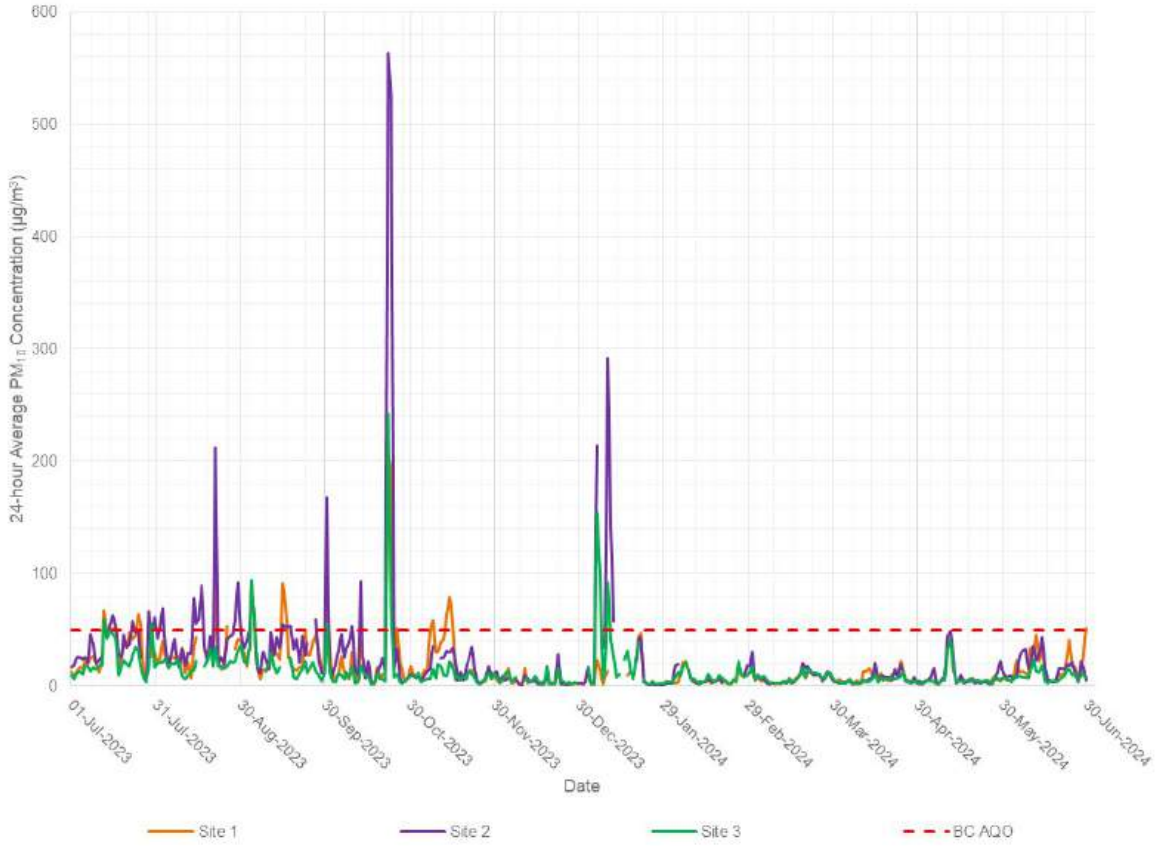


Figure B.3.11 Box-Whisker Plot of the 24-hour Average Coarse Particulate Matter Concentrations Measured at the Springbank Project Air Quality Monitoring Stations

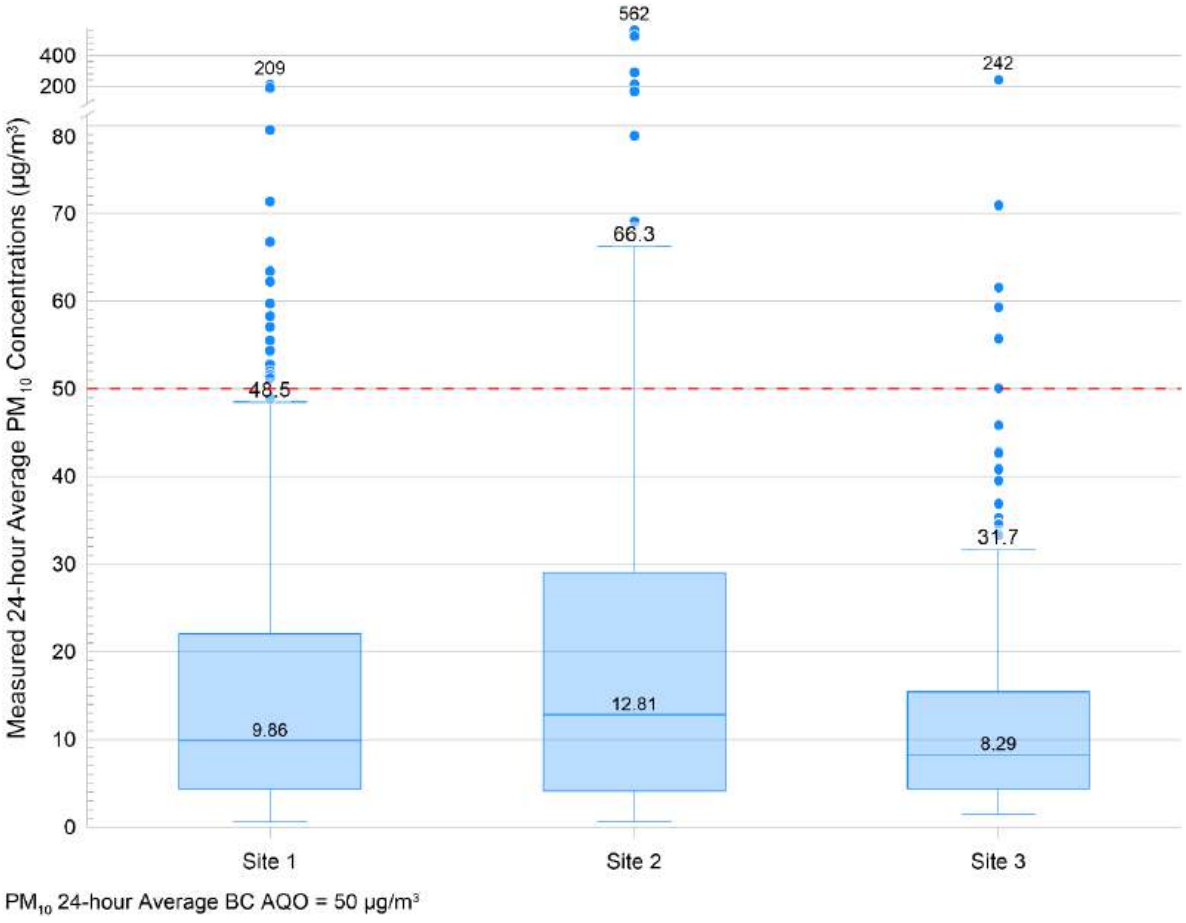


Figure B.3.12 Scatter Plot of the 24-hour Average Coarse Particulate Matter Concentrations and the $PM_{2.5}/PM_{10}$ Ratio at Site 1

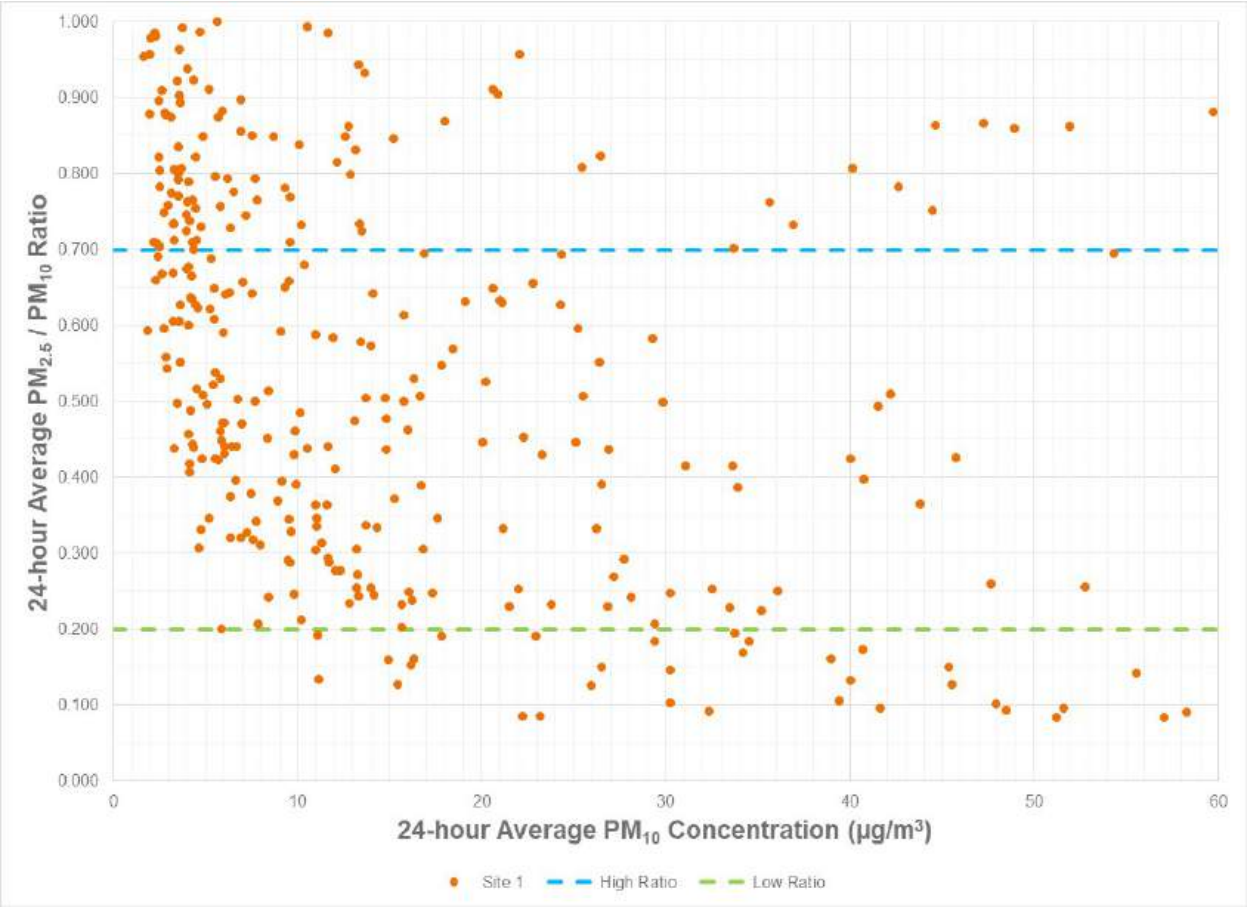


Figure B.3.13 Scatter Plot of the 24-hour Average Coarse Particulate Matter Concentrations and the $PM_{2.5}/PM_{10}$ Ratio at Site 2

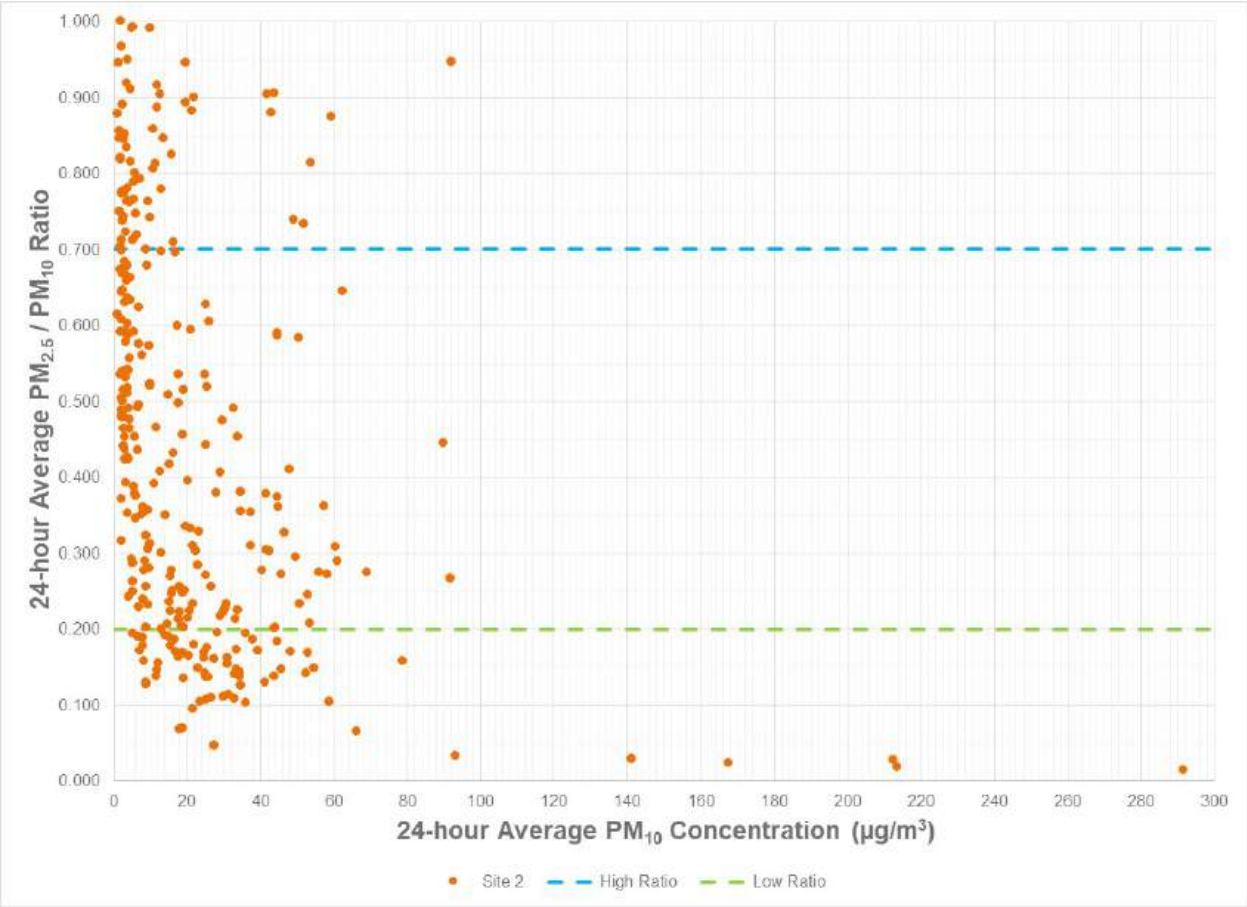


Figure B.3.14 Scatter Plot of the 24-hour Average Coarse Particulate Matter Concentrations and the $PM_{2.5}/PM_{10}$ Ratio at Site 3

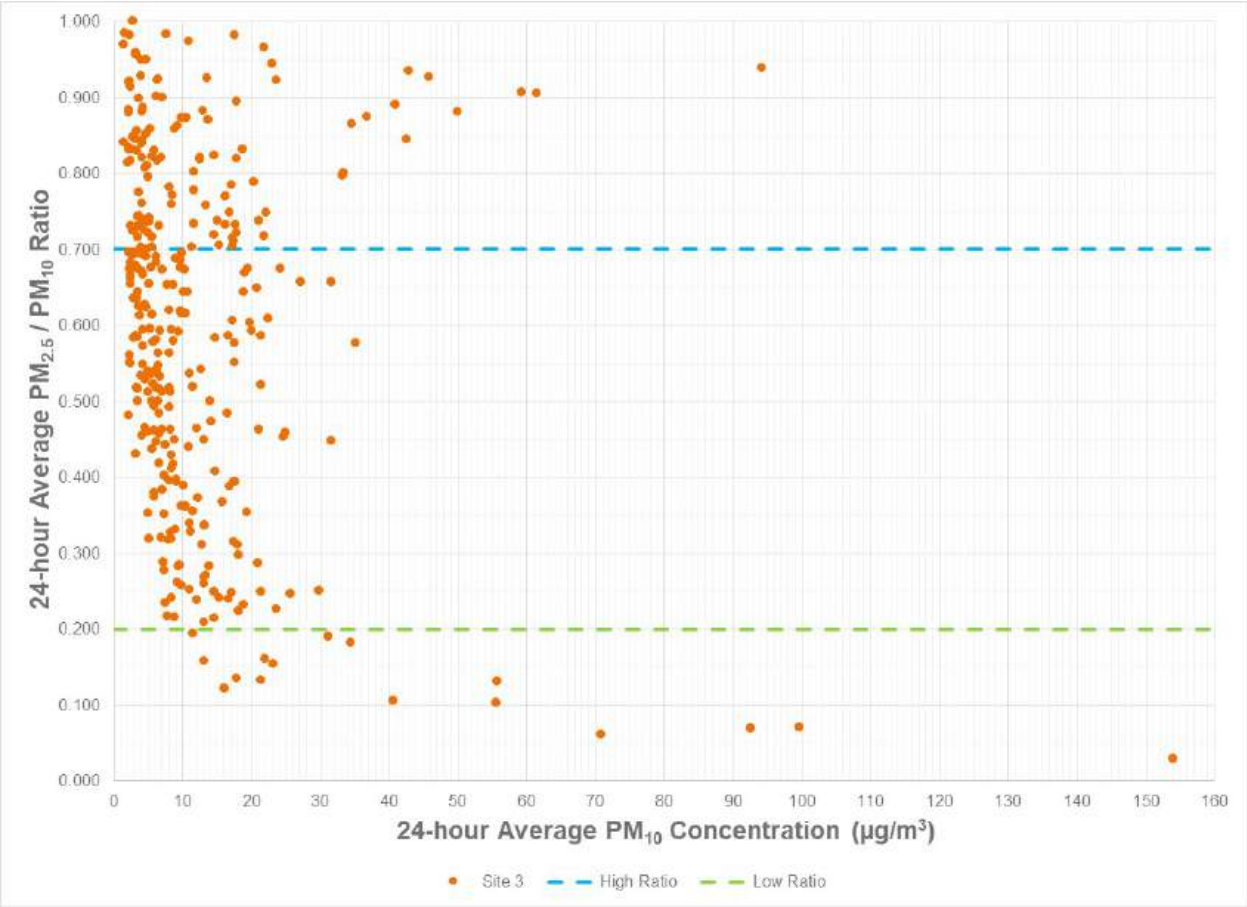


Table B.3.7 Summary Statistics of the Measured 24-Hour Average Concentrations of Total Suspended Particulates at the Springbank Project Air Quality Monitoring Stations – July 2023 to June 2024

Statistic	Total Suspended Particulates (TSP) Concentrations (µg/m³) [a]				
	SR1 Stations				
	Site 1	Site 2	Site 3	Calaway Park [b]	AAAQO [c]
Minimum (Non-Zero)	1.24	0.826	2.43	3.21	100
Annual Average of 1-hour Averages	40.2	53.7	20.6	20.2	60
Median	21.3	26.3	13.9	17.0	100
Maximum	**301**	**508**	**274**	96.5	100
Standard Deviation	49.2	68.9	22.7	13.7	
Number Observations	360	340	353	132	
Expected Observations [d]	366	366	366	164	
% Complete [e]	98.4%	92.9%	96.4%	80.5%	
Hours above 24-h Average AAAQO	38	66	2	0	

Notes:

[a] µg/m³ is the mass of the substance in micrograms per cubic meter of air.

