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# Cando Rail & Terminals

Cando Sturgeon Rail Terminal  
West Expansion

Summary Project Description  
Under the Impact Assessment Act  
N ½ 34-55-22-W4M  
Sturgeon County, Alberta

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**Clifton**



12 February 2024

File CG3821

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Initial Project Description Under the Impact  
Assessment Act

N ½ 34-55-22-W4M

Sturgeon County, Alberta

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Impact Assessment Agency	12 February 2024	1	MW	Portal	PDF	Final Report	0

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## List of Acronyms

ACIMS	Alberta Conservation Information Management System
ACO	Government of Alberta's Aboriginal Consultation Office
ACSW	Alberta Ministry of Arts, Culture and Status of Women
AD	Arrival/Departure Railyard
AEPA	Alberta Environment and Protected Areas
AER	Alberta Energy Regulator
ATEC	Alberta Transportation and Economic Corridors
AF	Activity Factor
BAT/BEP	Best Available Technologies / Best Environmental Practices
CEAA	Canadian Environmental Assessment Agency
Cando	Cando Rail & Terminals
CH <sub>4</sub>	Methane
CF	Conversion Factor
Clifton	Clifton Engineering Group Inc.
CN	Canadian National Railway Company
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2e</sub>	Carbon Dioxide Equivalent
db	decibel
ECCC	Environment and Climate Change Canada
EDI	EDI Environmental Dynamics Inc.
EF	Emission Factor
USEIA	The United States Energy Information Agency
ESA	Environmental Site Assessment
FWMIS	Fisheries and Wildlife Management Information System
GHG	Greenhouse Gas
GPS	Global Positioning System
GWP	Global Warming Potential
ha	Hectare(s)
HC	Hydrocarbons
HP	Horsepower
IAAC	Impact Assessment Agency of Canda
IPCC	Intergovernmental Panel on Climate Change
km	Kilometer(s)
kV	kilovolt

kWh	kilowatt hour
LPG	Liquefied Petroleum Gases
LUC	Land Use Change
Mt	Million metric tonnes
MW	Megawatt
MWh	Megawatt hour
NCIA	Northeast Capital Industrial Association
NG	Natural gas
NO <sub>x</sub>	Nitrous oxides
N <sub>2</sub> O	Nitrous oxide
PM <sub>2.5</sub>	Fine Particulate Matter
PM <sub>10</sub>	Particulate Matter
RAP	Restricted Activity Period
SARA	Species at Risk Act
scf	Standard cubic feet
SO <sub>2</sub>	Sulphur Dioxide
SWMP	Stormwater Management Plan
t	Metric Tonne
TDG	Transportation of Dangerous Goods
TDS	Total Dissolved Solids
USEPA	The United States Environmental Protection Agency
WAIF	Wetland Assessment and Impact Form
WAIR	Wetland Assessment and Impact Report

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## Introduction

This application is being submitted by Clifton Engineering Group Inc. (Clifton) on behalf of Cando Rail & Terminals Ltd. (Cando) to conform with the requirements of an Initial Project Description under the Government of Canada's *Impact Assessment Act, 2019*. Cando is a Canadian company founded in Manitoba that provides custom rail solutions. Since the company's beginnings in 1978 they have expanded to include multi-purpose rail facilities throughout Canada and the eastern United States.

This application is in support of the expansion of Cando's existing rail terminal located in Sturgeon County, Alberta. The existing rail terminal is located approximately 23 km to the northeast of Edmonton, Alberta. The existing rail terminal was previously approved in 2019 under the *Canadian Environmental Assessment Act, 2012* (CEAA), and the reference number of the project was 80167. Since the original approval, the legislation has changed, and this application is being presented to the Canadian Impact Assessment Agency (IAAC) under the *Impact Assessment Act*. The existing and proposed expansion rail terminal are not considered a Class 1 railway; therefore, the operation of the terminals themselves will be regulated by Alberta Transportation and Economic Corridors (ATEC) rather than Transport Canada.

The information included in this application has been prepared in accordance with the Annex I – Contents of an Initial Project Description. Annex I aligns with Schedule 1 of the *Information and Management of Time Limits Regulation*. Throughout the report under the main section headings there is blue italicized text that includes the guidance language from the Annex I – Contents of an Initial Project Description to which the section is directly applicable. This was included for the convenience of the reviewers and readers to correlate the section content with the guidelines and demonstrate concordance with the Annex I.

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## 1.0 General Information

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### 1.1 Project's Name, Type/Sector, and Proposed Location

*The project's name, type or sector, and proposed location. When naming the project, proponents are encouraged to include a unique identifier, the main resource or sector that is the focus of the project, and the type of project.*

<b>Table 1-1: General Project Information</b>	
<b>Name</b>	Cando Sturgeon Rail Terminal West Expansion
<b>Type/Sector</b>	Railyard
<b>Proposed Location of the Railyard</b>	<p>Municipality: Sturgeon County Alberta</p> <p>Zoning: Industrial Land Use – Alberta’s Industrial Heartland</p> <p>Alberta Township Survey System Description: N ½ 34-55-22-W4M</p> <p>Approximate GPS Coordinates: 53°47'59.43"N (latitude), and 113°11'11.97"W (longitude)</p> <p>Legal Land Descriptions: NE 34-55-22-W4M, NW 34-55-22-W4M, Railway Plan 0824867 Area C (short legal 0824867;C), and Plan 0824867 Area D (short legal 0824867;D)</p>

The project applicable to this submission is the expansion of Cando’s existing rail terminal located in Sturgeon County, Alberta. The existing rail terminal consists of a railyard that covers a half section of land. The expansion is to include the half section immediately to the west of the existing rail terminal. The expansion rail terminal will cover roughly the same amount of land as the existing rail terminal essentially doubling the terminal’s capacity. The official project name for this application is the Cando Sturgeon Rail Terminal West Expansion; however, it will be referred to as the Project or the expansion rail terminal throughout this document. For reference, the previous submission for the existing rail terminal to the Canadian Environmental Assessment Agency was similarly named the Cando Sturgeon Rail Terminal Project. The location of the project within the Province of Alberta is depicted in Figure 1.

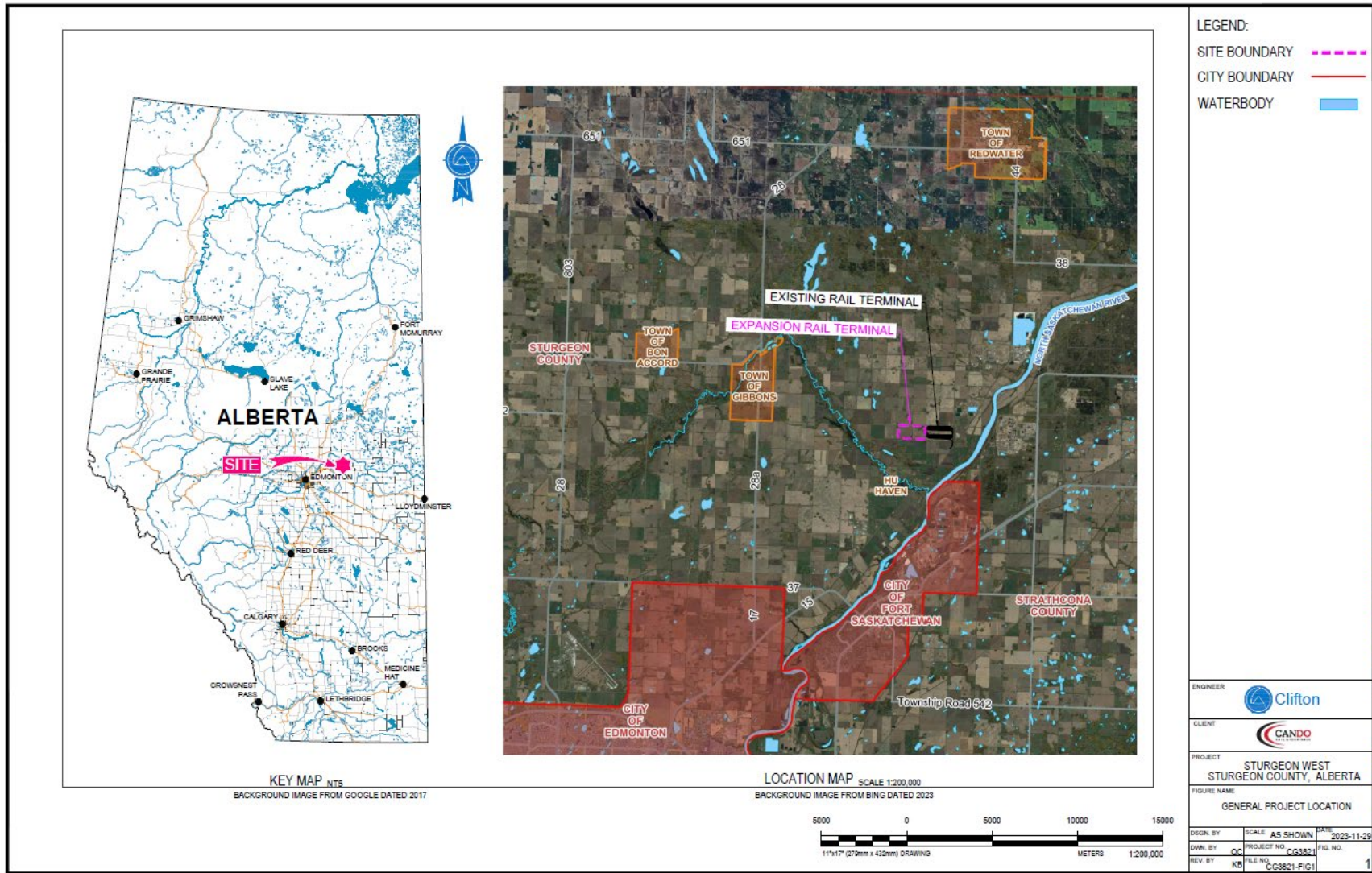


Figure 1: General Project Location

After initial discussions with the Impact Assessment Agency the project was determined to be an expansion of an existing rail terminal as the two rail terminals are located adjacent to one another which establishes a clear connection between the two railyards. In addition, the two rail terminals will be directly connected by track, and components of the existing rail terminal, notably its connection to the Canadian National Railway Company (CN) rail line, will be necessary for the function and operation of the expansion rail terminal.

An important component of the project location is that it is in the Sturgeon County portion of Alberta's Industrial Heartland, a Designated Industrial Zone. Alberta's Industrial Heartland consists of 582 km<sup>2</sup> of land within the City of Fort Saskatchewan and the Counties of Lamont, Strathcona, and Sturgeon as well as a portion within the boundaries of the City of Edmonton (Alberta's Industrial Heartland, 2023). The North Saskatchewan River also runs through the Industrial Heartland zoning separating the portions of land which are within Sturgeon County from those within Strathcona County and Lamont County. The entirety of the region is zoned for heavy industrial land use and offers a concentrated location for chemical, petrochemical, and oil and gas facilities (Alberta's Industrial Heartland, 2023). The region offers an attractive location for industrial development and investment as well as provincial regulatory streamlining and cumulative environmental management (Alberta's Industrial Heartland, 2023). Figure 2 shows the location of the project within the boundaries of Alberta's Industrial Heartland.

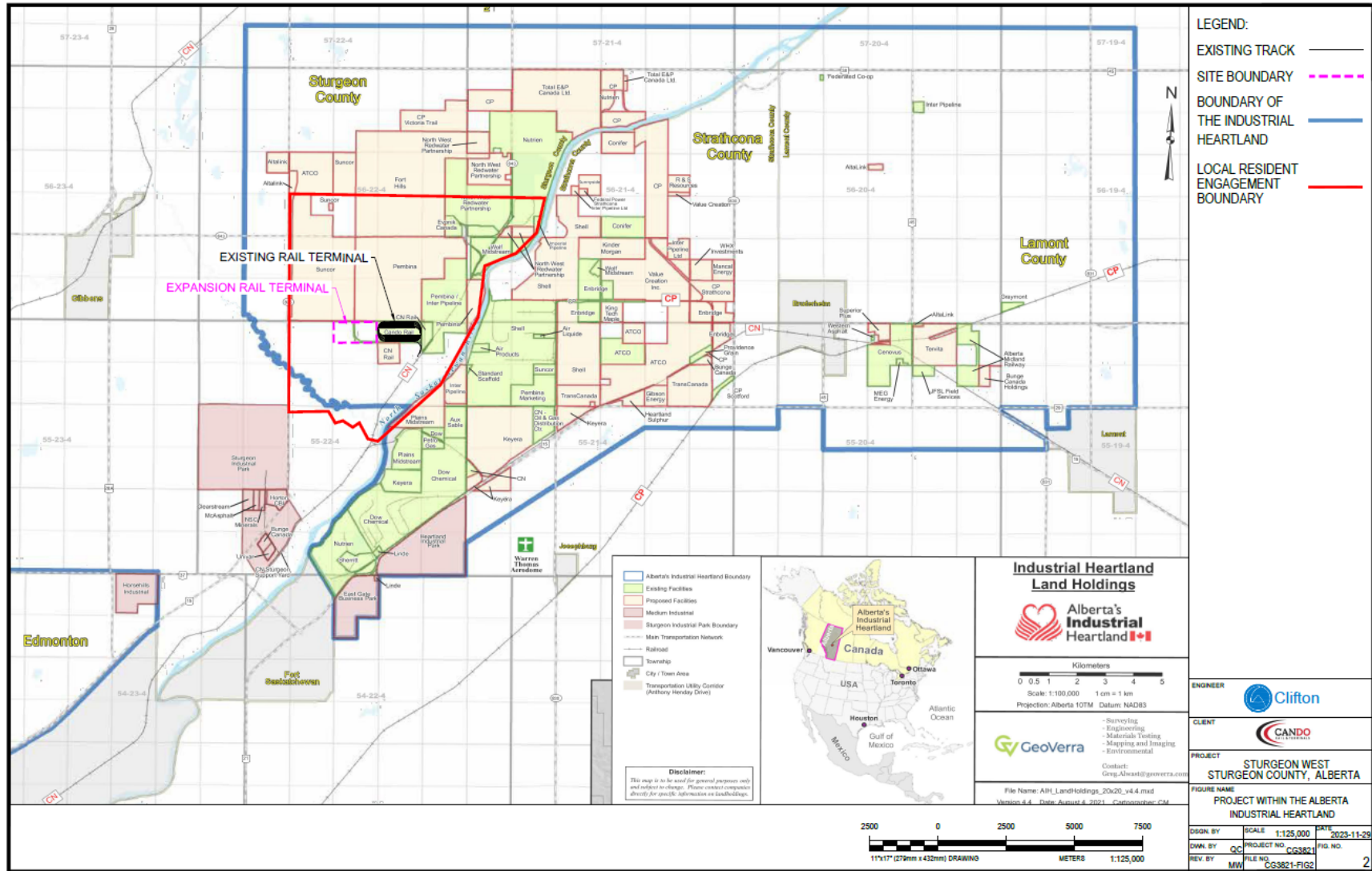


Figure 2: Project Within the Alberta Industrial Heartland

The two quarter sections to be used for the expansion rail terminal are the northeastern and northwestern quarters of section 34, township 55, region 22, west of the 4<sup>th</sup> meridian (N ½ 34-55-22-W4M). The approximate latitude and longitude of the project are 53°47'59.43"N and 113°11'11.97"W, respectively. The legal land descriptions for the expansion rail terminal are: NE 34-55-22-W4M, NW 34-55-22-W4M, Railway Plan 0824867 Area C (short legal 0824867;C), and Plan 0824867 Area D (short legal 0824867;D). The two land titles for the quarter sections are privately owned whereas the two titles under Plan 0824867 are owned by CN Rail; however, CN Rail does not operate on the land. It is currently cultivated agricultural land. The total area to be used for the expansion rail terminal is approximately 130 hectares (ha).

A secondary component to the project consists of the creation of a bypass road. The connection between the existing rail terminal and the expansion rail terminal will cross Range Road 222. These connections may be in use at almost any time of the day for long periods of time with railcar crossings. For the safety and convenience of the surrounding residents, Cando is working with Sturgeon County to permanently close Range Road 222 between the two rail terminals. The bypass will include upgrades to the existing Sturgeon County operated Range Road 223 to the west of the W ½ 34-55-22-W4M, and the intersection of Range Road 222 and Township Road 560 to the northeast of the property. To complete the bypass, roadways will also be constructed to the south of the S ½ 34-55-22-W4M (extension of Township Road 555) and a cul-de-sac will be constructed to the south of the expansion rail terminal where Range Road 222 ends. Once the road is constructed Sturgeon County will take over ownership and be responsible for the operation and maintenance.

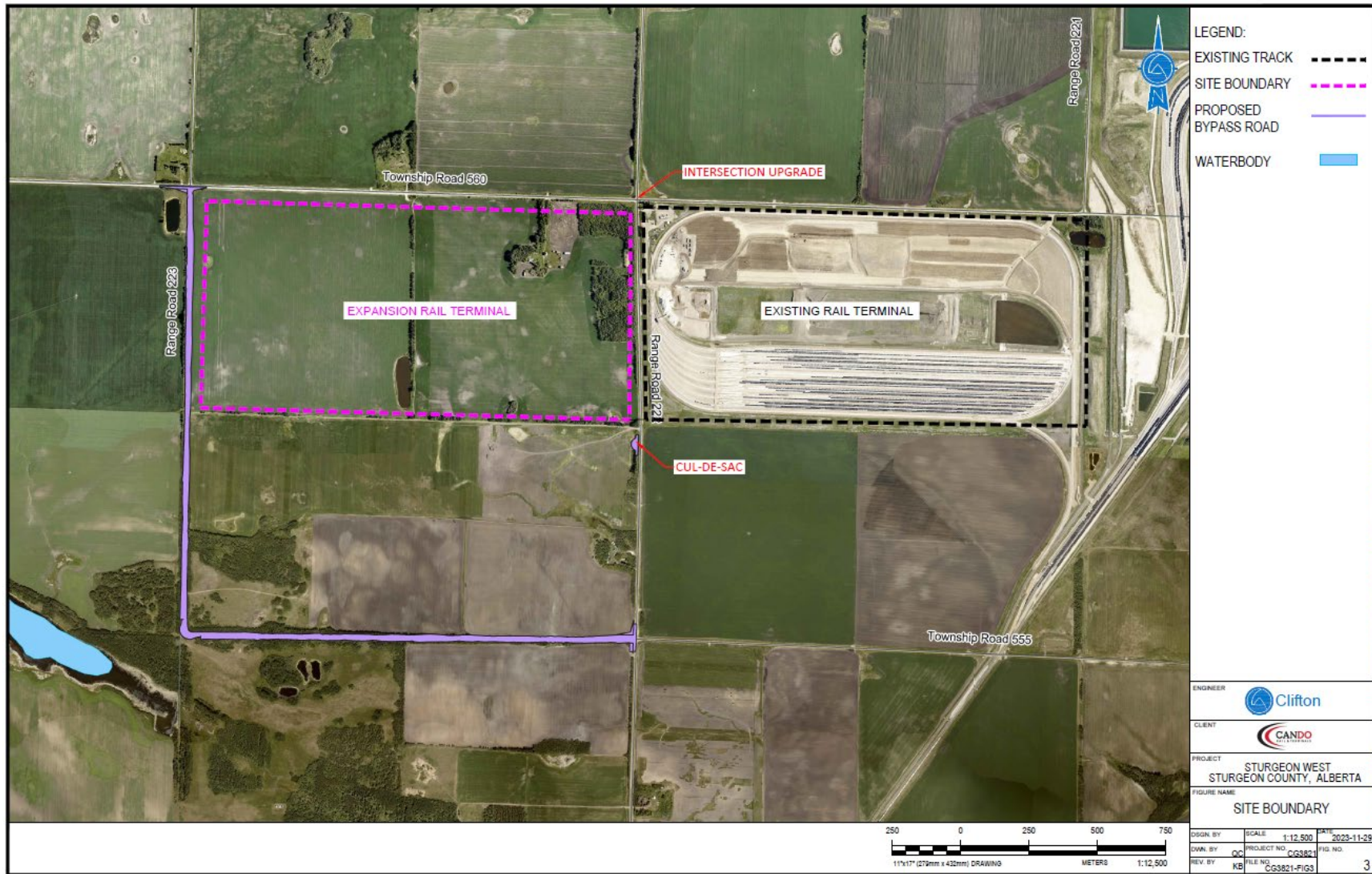


Figure 3: Site Boundary

### 1.2 Proponent Contact Information

*The proponent’s name and contact information and the name and contact information of their primary representative for the purpose of the description of the project.*

The proponent contact information for the purpose of this application is detailed below.

<b>Table 1-2: Proponent Information</b>	
<b>Name of Project</b>	Cando Sturgeon Rail Terminal West Expansion
<b>Name of Proponent</b>	Cando Rail & Terminals Ltd.
<b>Proponent’s Contact Information</b>	Unit 400 – 740 Rosser Avenue Brandon, Manitoba R7A 0K9  info@candorail.com Toll-Free: 1-866-989-5310 Phone: 204-725-2627 Fax: 204-725-4100
<b>Primary Representative</b>	Maxim Delisle GM Infrastructure Development
<b>Primary Representative’s Contact Information</b>	Maxim.Delisle@candorail.com 1-416-799-5998

### 1.3 Engagement with Jurisdictions or Agencies

*A summary of any engagement undertaken with any jurisdiction or other party, including a summary of the key issues raised and the results of engagement and brief description of any plan for future engagement. This should include any engagement with public or other participants.*

Through the completion of the existing rail terminal, Cando has established a strong relationship with stakeholders in the area and an understanding of the project location. Cando has followed in the successful model of the existing rail terminal project and has completed engagement activities with various stakeholders including landowners, residents, industry, and Sturgeon County throughout the planning phase of the expansion rail terminal. Clifton, on Cando’s behalf, has also been engaging in conversations with federal and provincial regulatory officials. Indigenous engagement is covered in Section 1.4. A list of the parties engaged is detailed below (Table 1.3).

**Table 1-3: Public and Regulatory Stakeholders****Federal Stakeholders**

- Impact Assessment Agency of Canada (IAAC)

**Provincial Stakeholders**

- Alberta Environment and Protected Areas
- Alberta Transportation and Economic Corridors
- Alberta Ministry of Arts, Culture and Status of Women

**Municipal Stakeholders**

- Sturgeon County

**Individual Stakeholders**

- Landowners
- Residents
- Surrounding Industry

Project engagement began in the Spring of 2023. Engagement with all stakeholders is ongoing and will continue, as necessary, throughout the lifespan of the project. Cando will continue to respond to and resolve any issues that may arise throughout the planning and implementation phases of the project. Cando is open to discussing any potential issues or complaints with stakeholders through in-person meetings, phone calls, or emails. A summary of specific engagement details for each stakeholder are described in Sections 1.3.1 to 1.3.6. Further information related to engagement is kept within Cando records and has been logged. To organize the responses received and accommodate a timely response Cando created a dedicated email ([candolistens@candorail.com](mailto:candolistens@candorail.com)) for all non-government stakeholders. The email can be accessed by select Cando employees who are designated liaisons with the public for the project.

**1.3.1 Federal Stakeholder Engagement**

Clifton began correspondence with the Impact Assessment Agency of Canada (IAAC) in June 2023 to determine whether the project would meet the criteria requiring the completion of an Initial Project Description. It was determined that the project would fall under the federal jurisdiction of the *Impact Assessment Act, 2019*. Following this evaluation, a meeting was conducted between Clifton and the IAAC to discuss the known details of the project including the project location and its connection to the existing rail terminal. Through this meeting and correspondence with the IAAC it was determined that the project would be considered an expansion of the existing rail terminal. Discussions and correspondence related to the project continue to the present date with topics including potentially affected Indigenous groups, project timelines, changes to the review process, and any studies, plans, or strategic assessments completed in the area.

The pre-construction approval of the expansion rail terminal falls under the *Impact Assessment Act*; however, this is the only Federal control over the project. As the existing and expansion rail terminals are not a Class 1 railway the operation would fall to ATEC to approve and oversee rather than Transport Canada.

### 1.3.2 Provincial Stakeholder Engagement

Clifton has spoken to various individuals within the Government of Alberta's Environment and Protected Areas (AEPA) between September 2023 and the present. Clifton initially held a meeting with AEPA representatives working in permitting for the Industrial Heartland and the Designated Industrial Zone in October 2023. The discussion included an introduction to the project scope and location and conversations around applicable legislation and provincial submissions. Clifton continues to correspond with the AEPA representatives and will work with the province to ensure provincial legislative requirements are met. It was determined that the project does not trigger an application through the *Environmental Protection and Enhancement Act*; however, approvals for the Stormwater Management Plan (SWMP) and the Wetland Assessment and Impact Reports (WAIRs) will require approval through the Province's *Water Act*. Based on a review of the project it does not appear that further approvals will be required by AEPA.

Clifton reached out to representatives of the Government of Alberta's Transportation and Economic Corridors (ATEC) department to discuss the Operating Permit requirements under the *Railway (Alberta) Act*. This discussion was specific to the additional requirements and timeline for review necessary for approval. Specific project details were not included as part of this discussion. Cando's existing rail terminal complies with all the necessary provincial requirements to operate a rail terminal and they continue to have a strong relationship with officials within the Rail Safety Department of ATEC.

A third provincial agency which has an interest in the project is the Alberta Ministry of Arts, Culture and Status of Women (ACSW). An historical resources application detailing the physical location of the project was submitted to ACSW for evaluation as is required prior to beginning any development project in Alberta. The evaluation includes a review of the project area and depth to determine the likelihood that the project would impact known or potential historical resources. As of the date of this document a response has not been received from the ACSW. Once the evaluation is received, Cando will review the results and proceed as necessary to ensure compliance with the ACSW. If approval is granted it would still be subject to section 31 of the *Historical Resources Act* which relates to the chance discovery of a historical resource. If a historical resource is encountered during the project, it will be properly reported.

### 1.3.3 Municipal Stakeholder Engagement

Cando has an ongoing, collaborative relationship with Sturgeon County since the commencement of the existing rail terminal project. Numerous meetings and correspondence between Sturgeon County Administration and Cando have been completed throughout the planning phase of the Project. Representatives of Sturgeon County have been providing advice and support regarding the County's interest in the project including development of the railyard, partial closure of Range Road (RR) 222, construction of the Bypass Road, traffic management for these components, development permit obligations, resident, and business interests. Formal engagement activities have also included creation of a formal Project engagement email address (CandoListens@candorail.com), and a municipal vote by Sturgeon County Council for the proposed partial closure of RR 222.

Cando worked with Sturgeon County Administration to mail Project Notification Letters to stakeholders (residents, landowners, and industry) near the Project area on October 24, 2023 (see Figure 2). This letter provided an overview of Project elements including scope, location, the intended operating and connection plan of the combined terminals, information on the proposed closure of RR 222 and Bypass, and Project timeline. The notification letter also encouraged use of the Project engagement email address, provided direct contact information to Cando representatives, and invited stakeholders to attend a Project Information Session scheduled on November 2, 2023.

The Project Information Session was used to inform nearby stakeholders about Project elements. The Information Session was lightly attended, although some residents and industry stakeholders did ask questions related to the Project. Few concerns were noted, and most attendees seemed to be gathering information to better understand the Project. One stakeholder/farm family noted concern about the proposed closure of RR 222 and committed to bringing that forward at the Public Hearing (below).

The First Reading by Sturgeon County Council of the road closure bylaw (Bylaw 1638/23 – Road Closure for Portion of Range Road 222) took place on November 14, 2023, and was carried/passed unanimously by Council. Following statutory guidelines, A Public Hearing about the proposed closure of RR 222 was held on January 16, 2024, to formally gather public input and to inform Sturgeon County Council ahead of a referral/submission to Alberta Transportation and Economic Corridors (ATEC) about the proposed closure. Although it is a local road closure, ATEC sign-off is needed before the road closure bylaw can progress to Second and Third Readings municipally.

At the Public Hearing, four people noted concerns about the road closure. Two noted concerns about increased traffic and development near their properties, and the protection of trees and irrigation routes, although they have suggested mitigation measures both publicly and privately to Cando. Cando is taking appropriate action on these mitigations, and will action them in partnership with the county, if feasible. One speaker noted concerns about industrial development of any kind in the area, given local farming history. Cando notes the area has been zoned for heavy industrial development for decades and is seeing increased development interest and projects as it is part of Alberta's Industrial Heartland and the provincial Designated Industrial Zone. One resident claimed the road closure and the extra length of time needed to drive large trucks and farm equipment around using the Bypass would be detrimental to farm operations. Cando indicated at the Public Hearing (and to the resident privately) that the proposed closure and Bypass (mitigation) are critical needs of the Project to increase safety. There is a high likelihood of trains always blocking RR 222 for extended periods throughout the day, and it is simply not safe or feasible to have a local road and public access through an active railyard. While the Bypass may create a minor inconvenience by adding a small distance to a rural travel route, it also substantially increases safety and is the best possible mitigation to ensure safe rail-based development in the area.

Following referral of the Road Closure Bylaw to ATEC, and assuming Ministerial sign-off, a Second and Third Reading by Sturgeon County Council of the Bylaw will take place. Timing of the Second and Third Readings, and the likely approval of the partial closure of RR 222 by Sturgeon County, are dependent on a response from ATEC. It is hoped this will occur in the first half of 2024. Cando will continue to work with the County regarding the road closure and Bypass, and notes both the County Administration and Council have indicated their support throughout the process.

#### **1.3.4 Landowner**

The land allocated for the use of the project is currently owned by a variety of individuals including private residents and businesses. These individuals or representatives of the businesses have been informed of the project with inquiries and negotiations having begun regarding land transactions. Cando is working closely with the landowners to resolve any issues and to keep them informed on the progress of the project. There do not currently appear to be any issues or concerns regarding the land sales and the properties have been accessed for preliminary assessments including geotechnical and environmental investigations.

#### **1.3.5 Resident Stakeholder Engagement**

Through working closely with Sturgeon County, Cando has sent notification letters to residents that would be potentially affected by the project. This included residents within Sturgeon County within the area outlined in Figures 2 and 4. The total area encompasses approximately 5,765 ha of land within Sturgeon County. To maintain the privacy of the residents contacted, Sturgeon County facilitated mailing out the letters. The letters provided the residents with contact information for Cando and encouraged feedback from the community. Cando, in conjunction with Sturgeon County, also advertised and assisted in organizing an information session for the residents which took place on 02 November 2023. The information session included a presentation by Cando that included a project overview, location, scope, plan, design, engagement activities, timeline, and safety considerations. The residents in attendance at the information session were also able to ask questions and sign up to receive a copy of the presentation. Any concerns noted during the information session were logged by Cando and will be taken into consideration during the remaining portions of the planning phase. All residents who reached out to Cando will be provided an individual response. An example of the letter sent is included in Appendix A.

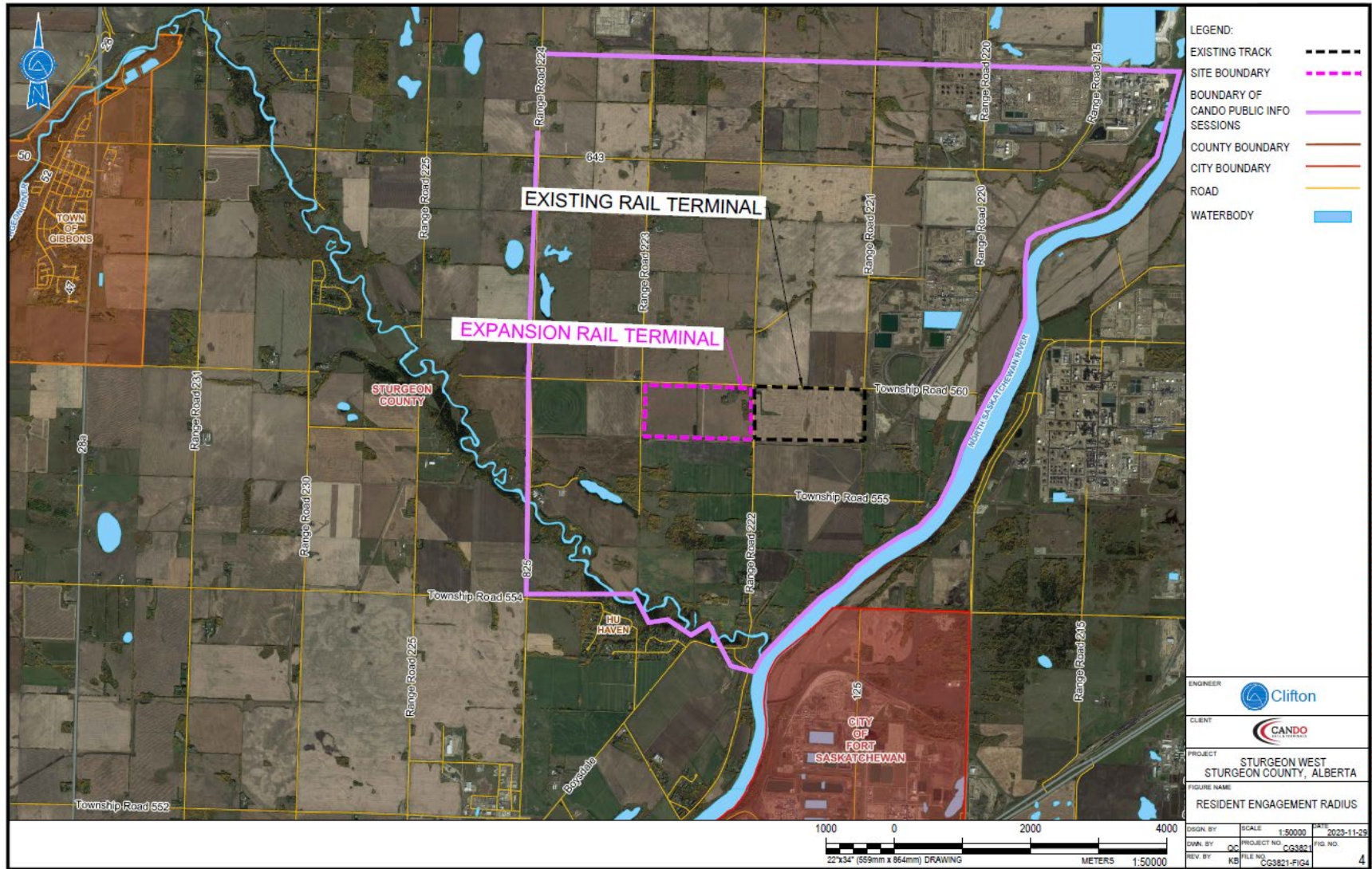


Figure 4: Resident Engagement Radius

### 1.3.6 Industry Stakeholder Engagement

Cando works closely with the local industry in Alberta's Industrial Heartland especially some of the surrounding industrial facilities who are customers of Cando's existing rail terminal using the facility for railcar storage. As part of the project, all industrial facilities within the Sturgeon County portions of the Industrial Heartland were emailed an information package on the package. Some of the letter recipients were: Nutrien, ATCO, Pembina Pipeline, Suncor, Altalink, Wolf Midstream, and NorthWest Redwater Partnership. The package included a letter describing the project and figures detailing the project location and a preliminary design drawing of the facility. The letters provided contact information and encouraged feedback. To this date no objections or concerns regarding the project have been brought forward by industry stakeholders. An example of the letter sent is included in Appendix A.

### 1.4 Indigenous Engagement

*A list of Indigenous groups that may be affected by the carrying out of the project, a summary of any engagement undertaken with the Indigenous peoples of Canada, including a summary of key issues raised and the results of the engagement, and a brief description of any plan for future engagement.*

Following Clifton's initial meeting with representatives of IAAC, a list of Indigenous groups which may be potentially impacted by the project was provided by the IAAC. This list of the 15 Indigenous groups was provided via email. In addition to the list provided by IAAC, Cando also contacted the Alexis Nakota Sioux Nation and Paul First Nation which are both located to the west of the Edmonton. The following is the list of Indigenous groups contacted.

Alexander First Nation	Montana Cree Nation	Otipemisiwak Métis Government
Alexis Nakota Sioux Nation	Paul First Nation	Otipemisiwak Métis Government – Region 4
Enoch Cree Nation	Saddle Lake Cree Nation	Buffalo Lake Métis Settlement
Ermineskin Cree Nation	Samson Cree Nation	Kikino Métis Settlement
Kehewin Cree Nation	Foothills Ojibway Society	Lac Ste. Anne Métis Community Association
Louis Bull Tribe	Kelly Lake First Nation	

Following receipt of the Indigenous groups list from IAAC, contact information was collected from Alberta's Aboriginal Consultation Office (ACO), IAAC, or the Indigenous group's website to first send a Project Notification Letter. The letter was sent via email, with read receipts requested, to each group. The letters

requested a response within 30 days. Prior to the 30-day mark a follow-up email was sent as a reminder of the request for feedback. An information letter was sent via email, with read receipt, to all contacts listed between September and December 2023. The documents were sent requesting a response within 30 days to the designated email address (candolistens@candorail.com). Before the Holiday break, a response had been received from the following First Nations and Indigenous organizations:

- Enoch Cree Nation – Engagement activities have included numerous emails and an in-person meeting. Most of the correspondence has been in relation to Cando’s upcoming needs for contractors and Project-related services. Cando will continue to engage with Enoch Cree Nation as the project progresses to determine if there is the potential for a future collaboration or procurement.
- Ermineskin Cree Nation – A letter was received by Ermineskin Cree Nation requesting an in-person meeting. The letter further stated that the project is located on their ancestral territory and as such they would like to complete a site assessment to ground truth all potential impacts and to offer recommended mitigation measures to ensure seven generations of use. The letter stated that it was not Ermineskin’s intent to impede the proposed project but as stewards of the land it is their duty to protect the safety of flora, fauna, birds, water, soil, air, and culturally sensitive areas. Cando has acknowledged receipt of the letter and is working to set up a meeting.
- Kehewin Cree Nation – An email was received by Cando from a representative of Kehewin Cree Nation requesting clarification on the Cando contact information for the project. Cando has responded to the request and as per the date of the document no further response from Kehewin Cree Nation has been received.
- Kelly Lake First Nation – A representative of Kelly Lake First Nation contacted Cando stating that they had no objections to the project as outlined in the information letter. They did indicate that they would like to be informed about Project milestones.
- Samson Cree Nation – An in-person meeting was conducted between Cando and representatives of Samson Cree Nation. The meeting went through an overview of the project with follow-up discussions and questions. During the meeting the representatives of Samson Cree Nation discussed having access to any wood following tree clearing activities and potentially providing a monitor during construction activities for spiritual safety and artifact identification. The Samson Cree representative also asked about contractor or procurement opportunities. Following the meeting, Samson Cree Nation was also to provide a list of companies and services they could potentially provide Cando for future collaborations. Cando is continuing to work with Samson Cree Nation regarding these requests.
- Lac Ste. Anne Métis Community Association (LSAMCA) – A virtual meeting was held to provide a Project overview and see if there were any initial questions or concerns by LSAMCA. Representatives noted they would like additional mapping of the Project location (provided), asked how they were added to consultation lists for contact (IAAC, ACO), asked when IAAC would be making decisions, noted concern that Cando did not yet have a formal Indigenous Consultation Policy (in development), asked Cando to share early site works activities and opportunities for involvement, and noted interest in a site assessment.

Following the Holiday break, Cando has continued following up by phone and email with Indigenous groups that were initially contacted, prioritizing those from which no initial response was received, or communication was halted due to the Holidays. Cando began notifying First Nations and Indigenous organizations that they would like to start wrapping up the information gathering phase and start

addressing/closing the comments/feedback received. Additional comments, and their disposition are noted below:

- One group indicated that they wanted to have a monitor on site during the construction period. Cando has indicated that given the prior use of the site as a farm the likelihood of cultural artifacts being found is very low. That said, a chance find protocol will be in place in the unlikely event that a heritage resource is uncovered.
- Several groups have indicated that they would like a site visit in the spring and Cando considers this a reasonable request and will work to accommodate it. Cando's preference would be to make the site available for a day or two for groups, though not all groups are open to having other First Nations or Indigenous organizations attend at the same time.
- One group has indicated they would like access to the firewood when the site is cleared and grubbed. Cando is okay with lumber salvage, though First Nations and Indigenous groups will need to arrange transport of the firewood.
- Several requests for work, especially in clearing and grubbing, roads and civil earthworks. While this work is some way off yet, Cando is maintaining a list of the interested Indigenous contractors and their capabilities to send proposals or tenders to.
- There were some requests for technical documents generated for the project and Cando indicated that some will be available online once regulatory submissions are available to the public, and that any that are not included in a report or submission are considered confidential. That said, Cando has noted during consultations that they are willing to discuss the findings of specific reports in a summary manner.

Consultation, communications, and clarification with Indigenous groups is ongoing, though is now focused on addressing and closing the comments and feedback received. It is the intention of Cando, in pursuit of this application, to continue consultation activities. These include, wherever possible, ensuring the Project Notification Letter/Email was received by all Indigenous groups shown in Table 1-4, gathering input on the potential for the Project to impact treaty and other rights and traditional land uses, and working to address concerns or comments in a manner that is both respectful and feasible. Moving forward, Cando will maintain the Indigenous contractors on its suppliers list and when work matching their capabilities arises, provide them with an opportunity to bid on the work. Cando will continue to gather information about Indigenous contractors and their capabilities. Cando will also maintain its contact email and phone line to receive any requests to engage, comments and complaints and maintain their service standard for response to those inquiries or complaints. Cando will also respond to requests for information, meetings, and site visits where practicable.

In addition to the engagement activities undertaken for this submission, provincial applications will be required under Alberta's Water Act. These applications will require the completion of a Pre-Consultation Assessment through the ACO. Cando will complete further engagement with Indigenous Groups if deemed necessary following the ACO's pre-consultation assessment. Cando's First Nations Consultation number with ACO is: FNC202450136.

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## 1.5 Studies and Plans

*Any study or plan relevant to the project that is being or has been conducted of the region where the project is to be carried out, including any Regional Assessment carried out under the Impact Assessment Act, or by any jurisdiction including by or on behalf of an Indigenous governing body, where the study or plan is available to the public.*

Based on correspondence between Clifton and the IAAC there are no known studies or plan, relevant to the project, under section 92 or 93 of the *Impact Assessment Act* or by any jurisdiction, including by or on behalf of an Indigenous governing body.

There are several environmental initiatives in the region as set out by the province and the Industrial Heartland. These initiatives include the following (Government of Alberta, 2023a):

- An air quality management framework with local air quality monitoring through the Fort Air Partnership. A greenhouse gas (GHG) inventory and a discussion on air quality management is included in this report,
- A topsoil guideline document specific to the Industrial Heartland which outlines conservation, off-site storage, and off-site use of topsoil. Cando will continue to discuss the topsoil management with Sturgeon County.
- Water quality will be managed through the North Saskatchewan Region Surface Water Quality Management Framework. Surface water quality management is discussed in this report and, although this item does not require specific approvals or permits, Cando will implement best management practices to conserve the quality of the regional surface waters.
- Water drainage will be managed through municipal master drainage plans and Water Act approvals. Cando is working with qualified professionals to manage the on-site wetlands and future surface water drainage. Both project components are provincially regulated by AEPA through the Water Act.

Through the planning phase of the existing and expansion rail terminals Cando is aware of the interests in preserving the environmental quality of the air, soil, and water. Cando is working with qualified professionals and government agencies to ensure that all regional requirements are considered prior to the implementation of the expansion rail terminal.

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## 1.6 Strategic Assessments

*Any strategic assessment, relevant to the project, that is being or has been carried out under section 95 of the Act.*

Based on correspondence between Clifton and the IAAC there is one strategic assessment that would be applicable to the project. The Strategic Assessment of Climate Change, published in 2020, would be relevant to the project; it is a strategic assessment conducted under subsection 95(2) of the *Impact Assessment Act*, and it applies to all designated projects under the *Impact Assessment Act*.

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## 2.0 Project Information

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### 2.1 Project Purpose and Need

*A statement of purpose of and need for the project, including any potential benefits.*

#### **Purpose**

With connections to a Class 1 railroad (Canadian National), the purpose of the project is to provide rail services to clients in the petrochemical industry located in Sturgeon County and the adjacent Strathcona County, within the Alberta Industrial Heartland Zone and beyond. Those rail services include rail car storage, train marshalling and assembly especially for unit trains, limited transloading of hazardous and non-hazardous materials, minor repairs and servicing to railcars and locomotives, and other rail services as may be identified by rail customers. The Cando Sturgeon Rail Terminal West Expansion is intended to be a full-service, multi-purpose facility for the storage, grouping, maintenance, and transloading of rail cars from various industries. This has resulted in the need to expand the existing Sturgeon East Railyard to handle demand.

The primary objective of the expansion project is to provide a large enough railyard for unit trains to arrive and depart with a classification railyard for breaking down and assembling those unit trains. In addition, there is need for a mechanical area to service and repair locomotives and rollingstock. The project is intended to be developed in multiple stages, with the timing of staging dependent on market conditions and customer demand.

#### **Need**

The Class 1 railroads in Canada have largely stopped storing railcars for customers creating a national need for railcar storage facilities. Combined with the increasing industrial presence around the Project, and the increasing need for the transport of bulk products, there is a need for railyards to service customer railcars. The petrochemical industry located in Sturgeon County and the adjacent Strathcona County use large numbers of predominantly tank and hopper cars to transport their products to customers. The tank cars are privately owned and require rail facilities to store cars when they are not actively in use at either a production facility, a user's facility or in transit. Consolidating rail staging operations in one area removes the need for each individual industry to provide its own facility, assists with network fluidity for the Class 1 Railroads and improves railcar handling efficiency at the end destination. This in turn lowers industry infrastructure and capital costs and increases competitiveness.

To meet the local needs for handling and servicing unit trains (trains that contain a single commodity) and to maintain connections to the CN Rail line and the rest of the North American market it is imperative that the expansion rail terminal be comprised of long tracks with connections on both the north and south sides to the existing rail terminal.