[b] Calaway Park was operational from May 2, 2023, to October 12, 2023, and May 2, 2024, and is planned to be decommissioned in October 2024 at the end of the park's operational season.

[c] AAAQO (AEPA, 2024), **BOLD** values indicate measured concentrations above the AAAQO.

[d] Values are based on the number of hours the station was deployed during the year.

[e] Completeness is calculated based on the number of valid observations over the deployment period. The annual average for the Calaway Park Station is not valid as the station was removed during the off-season (October – April) during July 2023 to June 2024 period.

Figure B.3.15 Timeseries of the 24-hour Average $PM_{2.5}$, PM_{10}, and TSP Concentrations Measured at Site 1 – July 2023 to June 2024

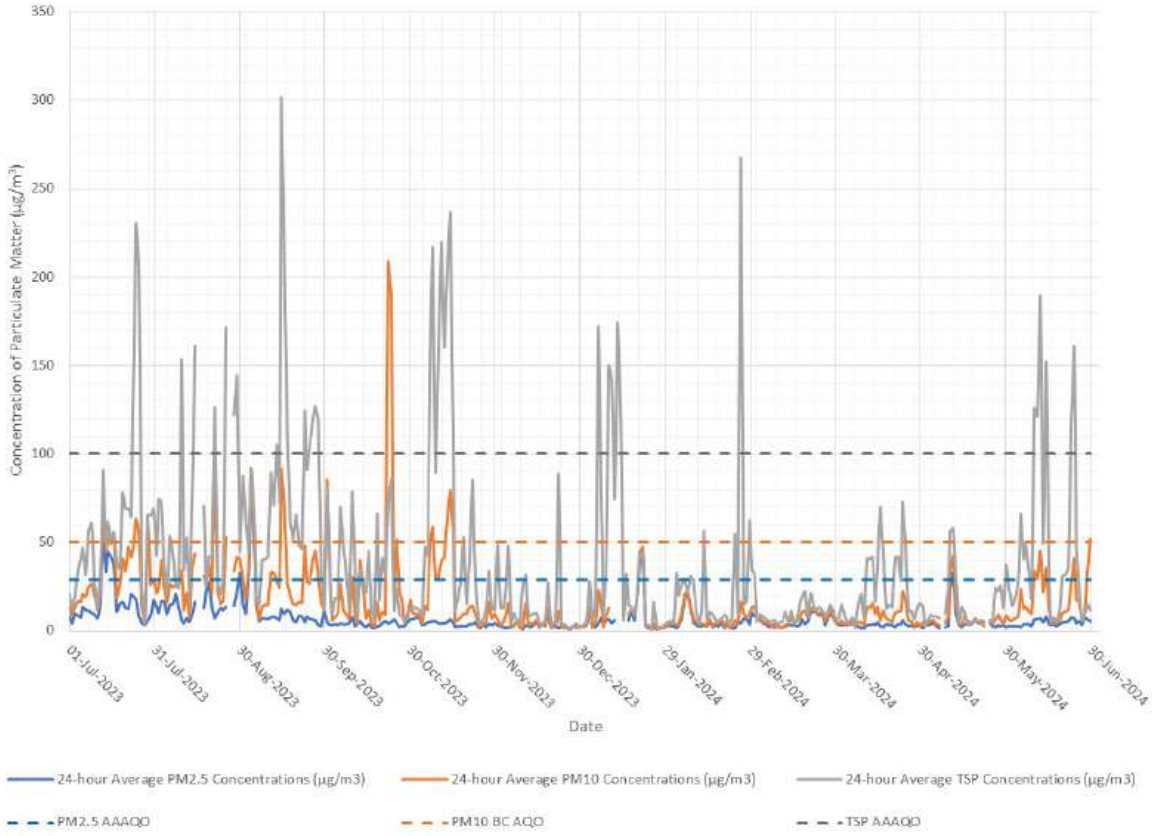


Figure B.3.16 Timeseries of the 24-hour Average $PM_{2.5}$, PM_{10}, and TSP Concentrations Measured at Site 2 – July 2023 to June 2024

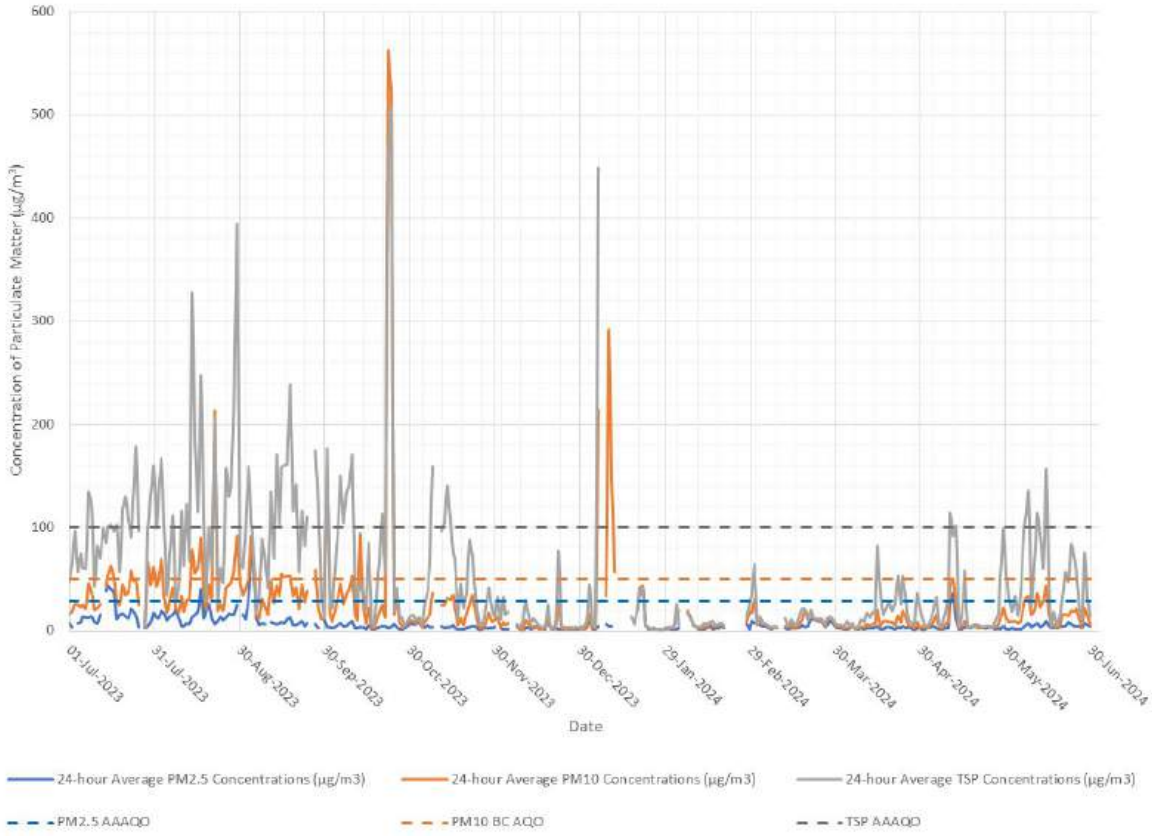


Figure B.3.17 Timeseries of the 24-hour Average $PM_{2.5}$, PM_{10}, and TSP Concentrations Measured at Site 3 – July 2023 to June 2024

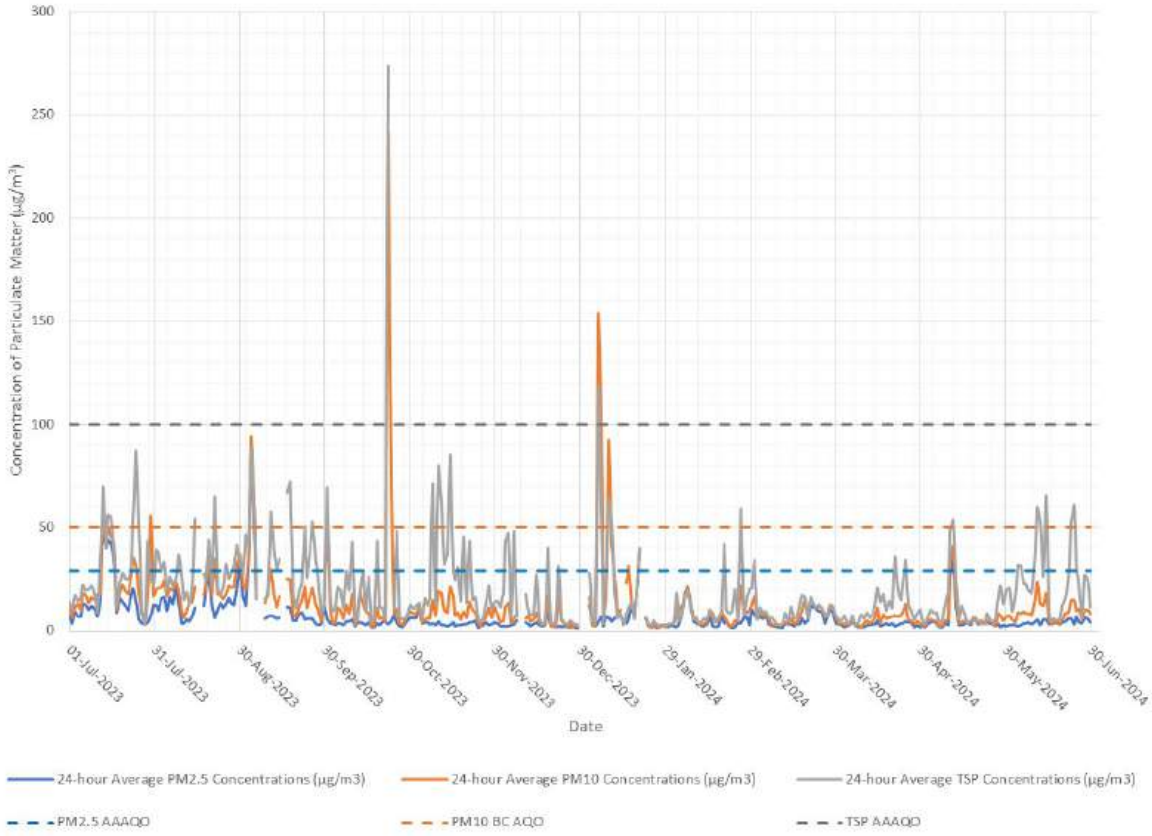


Figure B.3.18 Timeseries of the 24-hour Average $PM_{2.5}$ and TSP Concentrations Measured at Calaway Park – July 2023 to June 2024

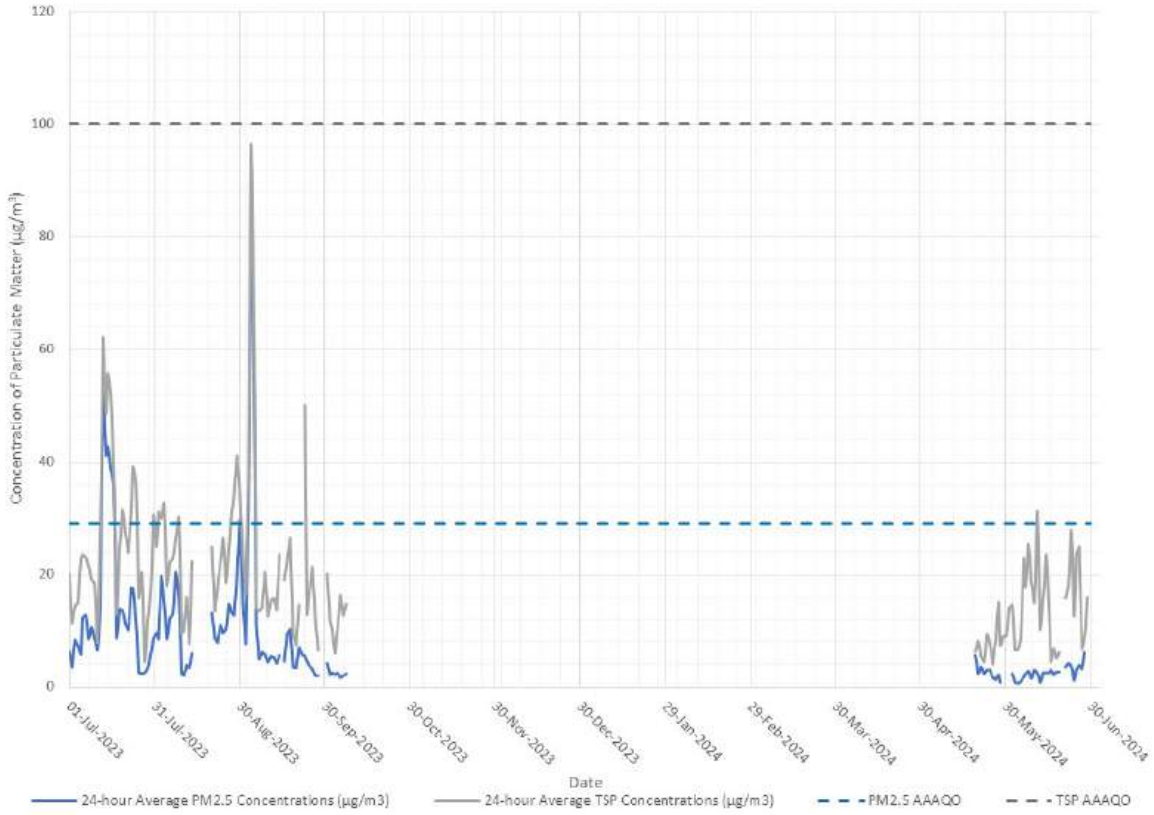


Figure B.3.19 Box-Whisker Plot of the 24-hour Average Total Suspended Particulate Concentrations Measured at the Springbank Project Air Quality Monitoring Stations

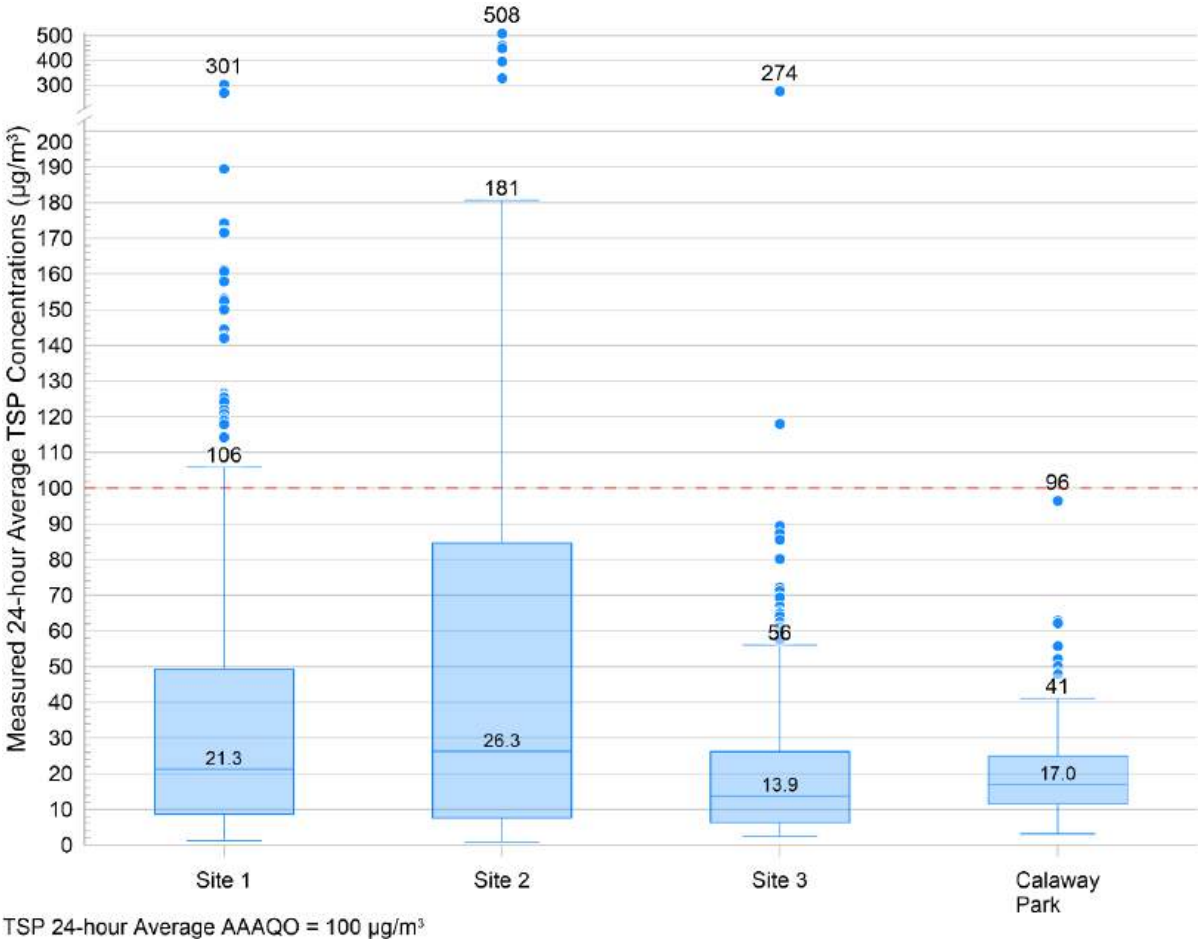


Figure B.3.20 Scatter Plot of the 24-hour Average Total Suspended Particulates Concentrations and the $PM_{2.5}$/TSP and PM_{10}/TSP Ratios at Site 1

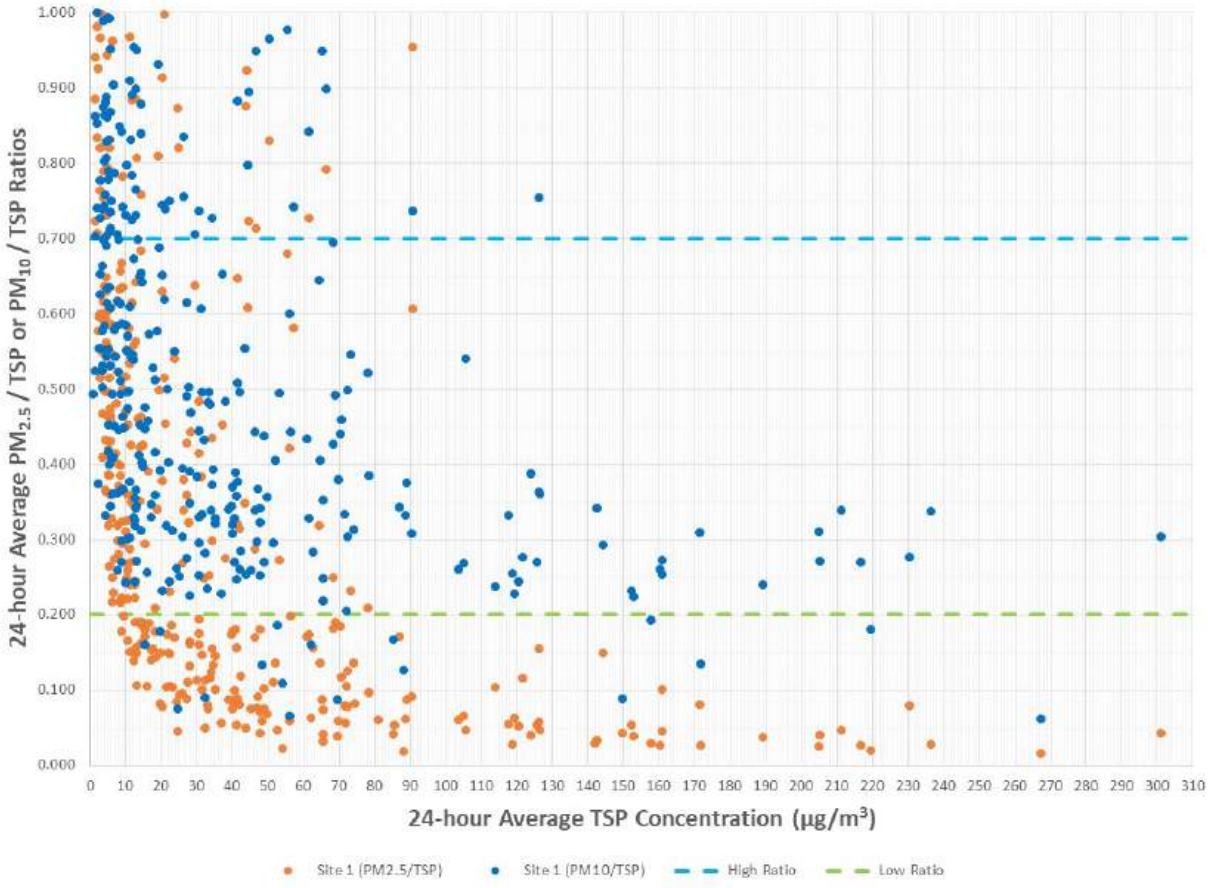


Figure B.3.21 Scatter Plot of the 24-hour Average Total Suspended Particulates Concentrations and the $PM_{2.5}$/TSP and PM_{10}/TSP Ratios at Site 2

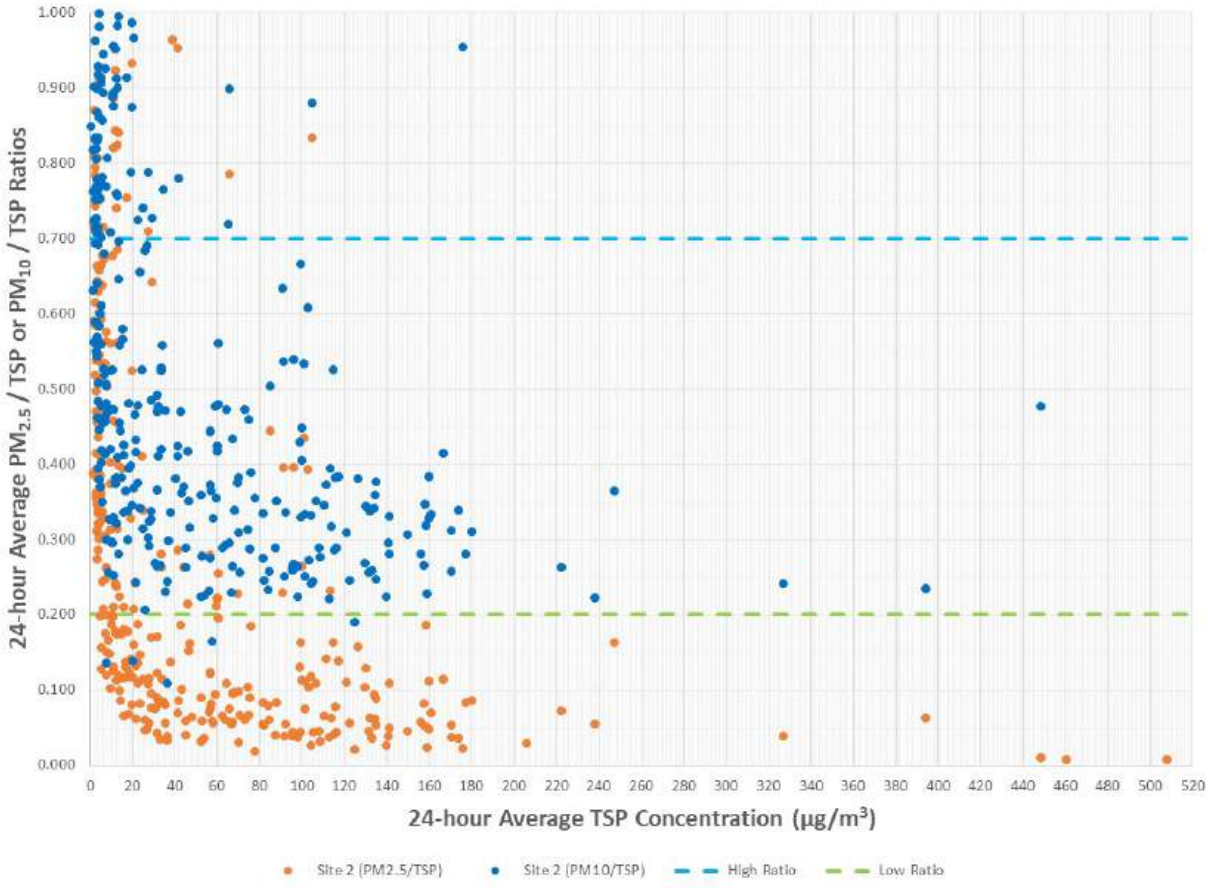


Figure B.3.22 Scatter Plot of the 24-hour Average Total Suspended Particulates Concentrations and the $PM_{2.5}$/TSP and PM_{10}/TSP Ratios at Site 3

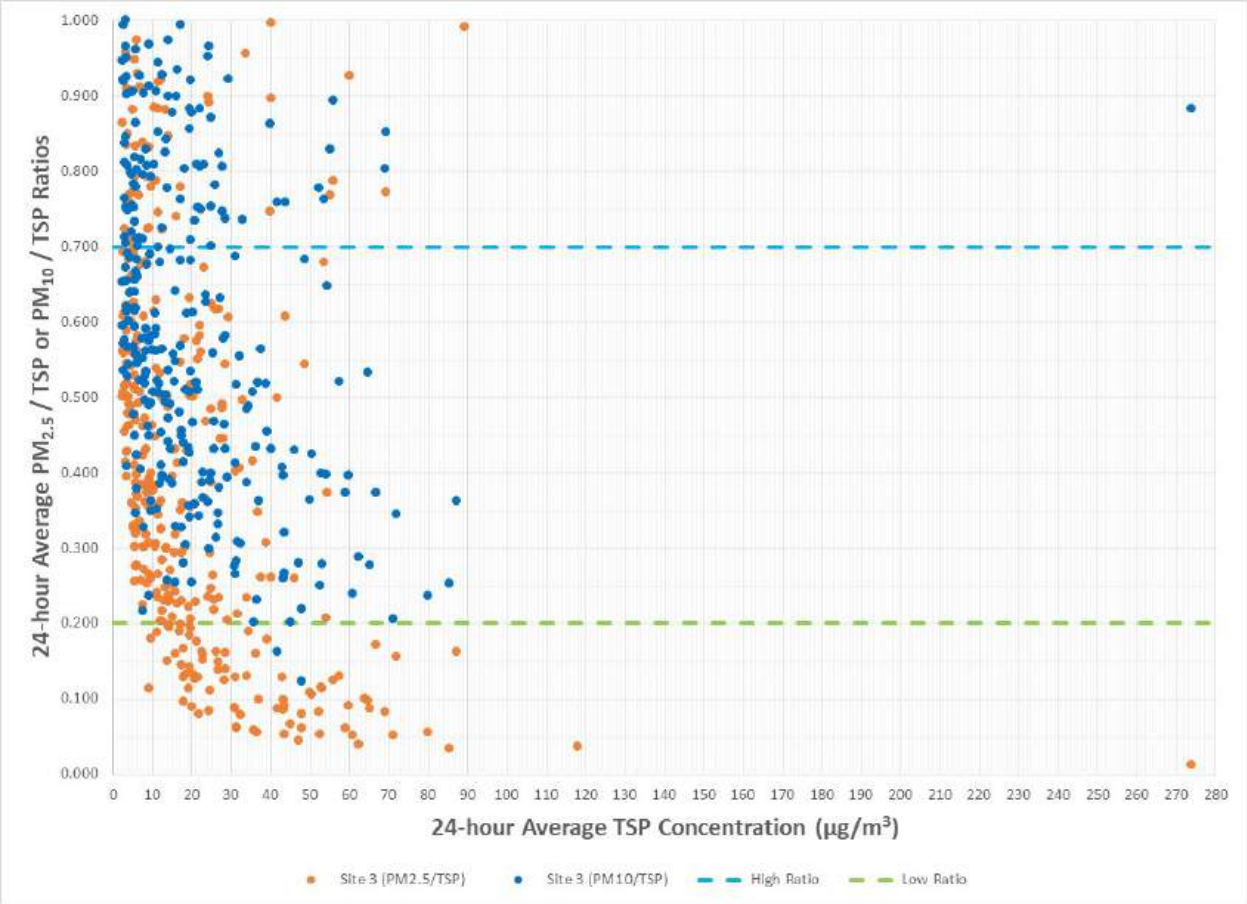


Figure B.3.23 Scatter Plot of the 24-hour Average Total Suspended Particulates Concentrations and the $PM_{2.5}$/TSP Ratio at Calaway Park

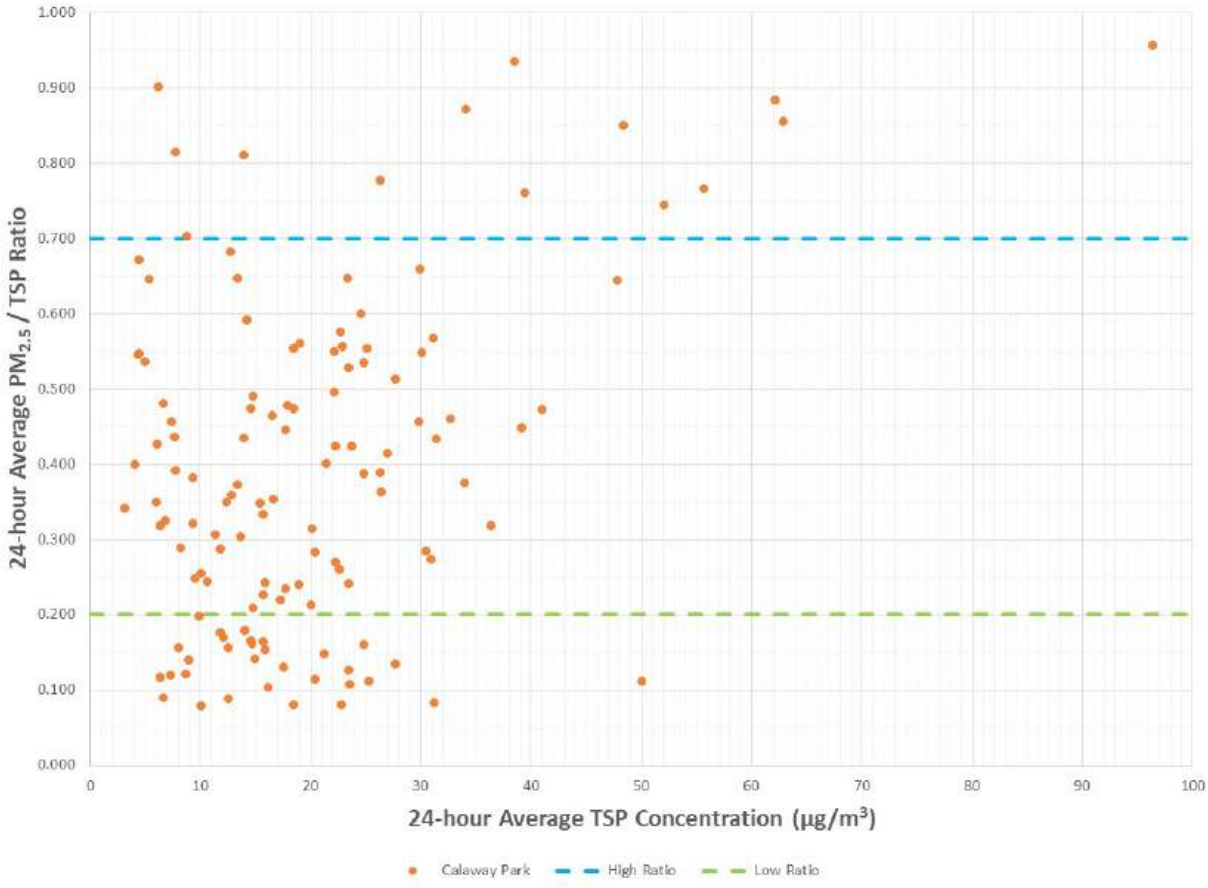


Table B.3.8 Summary Statistics for the Meteorological Parameters Measured at Site 1 – July 2023 to June 2024

	Wind Speed (m/s)				Temperature (°C)				Relative Humidity (%)				Barometric Pressure (kPa)			
Month	**n**	**Min**	**Max**	**Avg**	**n**	**Min**	**Max**	**Avg**	**n**	**Min**	**Max**	**Avg**	**n**	**Min**	**Max**	**Avg**
July	744	0.00	5.47	1.29	744	4.0	32.5	15.9	744	19	100	68.4	744	86.9	88.7	87.9
August	694	0.03	5.17	1.35	694	3.3	33.7	16.3	694	21	100	67.5	694	86.7	88.9	88.0
September	720	0.00	4.53	1.30	720	-2.8	28.4	11.2	720	13	100	65.5	720	86.8	88.8	87.7
October	737	0.06	5.89	1.35	741	-17.0	25.9	4.0	741	16	100	73.7	741	86.0	89.2	87.8
November	715	0.03	8.56	1.78	715	-13.4	15.3	1.0	715	20	99	60.7	715	85.7	88.9	87.4
December	723	0.03	8.36	1.62	743	-15.5	16.2	-0.5	743	23	100	69.8	743	85.5	88.4	87.2
January	736	0.06	6.39	1.28	736	-39.3	13.0	-9.9	736	32	97	75.3	736	84.5	88.8	87.0
February	670	0.00	7.58	1.53	694	-22.2	11.4	-4.9	694	30	97	75.9	694	84.7	88.5	86.9
March	729	0.06	7.36	1.45	732	-26.8	15.2	-5.1	732	23	99	74.2	732	85.5	88.0	86.7
April	690	0.08	8.72	2.24	720	-8.0	17.7	4.4	720	21	100	61.4	720	85.9	88.8	87.2
May	716	0.03	9.39	2.26	720	-1.8	24.9	8.4	720	18	100	67.3	720	85.7	88.9	87.1
June	711	0.03	10.1	1.81	718	0.1	25.7	12.0	718	25	100	62.8	717	85.3	88.3	87.3
Annual	8,585	0.00	10.1	1.60	8,677	-39.3	33.7	4.4	8,677	13	100	68.6	8,676	84.5	89.2	87.3

Table B.3.9 Summary Statistics for the Meteorological Parameters Measured at Site 2 – July 2023 to June 2024

	Wind Speed (m/s)				Temperature (°C)				Relative Humidity (%)				Barometric Pressure (kPa)			
Month	**n**	**Min**	**Max**	**Avg**	**n**	**Min**	**Max**	**Avg**	**n**	**Min**	**Max**	**Avg**	**n**	**Min**	**Max**	**Avg**
July	709	0.03	7.06	1.64	709	4.4	33.2	16.7	709	17	100	66.9	709	87.3	89.1	88.2
August	731	0.03	6.94	1.62	731	2.9	33.7	16.5	731	21	100	66.2	731	86.9	89.2	88.2
September	672	0.08	8.69	1.47	672	-3.4	28.2	10.9	672	13	99	66.3	672	87.2	89.2	88.1
October	708	0.06	7.19	1.66	734	-18.1	25.2	3.6	734	15	100	73.1	734	86.4	89.6	88.1
November	659	0.08	12.1	2.02	673	-14.8	15.3	0.5	673	19	99	61.5	673	86.1	89.2	87.6
December	672	0.06	10.2	1.49	691	-16.3	16.1	-1.2	705	24	100	70.6	705	85.5	88.5	87.4
January	603	0.08	7.25	1.52	603	-39.9	13.8	-7.1	603	31	97	74.4	603	84.9	89.2	87.3
February	499	0.06	7.14	1.65	499	-21.0	11.7	-5.2	499	27	97	76.8	499	84.9	88.7	87.1
March	701	0.03	8.06	1.84	701	-26.9	15.3	-4.9	701	31	98	75.6	701	85.7	88.4	87.0
April	680	0.06	9.61	2.45	713	-8.7	17.5	4.0	713	20	100	61.1	713	86.1	89.2	87.4
May	728	0.11	12.9	2.42	738	-2.2	23.9	8.3	738	19	100	67.1	738	85.9	89.1	87.3
June	715	0.06	8.61	2.11	715	-0.6	25.4	11.8	715	22	100	60.9	715	85.5	88.4	87.5
Annual	8,077	0.03	12.9	1.83	8,179	-39.9	33.7	5.0	8,193	13	100	68.1	8,193	84.9	89.6	87.6

Table B.3.10 Summary Statistics for the Meteorological Parameters Measured at Site 3 – July 2023 to June 2024

	Wind Speed (m/s)				Temperature (°C)				Relative Humidity (%)				Barometric Pressure (kPa)			
Month	**n**	**Min**	**Max**	**Avg**	**n**	**Min**	**Max**	**Avg**	**n**	**Min**	**Max**	**Avg**	**n**	**Min**	**Max**	**Avg**
July	742	0.03	6.97	1.76	742	3.6	33.2	16.3	742	16	100	68.3	742	87.5	89.2	88.4
August	714	0.14	6.00	1.79	714	1.6	33.5	16.2	714	21	100	67.4	714	87.1	89.3	88.4
September	685	0.03	6.17	1.69	685	-3.2	28.9	11.2	685	12	99	66.9	685	87.2	89.2	88.1
October	720	0.03	7.33	1.77	741	-19.1	26.1	3.6	741	14	100	74.6	741	86.3	89.6	88.1
November	710	0.06	9.64	1.82	715	-17.8	15.7	0.2	715	20	99	63.5	715	86.1	89.2	87.7
December	658	0.03	7.89	1.56	693	-19.3	16.2	-2.0	693	27	100	73.0	693	85.7	88.8	87.6
January	691	0.11	6.56	1.55	690	-40.0	13.6	-10.8	692	33	97	75.7	692	84.9	89.3	87.4
February	694	0.06	7.03	1.79	694	-22.3	11.4	-5.7	694	31	97	77.3	694	84.9	88.9	87.2
March	733	0.06	6.94	1.81	733	-28.7	16.9	-4.1	733	29	99	75.8	733	85.9	88.5	87.1
April	695	0.03	8.78	2.58	719	-8.1	18.6	4.8	719	19	100	62.0	719	86.3	89.2	87.5
May	741	0.06	8.72	2.51	743	-2.9	25.3	8.2	743	15	100	67.7	743	86.0	89.2	87.5
June	719	0.06	7.33	2.16	719	-0.7	25.8	11.8	719	22	100	61.8	719	85.7	88.5	87.6
Annual	8,502	0.03	9.64	1.90	8,588	-40.0	33.5	4.2	8,590	12	100	69.5	8,590	84.9	89.6	87.7

Table B.3.11 Summary Statistics for the Meteorological Parameters Measured at Calaway Park – July 2023 to June 2024

Month	Wind Speed (m/s)				Temperature (°C)				Relative Humidity (%)				Barometric Pressure (kPa)			
	n	Min	Max	Avg	n	Min	Max	Avg	n	Min	Max	Avg	n	Min	Max	Avg
July	742	0.03	8.25	1.42	742	2.8	33.3	16.0	742	16.0	100.0	68.0	742	87.3	89.1	88.3
August	663	0.03	7.67	1.45	663	3.4	33.2	16.9	663	21.0	100.0	66.1	663	86.9	89.2	88.3
September	684	0.03	6.36	1.36	684	-3.2	29.3	12.0	684	12.0	100.0	63.9	684	87.2	89.2	88.1
October [a]	229	0.03	4.92	1.58	231	-4.7	25.4	8.2	231	20.0	100.0	66.7	231	86.4	89.6	88.1
November	0	—	—	—	0	—	—	—	0	—	—	—	0	—	—	—
December	0	—	—	—	0	—	—	—	0	—	—	—	0	—	—	—
January	0	—	—	—	0	—	—	—	0	—	—	—	0	—	—	—
February	0	—	—	—	0	—	—	—	0	—	—	—	0	—	—	—
March	0	—	—	—	0	—	—	—	0	—	—	—	0	—	—	—
April	0	—	—	—	0	—	—	—	0	—	—	—	0	—	—	—
May [a]	649	0.03	10.8	2.57	670	-3.5	25.3	8.9	670	15.0	100.0	64.5	670	86.0	89.2	87.4
June	642	0.03	10.9	2.17	659	-0.1	26.0	12.2	659	21.0	100.0	59.4	659	85.6	88.5	87.5
Annual	3,609	0.00	10.9	1.77	3,649	0.0	33.3	12.9	3,649	0.0	100.0	64.6	3,649	0.0	89.6	87.9

Note:

[a] Calaway Park was operational from May 2, 2023, to October 12, 2023, and May 2, 2024, and is planned to be decommissioned in October 2024 at the end of the park's operational season.