In addition, Cando is committed to creating sustainable, long-term economic development opportunities that expand market access, make support chains more resilient, and generating potentially 40 new full-time

jobs. Additional financial benefits include an approximate \$140 million dollar spend and an increased tax assessment to all levels of government.

The main project components are: (Figure 5):

- The construction of the arrival/departure yard wrapping around the entire property.
- The classification yards for sorting railcars shown in the centre of the property.
- The mechanical area for locomotive and railcar repairs shown on the east side of the railyard.

Within the mechanical repair area, it is intended that in time additional ancillary facilities would be built to support railway operations based upon customer requirements. Further facilities that may be constructed include storage tanks for fueling, mobile transloading, and an expansion of the repair facilities. These uses may be developed in time along with appropriate permits and support infrastructure including power and surface and stormwater management.

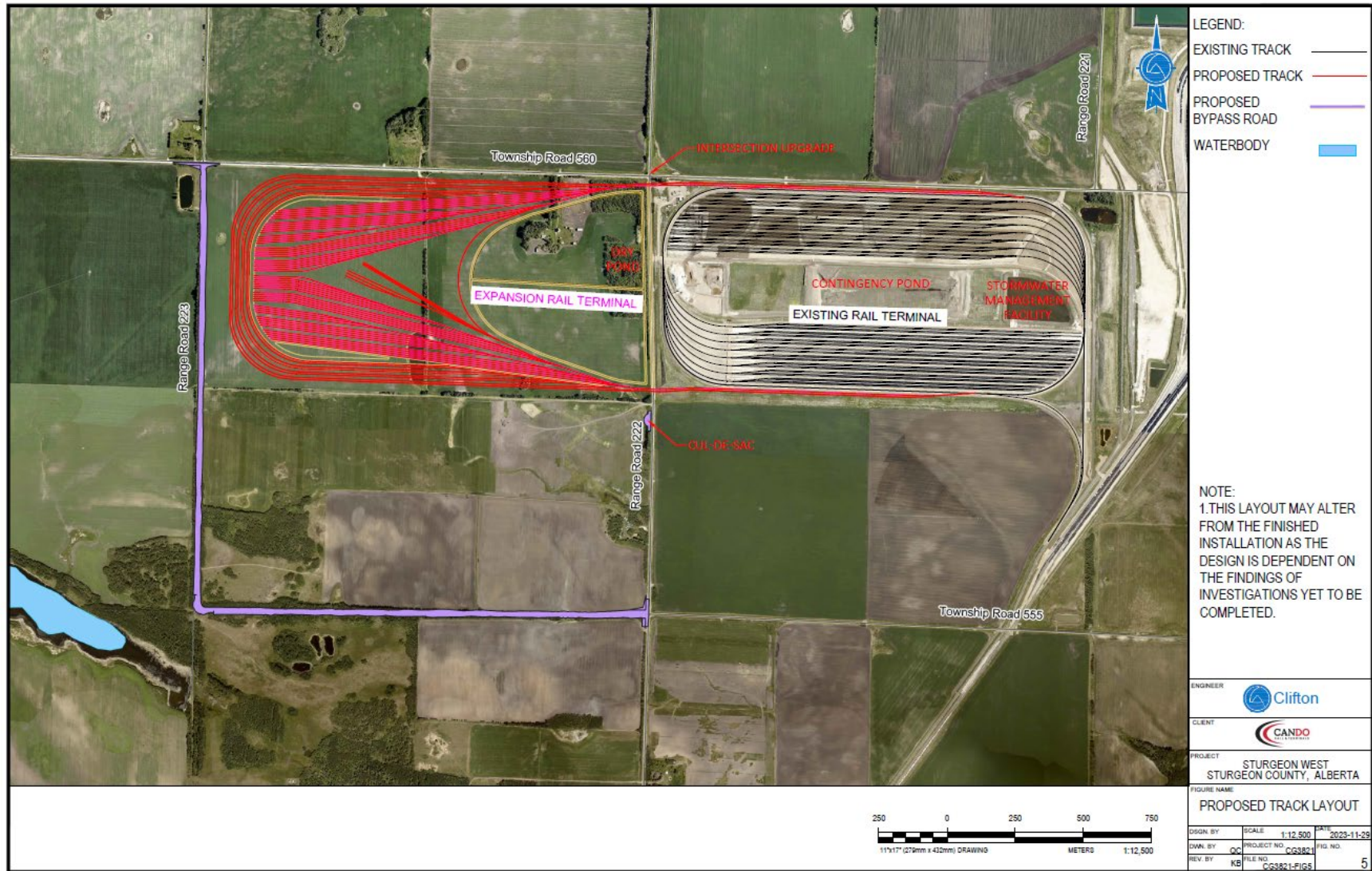


Figure 5: Proposed Track Layout

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## 2.2 Project Applicable Physical Activities Regulation

*The provisions in the schedule to the Physical Activities Regulations describing the project, in whole or in part. Proponents must detail how the project meets the description, threshold, and the criteria in any of the other provisions.*

The project is subject to Section 55 of the *Physical Activities Regulation* which states the following:

*“The expansion of an existing railway yard, if the expansion would result in an increase of its total area by 50% or more and a total area of 50 ha or more”.*

The project is subject to a review of the Initial Project Description by the IAAC as the area of the expansion railyard encompasses a total area of approximately 130 ha of land which is greater than the 50 ha indicated. The expansion rail terminal would also increase the capacity of the overall facility by approximately 50%.

There is no other criteria presented in the *Physical Activities Regulation* which would be applicable to the project.

There do not appear to be any other federal authorities that would have direct jurisdiction over the expansion rail terminal. The operations of the terminal would be regulated by ATEC and any spills or complaints would be under AEPA's control. That said, Cando is aware of the need to comply with the *Migratory Birds Convention Act* and the *Species at Risk Act* in developing the project and they have retained biological consultants to advise on these aspects of the project.

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## 2.3 Project Activities, Infrastructure, and Physical Works

*A list of all activities, infrastructure, permanent or temporary structures and physical works to be included in and associated with the construction, operation, decommissioning of the project. Include existing structures or related activities that will form part of or are required to accommodate or support the designated project.*

Throughout this Section 2.3 and subsections details of all activities will be presented including permanent infrastructure, temporary structures, and physical works related to the construction, operation, and decommissioning phases of the project.

### 2.3.1 Proposed New Infrastructure

The following project description includes items related to the project that will be discussed further in the construction, operation, and decommissioning activities sections. The proposed new infrastructure for the project is detailed below in Table 2-1.

<b>Table 2-1: Proposed New Infrastructure for the Expansion Rail Terminal</b>	
<b>Proposed Infrastructure</b>	<b>Description</b>
Arrival/Departure Yard	The arrival/departure (AD) yard is to become the primary spot for the inbound and outbound train traffic to the existing rail terminal. The AD tracks, ranging in holding capacity from 99 to 179 railcars, would provide a total of approximately 1,088 railcar spots. There is the potential to add locomotive storage tracks on both the north and south sides of the AD yard to allow staging of locomotive power while trains are being built.
Classification Yards	The classification yards are comprised of four smaller yards, with a combined railcar capacity of 1,860 railcars. These four yards would be used to support the railcar demands of local industries and be used to assist in breaking up inbound unit trains and building outbound unit trains.
Mechanical Yards	The mechanical yard or railcar repair facility is in the center of the project area and is intended to connect the classifications yards and the AD yard. It contains a small staging yard with 70 railcar spaces and locomotive parking in addition to locomotive and railcar maintenance and servicing areas. These areas would be intended for minor repairs such as replacing wheels, trucks, brake components, and couplers. It also includes a connecting loop to assist in movements between the north and south of the facility.
Rail Connection	The new terminal is to be connected at both the northern and southern track extents to the existing rail terminal located to the east of Range Road 222. It is imperative that both facilities be extended as shown in Figure 5. The extension of both the south and the north line is to be completed to ensure that all operations on both the expansion and existing rail terminals can occur simultaneously without disturbing the ability of either facility to meet customer demands.
Access Roads	Roadways will be constructed for crew and staff access by personal vehicle, for truck traffic to enter to refuel locomotives, and for service vehicles to provide water and remove waste products. The portion of Range Road 222 between the expansion and existing rail terminals is to be repurposed into the designated access point. Primary access is planned to be on the south side of the expansion rail terminal property from Township Road 555 with a second emergency access from Range Road 560.

**Table 2-1: Proposed New Infrastructure for the Expansion Rail Terminal**

Proposed Infrastructure	Description
Internal Roads	Internal gravel service roads will be constructed beside the tracks along with gravel pads in the designated repair and transload areas (if constructed in the future) to allow for inspections and light maintenance of rail cars and equipment. The service roads will be crowned to provide positive drainage away from the rail tracks and into the stormwater management system.
Water Management Infrastructure	Water supply for the expansion rail terminal is to be trucked to site and stored in cisterns until it is needed. As additional facilities and processes are added, it is expected that additional infrastructure may require water supply wells. The water supply wells will be completed in accordance with all provincial licensing requirements under Alberta’s <i>Water Act</i> . Surface and stormwater management will consist of drainage ditches and culverts strategically placed to collect and direct surface runoff to the on-site surface water management pond and into the County’s stormwater management system.
Offices	Offices used during project construction will be housed in mobile, temporary trailers. Offices for the operation of the rail terminal are expected to be housed in a series of modular buildings with portable services (tanks for water, sewer, and gas connections) along with suitable gravel parking areas for employees. As services expand, it is expected that offices could migrate into structures, such as maintenance shops, with fixed utility connections.
Services	Services including electrical power and internet will be connected to the expansion rail terminal from the existing rail terminal. Electrical power for the project is to be upgraded to support 3-phase power requirements and to power the various equipment, facilities, and offices as necessary. The power feed and distribution lines will be constructed and operated in accordance with an arrangement between Cando and the electrical service provider. A small motor control center building may be required to house major electrical components. Internet and radio connections will be installed and operated in agreement with a third-party provider.
Security	Planned security measures for the expansion rail terminal includes a standard 6 feet high chain link fence along with intermittent lights and

Table 2-1: Proposed New Infrastructure for the Expansion Rail Terminal	
Proposed Infrastructure	Description
	security cameras. The fence is to be installed around the perimeter with strategically placed gates and emergency egress points. The lights and cameras are to be placed to cover important operational areas, gates, and office locations. The fence will limit unpermitted access from both humans and wildlife.
Bypass Road	Due to the closure of Township Road 222 between the two railyards Cando, with guidance from Sturgeon County, is to create a bypass road. The bypass will include upgrades to the existing Sturgeon County operated Range Road 223 to the west of the W ½ 34-55-22-W4M and the intersection of Range Road 222 and Township Road 560 to the northeast of the property. To complete the bypass, roadways will also be constructed to the south of the S ½ 34-55-22-W4M (an extension of Township Road 555) and a cul-de-sac will be constructed at the end of Range Road 222 south of the expansion rail terminal.

Based on the currently known tasks of the project the only temporary structures are the mobile office and workspaces to be used during the project construction phase. The remaining infrastructure will be permanent. The temporary structures will be removed once the construction phase of the project is complete.

**2.3.2 Existing Infrastructure**

Some infrastructure that will be critical to the project is already in place at the existing rail terminal. This existing infrastructure includes:

- Utilities and third-party infrastructure services are already in place in the area or have been upgraded for the existing rail terminal. These services include internet, upgraded electrical power to 600 amp peak usage services – 300 kva 3 phase power, and local natural gas services.
- Once the tracks of the expansion rail terminal and the existing rail terminal are connected this will in turn provide the connection to the CN Rail line.
- The surface and stormwater management system on the existing rail terminal will also be part of the stormwater management system for the expansion rail terminal.
- There are facilities for staff such as offices and washrooms on the existing rail terminal that may be used for staff of the expansion rail terminal.

- The bypass road will include upgrades to the existing roadways including Range Road 223, the intersection of Township Road 560 and Range Road 222, and Range Road 222 to the south of the expansion rail terminal where a cul-de-sac will be constructed.

### **2.3.3 Project Activities**

Although activities associated with the project are being completed by third-party consultants and contractors they remain under the care and control of Cando. All of the potential contractors and services cannot be determined at this time but may include mechanical, civil, structural, electrical, earthworks, and environmental contractors. The contractors/consultants will be procured by Cando and will be subject to Cando's safety and environmental standards.

Potential activities to be completed outside of the care and control of Cando are those related to utilities. These activities will be directed by the utility provider with Cando's involvement as required.

### **Planning Activities**

Prior to the completion of any construction activities the project is undergoing an extensive planning period. Components of the project planning include desktop studies, field testing, reporting, and design. Specific activities include:

- A desktop biophysical baseline review with field verification to determine important physical biological related to the siting, landscape, land use, terrain, soils, vegetation, wildlife, habitat, surface water, and hydrology.
- A Wetland Assessment and Impact Report (WAIR) for each of the expansion rail terminal and the bypass road meeting AEPA requirements.
- A Phase I Environmental Site Assessment (ESA) for both the expansion rail terminal and the bypass road meeting the AEPA requirements to determine the potential for contamination to the subsurface soil and groundwater.
- A Phase II ESA to collect subsurface soil and groundwater samples targeting areas identified in the Phase I ESAs for having potential contamination. The Phase II ESA will be completed to meet the AEPA requirements.
- A geotechnical investigation to determine the soil characteristics in the area to support the design of the expansion rail terminal.
- A Wetland Assessment and Impact Form (WAIF) was completed to allow for the temporary disturbance to the wetland areas caused by the completion of the geotechnical drilling program in accordance with AEPA requirements.
- A stormwater management plan (SWMP) that aligns with requirements of both the county and AEPA,
- A traffic impact assessment to support the design of the bypass road.
- Field surveys to determine the elevations and topographical terrain of the expansion rail terminal.

These investigations have been completed to adhere to regulatory requirements, support regulatory applications and submissions, and to inform the project design. The planning activities were completed with landowner permissions and were of minimal disturbance to the lands with the mobilization of small track mounted drill rigs to collect subsurface soil samples. Some samples and observations, notably those for the biophysical assessment, were collected by foot.

### ***Construction Activities***

The physical works associated with the construction activities include the implementation of the rail tracks and associated components, site access roads, surface water drainage infrastructure, and the bypass road. These activities will take place subsequent to the acquisition of the proper permits and approvals from the IAAC following the review of this submission, AEPA following the review of the WAIRs and the SWMP, and the county. Cando is working directly and closely with the county to ensure that all necessary requirements are met.

A safety plan including emergency response procedures will be created prior to beginning construction. In addition, security measures will be implemented throughout the construction phase for safety purposes to limit access to the property by unauthorized personnel, and animals. Equipment used during the construction activities will be stored on the expansion rail terminal property when not in use. The area will undergo extensive utility locates to ensure the safety of on-site workers and to avoid damage to the utilities.

### ***Land Preparation – Vegetation Clearing and Demolition***

The first stage of construction activities includes the preparation of the land. This would include planning with any on-site utility providers, the removal of vegetation, and the demolition of existing structures. The vegetation includes the cropland, grasses, and trees in any of the areas to be used for the construction of the expansion rail terminal and the bypass road. Only the vegetation within the footprint of the project is to be removed. The demolition or removal of any structures or objects related to the rural residential property would also include the removal of any concrete foundations. The construction materials will be properly recycled or disposed of off-site by a third-party contractor. During the demolition activities remedial excavation activities may also take place, if indicated by the results from the Phase II ESA. If considered necessary, a Hazardous Building Materials Assessment will be completed on the structures to determine if there are designated materials such as asbestos, lead, or ozone depleting substances that will require abatement prior to demolition.

### ***Soil Stripping***

The construction footprint areas will then be stripped. The stripping activities will segregate the topsoil and the subsoil, which will be stockpiled separately. The topsoil management plan has not been finalized but based on conversations with AEPA the topsoil management aspects of the project would fall under the sole jurisdiction of Sturgeon County. It is most likely that the topsoil materials stripped will be stockpiled on the property for potential future reuse or repurposed at another location (e.g., soil amendments for farming operations).

### ***Cut/Fill Activities***

Once the topsoil has been stripped the area will be cut/filled as determined to be appropriate and with the reuse of soil from high elevations to areas of lower elevation if the material is deemed suitable. If imported material is required, it will be tested for environmental and geotechnical suitability prior to placement. It was determined that the northwest corner of the expansion rail terminal is at a higher elevation than the land on the southeastern corner. The material will be moved using excavators and rock trucks. Material will be spread primarily using a dozer and will be compacted using a pad foot packer.

As the material is being excavated any additional work necessary for the completion of the approved SWMP such as specific on-site grading or ditches will also take place. The current SWMP design ties into the stormwater system on the existing rail terminal and will require the installation of a culvert to the north of the property. A preliminary SWMP design is included in Appendix B and consists of ditches and grading throughout the project footprint, a dry pond on the expansion rail terminal, and a contingency pond on the existing rail terminal. All of the stormwater then settles into the stormwater management facility on the existing rail terminal. The plan is being developed but has yet to be approved by the county or AEPA. If any underground infrastructure such as placement of power lines and natural gas connections is deemed necessary, it will be completed to the standards of the specific utility provider. It is possible that dewatering activities will be necessary during the cut/fill activities. The groundwater removed may be discharged following any necessary approvals from AEPA or the County to ensure that the water quality and quantity will not cause adverse effects. The main contaminant to be considered during dewatering activities would be the potential for suspended solids. The presence of suspended solids can be reduced if the water is retained prior to discharging allows the solids to settle.

### **Grading**

Once the fill/cut is complete and the material has been compacted and meets the site specifications the granular material for the road surfaces, pit run gravel, and sub ballast will be placed. Granular material will be trucked over and spread out with dozers and graders. Material will be compacted with a smooth drum packer and placed in engineered lifts with testing completed to ensure that site-specific compaction specifications are met.

### **Track Construction**

Once the grade has been completed and inspected, track construction can begin. During the construction phase of the project, it is likely that portions of the expansion and existing rail terminals will be used to store the construction materials including soil and aggregate stockpiles and track materials. Track construction includes material distribution, skeleton track construction, and ballasting and surfacing. The material distribution includes getting the ties, rail and other track materials positioned on the grade where it is required for assembly. This is a necessary step to be completed prior to the skeleton track. The skeleton track construction consists of laying out the ties on the prepared grade at the correct spacing, connecting the sections of rail to each other and the ties while getting the track on the design alignment. The ballast will be brought to the property and placed around the skeleton track. The track is then raised, and the ballast is compacted under and between the ties while the alignment and elevation is aligned.

### **Bypass Road Construction**

The bypass road construction will follow some similar steps to the track construction in which any vegetation in place will be cleared, the topsoil will be stripped, and fill material will be placed in engineered lifts and tested to meet specifications. The design of the roadway will be crowned with ditches to direct surface water drainage. The design of the bypass roadway will meet the necessary provincial and municipal requirements.

### **Vegetation Control**

In general, to manage weeds and vegetation on the property the construction equipment and any personal use vehicles are to be brought to site clean and free of vegetation, debris, and seeds. This is primarily to

limit the potential for the spread of noxious weeds. To avoid unnecessary erosion to undeveloped portions of the property weed-free seed mixtures will be used.

### **Operation Activities**

The expansion rail terminal will come into operation following the commencement of construction. The construction will be phased, and some railway operations may be able to take place at the same time as some construction activities. The operation of the rail terminal and repair functions of the project would be completed by Cando employees.

The operation of the expansion rail terminal will follow the direction of the existing rail terminal. The main activities to take place at the expansion rail terminal include sorting incoming and outgoing railcars, storing railcars, and assembling unit trains for departure. There will be nine shunting locomotives with six working at any given time. This would account for two locomotives in the north, two in south, and two in the terminals. The remaining three locomotives would be kept on-site as spares.

The actual operations of the expansion rail terminal will be under the jurisdiction of ATEC. To ensure compliance with ATEC, updates to the existing site-specific General Operating Instructions, Emergency Response Plan, Safety Management System (completed to Transport Canada standard), and the Operating Certificate (which is issued under the *Railway (Alberta) Act*) would be completed. Other internal guidance that would dictate the operation of the expansion rail terminal are Cando's Environmental, Social and Governance Policy, and the Occupation Health and Safety policy and procedures.

The primary purpose of the both the expansion and existing rail terminals is to allow a singular location for the storage of railcars for the use of local industry. Additionally, the expansion rail terminal will offer some maintenance and repair services for cars and locomotives. Between the expansion and existing rail terminals there could be up to 120 employees with 40 employees working per shift. The expansion rail terminal will operate 24 hours a day, seven days a week.

### **Decommissioning Activities**

The project will operate without a defined end point. The decommissioning activities will be completed in accordance with the industry standards and regulations in place at that time.

In general, the decommissioning activities will include disconnecting any on-site utilities and removing any in-place infrastructure including buildings, tracks, tanks, etc. The materials will be removed from site by a qualified contractor. It is intended that the removal will include the recycling of any applicable construction materials with the remaining materials disposed of properly.

The decommissioning process will include an assessment of potential contamination to the subsoil or groundwater. If determined to be necessary, the decommissioning process will also include the reclamation of contaminated soil and groundwater. Reclamation will likely begin by first removing the source of the contamination. Once the source is removed residual contamination will then be addressed potentially by excavating contaminated soils for off-site disposal. The entire region is zoned for industrial land use with it intended to continue to be used for industrial purposes; therefore, all remediation activities would be

completed to meet the province's industrial land use environmental quality standards applicable at the time of decommissioning.

### 2.3.4 Incidental Activities

*This is to include physical activities that are incidental to the designated project.*

The primary project is the completion of the expansion rail terminal. To make the expansion rail terminal project safe and feasible additional roadways are required to be constructed. This includes the completion of the bypass road works. There are no physical activities other than those described for the project, identified.

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## 2.4 Production Capacity

*An estimate of maximum production capacity of the project and a description of the production processes to be used. Capacity refers to the maximum capacity based on the project's design and operating conditions, not the planned capacity of a project. This information may not be relevant to all project types (e.g. highway, railway line), and the proponent should simply indicate where this is the case. The proponent may instead provide other relevant metrics of project size (e.g. area, length, usage).*

The arrival/departure yard is anticipated to consist of multiple tracks, with holding capacities ranging from 99 railcars to 179 railcars, with a total of approximately 1,088 railcar spots (approximately 60 ft or 18.3 m/rail spot). As this concept progresses, it is intended to add locomotive storage tracks on both the north and south sides of the AD yard to allow staging of locomotive power while trains are being built.

The classification yards are comprised of four smaller yards, with a combined railcar capacity of approximately 1,860 railcars. These four yards would be used to support the railcar demands of local industries and be used to assist in breaking up inbound unit trains and building outbound unit trains.

The mechanical yard is in the center of the facility and is intended to connect the classifications yards and the AD yard. It contains a small staging yard of approximately 70 railcar spaces, locomotive parking, as well as locomotive and railcar maintenance and servicing areas. It also includes a connecting loop to assist in movements between the north and south of the facility.

The track and associated activities are thought to encompass the entirety of the half section, approximately 130 ha in size. The expansion rail terminal will operate 24/7 and the anticipated traffic is approximately as follows:

- CN Arrival: 4 to 5 Trains/day.
- CN Departure: 4 to 5 Trains/day.
- Customer Inbound: 2 to 3 Trains/day.
- Customer Outbound: 2 to 3 Trains/day.
- Up to 2000 railcars arriving and departing daily.
- Up to 730,000 railcars arriving and departing yearly.

**2.5 Anticipated Schedule**

*The anticipated schedule for the project’s construction, operation, decommissioning, and abandonment, including any expansions of the project.*

The first phase of the physical works is anticipated to beginning in the last quarter of 2024. Construction activities will begin with the AD yard. The construction activities will then be phased over 6 to 7 years at which point the railyard will be at full build out. The first phase of construction will take approximately 1 to 2 years to complete. Following the first phase of construction the expansion rail terminal can begin limited operations. The remaining construction phases will occur while the terminal is in operation. The anticipated construction schedule without an Impact Assessment is as follows Table 2.2:

<b>Table 2-2: Anticipated Construction Schedule Without an Federal Impact Assessment</b>	
<b>Project Task</b>	<b>Timeframe</b>
From approval to full build out	6-7 years
Site Preparation	November 2024 to February 2025
Construction Phase 1	February 2025 to February 2027
Further Construction Phases	2027 to 2030
Project Lifespan	TBD – No fixed end date.
Decommission	TBD – minimum 50 years

The anticipated construction schedule with an Impact Assessment is shown in Table 2.3.

<b>Table 2-3: Anticipated Construction Schedule – With a Federal Impact Assessment</b>	
<b>Project Task</b>	<b>Timeframe</b>
IAAC Planning Phase	2024
Impact Assessment Completion	2024 – 2026 (assumes limited federal scope requirements)
Assessment and Decision Making	Early 2027

**Table 2-3: Anticipated Construction Schedule – With a Federal Impact Assessment**

Project Task	Timeframe
From concept to full build out	6-7 years
Site Preparation	March 2027 to July 2027
Construction Phase 1	July 2027 to July 2029
Potential Further Construction Phases	2029 to 2033
Project Lifespan	TBD – No fixed end date.
Decommission	TBD – >50 years

## 2.6 Potential Alternatives

### *A list of potential:*

- *Alternative means that the proponent is considering and that are technically and economically feasible, including through the use of best available technologies; and,*
- *Alternatives to the project that the proponent is considering and that are technically and economically feasible, and directly related to the project.*

For rail, there are not a lot of alternate means of delivering a project of this type. While Cando will start this project with conventional diesel electric locomotives, they are exploring the use of low-carbon fuels for combustion engines in the short-term and the electrification of its fleet of locomotives using batteries, hydrogen fuel cells or a hybrid of both. Cando, in cooperation with Emissions Reduction Alberta, is a leading participant in the lithium-ion battery-powered locomotive initiative. Battery powered trains use multiple locomotives that would carry batteries to provide traction power for in-service use. The traction system of a battery powered train is based on that of a conventional electric train, but which is self-contained with the addition of on-board battery storage, supporting power converters, and temperature management for the batteries.

The only practical alternative to the expansion yard is to require clients to build their own storage yards and assemble trains there. This would result in many storage yards that will require a lot of land, as a minimum amount of land is required to provide for proper train movement, switching and storage, but will be under utilized at customer sites relative to the Sturgeon East and West yards, which will be managed full time to maximize the yards utilization. Individual facilities are generally not be able to take advantage of economies of scale, efficiency of train movements, nor the marshalling and assembly of unit trains for the Class 1

railways and receiving destinations which may require railcars from multiple individual customers. By effectively managing the yard, Cando can service multiple clients.

Multiple track layout alternatives have been and continue to be assessed, but the overall functionality of the expansion has not changed. There have been alternative track design drawings created by Clifton that will be reviewed and potentially approved by Cando. The track design laid out in this application is approximate based on Cando’s original concept but does not necessarily represent the exact final design. The overall track design will still include the same basic concept of the AD yard, the classification yards, the mechanical yards, and rail connections. In addition, there is the potential to add locomotive storage tracks on both the north and south sides of the AD yard to allow staging of locomotive power while unit trains are being built.

In addition to the above there are potential items that may be included in the expansion rail terminal. These items are not included as part of the initial design but are those that Cando may want to implement in the future depending on the physical space available within the expansion rail terminal and customer demands (Table 2.4). All potential future infrastructure would fall under provincial jurisdiction and require review and approval.

**Table 2-4: Potential Infrastructure Development**

Railcar Repair Shop	<p>Staging of railcars in need of maintenance and light repairs would be performed outside, with heavy repairs completed within a three-bay structure. If constructed, the structure would be comprised of a main shop with an office and support area. The railcar repair shop would include flaring and purging capabilities, to ensure that works can be safely conducted on railcars. The construction of a railcar repair shop does not trigger a specific approval under Alberta’s jurisdiction, but the facility will be required to implement spill prevention and would be subject to Alberta’s Release Reporting Regulation should a spill or release occur.</p>
Locomotive Repair Shop	<p>A full-service locomotive repair facility along with infrastructure to complete heavy repairs within the building may be constructed at the expansion rail terminal. Light maintenance activities such as minor repairs, watering, sanding, and fueling the locomotives would be completed outside the building in a designated area. Additional electrical charging infrastructure associated with Emissions Reduction Alberta and Cando’s lithium-ion battery locomotive initiative would be included in the locomotive repair shop area. More on the lithium-ion batteries is included in Section 5.5.4.3. The construction of a locomotive repair shop does not trigger a specific approval under Alberta’s jurisdiction, but the facility will be required to implement spill prevention and would be subject to Alberta’s Release Reporting Regulation should a spill or release occur.</p>

**Table 2-4: Potential Infrastructure Development**

<p>Storage Tanks</p>	<p>Temporary and modular buildings will require storage or holding containers for potable water, liquid waste including domestic wastewater, and solid waste. Other above ground storage tanks associated with the activities noted within this project description are thought to consist of:</p> <ul style="list-style-type: none"> <li>• Diesel Fuel for operations.</li> <li>• Gasoline for operations.</li> <li>• Nitrogen for equipment, maintenance, and shops.</li> <li>• Recovery Tank for equipment, maintenance, and shops.</li> <li>• Used oil from equipment, maintenance, and shops.</li> <li>• Glycol for equipment, maintenance, and shops.</li> </ul> <p>The amount of storage for the above items is not known at this time but is thought to remain below the provincial <i>Activities Designation Regulation</i> which states that an approval is required for a facility with a chemical storage capacity of 5,000 m<sup>3</sup> or more. The tanks will be registered with the province or county as necessary. This includes the procurement of an Operating Permit through Alberta Safety Codes Council which issues permits of flammable and combustible liquid storage tank systems that have a capacity of 2,500 L or greater. Due to the proposed chemicals to be stored, Cando will also work with the local emergency response system, such the fire department.</p>
<p>Mobile Transload</p>	<p>There is a potential to provide a small scale mobile transload services to move products between railcars and trucks in support of local industries. Products to be transloaded are expected to consist of dry bulk, aggregates, biodiesel, refined fuels, liquefied petroleum gases (LPGs), and other products. The quantity of materials is expected to be limited to a maximum of 4 railcars per day, generating a maximum of 24 truck movements in/out of the facility. Infrastructure needed for this is expected to consist of gravel pads along tracks to accommodate truck traffic, grounding and bonding on designated tracks, minor electrical services, and other spill management equipment. The requirements regarding the transloading of products have been discussed with ATEC as well as AEPA. ATEC is the governing body for the transload of dangerous goods by rail and requires the following be in place prior to issuing a permit:</p> <ul style="list-style-type: none"> <li>• Safety Management Plan.</li> <li>• General Operating Instructions.</li> <li>• Emergency Response Plan.</li> <li>• Confirmation of communication with local emergency response.</li> <li>• The tracks be insulated, bonded, grounded, and resistance tested.</li> <li>• TDG training of all on-site staff and compliance with TDG regulations including <i>The Transportation of Dangerous Goods Act</i>; and</li> </ul>

**Table 2-4: Potential Infrastructure Development**

- Compliance with the *Railway (Alberta) Act* and associated circulars. Including, spill prevention methods, spill containment, and spill/release response protocols.

## 3.0 Location Information and Context

### 3.1 Geographic Coordinates

*Proposed geographic coordinates, including, for linear development projects, the proposed locations of major ancillary facilities that are integral to the project and a description of the spatial boundaries of the proposed study corridor. Coordinates should be appropriate for the project type. For example: for the centre of a facility, for the boundaries of a proposed mine site, or for the beginning and end points and path of a linear project. Indicate if you will be using an existing right of way that has been previously used for a different type of linear project.*

The geographic centre of the expansion rail terminal is approximately 53°47'59.43"N (latitude), and 113°11'11.97"W (longitude). The terminal itself will cover a half section of land, approximately 130 ha in size. The Alberta township description is N ½ 34-55-22-W4M.

The bypass road is expected to have the following approximate geographic extents:

**Table 3-1: Bypass Road Geographical Extents**

Description	Latitude	Longitude
Intersection of Township Road 560 and Range Road 222	53°48'12.32"N	113°10'27.87"W
Upgrades to Range Road 223	53°48'12.43"N - 53°47'19.54"N	113°11'56.77"W - 113°11'55.95"W
Southern Side – New Road Construction	53°47'19.54"N - 53°47'20.56"N	113°11'55.95"W - 113°10'25.15"W
Cul-de-sac	53°47'44.39"N	113°10'25.56"W

The majority of the bypass road is contained either within properties that are to be used for the rail terminal or within existing rights-of-way. There will be small portions that will need to be acquired from local landowners prior to construction. The exact amount of land to be purchased depends on the final design of the roadway. Drawings of the current, preliminary road design are included in Appendix B.

### **3.1.1 Site Maps**

*Site maps produced at an appropriate scale in order to determine the project's proposed general location and the spatial relationship of the project components.*

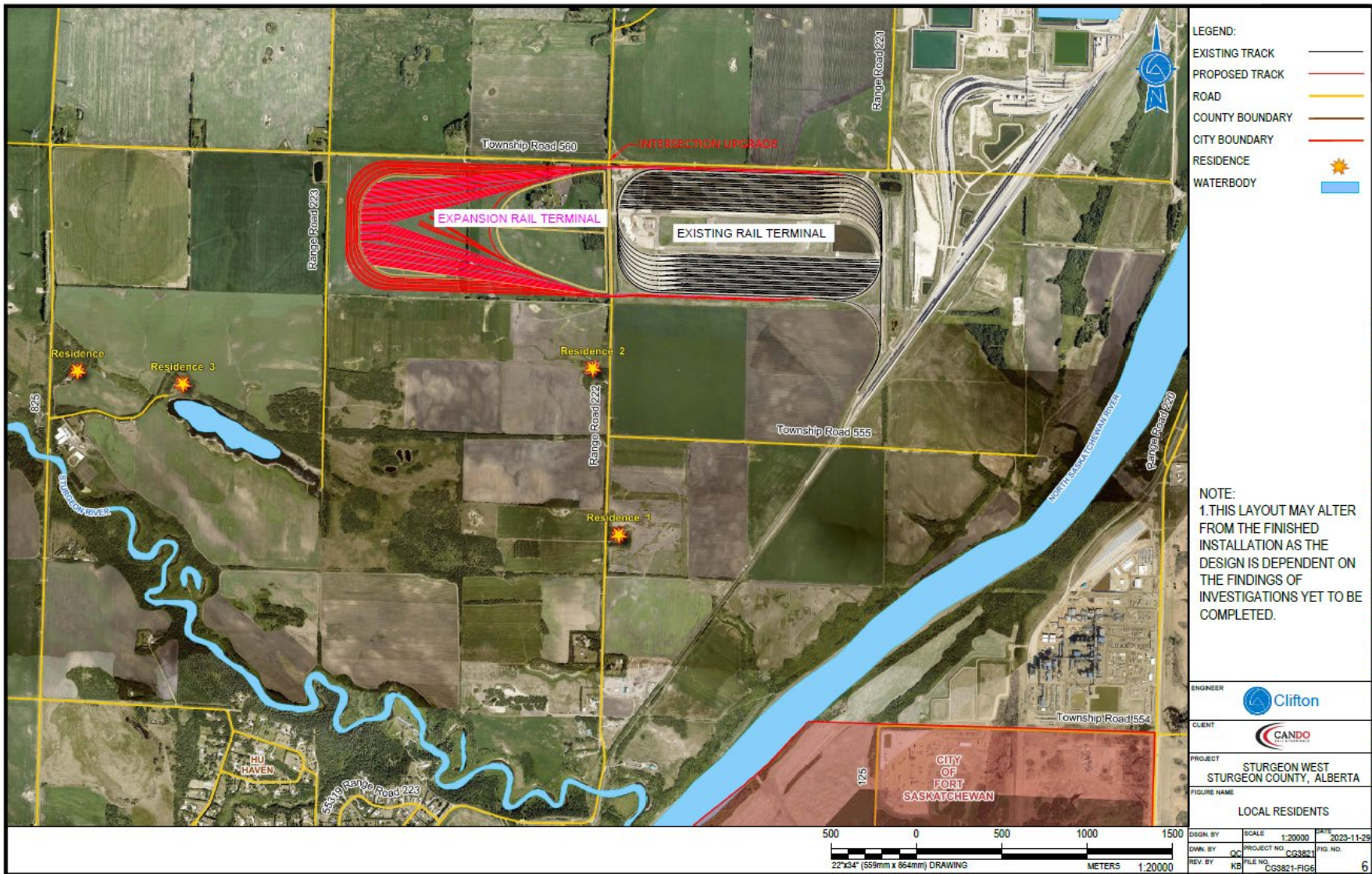


Figure 6: Local Residents

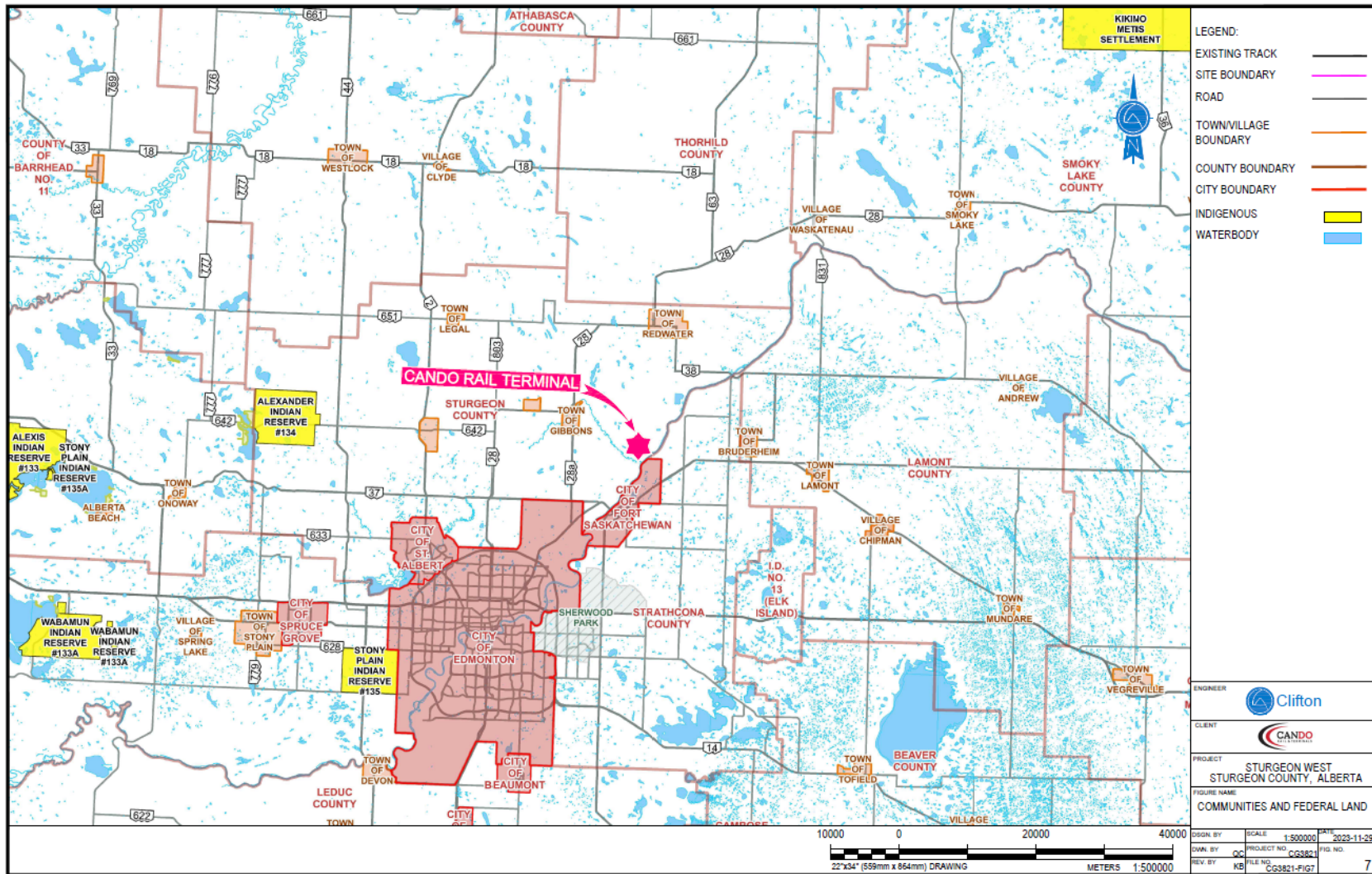


Figure 7:Communities and Federal Land

### 3.1.2 Legal Land Descriptions and Landowner Documents

*The legal description of land to be used for the project, including, if the land has already been acquired, the title, deed or document and any authorization relating to a water lot. The level of detail should be appropriate for the project type.*

The legal land descriptions of the expansion rail terminal properties are NE 34-55-22-W4M, NW 34-55-22-W4M, Railway Plan 0824867 Area C (short legal 0824867;C), and Plan 0824867 Area D (short legal 0824867;D).

Based on the current design the legal land descriptions and portions of land that may be purchased for the bypass road are as follows (Table 3-2).

<b>Table 3-2: Bypass Legal Descriptions</b>	
<b>Location</b>	<b>Legal Land Description</b>
Intersection of Township Road 560 and Range Road 222	Existing right-of-way and approximately 24 m <sup>2</sup> of SE 3-56-22-W4M
Intersection of Township Road 560 and Range Road 223	Existing right-of-way and approximately 340 m <sup>2</sup> of NE 33-55-22-W4M
Range Road 223	Existing right-of-way, 8,021 m <sup>2</sup> of SW 34-55-22-W4M, and approximately 8,121 m <sup>2</sup> of NW 34-55-22-W4M
Intersection of Range Road 223 and new construction on southern boundary	Existing right-of-way and approximately 150 m <sup>2</sup> of SW 34-55-22-W4M
Southern Boundary along the S ½ 34-55-22-W4M	Undeveloped right-of-way in SW 34-55-22-W4M and portions of SE 34-55-22-W4M and NE 27-55-22-W4M
Cul-de-sac	Approximately 1110 m <sup>2</sup> in the northern half of SE 34-55-22-W4M

Land for the project has not yet been purchased but all landowners have been engaged by Cando and discussions are ongoing.

### 3.1.3 Proximity to Residents and Communities

*The project's proximity to any permanent, seasonal or temporary residences and to the nearest affected communities.*

The zoning of the land in most of this portion of Sturgeon County within the Industrial Heartland is I5 – Heavy Industrial District (Sturgeon County, 2023 Land Use Bylaw). As noted, Alberta's Industrial Heartland is also a Designated Industrial Zone within the province of Alberta (see Figure 2). There is no indication of a future change in land use. No future residential development will occur within at least 800 m of the project boundaries. The railyard project property is cultivated agricultural land with a single residence that will be vacated prior to construction.

To the north of the property is Township Road 560 followed by heavy industrial-zoned land that is primarily cultivated agricultural land leased out to local farmers. To the east is the existing rail terminal. To south is a pipeline right-of-way followed by a sod farm. To the west is Range Road 223 followed by land that is primarily cultivated agricultural land but is zoned heavy industrial. There are treed areas within the cultivated properties. Based on a review of Google Earth© there appear to be four residences located within a 1.5 km radius of the site; two to the south of the site and the remaining two to the southwest.

The nearest residence is 500 metres south of the edge of the proposed expansion yard. Currently, this land is zoned heavy industrial, and it is for sale. At the January 16th Public Hearing, a member of the owner's family indicated that the owner/occupant of this residence did not consider the existing East Yard noisy. The (existing) Sturgeon Terminal site GM and Supervisor have not received any noise complaints about the East Yard from the public to-date. (M. Richard, personal communications, 2024).

### 3.1.4 Project Proximity to Traditional Indigenous Uses

*The project's proximity to land used for traditional purposes by Indigenous peoples of Canada, land in a reserve as defined in subsection 2(1) of the Indian Act, First Nation land as defined in subsection 2(1) of the First Nations Land Management Act, land that is subject to a comprehensive land claim agreement or a self-government agreement and any other land set aside for the use and benefit of Indigenous peoples of Canada.*

The properties designated for the project are located on Treaty 6 land. The closest First Nation's reserves are the Alexander First Nation which is 49 km away to the west; the Enoch Cree Nation located 48 km to the southwest; and the Saddle Lake Cree Nation 89 km to the northeast. While there are other First Nations located further away none are within 150 km to the north, east, southeast, or south of the Project. The closest documented Métis Settlement is Kikino located approximately 84 km to the northeast. These locations are based on a review of the documented reserves as mapped by the province (Government of Alberta, 2021, see Figures 6 and 7).

The project is located within Otipemisiwak Métis Government Region 4 and District 11 – St. Albert Métis District (Otipemisiwak Métis Government, 2023). The closest documented Métis Settlement is Kikino which is located approximately 84 km to the northeast of the project.

Traditional land uses specific to the project location have not been identified. The larger area has been historically used by Indigenous communities through harvesting, fishing, and hunting. There may be some

ancestral connections to the lands and Cando will continue to engage when and as needed throughout the lifespan of the project. The landscape in the area has changed through cultivation and the more recent industrial developments as Alberta's Industrial Heartland. The project location itself has been used as cultivated agricultural land since at least 1950 (Clifton, 2023).

### 3.1.5 Proximity to Federal Lands

*The project's proximity to any federal lands.*

The Edmonton Garrison (Canadian Forces Base) is located to the north of the City of Edmonton and is approximately 18.5 km to the southwest of the project boundary. Elk Island National Park is located approximately 20 km to the southeast of the Project. Elk Island National Park is located within the Beaver Hills Biosphere. The Beaver Hills Biosphere has national partners including Nature Conservancy of Canada. The boundary of the biosphere is approximately 16 km to the southeast of the Project (Beaver Hills Biosphere, 2023).

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## 3.2 Physical and Biological Environment

*A brief description of the physical and biological environment of the project's location, based on information that is available to the public.*

Cando retained the services of EDI Environmental Dynamics (EDI) to complete a Biophysical Baseline assessment for the project. The biophysical assessment includes a desktop review with field verification. Their findings have been documented below and the full report can be found in Appendix D. Following a summary of the publicly available information is a brief description of the site-specific field observations, potential risks, and mitigation measures.