Table B.3.12 Summary Statistics for the Meteorological Parameters Measured at the Springbank AQMS – July 2023 to June 2024

Month	Wind Speed (m/s)				Temperature (°C)				Relative Humidity (%)				Barometric Pressure (kPa)			
	n	Min	Max	Avg	n	Min	Max	Avg	n	Min	Max	Avg	n	Min	Max	Avg
July [a]	578	0.03	8.39	1.95	586	2.6	32.6	16.7	586	13.0	99.0	66.1	587	87.5	89.3	88.4
August	730	0.03	8.64	2.01	730	1.7	32.2	16.1	730	18.0	99.0	64.7	730	87.1	89.4	88.5
September	688	0.03	8.11	1.91	688	-4.6	28.1	10.8	688	9.0	99.0	64.7	688	87.4	89.4	88.3
October	742	0.00	9.89	2.12	742	-20.2	25.4	3.0	742	12.0	100.0	71.9	742	86.6	89.9	88.4
November	707	0.03	10.5	2.20	707	-18.6	15.2	-0.6	707	16.0	97.0	61.8	707	86.4	89.5	88.0
December	717	0.00	8.31	1.64	719	-21.2	16.0	-2.9	719	17.0	98.0	70.6	719	86.0	89.1	87.9
January	740	0.00	8.69	1.65	741	-39.9	13.5	-11.5	741	29.0	95.0	70.7	741	85.5	89.7	87.9
February	689	0.00	8.94	2.02	689	-23.5	12.2	-6.1	689	24.0	93.0	72.6	689	85.5	89.3	87.7
March	744	0.03	6.92	1.98	744	-30.3	15.3	-5.3	744	20.0	97.0	70.7	744	86.6	89.4	87.9
April	714	0.00	11.3	3.25	714	-11.1	17.3	3.5	714	15.0	99.0	58.9	714	87.1	89.8	88.0
May	722	0.08	11.7	3.12	722	-5.4	24.6	8.2	722	12.0	98.0	63.2	722	86.5	89.7	87.9
June	720	0.00	11.1	2.78	720	-1.5	25.4	12.0	720	17.0	99.0	57.4	720	86.2	89.0	88.0
Annual	8,491	0.00	11.69	2.22	8,502	-39.9	32.6	3.4	8,502	9	100	66.1	8,503	85.5	89.9	88.1

Note:
[a] Springbank Air Quality Monitoring Station started monitoring on July 7, 2023.

Table B.3.12 Summary Statistics for the Meteorological Parameters Measured at the Springbank AQMS – July 2023 to June 2024 (cont'd)

Month	Solar Radiation (W/m^2)				Precipitation (millimetre per hour (mm/h))			
	n	Min	Max	Avg	n	Min	Max	Avg
July [a]	430 [b]	0.0	952.0	243.0	587	0.0	13.2	0.1
August	720	0.0	953.0	227.8	730	0.0	8.1	0.0
September	677	0.0	807.0	161.0	688	0.0	0.9	0.0
October	742	0.0	658.0	100.9	742	0.0	1.9	0.0
November	692	0.0	479.0	66.9	707	0.0	0.3	0.0
December	719	0.0	369.0	47.8	719	0.0	0.5	0.0
January	726	0.0	402.0	57.3	741	0.0	0.1	0.0
February	689	0.0	744.0	102.2	689	0.0	1.0	0.0
March	744	0.0	863.0	161.3	744	0.0	0.3	0.0
April	688	0.0	907.0	199.1	714	0.0	1.4	0.0
May	48 [c]	0.0	596.0	105.1	722	0.0	2.0	0.0
June	632	0.0	1,033.0	274.5	720	0.0	4.5	0.0
Annual	7,507	0.0	1,033.0	143.9	8,503	0.0	13.2	0.0

Notes:

[a] Springbank Air Quality Monitoring Station started monitoring on July 7, 2023.

[b] Solar radiation sensor issues during commissioning and was replaced on July 13, 2023.

[c] Solar radiation sensor failure on May 3, 2024, replaced on June 4, 2024.

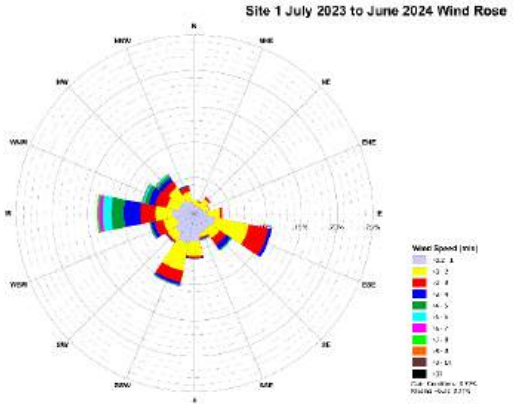
Table B.3.13 Summary Statistics for the Meteorological Parameters Measured at the Springbank Airport – July 2023 to June 2024

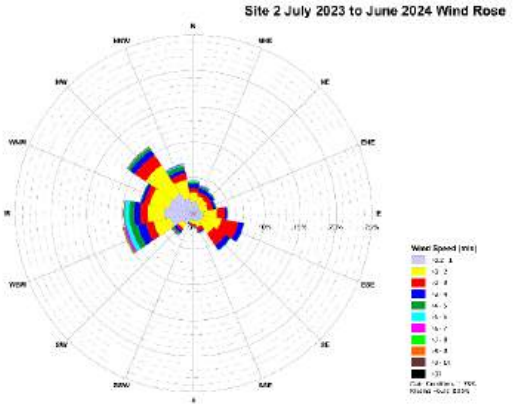
Month	Wind Speed (m/s)				Temperature (°C)				Relative Humidity (%)				Barometric Pressure (kPa)			
	n	Min	Max	Avg	n	Min	Max	Avg	n	Min	Max	Avg	n	Min	Max	Avg
July	666	0.00	12.50	3.42	666	-11.2	7.0	-0.9	732	18.0	100.0	72.0	732	87.1	88.9	88.1
August	679	0.00	11.39	3.54	679	-9.5	8.8	-0.6	731	18.0	100.0	67.8	731	86.7	89.0	88.1
September	678	0.00	9.72	3.45	678	-8.7	8.2	0.1	720	11.0	99.0	65.1	720	87.0	89.0	87.9
October	703	0.00	13.33	3.54	703	-11.3	9.0	-0.4	744	15.0	99.0	72.5	744	86.2	89.4	88.0
November	684	0.00	18.61	3.78	684	-8.2	7.0	-0.8	720	18.0	97.0	62.6	720	85.9	89.1	87.6
December	697	0.00	13.89	3.41	697	-8.7	8.2	-0.6	744	24.0	98.0	68.6	744	85.6	88.7	87.5
January	703	0.00	11.39	3.10	703	-9.7	5.0	-0.7	744	37.0	95.0	71.7	744	85.1	89.2	87.5
February	656	0.00	11.39	3.37	656	-11.4	10.2	-0.8	696	35.0	95.0	74.6	696	85.0	88.9	87.3
March	685	0.00	10.28	3.33	685	-8.9	7.2	0.3	730	30.0	97.0	73.1	723	86.2	88.9	87.5
April	683	0.00	15.28	4.72	683	-12.4	9.2	-1.4	719	17.0	98.0	60.0	700	86.7	89.4	87.6
May	694	0.00	16.11	4.62	694	-13.7	8.8	-1.7	744	15.0	98.0	66.7	744	86.1	89.3	87.5
June	661	0.00	12.78	4.26	661	-9.3	8.8	-0.3	720	22.0	99.0	61.7	720	85.8	88.6	87.6
Annual	8,189	0.00	18.61	3.71	8,718	-40.5	32.4	3.8	8,744	11	100	68.1	8,718	85.0	89.4	87.7

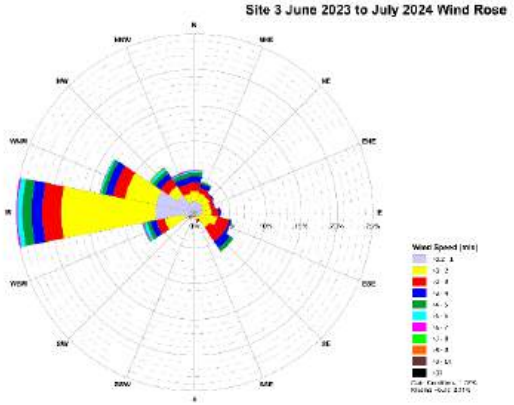
Table B.3.13 Summary Statistics for the Meteorological Parameters Measured at the Springbank Airport – July 2023 to June 2024 (cont'd)

Month	Precipitation (mm/h)			
	n	Min	Max	Avg
July	732	0.0	16.0	0.1
August	731	0.0	9.1	0.1
September	720	0.0	3.3	0.0
October	744	0.0	3.0	0.0
November	720	0.0	0.8	0.0
December	744	0.0	0.8	0.0
January	744	0.0	0.5	0.0
February	696	0.0	1.8	0.0
March	731	0.0	1.2	0.0
April	720	0.0	1.8	0.3
May	744	0.0	4.0	0.2
June	720	0.0	10.2	0.2
Annual	8,746	0.0	16.0	0.1

Figure B.3.24 Joint Frequency Distribution Plots (Wind Roses) from the Site 1 (Upper Left), Site 2 (Upper Right), Site 3 (Lower Left), and Calaway Park (Lower Right) EBAM Stations – July 2023 to June 2024







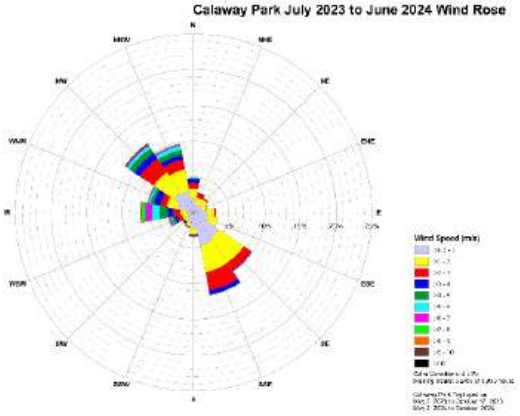


Figure B.3.25 Joint Frequency Distribution Plots (Wind Roses) from the Springbank AQMS (Left) and Springbank Airport (Right) Ambient Air Quality Stations – July 2023 to June 2024

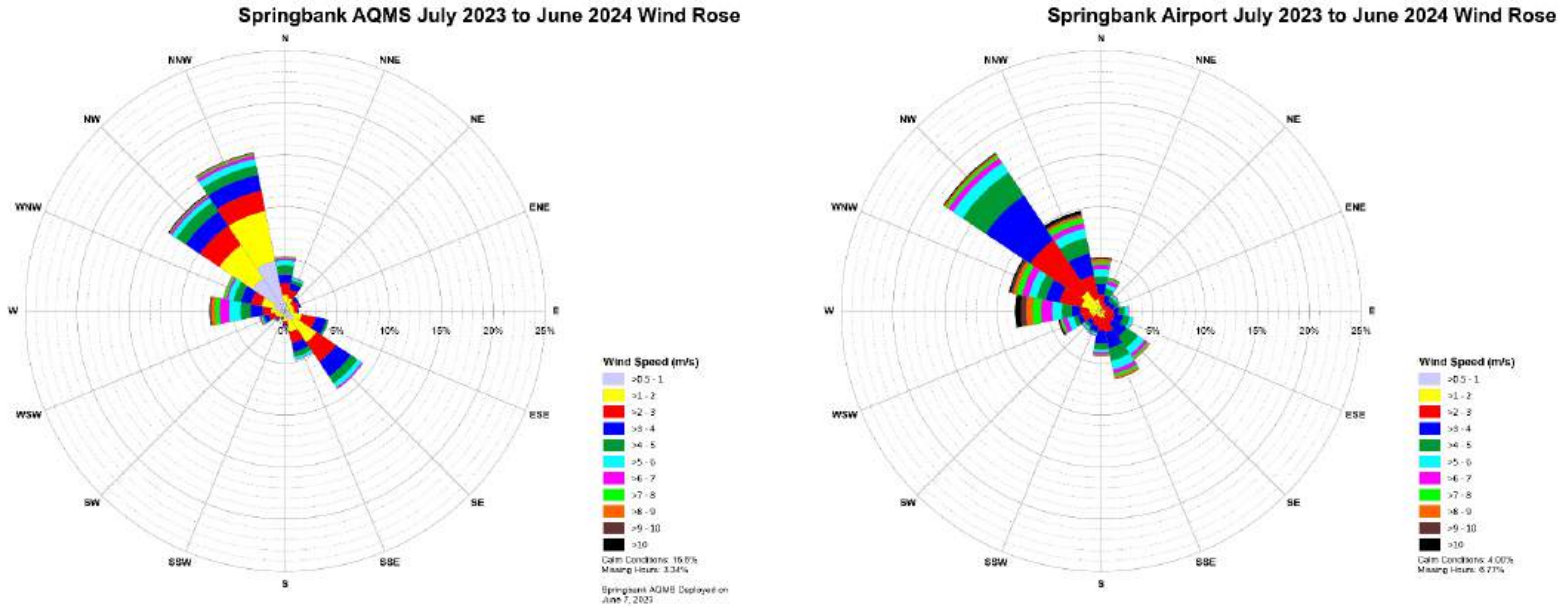


Figure B.3.26 Frequency Histogram of the 1-hour Average Wind Speeds Measured at the SR1 Project Sites and the Springbank Airport – July 2023 to June 2024

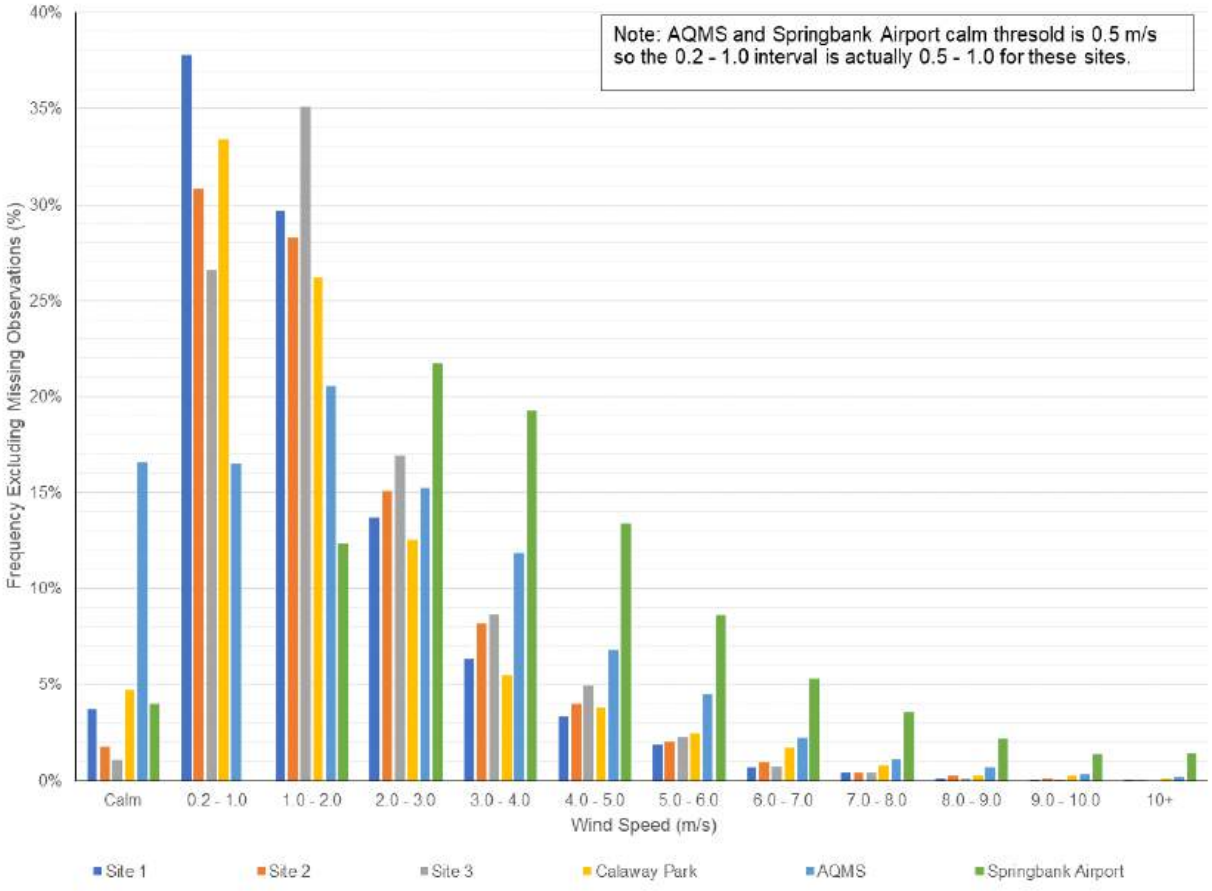


Figure B.3.27 Frequency Histogram of the 1-hour Average Ambient Temperature Measured at the SR1 Project Sites and the Springbank Airport – July 2023 to June 2024