### 3.2.1 Terrain and Soil Summary of Publicly Available Information

#### 3.2.1.1 Summary of Publicly Available Information

The project is located within the southern Dry Mixed Wood Natural Subregion (Natural Regions Committee, 2006). This region is typically characterized by undulating or hummocky surface expression with variable relief including some low-relief and inclined areas. The local topography was described as generally flat with a downward slope towards to the south and east. This would correspond with topography sloping downwards towards the Sturgeon River to the south and the North Saskatchewan River to the east.

There are three soil mapping polygons consisting of five soil series listed within the project area (Government of Alberta and Alberta Agricultural and Forestry, 2023). The soil series are Hobbema, Ponoka, Peace Hills, Primula, and Gleyed Peace Hills. Each soil series has its own characteristics but generally the soils were described as eluviated or orthic black chernozems, the Gleyed Peace Hills was described as gleyed black chernozems. The majority of the project footprint was noted to be Hobbema and Ponoka which were eluviated black chernozems with loam, silty loam, silt loam, and very fine sandy loam textures. Three of the five soil series listed were deposited by wind and water.

#### 3.2.1.2 Site-Specific Risks and Mitigation

Field results from EDI's investigation as well as Clifton's geotechnical investigation generally confirmed these surface soil results from the desktop review. It was noted that the black topsoil material (A horizon)

was approximately 20 to 40 cm thick. EDI described the A horizon as a silty clay loam or clay loam. The B horizon was an additional 20 to 40 cm thick and was described by EDI as clay loam or clay. The A and B horizon soils in the footprint of the project, notably the expansion rail terminal, will be stripped prior to construction. Prior to any construction activities Cando will discuss the soil management of the project with Sturgeon County. In discussions between Clifton and AEPA it was determined that the conservation and management of the surface soils would fall under the jurisdiction of Sturgeon County, typically under a stripping or development permit. The management of the soils must still comply with Alberta’s *Soil Conservation Act*.

The risks to the soil due to the project include:

- Loss of soil due to erosion.
- Degradation of stockpiled materials.
- Soil compaction due to rutting and moving equipment.
- Potential for soil contamination.

Table 3-3: Soil Risks and Mitigations	
Risk	Mitigation
Erosion	<ul style="list-style-type: none"> <li>• Limit the area stripped as much as practicable.</li> <li>• In dry, windy conditions use water on the surface of exposed soils to reduce the potential of erosion.</li> <li>• If possible, strategically place any stockpiled fine-grained materials away from low-lying areas and drainage courses and in locations with wind coverage to avoid the migration of material from entering waterbodies.</li> <li>• If possible, cover the stockpiled materials with a tarp, or if they are intended for long term storage seed the stockpiles with an acceptable mixture.</li> <li>• To reduce siltation to nearby waterbodies, construct earthen berms, or ditches to control the surface water runoff. Based on the proposed SWMP completed by Clifton the surface water runoff is to be directed to retention ponds on the existing rail terminal which will allow for the settlement of suspended solids.</li> </ul>
Degradation	<ul style="list-style-type: none"> <li>• Test the soils for Clubroot. Clubroot is a soil borne disease which can affect canola, mustard, and other crops in the cabbage family.</li> <li>• The A and B horizons are to be stockpiled separately so the soils can be properly reused.</li> <li>• Reuse and/or remove soils from the site pending the approval of Sturgeon County to avoid degradation from long-term storage.</li> <li>• If soils are to be stockpiled long-term, consider testing and amending the soil to improve the chemical/physical characteristics prior to reuse.</li> </ul>

Table 3-3: Soil Risks and Mitigations	
Risk	Mitigation
Compaction	<ul style="list-style-type: none"> <li>• Avoid using equipment on off-site areas to reduce the effects of compaction as compact soils result in the reduction of plant rooting and growth.</li> <li>• Use designated paths when running equipment.</li> </ul>
Contamination	<ul style="list-style-type: none"> <li>• Prevent contamination to soil by preventative use of drip pads and spill containment during activities with a higher risk of a spill/release occurring. For exempling, place a drip tray below the nozzle when completing refueling activities.</li> <li>• Properly dispose of all deleterious materials.</li> <li>• Keep all on-site vehicles and equipment in good condition and free of leaks. Inspect equipment regularly. If equipment is determined to be leaking it should be removed from site for the proper repairs to be completed.</li> <li>• Keep spill response materials on-site and clean-up any spill or release immediately with proper disposal of all contaminated materials including any soil or water to avoid the migration of the contaminants.</li> <li>• Ensure compliance will all TDG regulations including the handing and storage of materials and the use of placards.</li> <li>• Engage a qualified third-party for the proper remediation and removal of any contaminated materials.</li> </ul>

### 3.2.2 Vegetation

#### 3.2.2.1 Summary of Publicly Available Information

The Dry Mixed Wood Subregion of the Boreal Natural Region (Natural Regions Committee, 2006) is composed of aspen forests and cultivated lands with wetlands and low-lying areas. A review of the Alberta Conservation Information Management System (ACIMS) system did not indicate the presence of a listed vegetation species within the project area (Alberta Environment and Protected Areas, 2023a). A large portion of the project area consists of cultivated land with limited native species. The remaining areas of the project consisted of a mix of deciduous trees, graminoid marshes, and deciduous swamps.

#### 3.2.2.2 Site-Specific Risks and Mitigations

The complete list of observed vegetation species are included in EDI’s biophysical report (Appendix D). Five different noxious weed species were observed within the project area. There was also one listed plant, clammy hedge-hyssop, identified in two different locations. The plant is not federally listed in the *Species at Risk Act* (SARA). The plan is also known to be present in disturbed wetlands, is locally abundant, and was reported to ACIMS.

Potential risks to vegetation include:

- Loss of native vegetation.
- Introduction and spread of invasive plants and noxious weeds.

**Table 3-4: Vegetation Risks and Mitigations**

Risk	Mitigation
Vegetation Loss	<ul style="list-style-type: none"> <li>• Limit clearing activities to the extents necessary and practicable.</li> <li>• Clearing activities should occur during the winter months to avoid disturbance to wildlife, especially birds, as per the Alberta <i>Wildlife Act</i> and Canada’s <i>Migratory Birds Convention Act</i>. In addition, winter clearing will avoid disturbing dormant plant species.</li> <li>• Use the existing and expansion rail terminals for equipment storage and laydown areas as much as is practical. The second option would be to use cultivated lands to avoid disturbing native plant species.</li> <li>• Native vegetation remaining in the project area is not to be harvested.</li> <li>• If culturally significant flora or fauna is identified in the area, specifically by an Indigenous group, Cando will engage with the party to come to a mutually agreed upon plan.</li> <li>• If possible, the listed plants will be salvaged prior to Project construction and translocated to waterbodies adjacent to the existing Sturgeon Terminal East.</li> </ul>
Invasive Species	<ul style="list-style-type: none"> <li>• To avoid the spread of invasive species and noxious weeds control measures approved by Sturgeon County will be implemented. These control measures should still conform to Alberta’s <i>Weed Control Act</i>. These measures could include the physical removal of the weeds, mowing the areas to prevent seeding, landscaping, tilling the soils, and the use of approved herbicides.</li> </ul>

### 3.2.3 Wildlife and Wildlife Habitat

#### 3.2.3.1 Summary of Publicly Available Information

The project is not located in any designated wildlife sensitivity zones. The closest sensitive zone is the Key Wildlife and Biodiversity Zone located approximately 280 m from the project and is associated with the Sturgeon and North Saskatchewan River Valleys (Government of Alberta, 2022). The project is located 200 m from a sharp-tailed grouse survey area and a sensitive raptor zone for the bald eagle (Government of Alberta, 2022). The project area does not overlap with any federally designated critical habitats. (Fisheries and Oceans Canada, 2022; Environment and Climate Change Canada, 2022b) or any important bird areas, migratory bird sanctuaries, or national wildlife areas (Government of Alberta, 2022).

Known wildlife to the area include mule and white-tailed deer, moose, many bird species, and small mammals. Three bird species have historically been reported within 2 km of the project and there is documented fish presence within the Sturgeon and North Saskatchewan Rivers (Alberta Environment and Protected Areas, 2023b). These species were not listed with the federal or provincial government. The cultivated lands may provide habitat for deer, some birds, and small mammals. The treed areas within the project area would provide habitat for birds, ungulates, and small mammals.

**3.2.3.2 Site-Specific Risks and Mitigations**

During the visit activity from woodpeckers was noted and there was an unoccupied stick nest observed. Other trees were noted to be large enough to support habitat for raptor nests and pileated woodpecker nest cavities. No active nests/cavities were noted during the site visit. Thirteen different bird species, deer tracks, mule deer, and red squirrel were observed during the site visit. A stick nest/nest cavity survey will be conducted within suitable habitat within 1 km of the Project Footprint during leaf-off conditions in 2024, with a follow-up survey in late May 2024 to verify the status (i.e., active or inactive) of the nest and identify the occupant species. A pre-disturbance wildlife and nest clearance sweep will be completed prior to the commencement of construction following the Wildlife Sweep Protocols (Alberta Environment and Parks 2020b).

Risks to the wildlife and wildlife habitat due to the project include:

- Loss of habitat.
- Disturbance to present wildlife including the potential for nested birds.
- Increased human interference in the area due to the presence of workers.

<b>Risks</b>	<b>Mitigations</b>
Loss of Habitat	<ul style="list-style-type: none"> <li>• Limit the removal of habitat to the areas necessary.</li> <li>• Concentrate construction activities, such as vehicle parking, to areas that have already been disturbed to avoid the unnecessary loss of habitat.</li> </ul>
Disturbance	<ul style="list-style-type: none"> <li>• Complete clearing activities in the winter months and outside of the migratory bird nesting period (generally beginning of April to end of August) to avoid disturbing an occupied nest.</li> <li>• Complete wildlife sweeps and a stick nest/cavity survey prior to construction activities. If occupied nests or other sensitive species are encountered complete mitigation measures to ensure the health and safety of the wildlife. Mitigations would be specific to the findings but could include revisions to the construction plan or monitoring the wildlife for signs of stress.</li> <li>• Manage dust and noise as much as practicable to avoid stress on wildlife.</li> </ul>

**Table 3-5: Wildlife Risks and Mitigations**

Risks	Mitigations
Human Interference	<ul style="list-style-type: none"> <li>• If practicable, install temporary fencing around construction activities to avoid wildlife activities during construction.</li> <li>• The stormwater pond may become a desirable place for birds and wildlife. As the quality of the water may not be suitable for animal consumption and poses a drowning risk. The pond should be maintained to avoiding plant growth which can be desirable habitat and regularly remove the water from the pond.</li> <li>• If the water in the pond is suspected of having been affected by a deleterious substance it should be tested promptly and disposed of properly by a qualified professional to avoid interactions with wildlife.</li> <li>• Wildlife incidents, including accidental vehicle collisions, should be include in site-specific protocols. These protocols should include the steps to report an incident.</li> <li>• Avoid interactions with wildlife including hunting, chasing, or feeding.</li> </ul>

**3.2.4 Water –Surface Water, Wetlands, and Groundwater**

**3.2.4.1 Summary of Publicly Available Information**

The project is located within the North Saskatchewan River watershed and the North Saskatchewan River Beaverhill Basin and Sub-basin. The Sturgeon River runs to the west, southwest, and south of the project. The nearest point is located more than 1 km to the southwest. The Sturgeon River flows southeast into the North Saskatchewan River which is primarily located approximately 1.5 km to the east of the project. The North Saskatchewan River then flows to the northeast. The regional surface water runoff generally follows in alignment with local topography. This means that the project would generally receive surface water from the northwest and that runoff from the project would generally flow to the south and east. Maps show a tributary of the North Saskatchewan River which may be connected to a wetland partially located within the project footprint (Alberta Environment and Protected Areas, 2023a).

Another aspect of water is the groundwater. The groundwater in the area underwent a regional assessment in 2001 (Hydrogeological Consultants Ltd., 2001). Based on this assessment, the aquifer in the region of the project is the Oldman Aquifer. There were 305 water well records reviewed with 41 records indicating dry or insufficient water. The yield of the Oldman Aquifer was, on average, less than 10 m<sup>3</sup>/day. The quality of the groundwater is mainly sodium-bicarbonate based and includes naturally elevated total dissolved solids (TDS) between 500 and 1,500 mg/L. Sulfate concentrations were generally below 500 mg/L. The chloride concentrations were expected to be mainly greater than 250 mg/L which is the Canadian Drinking Water Guideline for chloride. It should be noted that the 250 mg/L is an aesthetic objective and does not necessarily indicate that there is an imminent risk to human health (Government of Canada, 2023d). There are also instances of fluoride levels above the Canadian drinking water quality guideline of 1.5 mg/L.

### **3.2.4.2 Site-Specific Risks and Mitigations**

The local surface water runoff will be altered to direct the runoff to the engineered SWMP. In addition, the surface water runoff in the area would be directed and altered based on the presence of roadways, ditches, irrigation, cultivation, and berms. It was also noted that there is a sluice gate located north of the project within the northern ditch of Township Road 560. The sluice gate has the potential to alter the surface water flow. When the gate is closed to the south the water flows east along the northern ditch of Township Road 560. However, when the sluice gate is open to the south the water flows south onto the land allocated for the expansion rail terminal. It was also noted that there was 400 m of irrigation pipeline running north-south along SE 34-55-22-W4M, an 80 m shallow ditch running north-south along SE 34-55-22-W4M, and an irrigation pipeline with an intermittent ditch along Township Road 555 where the bypass road will be located.

Thirty-two wetlands, described as land saturated with water for long enough to promote the formation of water altered soils, growth of water tolerant vegetation, and biological activity adapted to a wet environment (Government of Alberta, 2013), were identified within the footprint of the expansion rail terminal. Nine wetlands were also identified within the footprint of the bypass road. These wetlands are shown in Figure 8. There were also ephemeral waterbodies and anthropogenic waterbodies (dugouts) identified within the project boundary. Ephemeral waterbodies are described as low-lying areas where water is briefly ponded in the spring or after a heavy precipitation events, but do not meet the requirements of a wetland (Government of Alberta, 2015). There were 18 ephemeral waterbodies, 13 ephemeral drainages, and three dugouts located within the project footprint. Detailed reports regarding the wetland assessment have been completed under separate covers for submission to AEPA under the Water Act. Two separate WAIR documents, one for the expansion rail terminal and one for the bypass road, have been submitted. The WAIR is designed to receive approval from AEPA for the removal of wetlands within the project footprint subject to approved offsets or financial compensation for the wetlands.

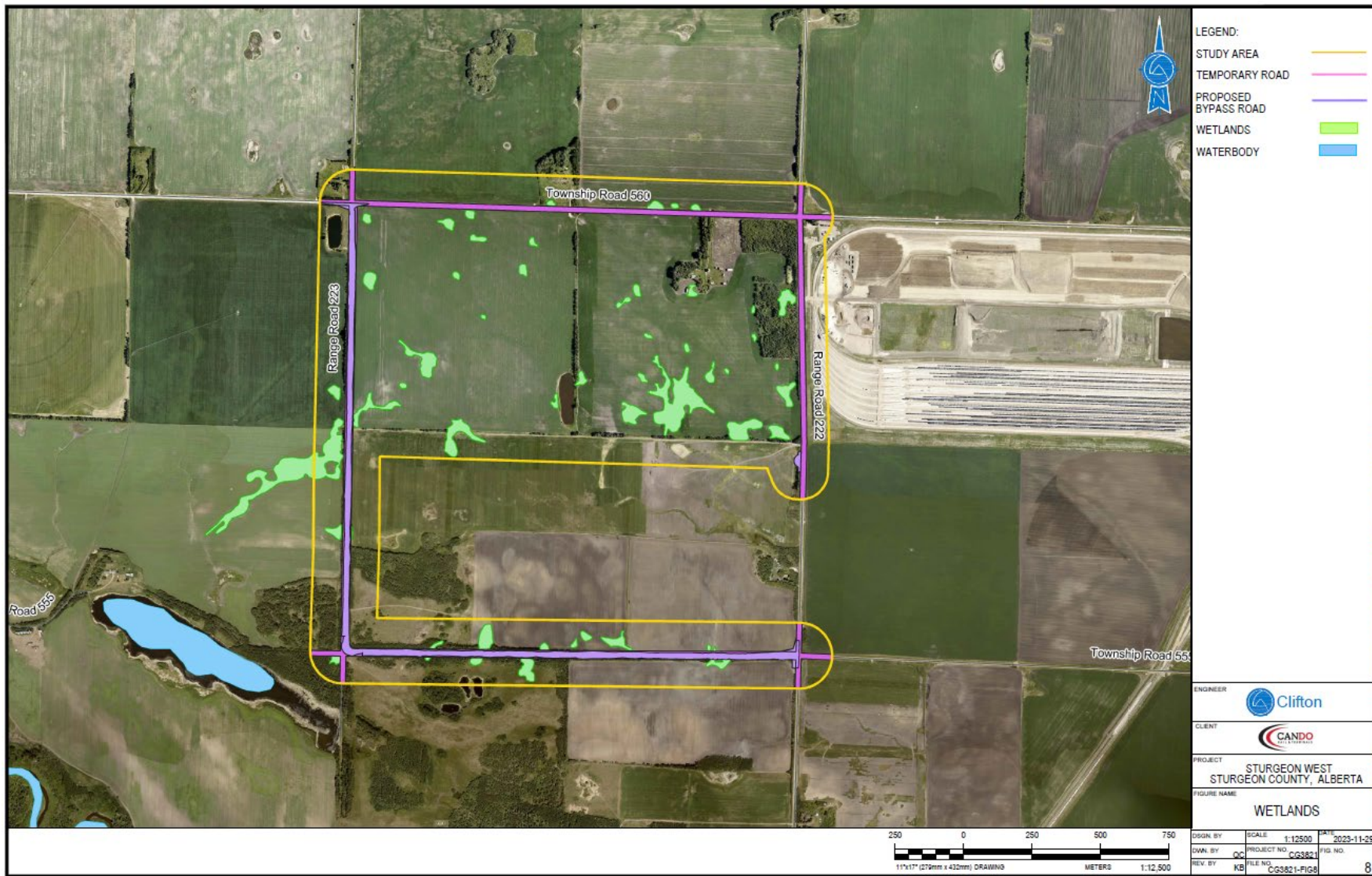


Figure 8: Wetlands

Clifton completed a subsurface investigation to support a Phase II ESA on the rural residential property within the footprint of the expansion rail terminal. A baseline environmental assessment was completed with surficial soil samples and groundwater samples collected throughout the footprint of the expansion rail terminal. Groundwater samples were collected and analyzed for a variety of analytes during these investigations. In addition, there was a geotechnical investigation completed on the property which included the installation of piezometers to determine the groundwater elevations. These assessments are designed to give Cando an understanding of the current groundwater chemistry, any design implications because of the groundwater table, and an understanding of any preexisting contamination that may need to be addressed. The results of the subsurface investigation will be reviewed and analyzed, and the Phase II ESA will be completed to AEPA standards and include recommendations. The results of the baseline environmental investigation could be called upon to determine site-specific soil and groundwater chemistry prior to the implementation of the expansion rail terminal which may be useful if a spill or release were to occur.

The risks to groundwater, surface water, and wetlands due to the project include:

- Contamination due to a spill or release.
- Sedimentation to surface waterbodies.
- Changes to drainage courses causing alterations to waterbodies.
- Destruction of wetland habitat.

**Table 3-6: Water Risks and Mitigations**

Risk	Mitigations
Contamination	<ul style="list-style-type: none"> <li>• Potential for contamination is known to exist on the rural residential property due to former activities including fuel storage. These potential sources should be properly assessed and, if contamination is present, specific handling procedures should be created by a qualified environmental professional. These could include removal and proper disposal of the contamination source and if contaminated groundwater is encountered and in need of dewatering the water should be contained for proper disposal.</li> <li>• Prevent contamination by using proper primary and secondary containment when storing hazardous substances. If any hazardous substances, including waste oil, are to be stored in above ground storage tanks the tanks should be double walled, or have other secondary containment capable of holding 110% of the contents of the container.</li> <li>• Ensure that there is an emergency response procedure if a spill or release is to occur this would include reporting procedures and clean-up using on-site spill kits.</li> </ul>

**Table 3-6: Water Risks and Mitigations**

Risk	Mitigations
	<ul style="list-style-type: none"> <li>• Use drip trays or absorbents when completing activities that may be high risk for the release of a deleterious substance such as fueling and maintenance.</li> <li>• If the surface water stored in the on-site ponds appears to have a hydrocarbon sheen or is known to have been affected by a deleterious substance use skimmers and booms to remove as much oil as possible.</li> <li>• Surface waters accumulated in the SWMP will be tested prior to release and if the water has physical/chemical characteristics above discharge criteria, then the material would be removed and properly disposed of by a qualified third-party. Based on conversations with AEPA, physical/chemical characteristics will not be provincially regulated but should follow local precedence based on <i>Water Act</i> approvals issued to other industry stakeholders within Alberta's Industrial Heartland.</li> <li>• Complete high-risk activities, including refueling, in a designated area, potentially with berms separating the area from the rest of the on-site drainage.</li> <li>• Inspect equipment and vehicles regularly for leaks. If a leak is observed ensure the equipment is properly repaired or fitted with a drip tray in the interim.</li> <li>• Use proper TDG protocols for the handling and transportation of hazardous materials and ensure staff are properly trained for the tasks they complete.</li> </ul>
Sedimentation	<ul style="list-style-type: none"> <li>• Prevent erosion.</li> <li>• Allow retention of surface waters in the on-site ponds to allow for the settlement of suspended solids.</li> <li>• Reduce dust and airborne particles by watering the ground surface (or using other dust prevention amendments) during dry, windy conditions.</li> <li>• If possible, cover or vegetate areas with a high potential for erosion.</li> <li>• Reduce dust generation through the implementation of speed limits.</li> </ul>
Drainage Courses	<ul style="list-style-type: none"> <li>• Ensure that a properly engineered SWMP is implemented that follows the provincial <i>Water Act</i> regulations and municipal master drainage plan. The SWMP has been submitted to AEPA for approval prior to implementation.</li> </ul>
Destruction of Wetland Habitat	<ul style="list-style-type: none"> <li>• Avoid wetlands outside of the project footprint to reduce unnecessary destruction of habitat.</li> <li>• Complete a thorough investigation of the wetlands within the project footprint and document the investigation in a WAIR for AEPA approval. The</li> </ul>

**Table 3-6: Water Risks and Mitigations**

Risk	Mitigations
	approval is contingent on compensation for all wetlands destroyed. The compensation is part of a wetland replacement program which aims to re-establish wetlands in other parts of the province to offset the habitat lost.