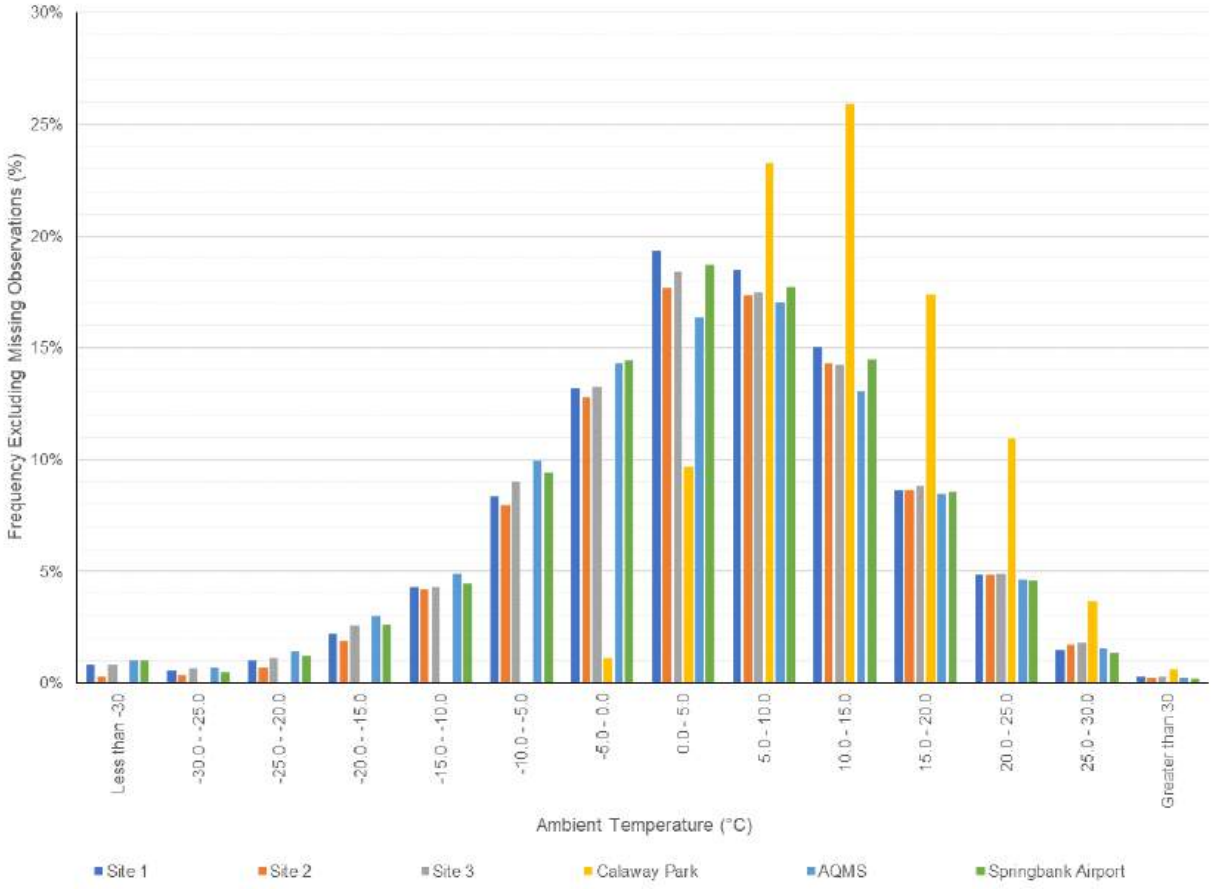


Figure B.3.28 Frequency Histogram of the 1-hour Average Relative Humidity Measured at the SR1 Project Sites and the Springbank Airport – July 2023 to June 2024

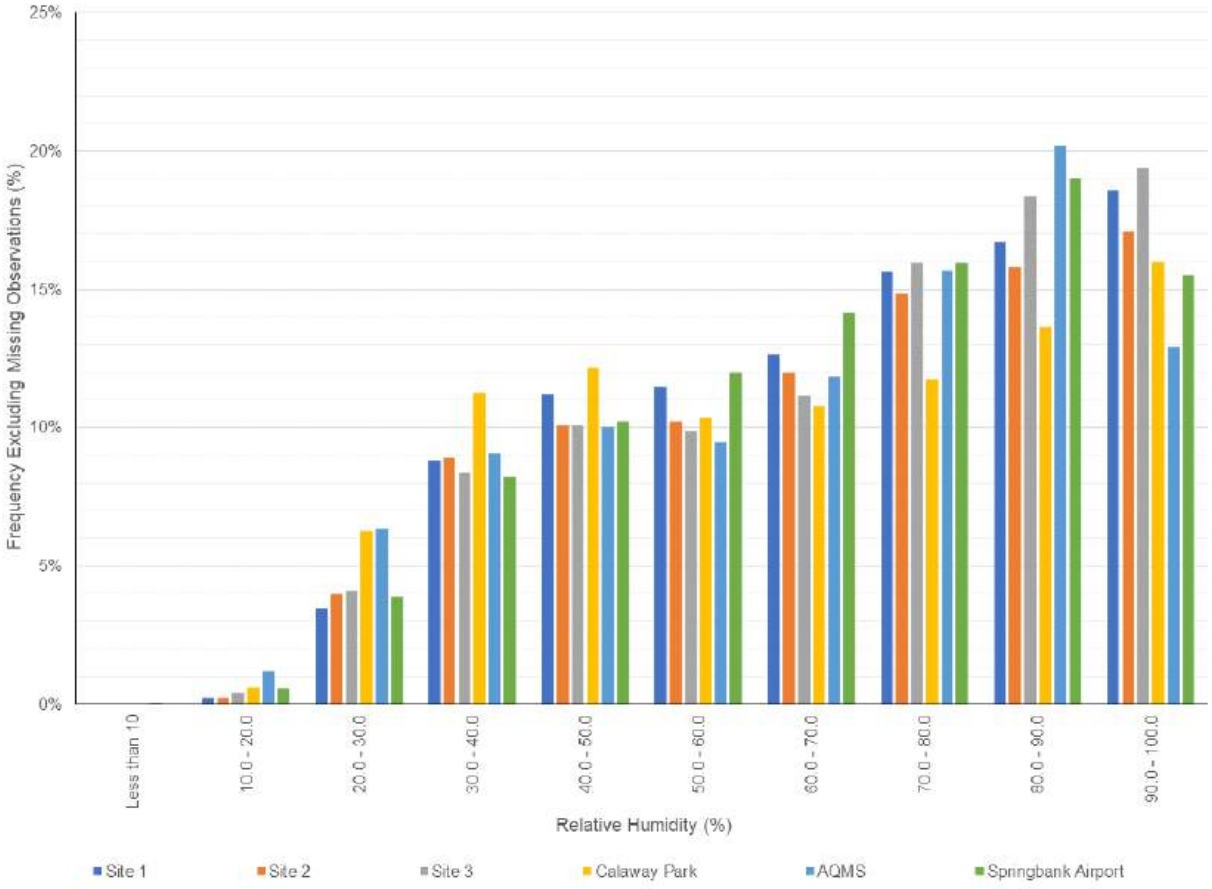


Figure B.3.29 Frequency Histogram of the 1-hour Average Atmospheric Pressure Measured at the SR1 Project Sites and the Springbank Airport – July 2023 to June 2024

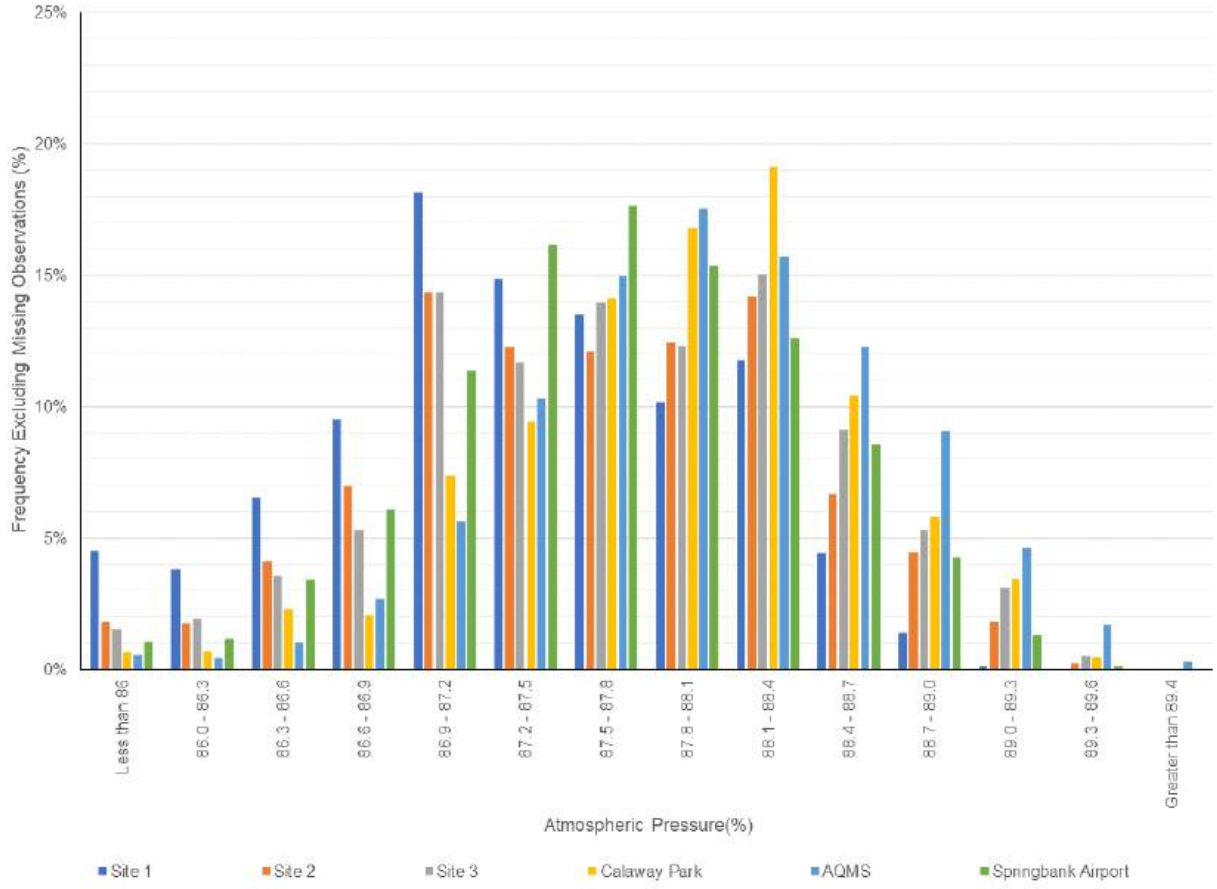


Figure B.3.30 Box-Whisker Plot of the 1-hour Average Solar Radiation Measured at the Springbank AQMS for Each Month – July 2023 to June 2024



Figure B.3.31 Time Series of the 1-hour Average Precipitation and Cumulative Precipitation Measured at the Springbank AQMS and Springbank Airport – July 2023 to June 2024

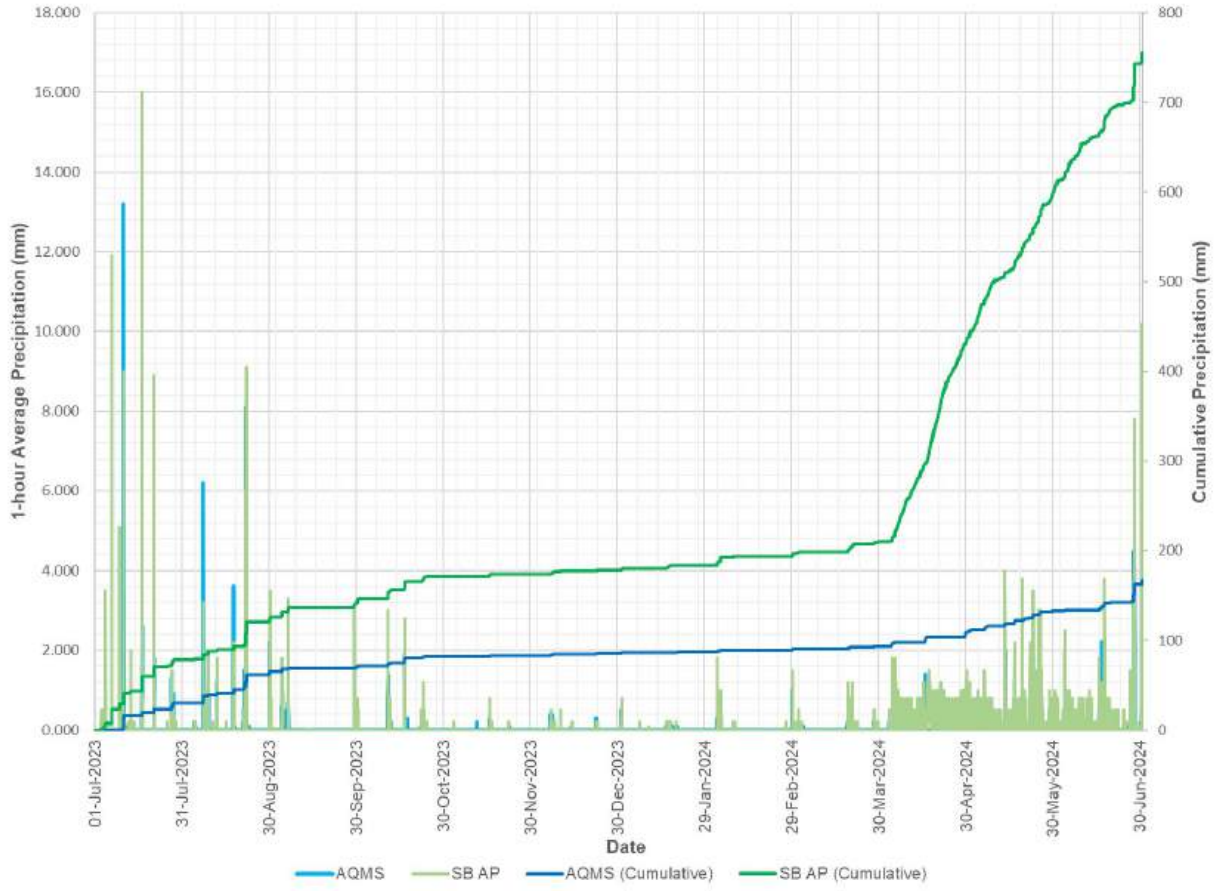


Figure B.3.32 Joint Frequency Distribution Plots of the Wind Direction and $PM_{2.5}$ 1-hour Average Concentrations Above the AAAQG (Left) and a Scatter Plot of the Wind Speed and $PM_{2.5}$ 1-hour Average Concentrations Above the AAAQG (Right) measured at Site 1 – July 2023 to June 2024

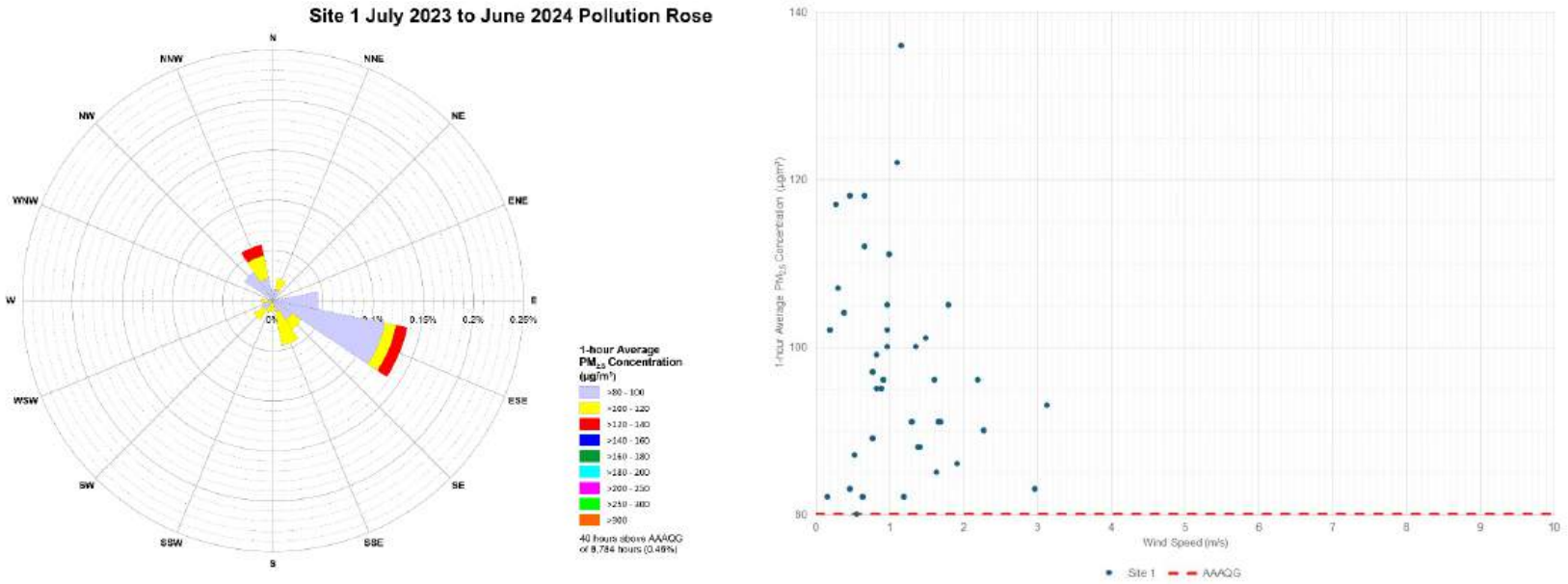


Figure B.3.33 Joint Frequency Distribution Plots of the Wind Direction and $PM_{2.5}$ 1-hour Average Concentrations Above the AAAQG (Left) and a Scatter Plot of the Wind Speed and $PM_{2.5}$ 1-hour Average Concentrations Above the AAAQG (Right) measured at Site 2 – July 2023 to June 2024

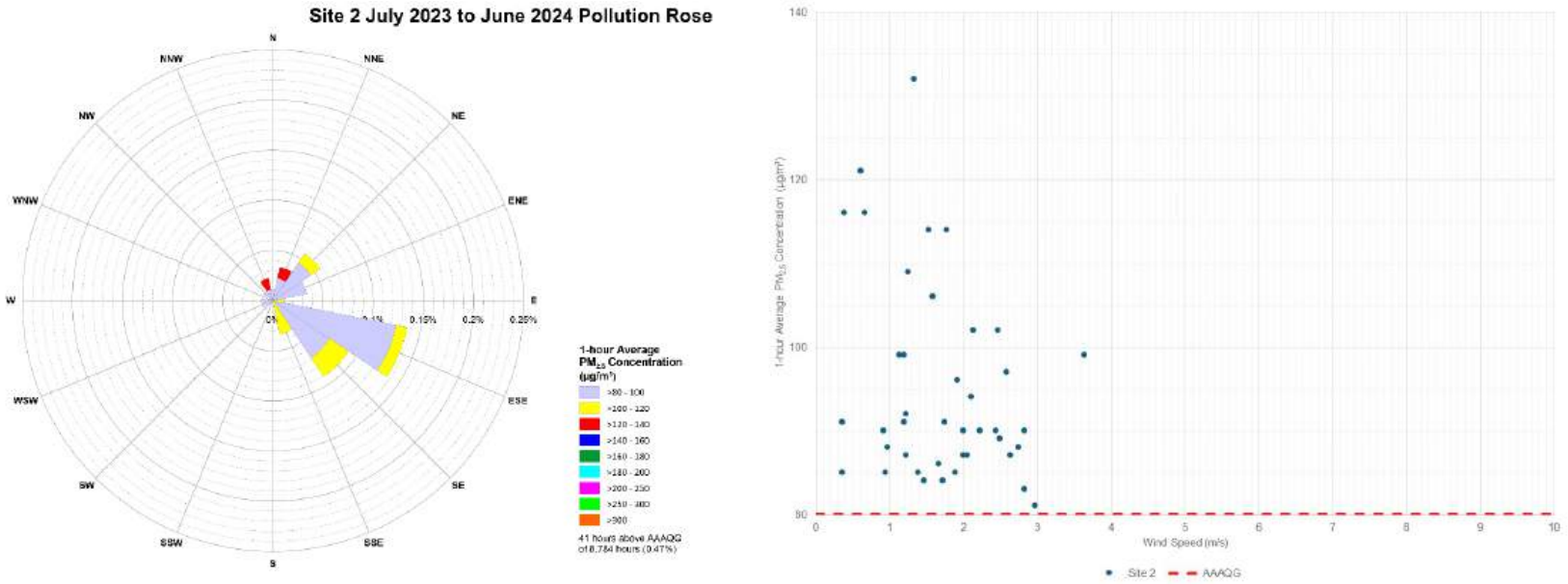


Figure B.3.34 Joint Frequency Distribution Plots of the Wind Direction and $PM_{2.5}$ 1-hour Average Concentrations Above the AAAQG (Left) and a Scatter Plot of the Wind Speed and $PM_{2.5}$ 1-hour Average Concentrations Above the AAAQG (Right) measured at Site 3 – July 2023 to June 2024

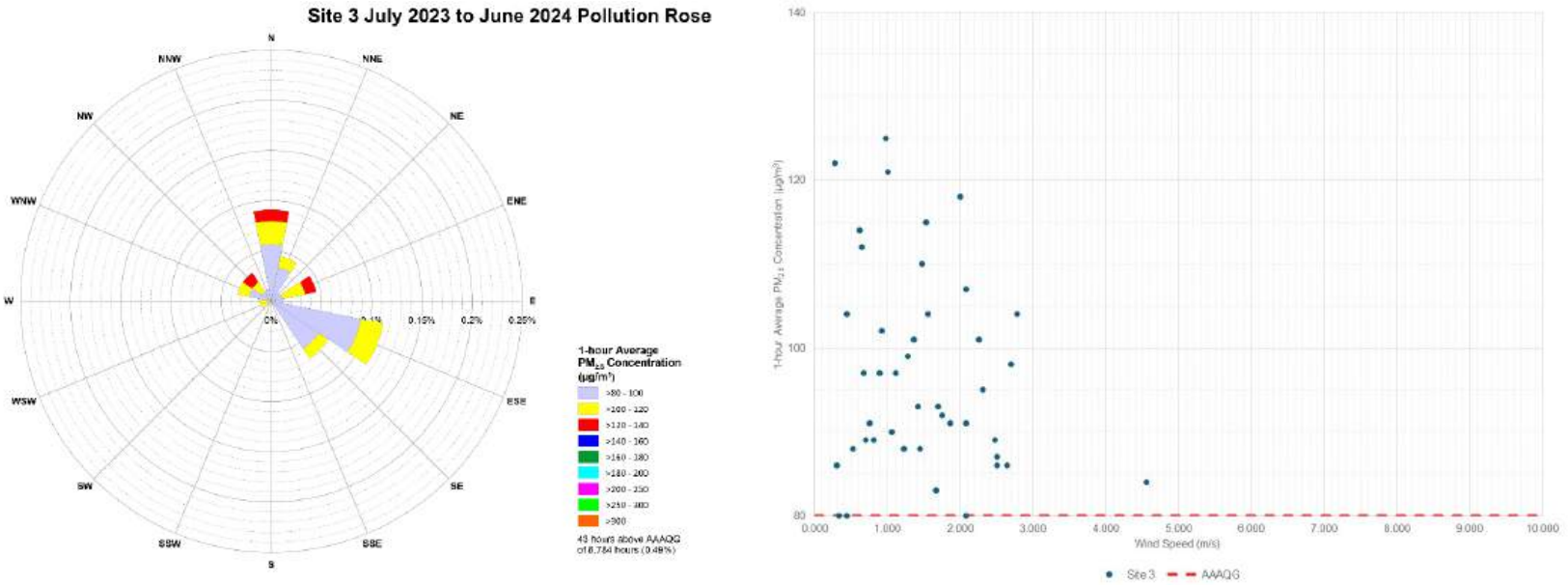


Figure B.3.35 Joint Frequency Distribution Plots of the Wind Direction and $PM_{2.5}$ 1-hour Average Concentrations Above the AAAQG (Left) and a Scatter Plot of the Wind Speed and $PM_{2.5}$ 1-hour Average Concentrations Above the AAAQG (Right) measured at Calaway Park – July 2023 to June 2024

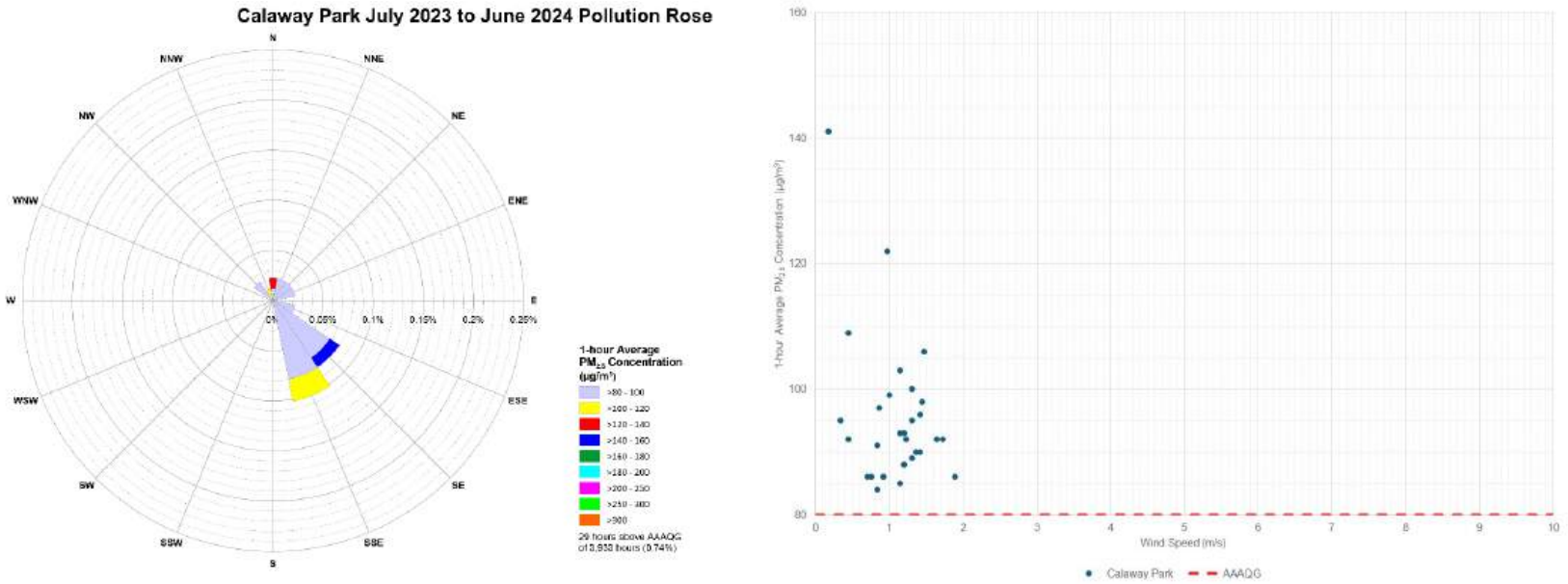
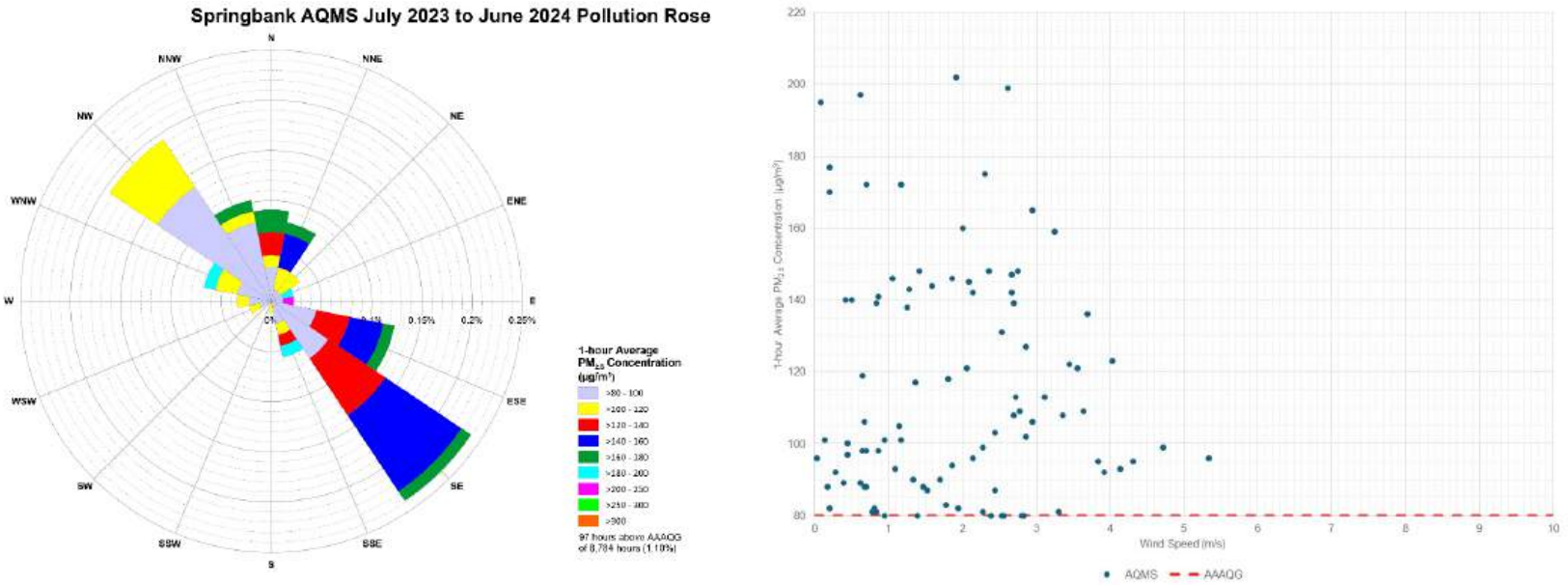


Figure B.3.36 Joint Frequency Distribution Plots of the Wind Direction and $PM_{2.5}$ 1-hour Average Concentrations Above the AAAQG (Left) and a Scatter Plot of the Wind Speed and $PM_{2.5}$ 1-hour Average Concentrations Above the AAAQG (Right) measured at Calaway Park – July 2023 to June 2024



APPENDIX C
IAAC CONDITION 12.1 AND 12.2

IAAC condition 12.1: *The Proponent shall submit to the Agency a schedule for all conditions set out in this Decision Statement no later than 60 days prior to the start of construction. This schedule shall detail all activities planned to fulfill each condition set out in this Decision Statement and the commencement and estimated completion month(s) and year(s) for each of these activities.*

IAAC condition 12.4: *The Proponent shall provide Indigenous groups with the schedules referred to in conditions 12.1 and 12.2, and any update to the initial schedule made pursuant to condition 12.3 at the same time the Proponent provides these documents to the Agency.*

	Condition #	Summary of Condition	Start Date (month and year)	End Date (month and year)
Definitions and General Conditions	**1.1 to 1.37**	Definitions	N/A	N/A
	2.1 to 2.3	General conditions	N/A	N/A
Consultation	**2.4.1, 2.4.3, 2.4.4, 2.5**	Consultation conditions	08-Jul-21	No end date
	2.4.2	Provide all information available and relevant to the scope and subject matter - not to be less than 30 days for consultation pertaining to current use of lands and resources for traditional purposes, physical and cultural heritage and structures, sites or things of historical, archaeological, paleontological or architectural significance, and species at risk, and not less than 15 days for other consultation activities	As required	As required
Follow-up requirements	**2.6, 2.7, 2.9**	Follow-up requirements (see conditions)	As required	As required
	2.8	The Proponent shall also provide any update made pursuant to condition 2.7 to the Agency and to the party or parties being consulted during the development of each follow-up program within 30 days of the follow-up program being updated.	within 30 days of the follow-up program being updated	
	2.10	Where consultation with Indigenous groups is a requirement of a follow-up program, the Proponent shall discuss the follow-up program with each group and shall determine, in consultation with each group, opportunities for their participation in the implementation of the follow-up program, including the conduct of monitoring, the analysis and reporting of follow-up results and whether modified or additional mitigation measure(s) are required, as set out in condition 2.9	2019	As required
Annual reporting	**2.11**	The Proponent shall prepare an annual report that sets out, for that reporting year (see sub-sections 2.11.1 - 2.11.8)	Annual report; due by October 31	
	2.12	The first reporting year for which the Proponent shall prepare an annual report pursuant to condition 2.11 shall start on the day the Minister of the Environment issues the Decision Statement to the Proponent pursuant to subsection 54 (1) of the *Canadian Environmental Assessment Act, 2012*.	08-Jul-22	Jun-2022
	2.13	The Proponent shall submit to the Agency and the First Nation Land Use Committee referred to in condition 8.11 the annual report referred to in condition 2.11, including a plain language executive summary in both official languages, no later than October 31 following the reporting year to which the annual report applies.	October 31 of each year	
Information Sharing	**2.14**	The Proponent shall keep these documents publicly available for 15 years following their publication	15 year period from issue date	
	2.15	When the development of any plan is a requirement of a condition set out in this Decision Statement, the Proponent shall submit the plan to the Agency prior to construction	N/A	Feb-2022
Change in Proponent	**2.16**	The Proponent shall notify the Agency and Indigenous groups in writing no later than 30 days after the day on which there is any transfer of ownership, care, control of Management of the Designated Project in whole or in part	30 days from transfer date	
Change to the Designated Project	**2.17.1 - 2.17.3**	If the Proponent is proposing to carry out the Designated Project in a manner other than described in condition 1.5, the Proponent shall notify the Agency in writing in advance.	As required	
	2.18	The Proponent shall submit to the Agency any additional information required by the Agency about the proposed change(s) referred to in condition 2.18, which may include the results of consultation with Indigenous groups and relevant authorities on the proposed change(s) and environmental effects referred to in condition 2.18.1 and the modified or additional mitigation measures and follow-up requirements referred to in condition 2.18.2	As required	
Fish and fish habitat	**3.1**	The Proponent shall develop, prior to construction, and implement and maintain during all phases of the Designated Project, measures to control erosion and sedimentation within the project development area in a manner consistent with the *Fisheries Act* and its regulations. See 3.1.1 to 3.16 for additional conditions.	Dec-2021	Feb-2022
	3.1.1 - 3.1.6	See specific conditions on what the Proponent shall do in terms of physical structures or activities relating to sediment and erosion protection	Feb-2022	Oct-2025
	3.2 - 3.8	See specific conditions on physical activities the Proponent shall so during construction	Feb-2022	Oct-2025

	Condition #	Summary of Condition	Start Date (month and year)	End Date (month and year)
Fish and fish habitat (cont'd)	**3.9**	The Proponent shall finalize, prior to construction, in consultation with Indigenous groups and to the satisfaction of Fisheries and Oceans, an offsetting plan related to the bull trout (*Salvenlinus confluentus*) and the fish population of the Elbow River. When finalizing the plan, the Proponent shall include the adaptive offset measures approach proposed in its Conceptual Offset Measures Plan (Canadian Impact Assessment Registry Reference Number 80123, Document Number 1366). The Proponent shall implement the plan. The Proponent shall submit any approved offsetting plan(s) to the Agency prior to implementation.	Jul-2021	Feb-2022
	3.10	The Proponent shall, for any fish habitat offsetting measure(s) proposed in any offsetting plan(s) referred to in condition 3.9 that may cause adverse environmental effects not considered in the environmental assessment, develop and implement measures to mitigate those effects. The Proponent shall submit these measures to the Agency before implementing them.	Q1 2022	Oct-2022
	3.11 - 3.15	See specific conditions on physical activities the Proponent shall do during and install construction specific to working in water (i.e. debris removal, maintain fish passage, rock v-weir, temporary water intake system, graded drainage)	Feb-2022	Oct-2025
	3.16	The Proponent shall develop and implement, prior to operation, a protocol to rescue juvenile and adult fish during post-flood operation. See 3.16.1 to 3.16.4 for conditions specific to the protocol.	2020	Oct 2025
	3.17	The Proponent shall develop and implement a follow-up program to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures as it pertains to fish passage in the Elbow River. See 3.17.1 to 3.17.3 for conditions to be included in the program.	Spring 2021	Oct 2025
	3.18	The Proponent shall develop and implement a follow-up program to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures as it pertains to fish rescue. See 3.18.1 to 3.18.2 for conditions to be included in the program.	2020	Oct 2025
	3.19	The Proponent shall develop and implement a follow-up program to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures as it pertains to water quality. See sub-sections 3.19.1 to 3.19.6 for conditions to be included in the program.	2019	Oct 2025
	3.20	The Proponent shall develop and implement a follow-up program to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures as it pertains to channel morphology. As part of the follow-up program, the Proponent shall monitor channel morphology of the Elbow River and outlet channel during post-flood operation.	Fall 2021	As required
Migratory Birds	**4.1 - 4.3**	The Proponent shall carry out the Designated Project in a manner that protects migratory birds and avoids harming, killing or disturbing migratory birds or destroying, disturbing or taking their nests or eggs. In this regard, the Proponent shall take into account Environment and Climate Change Canada's *Guidelines to reduce risk to migratory birds*. The Proponent's actions when carrying out the Designated Project shall be in compliance with the *Migratory Birds Convention Act, 1994, the Migratory Birds Regulations and with the Species at Risk Act.*	Feb-2022	As required
	4.2	The Proponent shall give preference to the use of existing access roads and disturbed areas for temporary workspaces and transportation activities over building new access roads and temporary workspace in undisturbed areas, and shall revegetate any area where native vegetation was removed for temporary workspace.	Feb-2022	Oct-2025
	4.3	The Proponent shall control the lighting required for Designated Project activities throughout all phases of the Designated Project, including its direction, duration of use, intensity, spectrum colour and brightness, to mitigate the adverse effects of the Designated Project on migratory birds and species at risk caused by sensory disturbances due to light, while complying with operational health and safety requirements.	Feb-2022	Oct-2025
	4.4	The Proponent shall identify, in consultation with Indigenous groups and relevant authorities, dates of breeding season for migratory birds and notify the Agency of these dates prior to construction.	Fall 2021	Feb-2022
	4.5	The Proponent shall develop, prior to construction, in consultation with Environment and Climate Change Canada and taking into account Environment and Climate Change Canada's *Description of Residence for bank swallow (Riparia riparia) in Canada*, measures to mitigate the adverse environmental effects on bank swallow (*Riparia riparia*) attributed to the Designated Project. The Proponent shall establish a schedule for the implementation of the measures and shall, as part of these measures: see specific conditions (4.5.1 - 4.5.4)	Fall 2021	Feb-2022
	4.5.1	maintain foraging habitat within 500 metres of bank swallow residences. If it is not technically feasible for the Proponent to maintain a distance of 500 metres, the Proponent shall provide a rationale to relevant authorities and develop and implement additional mitigation measures, in consultation with relevant authorities, to avoid effects on bank swallow. The Proponent shall submit these measures to the Agency prior to implementing them;	Fall 2021	Feb-2022