### 3.2.5 Air Quality and Noise

#### 3.2.5.1 Summary of Publicly Available Information

The air quality in Alberta’s Industrial Heartland is managed on a regional basis. The purpose of the Capital Region Air Quality Management Framework is to regulate air emissions on a regional basis, rather than regulating emissions from individual facilities. Four concentration level limits have been established for four contaminants of concern: nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), fine particulate matter (PM<sub>2.5</sub>) and ozone (O<sub>3</sub>). These limits are based on the Alberta Ambient Air Quality Objectives (AAQO) for NO<sub>2</sub> and SO<sub>2</sub>, and Canada Wide Standards for PM<sub>2.5</sub> and O<sub>3</sub> and are reviewed on an annual basis. Mitigative management actions are to be implemented as needed in response to triggering of limit thresholds.

Air quality in the region of the project is monitored by the Fort Air Partnership, which currently operates ten continuous and sixty-three passive air monitoring stations. Data is compared to provincial AAQOs and is used to calculate the Air Quality Health Index. The Air Quality Health Index is a publicly accessible report which provides daily risk ratings on a scale from low to very high risk related to outdoor activity. The closest continuous monitor to the project is located southeast at the Scotford Shell Refinery. The closest passive monitor lies approximately 65 km east of the project. The Air Quality Trend Health Index for 2019-2021 indicates that hourly readings were in the low-risk range for 85 to 90 percent of monitoring period.

Noise levels in the area are managed for member companies under the Northeast Capital Industrial Association (NCIA) Regional Noise Management Plan. The development of the Regional Noise Management Plan was based on a predictive computer noise model that incorporates noise models from various facilities in the region, as well as road and rail traffic noise levels. The model is publicly accessible via Google Earth and displays four model cases. Case 3D shows ‘Existing Facilities plus main Road and Rail Contributions’ using 2019 roadway traffic data and estimated rail traffic volume on the main lines over a 24-hour period in 2020. The industrial facilities model assumes all equipment is running at 100% capacity 100% of the time. The regional model is updated every few years and considers significant changes in noise levels at industrial facilities and new data provided by ATEC and rail companies (if available). The current model predicts sound levels to be 43 to 48 dBA.

The nearest noise monitoring stations are located at the southwest fence line of the Pembina Redwater Fractionation facility to the east of the project, with another located more than 1,500 m from the project. Measured noise levels at most locations were shown to be generally consistent with model predictions. The field validation annual report conducted on behalf of NCIA also indicated that noise levels at most locations

consisted of low frequency components with occasional mid/high frequency components. Trend analysis indicated no significant increasing or decreasing trends over baseline sound levels. Regarding rail transport activities, noise from train passages through the monitoring regions dominated the noise climate, although there had not been an increase of rail passages over 2019 observations.

### **3.2.5.2 Site-Specific Risks and Mitigations**

Air contaminant emissions are expected to be negligible, or minimal during all project phases. Expected emissions during the construction phase will be transient in nature. During construction, the major sources of atmospheric emissions are expected to be exhausts from the onsite mobile equipment and fugitive dust. The key contaminants from mobile equipment combustion will be sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), hydrocarbons (HC), and particulate matter (PM). The construction phase is planned to extend for 12 hours/day, 6 days/week for up to seven years. The presented emissions estimates are for one construction year for the onsite mobile equipment and diesel fuel is assumed to be used in the mobile equipment. Details regarding the estimate are included in Appendix E but the total compounds in air due to construction were estimated to be: 64.8 kg of SO<sub>2</sub>; 51,129 kg of NO<sub>x</sub>; 33,436 kg of CO; 8,617.4 kg of HC, and 4,752.7 kg of PM.

During operation, the main source of air emissions will be the combustion of diesel fuel in the locomotives. These emissions are expected to be predominately SO<sub>2</sub>, NO<sub>x</sub>, CO, HC, and PM from the locomotive exhaust. A total of eighteen GP-38 locomotives are estimated to be in use. The preliminary expected emissions during the operation were estimated to be: 20 tonnes/year of SO<sub>2</sub>; 20 tonnes/year of NO<sub>x</sub>; 20 tonnes/year of CO; 0.5 tonnes/year of PM<sub>10</sub>; and 0.3 tonnes/year of PM<sub>2.5</sub>.

Additional sources of emissions during the operations include fugitive emissions from the loaded rail cars, fugitive emissions from fuel storage, and fugitive dust resulting from the traffic on unpaved internal roads. These emission sources are expected to be negligible compared to the locomotives operation and will be transient in nature.

During the construction phase, noise will result from vehicles and equipment conducting activities including earthworks, material deliveries, and rail installation. Construction noise will be transient in nature. The primary noise sources during operation will be train shunting, coupling of rail cars, and the operation of locomotives. These activities will continue daily. The project will result in increased noise levels in the vicinity of the site; however, the increased noise during either construction or operation is not expected to contribute significantly to increasing trends at a regional level.

Noise receptors are expected to be occupied residences within a 5 km radius. It is not expected that increased noise levels will adversely affect receptors as the overall increase in noise levels over background is expected to be minor.

Table 3-7: Air Risks and Mitigations	
Risk	Mitigation
<b>Fugitive Dust</b>	<ul style="list-style-type: none"> <li>• Limit the area of disturbance by earthworks as much as practically possible.</li> <li>• Implement reduced vehicle speed limits or other speed control measures on the site.</li> <li>• Suppress dust as necessary using water trucks.</li> <li>• Conduct visual monitoring of dust to determine when suppression is needed.</li> </ul>
<b>Air Emissions</b>	<ul style="list-style-type: none"> <li>• Avoiding unnecessary vehicle and equipment idling.</li> <li>• Implement a regular maintenance program of vehicles, locomotives, and equipment to reduce combustion emissions and maximize fuel efficiency.</li> </ul>
<b>Potentially Disturbing Noise</b>	<ul style="list-style-type: none"> <li>• Notify nearby residents (landowners and lessees) of the intended project schedule before the start of construction to prevent or reduce the impact on their operations or activities.</li> <li>• Maintain equipment, machinery and locomotives in good working order, including noise abatement equipment.</li> <li>• Schedule operations to occur during daytime hours, whenever practical.</li> <li>• Reduce the number of switchers used at nighttime if nighttime operations are unavoidable.</li> <li>• Reduce the amount of time that switchers are left idling at the yard.</li> </ul>

### 3.3 Health, Social, and Economic Context

*A brief description of the health, social and economic context in the region where the project is located, based on information that is available to the public or derived from any engagement undertaken.*

#### 3.3.1 Health Context

Based on a profile report completed by Alberta Health in 2022 there were 6,102 people located in Sturgeon County East, the portion of Sturgeon County which includes the project area. This portion of Sturgeon County reportedly had a population increase of 35.9% between 2001 and 2022. There was 42.0% of the population within the region between the ages of 35-64 years old, individuals 17 and under were 22.8% of the population, and individuals 65 years and older were 13.8% (Alberta Health, 2022).

Important health indicators were also listed in the report. The percentage of obese individuals and those with mental health issues were like the provincial averages. Approximately 1.2% of the population identified as First Nation. The percentage of single parent households and low-income households were lower than provincial averages as were the general and teen birth rates. The childhood immunization rates were higher than the provincial average (Alberta Health, 2022).

The most common disease in Sturgeon County was hypertension at a rate of 23.6 per 100 people which was marginally higher than the provincial average of 20.6. The next most common chronic illnesses were diabetes, ischemic heart disease, and chronic obstructive pulmonary disease. The mortality rate per 100,000 people over the three-year period of 2019 to 2021 was 759.8 which was slightly higher than that of the province which was 700.3. The three main causes of death were neoplasms (cancer), circulatory system issues, and external causes (injury). All three of these causes of death had three year averages higher than that of the province (Alberta Health, 2022).

Semi-urgent and non-urgent emergency room visits accounted for 35.7% of all visits in 2020/2021. The most common reason for emergency room visits was upper respiratory infections. The rate of upper respiratory infections was like that of the province. The top three reasons for inpatient care was ischemic heart disease, diabetes, and mental/behavioural disorders due to psychoactive substance use. It was noted in the report that 100% of ambulance visits resulted in the patient receiving care outside of the geographical area. In addition, 73.2% of residents had a primary care physician outside of their geographical range; the provincial average was 53.2% (Alberta Health, 2022).

The project is not anticipated to contribute any impacts to human health. Cando is committed to ensuring the health and safety of all individuals who work on the project. All staff and workers receive training to complete their assigned duties and are mandated to follow Cando's health and safety protocols. The rail industry is heavily regulated and part of gaining the Operating Permit under the *Railway (Alberta) Act* includes the submission of General Operating Instructions, an Emergency Response Plan, and a Safety Management System (completed to Transport Canada standard). All of these documents provide detailed, site-specific, and comprehensive information regarding the safe procedures and emergency protocols. Safety is paramount to Cando and is a top priority - Cando is committed to operating safely and with minimum impact on communities and the environment. Cando works closely within the community and is working with all regulatory agencies to ensure compliance. Cando has an award-winning safety program and in 2023 won a Railway Association of Canada Safety and Environment Award for their Good Catch Campaign (Cando Rail & Terminals, 2021). The Good Catch Campaign is an employee driven program that recognizes and rewards exceptional safety hazard identification and action. This process is designed for field staff to proactively identify safety hazards and risks encountered.

### 3.3.2 Social Context

The population of Sturgeon County in 2021 was 20,061 people. This was a 2.1% decrease between 2016 and 2021. The population distribution is as such: 19.2% 14 years and younger, 65.2% 15 years old to 64 years old, 15.6% 65 years and older, and 1.3% 85 years and older (Statistics Canada, 2023). The median age of the population is 41.2 (Statistics Canada, 2023). Sturgeon County represents an area of 2,146.8 km<sup>2</sup> and has 0.46% of Alberta's population (Government of Alberta, 2023d).

There is a total of 7,021 private residences that are occupied with the vast majority at 6,295 being single detached homes. On average there are 2.8 people per household and a population density of 9.6 people per km<sup>2</sup>. Of the population over 15 years old, a total of 16,200 people, 10,945 are married or are living common-law. There are reportedly 5,870 families in private households with the following demographics: 4,700 of those are married households with 2,495 of those having children; 695 are common-law with 305

having children; and 475 are single parent households with 270 being single mothers and 205 single fathers. A total of 330 households were intergenerational (Statistics Canada, 2023).

The majority of the population at 17,725 people state that English is their mother tongue, 675 identified French as their mother tongue, and 10 people identify an Indigenous language as their mother tongue. The majority of people speak English in the home at 18,490, 150 speak French, and no households identified Indigenous languages as the household language. The most common household languages, other than French and English were Polish and Portuguese with both listed as having 25 people speaking the language (Statistics Canada, 2023).

There were 1,640 people who identified as Indigenous. There were 415 that identified as First Nation, 1,085 identified as Métis, 80 who identified as Inuit, and the remainder either had multiple or no identifications. There were 350 responses from Registered or Treaty Indians. The Alexander First Nation Reserve is located within Sturgeon County. The reserve is located on the western boundary of the county. The majority of the population of Sturgeon County, at 19,245 people, are Canadian citizens. Approximately, 14,895 are third generation (or greater) Canadian citizens. There have been 70 people who have immigrated to the area between 2016 and 2021. A total of 800 people in Sturgeon County identified as a visible minority in 2021 (Statistics Canada, 2023). In 2021, 3.83% of the population identified as a visible minority and 8.4% of this group identified as aboriginal (Government of Alberta, 2023d).

Of the population 25 to 64 years old which was reportedly 10,450 people, 9,380 have their high school diploma or equivalent, 6,795 have postsecondary education, and 1,915 have a Bachelor's degree or higher (Statistics Canada, 2023).

Sturgeon County has five towns within its boundaries: Bon Accord, Gibbons, Legal, Morinville, and Redwater. The county has an active recreation and parks department including community events, trail maps, golfing, ice skating, and ski trails. The county also offers a variety of adult, child, and youth programs. There are also family and community support services such as counselling, grants, and scholarship programs. The county is involved in other community initiatives including truth and reconciliation through active engagement, partnering with four local food banks, and industrial and economic growth initiatives. They are also involved in several environmental initiatives such as tree establishment, vegetation management, wetland replacement, and a clean energy improvement program (Sturgeon County, 2023).

As a company with rural roots, Cando is committed to fostering and maintaining strong relationships in the community and helping to build a sustainable future. Some of Cando's initiatives include monitoring and working towards lowering emissions, charitable donations, long-term community partnerships, sponsorships, and a national scholarship program. Cando has four core values that they stand by in every community they work; these are environmental stewardship, indigenous relations, workforce/people, and community giving. Through genuine engagement, Cando becomes a community partner in all the areas in which they work (Cando Rail & Terminals, 2021).

### 3.3.3 Economic Context

In 2020, 15,070 people in Sturgeon County over the age of 15, earned an income and 5,800 individuals worked full-time. The median income of full-time workers was \$77,000/year and the average income was \$91,200. The median income of part time workers was \$22,000 and the average income was \$38,800. In 2020, the median household income was \$124,000 and \$105,000 after taxes. The median income for single person households was \$56,400 and \$48,800 after taxes and the average incomes was \$68,400 and \$56,500 after taxes. The median income of households with two-or-more people was \$139,000 and \$117,000 after taxes. The average household income was \$151,400 and \$120,900 after taxes. The average income for two or more people households was \$166,400 and \$132,600 after taxes (Statistics Canada, 2023). The median income for lone parent households was \$92,000 (Government of Alberta, 2023d).

The top five employment sectors, in order from the most employed to the least were: construction; public administration; health care and social assistance; retail trading; and agriculture, forestry, fishing, and hunting. There were 20 different employment sectors listed for the people of Sturgeon County (Statistics Canada, 2023).

In 2022, Sturgeon County produced 34.9 million cubic meters of natural gas and 141,548 m<sup>3</sup> of oil. There was approximately \$744.6 million spent on major projects and 302 building permits were issued. The working population of Sturgeon County had a participation rate of 68% in 2021. This had declined by 4.76% from 2016 when the participation rate was 71.4%. In 2021, the unemployment rate was reportedly 8% which represented an 11.1% increase since 2016 when the unemployment rate was 7.2%. The employment rate was 62% which had declined by 6.49% since 2016 when it was 66.3% (Government of Alberta, 2023d).

It is estimated that the project will generate an additional 40 full-time jobs. There would also be the necessity of part-time skilled labour throughout the construction phase of the project which is scheduled to take more than six years to full-build out. Additional financial benefits include an approximate \$140 million dollar spend and an increased task assessment to all levels of government. The project is also ideally suited to Sturgeon County's goal of investment in the transportation and logistics sector. According to their website:

“Sturgeon County is a large municipality that covers 2,100 square kilometers, serviced by 14 highways and six industrial areas. Owing to its large size, proximity, and connectivity to both the Edmonton Metro Region and Alberta's Industrial Heartland, Sturgeon County boasts modern infrastructure and a large transportation and logistics sector.”

The website also states that the county has multiple rail-ready sites available for development with properties that enable a direct connection to critical rail transportation and logistics infrastructure (Sturgeon County, 2023). The project would provide an overall economic benefit to the area through the capital spend and the creation of both part-time and full-time jobs. Sturgeon County has publicly expressed interest in the development of rail transportation projects and there has been an overall increase in the unemployment rate in the county over the last five years. With all these factors in mind, the project is ideally suited to continue within Sturgeon County.

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## 4.0 Federal, Provincial, Territorial, Indigenous and Municipal Involvement and Effects

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### 4.1 Federal Financial Support

*A description of any financial support that federal authorities are, or may be, providing to the project.*

The project is not receiving any federal funding as Cando is the sole financier of the project.

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### 4.2 Federal Project Lands

*A list of any federal lands that may be used for the purpose of carrying out the project.*

There are no federal lands within the footprint of the project or adjacent to the project's boundaries.

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### 4.3 Jurisdictions with Powers, Duties, or Functions

*A list of any jurisdictions that have powers, duties, or functions in relation to an assessment of the project's environmental effects. This may include permits, licenses, or other authorizations that may be required by federal authorities or other jurisdictions. A list of any changes to the environment or to health, social or economic conditions that may occur in Canada that are directly linked or necessarily incidental to the involvement of a federal authority that would permit or enable the project to be carried out in whole or in part.*

Aside from the IAAC, there are permits/approvals that will be required through the provincial and municipal governments. No other approvals will be sought from other federal agencies in pursuit of the project.

The other agencies requiring approval would be:

- Alberta Environment and Protected Areas through the *Water Act*.
- Alberta Transportation and Economic Corridors through the *Railway (Alberta) Act*.
- Alberta Ministry of Arts, Culture and Status of Women through the *Historical Resources Act*.
- Sturgeon County through the Planning and Development Department.
- Alberta's Safety Codes Council.

Alberta Environment and Protected Areas will regulate the removal and compensation for the wetlands located within the footprint of the expansion rail terminal and bypass. They will also be the authority for the approval of the SWMP. The existing rail terminal received a *Water Act* approval from the province for the removal, and subsequent compensation, of the wetlands and the implementation of the existing stormwater management facility.

Alberta Transportation and Economic Corridors will approve the expansion rail terminal for operation. If, in the future, the transloading of dangerous goods is to be added to the services of the facility it would also

require approval through ATEC. The bypass road will also require a submission to ATEC by the county. The existing rail terminal has received all applicable documentation through ATEC to operate.

Alberta Ministry of Arts, Culture and Status of Women would be the authority for historical resources. An application for a Historical Resources Act approval has been sent but no reply has yet to be received. The existing rail terminal received approval to proceed without a historical impact assessment. Cando will conform to any requirements issued by the province based on their review of the current Historical Resources Act Approval submitted as part of the expansion rail terminal project.

Sturgeon County would be the authority for the operation of the bypass roadway, as it would ultimately be a county owned and operated road. The project will also require a development permit through the county. Based on discussions with AEPA the county would also be the authority for the management and conservation of topsoil. Cando continues to work closely with the county throughout the planning phase of the project.

The Alberta Safety Codes Council manages the permitting and inspection of storage tanks within unaccredited areas of Alberta. The portion of Sturgeon County which includes the project is in an unaccredited area which means that any storage tanks containing flammable or combustible liquids would be permitted and licensed through Alberta Safety Codes Council.

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## 5.0 Potential Effects of the Project

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### 5.1 Relevant Environmental Legislation

*A list of any changes that, as a result of the carrying out of the project, may be caused to the following components of the environment that are within the legislative authority of Parliament:*

- a. fish and fish habitat as defined in subsection 2(1) of the Fisheries Act;*
- b. aquatic species, as defined in subsection 2(1) of the Species at Risk Act (marine plants); and*
- c. migratory birds, as defined in subsection 2(1) of the Migratory Birds Convention Act, 1994.*

#### 5.1.1 Fish and Fish Habitat

There are no waterbodies within the project footprint that support fish or fish habitat. No activities associated with the project will take place in areas that support fish, fish habitat, or marine plants. There is the potential that fish habitat downgradient to the project could be affected. Two known fish-bearing watercourses are located within 2 km of the project footprint (Alberta Environment and Protected Areas 2023b). The Sturgeon River, located approximately 1 km southwest of the project footprint, flows southeast approximately 3 km to its confluence with the North Saskatchewan River, which then flows northeast. The North Saskatchewan River is located approximately 1.7 km southeast of the project footprint. The Sturgeon River is a large permanent Class C watercourse with a Restricted Activity Period (RAP) from April 16 to June 30, and the North Saskatchewan River is a large permanent Class C watercourse with a RAP from April 16 to July 31 (Alberta Environment and Sustainable Resource Development, 2012). One potential watercourse was indicated by FWMIS (Waterbody ID 41751) which is located outside of the project

footprint but within proximity to the south. However, no evidence of this watercourse was observed within 100 m of the project footprint during the field assessments.

Cando will mitigate potential effects to downgradient receptors through the engineered management of surface water runoff. The SWMP is designed so that all surface water generated within the footprint of the existing and expansion rail terminals will be retained on the property. The main water quality criteria thought to currently be affecting the surface water is sedimentation; however, this may change if additional services are to be provided on-site. The retention of the water on the property will allow for sediments to settle prior to discharge. Other criteria required for the discharge of surface water will be documented in a yet to be completed stormwater management guidance document. Once the quality criteria are met the surface waters will be released to Sturgeon County's drainage system which discharges into the North Saskatchewan River. The quality criteria is currently thought to include pH, electrical conductivity, turbidity, and oil and grease; this is based on the precedence set by *Water Act* approvals received by other industries within Alberta's Industrial Heartland. Based on conversations with AEPA, there are no current provincial regulations regarding the quality of the water to be discharged from the project property. The current stormwater management criteria is based on AEPA's recommendations and may change as the project progresses.

Other water sources required for the general operation of the expansion rail terminal including washroom facilities. The water for washrooms will be trucked to and stored on-site. Any wastewater generated will be kept in tanks or containers designed for this specific purpose. The wastewater will be removed from the property by a qualified third-party contractor.

Based on Cando's current operating procedure for the existing rail terminal and the mitigations measures to be put in place for the expansion rail terminal there are no known risks to fish or fish habitat as defined in the *Fisheries Act*.

### **5.1.2 Species at Risk Act: Aquatic Species/Marine Plants**

The *Species at Risk Act* prohibit the killing, harming, harassing, or capturing of species listed within the Act. Due to the nature of the property and the surrounding areas as primarily industrial and agricultural land use it is not expected that species at risk would be present within the project footprint. Cando will comply with the prohibitions in the *Species at Risk Act* throughout all stages of the project. There were no federally listed species at risk identified during the field verification portion of the biophysical assessment nor during the desktop assessment. No listed species are thought to be present within the footprint of the project.

### **5.1.3 Migratory Birds**

The *Migratory Birds Act* prohibits the harming of migratory birds or the disturbance/destruction of their nests and eggs. Many bird species were noted to be located within the project footprint during the desktop review and the field verification. The general breeding bird window is beginning of April to end of August. There are treed areas within the footprint of the project which could potentially be used as habitat for breeding birds as well as tall plants within the cultivated sections. No active nests/cavities were noted during the field verification; however, there was an unoccupied stick nest and habitat suitable for raptor nests and pileated woodpeckers. Given the proximity of the existing rail terminal which is an industrial

facility it is anticipated that wildlife would prefer the landscape of the nearby Sturgeon River and North Saskatchewan River in comparison to the project area.

Due to the potential for migratory birds to be present within the project footprint mitigation measures must be considered. A wildlife sweep will be conducted by a qualified biologist prior to the commencement of construction activities. Trees within the footprint of the project will be cleared outside of the breeding bird window and grasses will be mowed to prevent ground nesting birds. Additional mitigation measures can be implemented if there is the presence of migratory birds noted at the time of construction. These include adjusting the construction schedule by postponing activities near occupied nests, implementing a barrier between the occupied nest and the activity, moving equipment daily, relocating nests or wildlife, and monitoring the nest to determine if the inhabitant is showing signs of stress. With the primary mitigation measures in place, it is unlikely that an issue to migratory birds would occur during construction/operation but if an occupied nest is observed and there is any potential to harm migratory birds additional mitigations will be put in place.

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## 5.2 Changes to Federal Lands

*A list of any changes to the environment that, as a result of carrying out the project, may occur:*

- *On federal lands.*
- *In a province other than the province in which the project is proposed to be carried out.*
- *Outside of Canada.*

No changes to federal lands are anticipated as part of this project, nor will the footprint of the project cross provincial or international boundaries. The footprint of the project and the lands within proximity are wholly located within the Province of Alberta and Alberta's Industrial Heartland. Due to the direction and distance to the nearest federal lands, provincial borders, and international borders it is not anticipated that the project would create any changes to lands outside of the project footprint and the lands within proximity.