	Condition #	Summary of Condition	Start Date (month and year)	End Date (month and year)
Migratory Birds (cont'd)	**4.5.2**	install, prior to construction, and in consultation with Environment and Climate Change Canada, artificial nesting structures in suitable habitat to compensate for the loss of nesting sites within the project development area and identified in Appendix H, Figure 3- 1, of the Environmental Impact Statement. The Proponent shall perform maintenance on the nesting structures annually and maintain their accessibility and integrity during all phases of the Designated Project and shall ensure the presence of foraging habitat within 500 metres of the artificial nesting structures. If it is not technically feasible for the Proponent to ensure the presence of foraging habitat within a distance of 500 metres, the Proponent shall provide a rationale to relevant authorities and develop and implement additional mitigation measures, in consultation with relevant authorities, to avoid effects on bank swallow. The Proponent shall submit these measures to the Agency prior to implementing them;	Fall 2021	Feb-2022
	4.5.3	maintain the slope of topsoil, soil and sediment stockpiles located within the project development area and not used as artificial nesting structures in accordance with condition 4.5.2 at less than 70 degrees; and	Feb-2022	Oct-2025
	4.5.4	demonstrate how any other offsetting measures implemented by the Proponent will compensate for the adverse environmental effects on bank swallow (*Riparia riparia*) attributed to the Designated Project in the project development area.	As required	
	4.6	The Proponent shall conduct vegetation removal, and any other activity that could potentially disturb migratory birds, within the project development area outside of the breeding season(s) for migratory birds identified in condition 4.4. If vegetation removal or the conduct of other disturbance activity outside of the breeding season(s) is not technically feasible during any given year, the Proponent shall develop and implement additional mitigation measures, in consultation with relevant authorities, to avoid harm to migratory birds and their nests or eggs. The Proponent shall submit these measures to the Agency prior to implementing them.	Feb-2022	As required
	4.7	The Proponent shall remove debris in the off-stream reservoir within seven days after the draining of the reservoir. If it is not technically feasible for the Proponent to remove debris within seven days after the draining of the reservoir, the Proponent shall provide a rational to Indigenous groups and relevant authorities and develop and implement additional mitigation measures, in consultation with relevant authorities, to avoid harm to migratory birds and their nests or eggs. The Proponent shall submit these measures to the Agency prior to implementing them.	seven days after the draining of the reservoir	
	4.8	For any active migratory bird nests identified during construction or operation, the Proponent shall establish and implement, in consultation with relevant authorities, mitigation measures to avoid destroying, disturbing or taking the nest(s), including by implementing a disturbance setback buffer during construction and dry operation and by following the approach outlined in the Response to Information Request Round 2 Package 4 -01 to -04, IR4-03 (Canadian Impact Assessment Registry Reference Number 80123, Document Number 1311) during flood operation.	Feb-2022	As required
	4.9	The Proponent shall develop and implement, in consultation with Indigenous groups and relevant authorities, a protocol to prevent harm to migratory birds, including migratory birds species at risk identified in Table 3 of the environmental assessment report, within the project development area. The Proponent shall develop the protocol prior to construction and implement it prior to flood operation. The protocol shall include: 4.9.1 flood forecasting undertaken prior to inventories conducted in accordance with condition 4.10; and 4.9.2 measures to rescue migratory birds chicks and eggs.	Fall 2021	Feb-2022
	4.10*	The Proponent shall conduct, in consultation with Indigenous groups, inventories of potential migratory bird habitat, including the collection of information on breeding bird densities and the presence of ground nesting birds, as well as mapping of important habitat features, shrub lands, wetlands and grassland within the project development area every five years starting the first year of operation, and update the migratory bird protocol referred to in condition 4.9 based on the results of the inventories.	Spring 2024	every 5 years from the 1st year of operation
	4.11	The Proponent shall develop, prior to construction and in consultation with Indigenous groups and relevant authorities, a follow-up program to verify the accuracy of the environmental assessment and to determine the effectiveness of all mitigation measures to avoid harm to migratory birds, including migratory birds that are listed species at risk, their eggs and nests. The follow-up program shall include the mitigation measures used to comply with conditions 4.1 to 4.10. As part of the development of the follow-up program, the Proponent shall identify performance indicators that shall be used by the Proponent to evaluate the effectiveness of mitigation measures. The Proponent shall implement the follow-up program during all phases of the Designated Project. As part of the follow-up program, the Proponent shall: 4.11.1 monitor, annually during construction, for the first three years of operation and every five years thereafter, bank swallow use of the project development area.	Jun-2019	Feb-2022 for plan development; first 3 years of operations and every 5 years thereafter

	Condition #	Summary of Condition	Start Date (month and year)	End Date (month and year)
Species at Risk	**5.1**	The Proponent shall conduct pre-construction surveys to determine the presence of little brown myotis (*myotis lucifugus*) roosting sites in the project development area. The Proponent shall establish, in consultation with Indigenous groups and relevant authorities, buffer zones around little brown myotis (*myotis lucifugus*) active roosts identified during the pre-construction surveys or found by the Proponent or brought to the attention of the Proponent by an Indigenous group during any phase of the project. The Proponent shall maintain the buffer zones until it is determined the roosts are no longer active.	late summer 2021	Fall 2021
	5.2	The Proponent shall conduct breeding habitat surveys for the northern leopard frog (*Lithobates pipiens*), western toad (*Anaxyrus boreas*), and western tiger salamander (*Ambystoma mavoritium*) within the project development area.	Summer 2021	Fall 2022
	5.3	For any construction activity within 100 metres of breeding habitat identified under condition 5.2 for the northern leopard frog (*Lithobates pipiens*), western toad (*Anaxyrus boreas*), or western tiger salamander (*Ambystoma mavoritium*) during the breeding season, the Proponent shall develop, prior to construction and in consultation with Indigenous groups and relevant authorities, measures to prevent northern leopard frog (*Lithobates pipiens*), western toad (*Anaxyrus boreas*), and western tiger salamander (*Ambystoma mavoritium*) from accessing the active construction areas. See 5.3.1 and 5.3.2 for measures.	Fall 2021	Feb-2022
	5.5	The Proponent shall develop and implement, in consultation with Indigenous groups and relevant authorities, a protocol to prevent the mortality of amphibians, including northern leopard frog (*Lithobates pipiens*), western toad (*Anaxyrus boreas*), and western tiger salamander (*Ambystoma mavoritium*) during flood operation within the reservoir footprint. The Proponent shall develop the protocol prior to construction, taking into account the flood forecasting undertaken in accordance with condition 4.9.1. The protocol shall include measures to rescue and relocate northern leopard frog (*Lithobates pipiens*), western toad (*Anaxyrus boreas*), and western tiger salamander (*Ambystoma mavoritium*) to suitable habitat outside the reservoir footprint.	Fall 2021	Feb-2022
	5.8	The Proponent shall direct during construction any drainage pathway, constructed or modified as part of the Designated Project, away from wetlands and shall identify prior to construction wetlands where drainage pathway should not be directed during operation. The Proponent shall provide a map of the wetlands to be avoided to the Agency prior to construction.	Dec-2021	Feb-2022
	5.9	The Proponent shall submit to the Agency, prior to construction, a map of all wetlands that will be permanently removed for the construction of the Designated Project and shall not grub vegetation when undertaking construction work in wetlands except for those wetlands that will be permanently removed.	Dec-2021	Feb-2022
	5.4; 5.6; 5.7; 5.10	See specific conditions	As required	
Atmospheric Environment	**6.1**	See specific condition regarding vehicles and emission standards	N/A	
	6.2	The Proponent shall develop, prior to construction, and implement, during construction, a no-idling policy for all vehicles within the project development area. The Proponent shall require that all persons abide by this policy, unless not technically feasible or not feasible for health or safety reasons. The Proponent shall submit the policy to the Agency prior to construction.	Dec-2021	Feb-2022
	6.3	The Proponent shall develop, prior to construction and in consultation with relevant authorities, and implement during all phases of the Designated Project, measures to maintain baseline air quality and prevent exceedance of the Canadian Council of Ministers of the Environment' Canadian Ambient Air Quality Standards.	Jul-2020	Feb-2022
	6.4	The Proponent shall develop, prior to construction, and implement during all phases of the Designated Project, a follow-up program to verify the accuracy of the environmental assessment and determine the effectiveness of mitigation measures as it pertains to adverse changes to air quality attributed to the Designated Project. See 6.4.1 to 6.4.6 for conditions to include in the program.	Jul-2020	Feb-2022
	6.5	The Proponent shall provide Indigenous groups with the results of the follow-up program referred to in condition 6.4 in plain language at a minimum twice annually, at a time determined in consultation with Indigenous groups.	Twice annually	
Human Health	**7.1 and 7.2**	See specific condition regarding noise and blasting requirements	NA	
	7.3	The Proponent shall develop, prior to construction and in consultation with Indigenous groups, a protocol for receiving complaints related to exposure to noise attributable to the Designated Project. The Proponent shall provide the protocol to the Agency prior to construction and shall implement it during construction. As part of the implementation of the protocol, the Proponent shall respond to any noise complaint attributed to any component of the Designated Project within 48 hours of the complaint being received and shall implement any corrective action, if required to reduce exposure to noise, in a timely manner.	Dec-2021	Feb-2022

	Condition #	Summary of Condition	Start Date (month and year)	End Date (month and year)
Human Health (cont'd)	**7.4**	The Proponent shall develop a communication plan in consultation with Indigenous groups. The Proponent shall develop the communication plan prior to construction and shall implement and keep it up to date during all phases of the Designated Project. See 7.4.1 - 7.4.3 for conditions to include in the plan.	Dec-2021	As required
	7.5	The Proponent shall implement, during all phases of the Project, measures to mitigate fugitive dust emissions attributable to the Designated Project. As part of the measures, the Proponent shall: 7.5.1 establish speed limits on Designated Project roads during all phases of the Designated Project and require that all persons abide by these speed limits; and 7.5.2 apply dust suppressant on the Designated Project permanent access roads and parking areas during all phases of the Designated Project. The Proponent shall select, in consultation with relevant authorities, dust suppressants with the least potential effects on human health and the environment.	Feb-2022	As required
	7.6	The Proponent shall decommission and plug off water wells located within the project development area that are not used to monitor groundwater quality pursuant to condition 7.9.1, prior to the start of operation.	Feb-2022	Oct-2025
	7.7	The Proponent shall monitor, at a minimum twice prior to construction and weekly during flood operation, total mercury and methylmercury levels in the Elbow River upstream of the diversion system, in the off-stream reservoir, and in the low-level outlet downstream of the off-stream reservoir outlet gate, unless not feasible for safety reasons.	Twice prior to (Fall 2021 - January 2022)	As required
	7.8	The Proponent shall develop, in consultation with Indigenous groups and relevant authorities, a follow-up program to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures as it pertains to contamination of country food. See 7.8.1 to 7.8.4 for conditions to be included in the program.	summer 2021	As required
	7.9	The Proponent shall develop prior to operation, and implement, in consultation with Indigenous groups and relevant authorities, a follow-up program to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures as it pertains to drinking water quality. See 7.9.1 to 7.9.3 for conditions that need to be included in the plan.	Jun-2019	Oct-2025
	7.10*	The Proponent shall develop, prior to construction and in consultation with Indigenous groups and relevant authorities, a follow-up program to verify the accuracy of the environmental assessment and to determine the effectiveness of all measures to mitigate fugitive dust emissions attributable to the Designated Project.	Jun-2020	Feb-2022
	7.11*	The Proponent shall provide Indigenous groups with the results of the follow-up program referred to in condition 7.10 in plain language at a minimum twice annually, at a time determined in consultation with Indigenous groups.	Twice annually	
Current use of lands and resources for traditional purposes	**8.1**	The Proponent shall undertake, in consultation with Indigenous groups and relevant authorities, progressive reclamation of areas disturbed by the Designated Project, including bank and riparian areas. See 8.1.1 to 8.1.4 for additional conditions.	Jun-2019	Oct-2025
	8.2	The Proponent shall manage noxious weeds and invasive alien species as necessary to promote successful revegetation that includes traditional plant establishment and growth. In doing so, the Proponent shall not use herbicide within 30 metres of wetlands and waterbodies in the project development area.	Feb-22	As required
	8.3	The Proponent shall conduct pre-construction surveys to determine the presence of grizzly bear (Ursus arctos) western population active dens in the project development area. The Proponent shall establish, in consultation with Indigenous groups and relevant authorities, no-work buffer zones around grizzly bear (*Ursus arctos*) western population active dens identified during the pre- construction surveys or found by the Proponent or brought to the attention of the Proponent by an Indigenous group during any phase of the Designated Project. The Proponent shall maintain the buffer zones from their establishment and until the active den is no longer occupied.	Nov-2021	Oct-2025
	8.4	The Proponent shall follow the timing restrictions on industrial activities identified in the Alberta's Recommended Land Use Guidelines: Key Wildlife and Biodiversity Zones when undertaking construction and maintenance activities in the Key Wildlife and Biodiversity Zone identified along the Elbow River. 8.4.1 If it is not economically or technically feasible for the Proponent to follow the timing restrictions on industrial activities identified in the Alberta's *Recommended Land Use Guidelines: Key Wildlife and Biodiversity Zones*, develop and implement additional mitigation measures, in consultation with Environment and Climate change Canada and other relevant authorities. The Proponent shall submit these measures to the Agency prior to implementing them.	As required	

	Condition #	Summary of Condition	Start Date (month and year)	End Date (month and year)
Current use of lands and resources for traditional purposes (cont'd)	**8.5**	The Proponent shall install and maintain, during construction and operation, one underpass under Highway 22 where it crosses the diversion channel and wildlife friendly fences to provide passage for grizzly bear western population (*Ursus arctos*) and ungulates. The Proponent shall install the wildlife friendly fences as identified in Figure IR 15-1 submitted in the Response to Information Requests Round 1 Package 2 (Canadian Impact Assessment Registry Reference Number 80123, Document Number 1260), taking into account Alberta Conservation Association *Landholder's Guide to Wildlife Friendly Fencing*, to prevent access by livestock and allow safe passage for wildlife. The Proponent shall maintain the fences during all phases of the Designated Project.	May-25	As required
	8.6	The Proponent shall maintain navigation on the Elbow River during all phases of the Designated Project. The Proponent shall establish and maintain a portage route around the diversion system gate and the service spillway locations to maintain navigation on the Elbow River during construction of these project components and install safety signage to signal the presence of the diversion system gate and location of the portage route until such time that the portage route is no longer required to maintain navigation on the Elbow River.	Sep-2020	Oct 2025
	8.7	The Proponent shall provide the Agency and Indigenous groups with the final project design within seven days of its finalization and shall consult with Indigenous groups at least 60 days in advance of construction activities to understand locations and timing needed to allow Indigenous groups to catalogue, harvest and transplant traditional and medicinal plants present within the project development area, in a culturally appropriate way.	Jul-2021	Dec-2021
	8.8	The Proponent shall start developing, prior to construction and complete at the latest 1 year prior to start of operation, in consultation with Indigenous groups, a Land Use Plan to support Indigenous groups' use of the project development area, and implement the plan during all phases of the Designated Project. The Proponent shall submit the final plan to the First Nation Land Use Advisory Committee referred to in condition 8.11, First Nations and the Agency within seven days of its finalization. See sub-section 8.8.1 to 8.8.4 for conditions to be captured in the plan.	Dec-2021	Oct 2024
	8.9	The Proponent shall establish, in consultation with First Nations, a staging area for traditional use activities in close proximity to the land use areas identified in condition 8.8. The Proponent shall allow and provide sufficient space within the staging area for the construction of semi-permanent structures. The Proponent shall provide maps to the Agency and First Nations of the staging area prior to construction.	Dec-2021	May 2022
	8.10	The Proponent shall provide unimpeded access for First Nations to the staging area identified in condition 8.9, except during the flood operation, when access to the staging area may be prohibited for safety reasons and if not possible for maintenance purposes. The Proponent shall communicate to First Nations the closure of the staging area when required for safety reasons and during flood season	As required	
	8.11	The Proponent shall establish, prior to construction and in consultation with First Nations, and maintain, throughout construction and operation, a First Nation Land Use Advisory Committee (the committee) to support the development and implementation of the plan identified in condition 8.8. When establishing the committee, the Proponent shall consult with each First Nation with respect to whether they wish to participate as members of the committee and shall prioritize the selection of representatives from First Nations who wish to participate as members in the committee. As part of the establishment of the committee, the Proponent shall co-develop Terms of Reference for the committee with First Nations and update the Terms of Reference every 10 years. The Proponent shall provide the completed Terms of Reference to the Agency prior to construction and any update within 30 days of the Terms of Reference being updated. See sub-sections 8.11.1 - 8.1.11-7 for Terms of Reference conditions.	Nov-2021	Apr-2022 (update every 10 years)
	8.12	The Proponent shall include any Indigenous groups for which Aboriginal or Treaty Rights under section 35 of *The Constitution Act, 1982* are recognized by the Government of Alberta after the issuance of this Decision Statement in the Land Use Plan, the staging area and the First Nations Land Use Advisory Committee referred to in conditions 8.9, 8.10 and 8.11.	No date required	
	8.13	The Proponent shall develop, prior to operation, and in consultation with Indigenous groups, a follow-up program to verify the accuracy of the environmental assessment as it pertains to natural re-vegetation of the drained reservoir during post-flood operation. See sub-sections 8.13.1 and 8.13.2 for items to include in the follow up program.	Sep-2021	Oct-2025
	8.14	The Proponent shall develop, prior to construction and in consultation with Indigenous groups, a follow-up program to verify the accuracy of the environmental assessment and to determine the effectiveness of mitigation measures as it pertains to the adverse environmental effects of the Designated Project on the current use of lands and resources for traditional purposes. See sub-sections 8.14.1 - 8.14.5 for monitoring conditions.	Fall 2021	Feb-2022

	Condition #	Summary of Condition	Start Date (month and year)	End Date (month and year)
Physical and cultural heritage and structures, sites or things of historical, archaeological, paleontological or architectural significance	**9.1**	The Proponent shall retain, prior to construction, the services of Indigenous monitors to observe, record, and report to the Proponent and Indigenous groups on the implementation, throughout construction, of requirements set out in this Decision Statement including the archeological and heritage management plan referred to in condition 9.3. Prior to retaining the services of Indigenous monitors, the Proponent shall consult with each Indigenous group with respect to whether they wish to participate as Indigenous monitor. When retaining the services of Indigenous monitors from each Indigenous group who wishes to participate, the Proponent shall determine, in consultation with these Indigenous groups, the scope, purpose and objectives of the participation of each Indigenous monitor and shall provide that information to the Agency	Dec-2021	Apr-2022
	9.2	The Proponent shall develop and implement, prior to construction and in consultation with Indigenous groups and Alberta Ministry of Culture, Multiculturalism and Status of Women, a historic resource impact assessment of the project development area. The Proponent shall apply the archaeological and heritage management plan pursuant to condition 9.3 to structures, sites, or things of historical, archaeological, paleontological, or architectural significance or physical or cultural heritage resources identified as part of the historic resource impact assessment.	2016	end of 2022
	9.3	The Proponent shall develop, prior to construction and in consultation with Indigenous groups, Alberta Ministry of Culture, Multiculturalism and Status of Women, and implement, during construction and operation, an archaeological and heritage management plan for any structures, sites, or things of historical, archaeological, paleontological, or architectural significance or physical or cultural heritage resources within the project development area, including, but not limited to sites and things subject to the *Alberta Historical Act*. See sub-sections 9.3.1 - 9.3.4 for conditions to include in the plan.	Fall 2021	Feb-2022
	9.4	The Proponent shall develop, prior to construction and in consultation with Indigenous groups, cultural awareness training for all employees associated with the Designated Project. The Proponent shall implement the training prior to the start of construction and during all phases of the Designated Project.	Fall 2021	Apr-2022 - construction As required - post construction
	9.5	The Proponent shall, prior to construction and in consultation with Indigenous groups, provide access to Indigenous groups to the project development area for the purpose of conducting ceremonies, to the extent that such access is safe.	Jan-2022	Feb-2022
	9.6	The Proponent shall provide the Agency and Indigenous groups with a map of the final construction site within seven days of its finalization	within 7 days of finalization	Dec-2021
	9.7	The Proponent shall have a qualified individual conduct paleontological monitoring during construction when: 9.7.1 excavating bedrock for the diversion system; 9.7.2 excavating 4 metres of bedrock or greater, including for the emergency spillway; 9.7.3 excavating bedrock for new road alignments including on Highway 22; and 9.7.4 pipeline operators are using open cut methods for relocation of pipelines and utilities under the diversion channel.	Feb-2022	Oct-2025
	9.8	The Proponent shall strip and stockpile topsoil during construction and shall prevent mixing of topsoil with other soil horizons. The Proponent shall replace the topsoil during progressive reclamation pursuant to condition 8.1.	As required	
	9.9	The Proponent shall develop, prior to construction and in consultation with Indigenous groups and Alberta Ministry of Culture, Multiculturalism and Status of Women, a follow-up program to verify the accuracy of the environmental assessment and to determine the effectiveness of all mitigation measures for effects to any structures, sites, or things of historical, archaeological, paleontological, or architectural significance or physical or cultural heritage resources. The Proponent shall implement the follow-up program during all phases of the Designated Project and submit the results of the follow-up program to Alberta Ministry of Culture, Multiculturalism and Status of Women.	Fall 2021	As required
Independent Environmental Monitor	**10.1**	The Proponent shall retain, prior to construction, the services of a third-party independent environmental monitor, who is a qualified individual as it pertains to environmental monitoring in Alberta, to independently observe and record on the implementation of the conditions set out in this Decision Statement during construction and to report findings to the Proponent and the Agency.	Dec-2021	Feb-2022
	10.2	The Proponent shall require the independent environmental monitor to report to the Proponent, in writing, about the implementation of any condition set out in this Decision Statement during construction. The Proponent shall also require the independent environmental monitor to recommend to the Proponent, in writing, which action(s) in their view should be taken by the Proponent with respect to the implementation of conditions set out in this Decision Statement during construction	Feb-2022	Oct-2025
	10.3	The Proponent shall require the independent environmental monitor to provide to the Agency, at a frequency to be determined in consultation with the Agency, the information reported to the Proponent pursuant to condition 10.2 at the same time that the Proponent receives that information.	Feb-2022	Oct-2025

	Condition #	Summary of Condition	Start Date (month and year)	End Date (month and year)
Independent Environmental Monitor (cont'd)	**10.4**	The Proponent shall require the independent environmental monitor to retain the information reported to the Proponent pursuant to condition 10.2 for five years following submission to the Agency pursuant to condition 10.3.	2022	2030
Accidents and Malfunctions	**11.1**	The Proponent shall take all reasonable measures to prevent accidents and malfunctions that may result in adverse environmental effects and to mitigate any adverse environmental effect from accidents and malfunctions that do occur. See sub-sections 11.1.1 to 11.1.5 for measures.	As required	
	11.2	The Proponent shall consult, prior to construction, Indigenous groups on the measures to be implemented to prevent accidents and malfunctions.	Jan-2022	Apr-2022
	11.3	The Proponent shall develop an accident and malfunction response plan in relation to, and for the construction of the Designated Project and an accident and malfunction response plan in relation to, and for the operation of the Designated Project. The Proponent shall develop the accident and malfunction response plan in relation to, and for construction of the Designated Project prior to construction and the accident and malfunction response plan in relation to, and for the operation of the Designated Project prior to the first flood operation. See 11.3.1 to 11.3.6 for conditions that need to captured in the plan.	Jan-2022	Spring 2024
	11.4	The Proponent shall maintain the accident and malfunction response plan referred to in condition 11.3 up-to-date during all phases of the Designated Project. The Proponent shall submit any updated accident and malfunction response plan to the Agency and to the parties being consulted during the development of the plan within 30 days of the plan being updated	within 30 days of the plan being updated	
	11.5	In the event of an accident or malfunction with the potential to cause adverse environmental effects, the Proponent shall immediately implement the measures appropriate to the accident or malfunction referred to in condition 11.3.2. See sub-sections 11.5.1 - 11.5.4 for measures.	As required	
	11.6	The Proponent shall develop, in consultation with Indigenous groups and potentially affected parties, a communication plan for accidents and malfunctions occurring in relation to the Designated Project, including accidents and malfunctions occurring within the project development area which may affect area(s) outside of the project development area. The Proponent shall develop the communication plan prior to construction and shall implement and keep it up-to-date during all phases of the Designated Project. See sub-section 11.6.1 to 11.6.3 for plan specifics.	Jan-2022	Oct 2025
Schedules	**12.1**	The Proponent shall submit to the Agency a schedule for all conditions set out in this Decision Statement no later than 60 days prior to the start of construction. This schedule shall detail all activities planned to fulfill each condition set out in this Decision Statement and the commencement and estimated completion month(s) and year(s) for each of these activities.	Dec-2021	Dec-2021
	12.2	The Proponent shall submit to the Agency a schedule outlining all activities required to carry out all phases of the Designated Project no later than 60 days prior to the start of construction. The schedule shall indicate the commencement and estimated completion month(s) and year(s) and duration of each of these activities.	Dec-2021	Dec-2021
	12.3	The Proponent shall submit to the Agency in writing an update to schedules referred to in conditions 12.1 and 12.2 every year no later than October 31.	As required; if required by October 31 of each year	
	12.4	The Proponent shall provide Indigenous groups with the schedules referred to in conditions 12.1 and 12.2, and any update to the initial schedule made pursuant to condition 12.3 at the same time the Proponent provides these documents to the Agency.	Dec-2021 and if required October 31 of each year	
Records	**13.1**	The Proponent shall maintain all records relevant to the implementation of the conditions set out in this Decision Statement. The Proponent shall provide the aforementioned records to the Agency upon demand within a timeframe specified by the Agency.	Jul-2021	As required
	13.2	The Proponent shall retain all records referred to in condition 13.1 at a facility in Canada and shall provide the address of the facility to the Agency. The Proponent shall notify the Agency at least 30 days prior to any change to the physical location of the facility where the records are retained, and shall provide to the Agency the address of the new location.	30 days prior to any change in location	

IAAC condition 12.2: *The Proponent shall submit to the Agency a schedule outlining all activities required to carry out all phases of the Designated Project no later than 60 days prior to the start of construction. The schedule shall indicate the commencement and estimated completion month(s) and year(s) and duration of each of these activities*		
IAAC condition 12.4: *The Proponent shall provide Indigenous groups with the schedules referred to in conditions 12.1 and 12.2, and any update to the initial schedule made pursuant to condition 12.3 at the same time the Proponent provides these documents to the Agency.*		
Construction Schedule	**Start Date**	**End Date**
Pre-construction Submittals	Jan-2022	Apr-2022
Clearing and Grubbing	Feb-2022	Mar-2022
Diversion Structure		
River Diversion	Jul-2022	Aug 2024
Service Spillway	Sep-2022	Aug-2024
Diversion Inlet	Sep-2022	Jun-2025
Floodplain and Auxiliary Spillway	Sep-2023	Jun-2025
Diversion Channel		
Stage 1 Excavation	May-2022	Oct-2024
Stage 2 Excavation	May-2024	Oct-2024
Off-stream Storage Dam		
Low Level Outlet Works	Mar-2022	May-2023
Stage 1 Embankment	May-2022	Oct-2024
Stage 2 Embankment	May-2024	Oct-2024
Operation Schedule	**Start Date**	**End Date**
Operational for Design Flood	Mar-2025	NA

APPENDIX D
SUMMARY OF WILDLIFE SPECIES OBSERVED DURING THE 2023/2024 ANNUAL REPORTING YEAR

Table D.1 Summary of Wildlife Observations between July 2023 to June 2024

Date	Species Observed	Location Description
7/6/2023	Small Herd of Elk	Other side of Rock Bluffs along highway
7/6/2023	Deer	On the large hill north of dam area
7/7/2023	Elk visible in trees	Grade Control Structure
7/12/2023	Two deer	
7/15/2023	Approximately 19 geese (12 goslings), blue heron, and white tail doe with two fawns	Kiwanis pond
7/15/2023	2 deer	Field South of Kiwanis access road
7/31/2023	1 White-tailed deer	Unnamed Creek area
8/1/2023	Golden eagle	Unnamed Creek area
8/8/2023	15 ducks	In a pond along access road to Highway 22 Bridge
8/8/2023	2 or more frogs	Near Low-Level Outlet
8/9/2023	Coyote tracks	Unnamed creek
8/10/2023	2 Hawks	Top of hill north of dam area
8/12/2023	5 deer	Main Site Office
8/13/2023	1 deer	Main Site Office
8/13/2023	Hawk	Near Diversion Channel and Township Road 242 bridge construction area
8/29/2023	Herd of Elk (approximately 200 - 300)	NE of Project
8/30/2023	Herd of Elk (approximately 50)	West of Range Road 35, south of Highway 22
9/6/2023	Herd of Elk	West of Range Road 35
9/15/2023	2 Deer	By Main Site Office
9/20/2023	4 Deer	Topsoil piles near dugouts
9/21/2023	Hawk	Flying over access road on route to Emergency Spillway
9/22/2023	Rabbit	Topsoil piles North of Diversion Channel, East of Highway 22
9/22/2023	Herd of Elk	North of dam on top of hill
10/3/2023	Owl	Unnamed Creek
10/6/2023	6 deer	by Main Site Office
10/24/2023	2 coyotes	Kiwanis area/ Floodplain berm
10/24/2023	Deer, coyotes, rabbits (Number of each unknown)	
10/27/2023	2 eagles	Kiwanis area/ Floodplain berm
10/27/2023	Coyote	Low-Level Outlet Access Road

Date	Species Observed	Location Description
10/30/2023	5 deer	South of access road on topsoil piles near dugouts, emergency spillway area
11/1/2023	Herd of Elk (100-150)	North of dam on top of hill in the field
11/1/2023	3 deer	South of access road near dugouts
11/3/2023	7 deer	South of Township Road 242
11/4/2023	6 deer	Main Site Office
11/21/2023	Elk herd (approximately 50)	South of Emergency Spillway
11/21/2023	Deer (buck and doe)	West of barns
11/22/2023	Herd of Elk (approximately 200)	West of barns
11/23/2023	Herd of Elk (approximately 50)	NE of Borrow Area
11/23/2023	6 Deer	Field, north of Township Road 242
11/23/2023	1 Deer	Field NE of Project
11/24/2023	Cougar Tracks	Kiwanis Area
11/29/2023	Golden eagle	Main Site Office
12/1/2023	Deer	Access road to Main Site Office
12/4/2023	Stoat	Main Site Office Parking lot
12/6/2023	Herd of Elk (approximately 20 or more)	Tree line, on top of hill north of the dam
12/9/2023	White-tailed deer	Haul road
12/9/2023	Coyote	Near Vinci trailer
12/11/2023	Coyote	East of Range Road 41
12/13/2023	Deer (approximately 8)	Access Road to Emergency Spillway area, East of Highway 22
12/14/2023	Coyote	On top of hill north of the dam
12/16/2023	3 deer	Access Road into Main Site Office
12/19/2023	Herd of Elk (approximately 150)	Across Springbank Road
12/20/2023	Rabbit	Soil piles near Diversion Outlet Laydown yard
12/20/2023	Herd of Elk	On top of hill north of dam
12/21/2023	Herd of Elk	Field North of access road to Low-Level Outlet
1/15/2024	Herd of Elk	Across Springbank Road
1/15/2024	Herd of Elk (approximately 100)	East of Highway 22
1/15/2024	Herd of Elk (approximately 100)	East of Highway 22
1/17/2024	Deer and coyotes	On top of hill north of the dam
1/23/2024	Herd of Elk (approximately 150)	Across Springbank Road
1/23/2024	Grouse (approximately 6)	On Range Road 35
1/25/2024	Herd of Elk	North of Low-Level Outlet Dam Access Road

Date	Species Observed	Location Description
1/25/2024	Blue Heron	Range Road 35 close to Unnamed Creek area
1/26/2024	Coyote and (approximately 9) crows	North of Site office, Diversion Channel
1/27/2024	Herd of Elk	North of Low-Level Outlet Dam Access Road
2/13/2024	Eagle	North of dam on top of hill,, flying above trees
2/13/2024	Herd of Elk (approximately 200)	North of Springbank Road
2/14/2024	Herd of Elk (approximately 200)	North of dam on top of hill,
2/15/2024	Injured deer, later 2 coyotes	Along Springbank road, West of Range Road 35
2/15/2024	Herd of Elk	North of dam on top of hill, in trees
2/15/2024	Eagle	Kiwanis exit
2/15/2024	3 Bald eagles near now deer carcass	Springbank road, West of Range Road 35 (outside of Project Area)
2/15/2024	Herd of Elk	North dam on top of hill, in trees
2/15/2024	2 Bald eagles joined other 3 Bald eagles	Springbank road, West of Range Road 35
2/15/2024	Golden eagle	Springbank road, West of Range Road 35
2/15/2024	Golden eagle	Springbank road, West of Range Road 35
2/15/2024	Stoat (Weasel)	Main Site Office
2/20/2024	Coyote	
2/20/2024	2 Mule deer	Near Diversion Inlet
2/22/2024	Coyote	Field South of Barns
2/29/2024	Herd of Elk (approximately 100)	Springbank road
3/5/2024	Animal tracks in snow	Diversion Outlet/Grade Control Structure
3/5/2024	Animal tracks in snow	Emergency Spillway
3/12/2024	Bald eagle	Tree line along Range Road 35
3/12/2024	Herd of Elk (approximately 20)	Elbow River
3/13/2024	Herd of Elk	Range Road 35
3/19/2024	Coyote	
3/25/2024	3 Coyotes	Northwest of Borrow Area
3/25/2024	6 Elk	West of Borrow Area
3/26/2024	Coyote along haul road	Haul road south diversion channel.
3/26/2024	Observed numerous deer and coyotes and elk tracks at HR site.	On top of hill north of dam area.
4/9/2024	Two different sets of cougar tracks	Floodplain Berm
4/9/2024	Another set of cougar tracks	North of first set of tracks
4/16/2024	Herd of elk	On top of hill north of dam area.
4/18/2024	Herd of elk	On top of hill north of dam area.

Date	Species Observed	Location Description
4/23/2024	Herd of elk (approximately 50)	North of Springbank Road, West of Range Road 41
4/23/2024	3 deer	West of Highway 22 embankment raise
4/23/2024	5 deer	North of Township Road 242 bridge.
4/23/2024	Goose	On hilltop south of Diversion Inlet
4/23/2024	Herd of elk (approximately 50)	Range Road 41
4/24/2024	Herd of elk (approximately 60)	West of Range Road 41
5/2/2024	Moose	Along Springbank Road outside of Project
5/7/2024	2 geese	Elbow River
5/8/2024	Hawk	
5/21/2024	Coyote	On top of hill north of dam area.
5/22/2024	7 elk	Crossing access road to Emergency Spillway
5/23/2024	2 geese	Elbow River
5/27/2024	4 deer	Unnamed Creek
5/30/2024	Elk	Near Rock Bluffs
5/30/2024	Eagles flying overhead, one Elk	Unnamed Creek south of Low Level Outlet
5/31/2024	9 elk	Unnamed creek
6/3/2024	Herd of elk	South of Emergency Spillway Dugouts
6/5/2024	Minnow	In water near the Exit Channel
6/13/2024	1 White-tailed deer	Diversion Channel
6/17/2024	Deer	Township Road 242
6/19/2024	Deer tracks at exit channel	Exit channel
6/19/2024	Cougar tracks	Exit channel topsoil piles
6/24/2024	3 deer	Range Road 35 by Unnamed Creek
6/25/2024	4 Mule deer	North of Unnamed Creek
6/27/2024	1 moose	Unnamed Creek, view from hilltop
6/27/2024	1 White-tailed deer	On top of hill north of dam area.
6/27/2024	3 Mule deer, 1 White-tailed deer	On top of hill north of dam area.