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## 5.3 Impact to Indigenous Peoples

*With respect to the Indigenous peoples of Canada, a brief description of the impact — that, as a result of the carrying out of the project, may occur in Canada and result from any change to the environment — on:*

- *Physical and cultural heritage.*
- *The current use of lands and resources for traditional purposes.*
- *Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, based on information that is available to the public or derived from any engagement undertaken with Indigenous peoples of Canada.*

*A brief description of any change that, as a result of the carrying out of the project, may occur in Canada to the health, social or economic conditions of Indigenous peoples of Canada, based on information that is available to the public or derived from any engagement undertaken with Indigenous peoples of Canada.*

Cando is a company dedicated to building strong relationship within the communities that they work in and service. This includes long-term collaborations and continuous engagement. They have taken a hands-on approach to the engagement process with all Indigenous groups by issuing information packages as

described in Section 1.4 of this document. All communications received from Indigenous groups throughout the process have been responded to directly by Cando. This has included phone calls, emails, and in-person meetings. Cando believes the importance of understanding unique perspectives and will continue to work closely with all project stakeholders.

Potential effects to the physical and cultural heritage or the socio-economic health of the Indigenous peoples of Canada may continue to be revealed throughout the project engagement process. If any potential effects are brought forth, Cando will work with the party to help mitigate any issues. Given the responses receive to date following the initial engagement process there are not anticipated to be any effects to the physical heritage, cultural heritage, or traditional land uses for Indigenous people.

The area in which the project is located is all zoned for industrial purposes and is designed to be a consolidated location for industrial purposes. The land has been cultivated agricultural and privately owned for more than 70 years. The project footprint also contains a rural residential property. Given the zoning, current land use, and historical land use the potential for traditional land use is low as it would not be used for hunting, fishing, plant gathering, or spiritual use. There is no identified pathway for which the project would affect Indigenous peoples physical or cultural heritage.

There are no listings of historical resources within the footprint of the project. The closest historical resource listings are to the north of the project and to the south along the North Saskatchewan and Sturgeon Rivers, and those listings are primarily 5a and 5p which indicate areas with a high potential for an archaeological or palaeontological finding (Alberta Culture, 2023). A *Historical Resource Act* application has been submitted to the province of Alberta, and while a response has yet to be received, Cando will follow the directions and conditions included in the response. While preparing for the application the archaeologist reviewing the information made note of the potential for historical buildings within the footprint of the project. The *Historical Resource Act* application submitted as part of the existing rail terminal project was approved with the stipulation that a chance discovery be reported. In addition, Cando will follow the proper protocol if there is a chance encounter of an item of historical, archaeological, cultural, geological, natural, or palaeontological significance. This would include stopping work and reporting the find to an archaeologist.

Given the location of the project and the mitigations planned for the construction and operation there are thought to be no negative health effects. The site will be primarily used as a storage yard for rail cars. Some additional site uses may be performed including the maintenance of locomotives and refueling. These activities will be performed in specific locations with the use of containment materials, as necessary. If a spill or release is to occur, Cando will implement a spill response plan that conforms to the provincial regulations. The extents of any negative health or environmental effects due to the project will be localized and would be unlikely to affect Indigenous communities.

The project is not expected to increase travel or use to lands that are currently used for traditional land use purposes nor is it thought to cause disturbance to lands that are currently used for traditional purposes. The construction and operation activities will be limited to the project footprint and established roadways within the Industrial Heartland. The labour force to complete the construction of the project is likely to be

sourced locally and should not result in a significant increase in a transient population. Based on all the information available there are thought to be low social impacts to Indigenous people.

The economic impacts to the area include a capital investment into the construction and building of the expansion rail terminal. There will also be an increase in the workforce during the construction phase of the project and the creation of up to 40 full-time jobs for operation. There is the potential for Indigenous economic benefits through the procurement of vendor services, primarily used during the construction phase. There has been some interest from Indigenous groups engaged with to have the opportunity to bid on or provide vendor services. Cando will work with qualified Indigenous peoples with skills and services required for the project during the procurement process.

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## 5.4 Greenhouse Gas Estimate

*An estimate of any greenhouse gas (GHG) emissions associated with the project. This should be calculated as the net GHG emissions associated with the project and estimated based on the information available to proponents at this stage.*

Section 5.4 and subsections include a summary of the GHG estimate completed by Clifton. Further information regarding the GHG estimate and methodology can be found in Appendix E. In general, the equation used to calculate the carbon dioxide equivalent is as follows:

$$\text{CO}_{2e} \text{ (tonnes/year)} = \text{AF} * \text{EF} * \text{GWP} * \text{CF}$$

Where:

- CO<sub>2e</sub> (tonnes/year) – estimated GHG emissions expressed as CO<sub>2e</sub> equivalent in metric tonnes per year.
- AF – Activity Factor.
- EF – Emission Factor.
- GWP – Global Warming Potential for an evaluated GHG gas.
- CF – Units Conversion Factor.

Applied GWP conversion factors are based on the IPCC 5<sup>th</sup> Protocol are 1 for CO<sub>2e</sub>, 28 for CH<sub>4</sub>, and 265 for N<sub>2</sub>O.

### 5.4.1 Construction Phase

Identified significant sources (i.e., more than 1 % of the overall GHG emissions) for the construction phase of the proposed project (excluding any GHG emissions from the existing terminal operation) can be summarized as follows:

- **Direct GHG Emissions:**
  - o Mobile Combustion:
    - Mobile Diesel Combustion.
  - o Land Use Change:
    - Biomass Oxidation.

- **Indirect GHG Emissions:**

- o Construction Personnel Travel by Road.

#### **5.4.1.1 Mobile Combustion – Diesel**

The estimated GHG emissions contribution during the construction phase of the project, as a result of the diesel mobile combustion, were calculated by Clifton. The information required for the calculation including the equipment type, number of units, and usage was estimated based on information provided by Cando and their affiliated contractors/consultants. Other information required for the calculation including EF and equipment horsepower were obtained from public information sources.

Based on all the information available, and as outlined in Appendix E, the total GHG emissions in carbon dioxide equivalents for one year of construction was estimated to be 6,743.7 tonnes CO<sub>2e</sub>/year.

#### **5.4.1.2 Land Use Change – Biomass Oxidation**

Estimated GHG emissions contribution to the overall project's GHG emission profile as a result of the Land Use Change (LUC) contains two types of the carbon-related impacts:

- Emissions caused by the removal and oxidation of biomass during construction.
- The carbon not trapped by native vegetation that would have remained at the site should the project not have been constructed referred to as the lost carbon sequestration potential.

Calculations assumed a permanent removal of approximately 25 hectares (ha) of the forest and 7.505 ha of the wetlands in the expansion area of the project during the construction phase. Estimated LUC-related GHG emissions for the construction phase of the project were estimated to be 8,460.64 tonnes CO<sub>2e</sub>.

#### **5.4.1.3 Construction Personnel Travel by Road**

Estimated GHG emissions released during the construction phase of the project as a result of the construction personnel travel between the site and Fort Saskatchewan were quantified. The EF for gasoline was obtained from a public source and the AF was calculated using the estimated average construction personnel count based on the information provided by Cando and their affiliated contractors/consultants. It was estimated that 35 people would travel to site, assuming a schedule of 6 days a week for construction and a travel distance of Fort Saskatchewan to the site (about 30 km round trip). For estimate purposes the assumption considered gasoline fuel consumption for a light pickup truck, 2015 or newer. This resulted in a total estimate of 109.29 tonnes CO<sub>2e</sub>/year.

#### **5.4.1.4 Estimated Net Total GHG Emissions – Construction Phase**

Estimated net total GHG emissions for the construction phase are as follows:

Table 5-1: Estimated Net Total GHG Emissions – Construction Phase of the Project		
Construction Year	Estimated GHG Emissions CO <sub>2e</sub> (tonnes)	
	Mobile Diesel Combustion	Biomass Oxidation
Y-6	6743.7	
Y-5	6743.7	
Y-4	6743.7	8,460.64
Y-3	6743.7	
Y-2	6743.7	
Y-1	6743.7	
<b>Subtotal</b>	40462.2	8460.64
<b>Estimated Net Total GHG Emissions</b>		<b>48,922.84</b>

**5.4.2 GHG Emission Sources – Operation Phase**

Identified significant GHG emission sources for the operation phase of the proposed project (including GHG emissions from the existing terminal operation) can be summarized as follows:

- **Direct GHG Emissions:**
  - o Static Combustion:
    - Propane Combustion.
  - o Mobile Combustion:
    - Mobile Diesel Combustion – Locomotives.
    - Mobile Diesel Combustion – Auxiliary Vehicles and Equipment.
- **Indirect GHG Emissions (Formerly Scope 2 GHG Emissions):**
  - o Acquired Energy GHG Emissions.
- **Indirect GHG Emissions:**
  - o Employees Travel by Road.

**5.4.2.1 Static Combustion – Propane Combustion**

Propane is the primary heating source for the project and its combustion would be a contributing factor to the project’s GHG profile. The EF for propane was determined from publicly available sources. The proposed expansion does not require new propane-burning emission sources, and therefore, the AF is

based on the average propane usage at the existing terminal. Estimated GHG emissions for this category is 11.24 CO<sub>2e</sub> tonnes/year.

**5.4.2.2 Mobile Combustion – Diesel Combustion, Locomotives**

The EF for the combustion of diesel fuel due to the locomotives operating on site was collected from a publicly available source and the AF was estimated based on the information provided by Cando. The GHG emissions calculated for this category were 4,068 CO<sub>2e</sub> tonnes/year.

**5.4.2.3 Mobile Combustion – Diesel Combustion, Auxiliary Vehicles and Equipment**

This category covers the estimated GHG emissions due to the use of diesel fuel by auxiliary vehicles and equipment. The AFs were calculated using the estimated requirements for the on-site equipment. The equipment and usage were based on the information provided by Cando. Other information was collected from public sources. The estimated GHG emission for the usage of equipment/vehicles on-site was 3,721.2 CO<sub>2e</sub> tonnes/year.

**5.4.2.4 Acquired Energy GHG Emissions**

The AF for the energy imports to the site from the public electric grid were estimated using assumed requirements based on information provided by Cando. Other information was collected from publicly available sources. The estimated GHG emissions for this category are 164.91 CO<sub>2e</sub> tonnes/year.

**5.4.2.5 Employees Travel by Road**

The AF was calculated using the estimated average railyard terminal personnel count based on the information provided by Cando (90), assuming 3 rotating shifts, 7 days a week operations schedule and a road distance between the site and Fort Saskatchewan (about 30 km round trip). An average gasoline fuel consumption for the light pickup truck road travel, 2015 or newer, was estimated using the data from public sources. This resulted in an estimate GHG emissions of 318.76 CO<sub>2e</sub> tonnes/year.

**5.4.2.6 Estimated Net Total GHG Emissions – Operation Phase**

Estimated net total GHG emissions for an average operation year of the proposed project is summarized as follows:

<b>Table 5-2: Estimated Net Total GHG Emissions – Operation Phase of the Project</b>				
<b>Estimated GHG Emissions CO<sub>2e</sub> (tonnes/year)</b>				<b>Estimated Net Operation GHG Emissions CO<sub>2e</sub> (tonnes/year)</b>
<b>Static Combustion</b>	<b>Mobile Combustion Diesel- Locomotives</b>	<b>Mobile Combustion Diesel Vehicles</b>	<b>Acquired Energy</b>	
11.24	4068	3721	164.91	7965

**5.4.2.7 Estimated Carbon Intensity of the Project**

Estimated carbon intensity of the project per a year of the operation phase is presented as a ratio between the calculated net GHG emissions and railcars spots after the terminal expansion is as follows:

<b>Table 5-3: Estimate Carbon Intensity</b>		
<b>Estimated Net Operation GHG Emissions CO<sub>2e</sub> (tonnes/year)</b>	<b>Projected Capacity (railcars spots)</b>	<b>Estimated Carbon Intensity (t CO<sub>2e</sub>/railcars spots per a year)</b>
7965	5000	1.59

**5.5 Additional Considerations**

**5.5.1 Carbon Sinks Impact**

Carbon sinks impacts related to the LUC/vegetation removal as a part of the project were quantified using the methodology described in Section 5.4.1.2. Estimated GHG emissions resulting from a loss of carbon sequestration were estimated to be 342.7 CO<sub>2e</sub> tonnes/year.

**5.5.2 Carbon Sinks Mitigation Measures**

Based on the current project design and footprint options, a total area of approximately 7.505 ha of wetlands will be removed during the project development. In accordance with the Alberta Wetland Policy, Cando will submit an application to AEPA for a Water Act approval. As part of the approval process Cando will provide compensation for loss of wetlands which will go into the wetland replacement program.

Wetlands will not be disturbed and vegetation clearing in the vicinity of the wetland will not be conducted until Water Act approval for wetland removal has been received. Mitigation will include the applicable compensation for the affected wetlands. The effect of the proposed wetland mitigations is estimated to be as follows:

**Table 5-4: Carbon Sinks Mitigation Measures Summary**

Area Classified As	Estimated Removal/Restoration Area (ha)	CO <sub>2e</sub> (tonnes/year)
Forest	25	319.5
Wetlands	7.505	23.2
<b>Estimated GHG Emissions Total (Before Mitigation)</b>		<b>342.7</b>
Wetlands	18.617	- 57.5
<b>Estimated GHG Emissions Total (After Mitigation)</b>		<b>285.2</b>

**5.5.3 Estimation of Uncertainty**

Qualitative estimation of the impact of uncertainties on the accuracy of the presented GHG assessment is presented below:

**Table 5-5: Uncertainty Ranking**

<b>Propane Combustion</b>	Low Uncertainty – Propane consumption is based on the quantity of fuel purchased. Minimal loss is expected from storage or leakages. Propane emission factors are consistent and accurate.
<b>Diesel Combustion</b>	Medium Uncertainty – Diesel consumption is based on the utilization rates estimated by Cando and power rating. Minimal loss is expected from storage or leakages. Diesel emission factors are consistent and accurate.
<b>Acquired Energy</b>	Low Uncertainty – Electricity consumption is based on the metered electricity data purchased that is calibrated. The emission factor is based on an annual provincial grid average that includes all the province’s controllable fuel sources.
<b>Road Travel</b>	High Uncertainty – Annual road transport is an estimate based on available information regarding future staffing levels. Gasoline emission factors are consistent and accurate.

#### 5.5.4 Net-Zero Plan

The presented net-zero plan is based on the Best Applicable Technology/Best Environmental Practices (BAT/BEP) as outlined in the Delphi Group: *Towards Net Zero: Developing a Rail Decarbonization Roadmap for Canada*, December 2022, document. The proposed decarbonization path applicable to the project consists of the following implementation steps:

##### 5.5.4.1 Efficiency Improvements

Efficiency improvements to existing and new equipment and infrastructure have been the focus of railway decarbonization efforts to date and will continue to be prioritized. All efficiency improvements will serve to reduce the decarbonization burden placed on fuels and propulsion technologies.

**Description:** There are numerous ways to continue to enhance rail efficiency including further enhancing aerodynamics of locomotives and rail cars, automation, and data-driven solutions, among others.

**Carbon Reduction Potential:** less than 7 %

**Implementation Timeframe:** Available immediately

##### 5.5.4.2 Low-Carbon Fuels

Through low-carbon/renewable fuel regulations, federal and provincial governments have already mandated minimum blending requirements of up to 5% renewable content in diesel, and these will continue to increase. Efficiency improvements may be supplemented by the blending of renewable and low-carbon fuels beyond what is regulated.

**Description:** Biodiesel is a renewable fuel that can be manufactured from vegetable oils, animal fats, or recycled cooking oil for use in diesel vehicles or any equipment that operates on diesel fuel. Biodiesel's physical properties are like those of petroleum diesel, with some notable exceptions including inferior cold weather properties and reduced energy content.

**Carbon Reduction Potential:** up to 16 %

**Implementation Timeframe:** Estimated around 2030

##### 5.5.4.3 Alternative Propulsion

As railways seek to move past the limits of what low-carbon fuels and combustion engines can offer, electrification via battery, or hydrogen fuel cells are likely to prevail in the long-term. Cando, in cooperation with Emissions Reduction Alberta, is a leading participant in the lithium-ion battery-powered locomotive initiative.

**Description:** Battery powered trains are electric multiple units and locomotives which carry batteries in order to provide traction power for in-service use. The traction system of a battery powered train is based on that of an electric train but with the addition of on-board battery storage and supporting power converters and temperature management for the battery, if required.

**Carbon Reduction Potential:** up to 100 %

**Implementation Timeframe:** Estimated around 2035 (provided further technology development and successful testing).

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## 5.6 Types of Waste and Emissions

*A list of the types of waste and emissions that are likely to be generated — in the air, in or on water and in or on land — during any phase of the project.*

### 5.6.1 Air

The emissions to air include dust, emissions generated by equipment during the construction phase, and emissions generated by operations. In addition, the equipment operating will generate localized noise.

As discussed in detail in previous sections, and outlined in Appendix E, the GHG emissions, fugitive emissions, and noise generation due to the project are thought to be minimal in comparison to the background conditions within Alberta's Industrial Heartland. The fugitive emissions generated are thought to be primarily sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), hydrocarbons (HC), and particulate matter (PM) due to exhaust. Cando will still implement general mitigation measures including dust suppression, speed limits, vehicle/equipment maintenance programs, and avoiding idling whenever practicable.

Cando, in conjunction with the Government of Alberta, is currently developing a lithium-ion battery powered switching locomotive. This program will provide long-term GHG reductions. Cando's innovative solution to retrofit locomotives with a battery propulsion system will provide a scalable solution that is customized to their switching operations. Once the retrofit is complete Cando plans on evaluating the locomotive's performance at the Fort Saskatchewan rail terminal. The lithium-ion battery powered locomotives, which will be zero emission units, will have the potential to perform all the work required of diesel-powered locomotives currently used in switching operations. Overall, the program will result in fuel savings and GHG emissions reductions (Cando Rial & Terminals, 2023).

### 5.6.2 Water

There will be limited liquid waste generated as part of the project. The waste would include the generation of stormwater, liquid domestic waste, and waste oils.

The stormwaters created within the footprint of the project are to be stored on-site within the stormwater management facility. The storage of the stormwater will allow for the settlement of suspended solids. Given that the current purpose of the existing and expansion rail terminals is primarily for rail car storage there is thought to be little generation of dangerous goods or risk of contamination to the surface waters. The primary risk to surface waters is sediment and the resultant suspended solids load. The stormwater retained in the SWMP will be tested for turbidity to ensure that it meets the environmental quality guidelines prior to its release to the Sturgeon County's drainage system. If it is suspected that the water has come into contact with a deleterious substance, then further tests specific to the suspected substance would be performed by a qualified professional. If the water is deemed unsuitable to be diverted to the municipal drainage system, then it will be collected by a third-party for removal off-site to a designated treatment facility. Receipts or waste manifests documenting the removal of the material for disposal will be kept on record.

Liquid domestic waste will be generated on-site and will be retained in tanks or containers specific to this purpose. Once required, the materials will be removed from the tanks or containers by a qualified third-party for proper disposal. This is similar to the disposal method for waste oil/hazardous liquid materials. Any hazardous liquid waste generated on site due to the project will be stored in appropriate containers/tanks and will be disposed of by a qualified third-party. Receipts or waste manifests documenting the removal of the material for disposal will be kept on record.

### 5.6.3 Land

Potential solid waste generated by the construction and operation of the project includes contaminated soils, hazardous building materials, and garbage/scrap materials.

A Phase II Environmental Site Assessment with the collection of subsurface soil and groundwater materials is being completed within the project footprint. There is the potential that the Phase II ESA will reveal contaminated soils within the project footprint. If there are contaminated materials on-site that will be disturbed, then a soil management strategy will be created. This may include the segregation and off-site treatment or disposal of contaminated soils with confirmatory samples collected to determine if all contaminated materials were collected. The Phase II ESA being completed is specific to the areas identified as being potentially contaminated during the Phase I ESA.

Prior to the demolition of any on-site buildings suspected of containing hazardous building materials such as lead, asbestos, or ozone depleting substances, a Hazardous Building Materials Assessment may be completed. This assessment would include the collection and analysis of representative building materials. If the materials are found to contain hazardous substances, then further abatement will be completed with the materials disposed of off-site by a qualified third-party.

Cando is committed to reducing landfill waste and follows the waste reduction hierarchy starting with the source reduction of materials. This includes understanding quantities and project needs and not over ordering materials. Generally, waste will be separated on-site, and care will be taken to recycle or reuse materials whenever appropriate. Refuse generated by Cando will be stored within the boundaries of the project footprint with appropriate storage containers, such as dumpsters, used for refuse. Other non-hazardous materials that are not in danger of being transported off-site by wind or rain may be stored external to storage containers. All materials will be properly removed from site whether that be by a third-party to the landfill or to scrap metal recycling. All solid waste materials that may be generated can not be anticipated at this time but based on Cando's experience and commitment to waste reduction care will be taken to ensure proper removal.

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## 6.0 Summary

*A plain-language summary of the information in parts A to E is required in English and in French.*

A separate plain language summary of the contents of this main document has been prepared. A French language version of the summary document has also been prepared using a qualified, third-party translator.

Note: Despite the best efforts in translation, if there are any discrepancies between the French and English versions, the English version of the main document will be deemed correct.

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# Appendix A

## Example Engagement Letter



**Clifton**



Unit 400 – 740 Rosser Avenue  
Brandon, MB R7A 0K9

November 30, 2023

Duane Kootenay  
Manager, Lands Consultation Department  
Alexis Nakota Sioux Nation  
Box 337 Glenevis, Alberta T0E 0X0

**SENT VIA EMAIL:** [duane.kootenay@ansn.ca](mailto:duane.kootenay@ansn.ca)

***Project Notification – Cando Rail & Terminals Sturgeon Terminal, Sturgeon County, AB***

Dear Duane,

Cando Rail & Terminals (Cando) is committed to creating sustainable, long-term economic development opportunities that expand market access for Canadian manufacturers, make supply chains more resilient, and generate new jobs in the communities we call home. To that end, Cando is proposing to expand its Sturgeon Multi-Purpose Rail Terminal, adding two additional quarter sections of land directly west of the current railyard (the Project).

When fully developed, the combined operation will provide a safe, long-term transportation and storage advantage for industrial customers throughout Alberta's Industrial Heartland and Canada. These producers primarily use railcars for the bulk transport of products, and Cando is in the unique position to provide consolidated, large-scale rail services to assist in product staging, storage, transportation, and handling. Consolidating rail staging operations removes the need for each individual facility to provide its own rail loading and staging operations, lowering industry infrastructure and capital costs, and increasing competitiveness.

This package provides information on the Project, which is located within Sturgeon County's portion of Alberta's Industrial Heartland (the Heartland). Cando is seeking input on the potential for the Project to impact Indigenous, treaty and other rights, and traditional land uses.

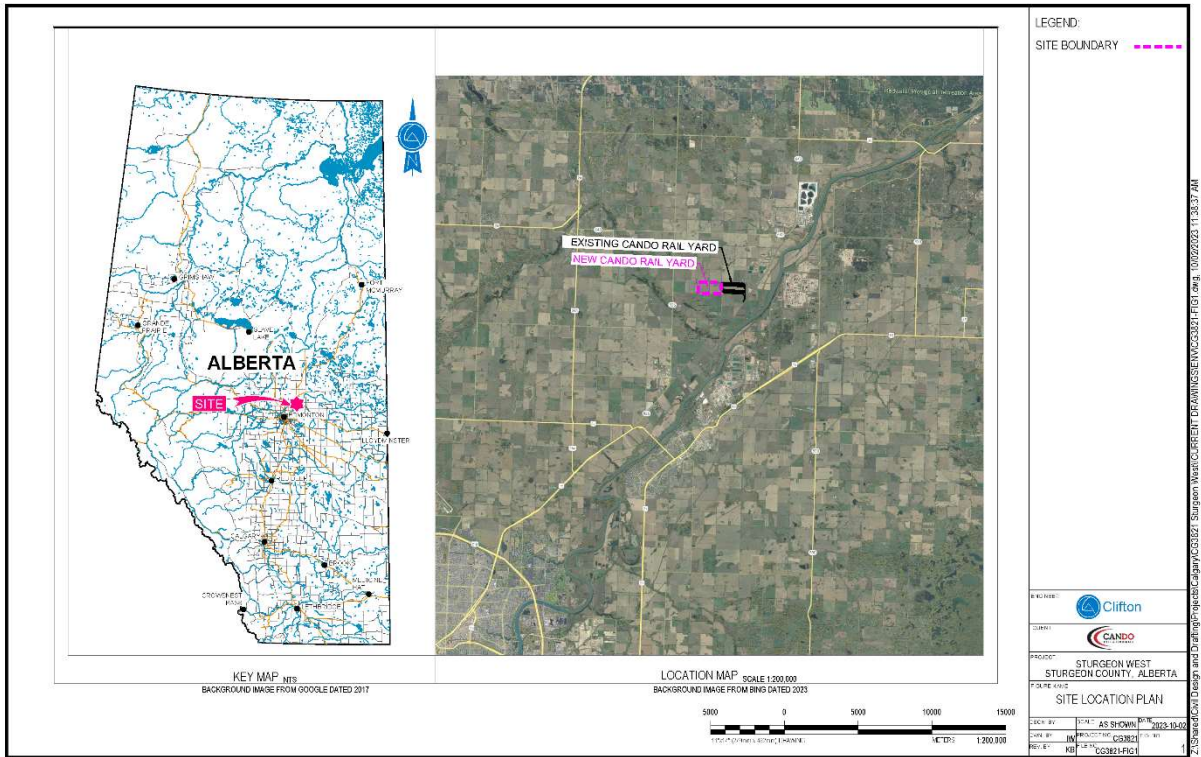
**Project Location**

The Project, depicted in Figure 1, is located within the province of Alberta, north of the City of Fort Saskatchewan, approximately 1.6 kilometres east of Highway 825.



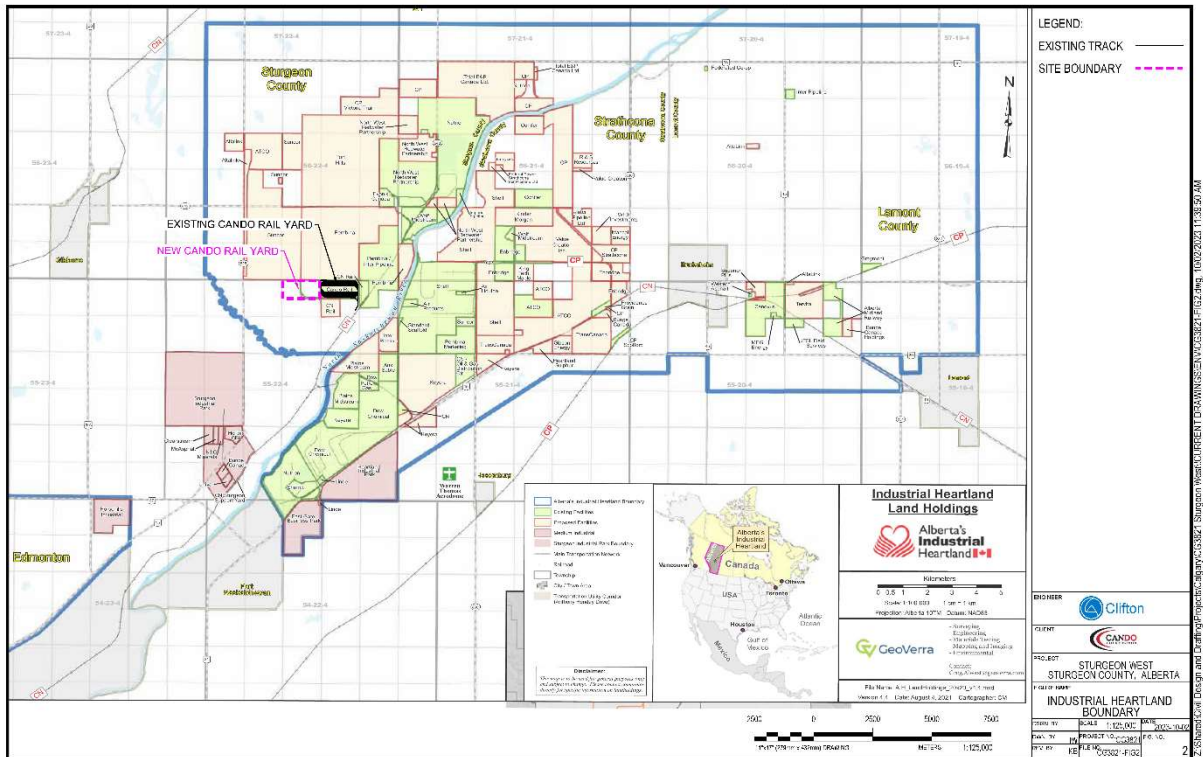
Platinum member

**P:** 1-204-725-2627 | **F:** 1-204-725-4100 | **E:** [info@candorail.com](mailto:info@candorail.com) | **W:** [www.candorail.com](http://www.candorail.com)



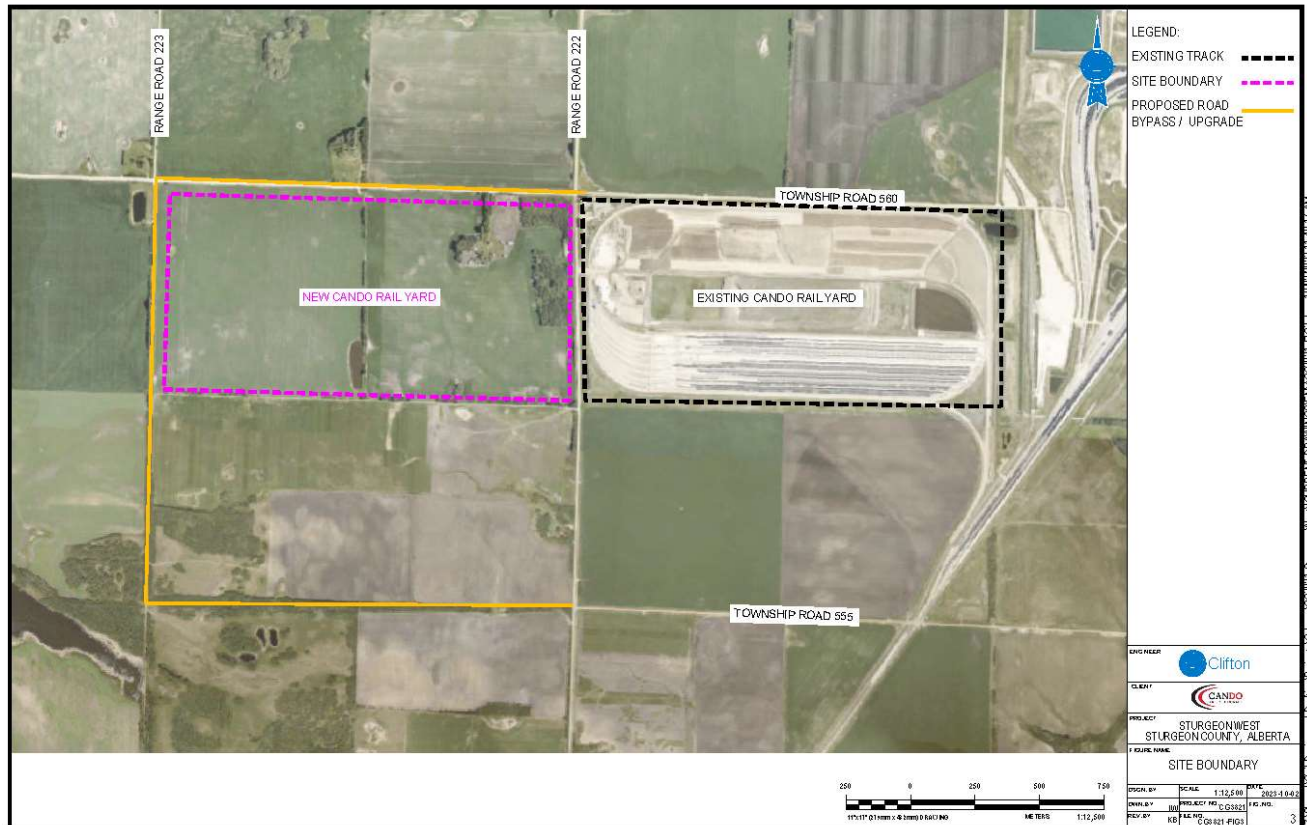
**Figure 1: Site Location Plan**

Figure 2 depicts the location of the proposed project within the boundaries of Sturgeon County's portion of Alberta's Industrial Heartland. The Project will be located adjacent to and west of the existing Cando Sturgeon Terminal.



**Figure 2: Industrial Heartland Boundary**

Figure 3 shows the location of the Project in proximity to the existing Cando Sturgeon Terminal, and the proposed road Bypass. More information on the road Bypass is given on page five.



**Figure 3: Site Boundary**

The Project will be located adjacent to and west of the existing Cando Sturgeon Terminal. The legal land description of the proposed rail terminal is the north half of Section 34, Township 55, Range 22, West of the Fourth Meridian (N ½ 34-55-22-W4M) with a total area of approximately 130 hectares.

Currently, the site is zoned I5 – Heavy Industrial District within Sturgeon County’s Land Use Bylaw and is being used as agricultural land with rural residential properties. The current terminal is connected to Canadian National (CN) rail right-of-way (ROW) and the Project would connect to the existing railyard. Through this proposed connection, the Project will connect to North American markets and ports, allowing for global distribution of Alberta-made products.

## Project Scope

The proposed footprint and design of the Project is depicted in Figure 4.

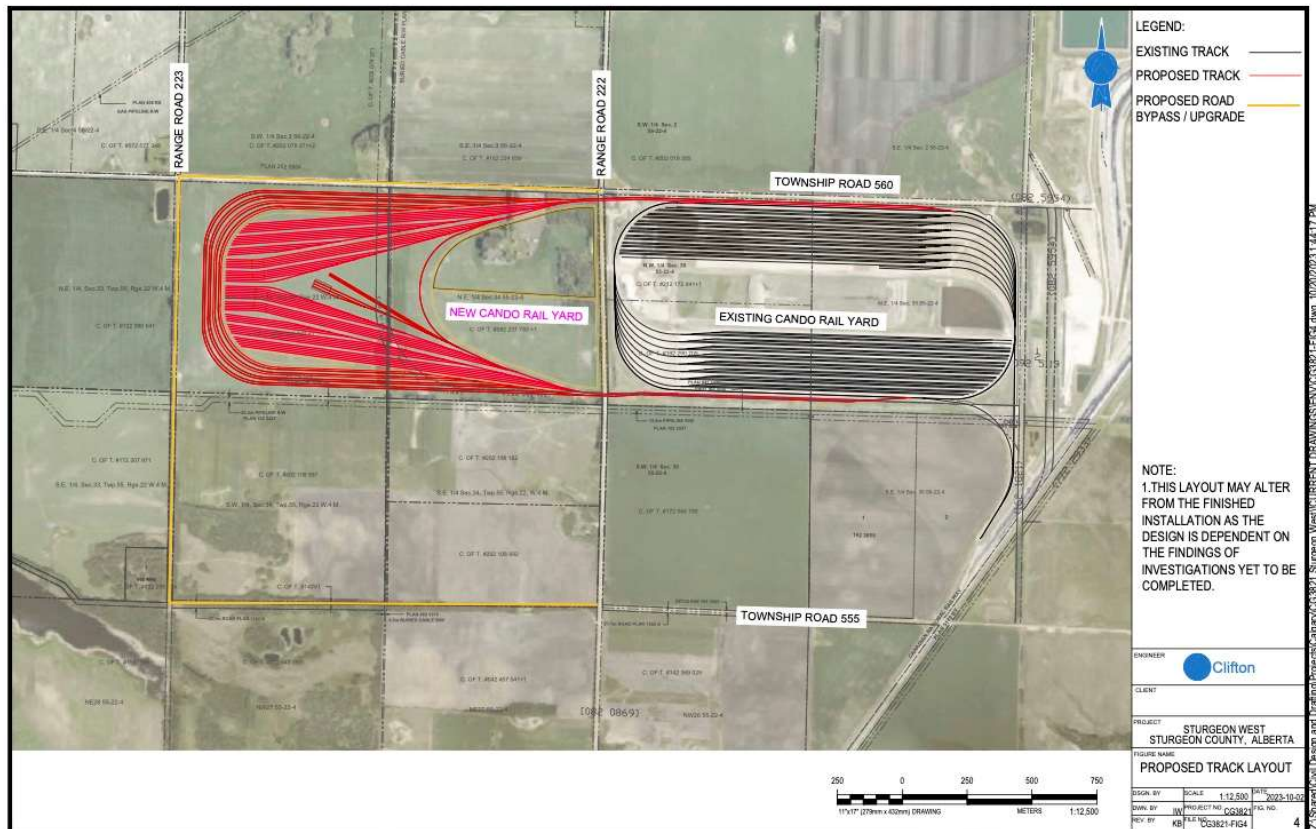


Figure 4: Proposed Track Layout

In general, the Project consists of a series of long tracks along the inside of the property boundary for inbound and outbound trains, a series of interior tracks for the sorting and storage of railcars, and an interior space for additional tracks and facilities to support operations. Additional infrastructure on site to support operations, such as roads, stormwater management and security measures will also be constructed.

All potential future facilities cannot be anticipated at this time, but based on Candorail's knowledge of the customer base in the area these facilities may include repair shops for locomotives and rollingstock, mobile transloading services, and other facilities to support railway and customer operations.

## Operating Plan

Candorail is committed to safety. We operate in a highly regulated industry with oversight provided by Transport Canada and the Government of Alberta. Our operating and development plans also face vigorous analysis by Class I railways. Trains will arrive and depart on the outermost tracks, and Candorail crews will use the interior tracks to sort the traffic for use by Heartland customers. The terminal is planned to operate on a 24/7/365 days/year basis. At full build-out, anticipated traffic includes multiple unit-trains arriving and departing the combined terminal, handling up to 2,000 on-site railcar movements daily.

### **Connection Plan**

The tracks (leads) connecting the existing Sturgeon Terminal to the Project will be the main arteries connecting both railyards. These connecting tracks will serve as the main working leads for rail traffic within the new terminal. These leads will be used by Cando crews sorting traffic between the leads and interior tracks; therefore, train traffic will occupy planned crossings over Range Road 222 for prolonged periods.

### **RR 222 Closure & Bypass**

The Project design is predicated on having at-grade connections (leads) with the existing terminal and will need to cross Range Road 222 (RR 222) to do so. These crossings will be in use at almost all times throughout the day, and they will often have loaded railcars crossing over them. For the public's safety, it is critical that a small portion of RR 222, in between the current Sturgeon Terminal and the Project, be closed.

As such, Cando is working with Sturgeon County and the Government of Alberta to provide alternate access (the Bypass) to accommodate the permanent closure of RR 222 in between the Sturgeon Terminal and the Project. The Project proposes to upgrade and expand adjacent roadways as needed to maintain and improve existing connections.

### **Project Timeline**

The Project is intended to be developed in multiple stages, with the timing of the development of additional trackage or supplemental services dependent on market conditions. The first phase is proposed to include the yard wrapping around the site and sufficient interior tracks to meet customer rail staging demands. Additional services and facilities may be constructed in subsequent stages to support customer and railway operations. The construction of the first phase of the rail terminal is anticipated to begin in the final quarter of 2024, following a rigorous design, permitting, and approval process required by federal and provincial and municipal entities.

### **Next Steps and Contact Information**

Cando is requesting that the information contained in this package be shared with First Nations communities and Indigenous groups. We are looking to understand if the proposed activities will adversely impact on rights holders and traditional land users. All responses will be responded to, and all correspondence provided for the record in the approvals process. Cando is happy to meet by whichever means suits you. We welcome any comments or questions from the community and request that any correspondence regarding the proposed activities be sent to the contact information below within 30 days from the date of this notification.

Mike Richard - Director, Property & Business Development, Cando Rail & Terminals  
780-499-9270

Or

Julie Pomehichuk - Director, Marketing & Communications, Cando Rail & Terminals  
204-868-5542

We ask that all email correspondence be sent to the Project engagement email address at:  
[CandoListens@candorail.com](mailto:CandoListens@candorail.com).

Yours sincerely,

Mike Richard

---

# Appendix B

## Preliminary Stormwater Management Plan



**Clifton**

# **CANDO Rail & Terminals Ltd.**

CANDO Sturgeon West Rail Terminal  
Storm Management Plan  
Sturgeon County, AB



**Clifton**

# CANDO Rail & Terminals Ltd.

## CANDO Sturgeon West Rail Terminal Stormwater Management Plan Sturgeon County, AB

Prepared by:  
Fang Guo PEng  
Water Resources Engineer

Reviewed by:  
Michael Bender PhD PEng  
Principal Water Resources Engineer

A draft of the SWMP was submitted to the county and its consultants, and AEPA for review, and this version addresses their comments and concerns. It will be submitted for final review and approval. Based on discussion to date, it is unlikely that the proposed plan and the report conclusions will change materially moving forward.

Distribution List							
Recipient	Date	Revision No.	By	Sent Via	Document Type	Description	No. of Hard Copies
CANDO Rail & Terminals Ltd.	23 November 2023	A	FG	E-mail	PDF	Draft Report	0
CANDO Rail & Terminals Ltd.	13 December 2023	B	FG	E-mail	PDF	Draft Report	0
CANDO Rail & Terminals Ltd.	16 February 2024	C	FG	E-mail	PDF	Draft Report	0
CANDO Rail & Terminals Ltd.	21 February 2024	D	FG	E-mail	PDF	Report for Submission	0

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# 1.0 Introduction

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## 1.1 Background

Clifton Engineering Group Inc. (Clifton) was commissioned to prepare this Stormwater Management Plan (SWMP) by CANDO Rail & Terminals Ltd. (CANDO) for the proposed Sturgeon West Rail Terminal Yard (West Yard or West Terminal) combined with a proposed expansion of the existing East Rail Terminal Yard (East Yard or East Terminal) in Sturgeon County, AB (the Project).

For the West Yard, CANDO is proposing to develop a new facility similar to the Sturgeon Rail Terminal previously constructed east of Range Road (RR) 222 (East Yard). The proposed new facility is west of RR 222, located on approximately 320-acre (130 ha) parcel, NW and NE 34-55-22-W4M in Sturgeon County's Industrial Heartland.

The proposed Project would increase CANDO's current rail storage capacity via connections to the adjacent existing east facility and would provide several loop tracks to allow for the switching of large trains. It is understood that the proposed facility will need to meet operating requirements for CN and CP plus Sturgeon County's stormwater and drainage requirements.

The project area is currently used for agricultural grain production and is generally a level plain strongly sloping from the northwest to the southeast. Heavy vegetation exists in the northeast corner where a farmyard currently exists. In addition, an unused CN easement (or Right-of-Way) exists along the south edge and SW corner of NE 34-55-22 W4M and along the east edge of NW 34-55-22-W4M. A natural gas pipeline, owned by West Lake Energy Corporation runs along the west limit of NW 34-55-22-W4M. Service gas lines also exist in the vicinity of the existing farmyard in NE 34-55-22-W4M.

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## 1.2 Purpose

The purpose of this report is to describe the Project SWMP, including site-wide stormwater management requirements, the proposed drainage infrastructure, and the expected performance during operations. The SWMP is a conceptual level of detail pending a final grading plan.

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## 1.3 Available Information

This SWMP is based on the following available information:

- CANDO Sturgeon County Yard Stormwater Management Plan by WSP. 09 September 2019.
- CANDO Sturgeon Terminal Issued for Construction Drawings by WSP. March 2020.
- Stormwater Management Plan for Drainage Basin 7 of Sturgeon Industrial Heartland prepared for Sturgeon County. Sameng, 2016.
- Phase I Environmental Site Assessment (ESA) for the construction of the CANDO Sturgeon West Rail Terminal by Clifton. 2023.

- Alberta Transportation (AT) Flow Profile Tool (V2.1) for Culvert Sizing. February 2022.
- Alberta Flow Estimation Tool for Ungauged Watersheds (AFETUW). 2023
- LiDAR topography (1 m grid) provided by CANDO. 2023.
- ESRI World Imagery dated 20 June 2021.
- Hydrography from Altalis (Government of Alberta). 2022.
- Precipitation data at climate Station Edmonton Blatchford (1999-2023) and Edmonton City Center (1937-2005) operated by Environment and Climate Change Canada (ECCC).
- Shallow lake evaporation data at Edmonton City Center Airport (Data period 1912-2009) by Alberta Environment and Sustainable Resource Development (AESRD). 2013.
- Short Duration Rainfall Intensity-Duration-Frequency (IDF) data for ungauged locations using the IDF\_CC Version 7 online tool developed by Western University and endorsed by Environment and Climate Change Canada (ECCC). Accessed October 2023.

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## 2.0 Design Basis

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### 2.1 Water Management Regulations

The SWMP is based on the following wastewater and stormwater management regulations:

- Stormwater Management Guidelines for the Province of Alberta. Alberta Environment Protection (AEP), 1999.
- Sturgeon County General Municipal Servicing Standards. Prepared in May 2002 and Amended in May 2009.
- Design Guidelines for Bridge Size Culverts. Alberta Transportation, September 2011.
- Municipal Policies and procedures Manual. Alberta Environment, April 2011.
- Wastewater and Storm Drainage Systems: Part 5 – Stormwater Management Guidelines. Government of Alberta, 2013. Sturgeon County Surface Drainage Bylaw 1558/21. August 2021.
- Surface Water Quality Management Framework for the North Saskatchewan and Battle Rivers Guidelines for use in Alberta. Government of Alberta, 2022.

---

### 2.2 Design Criteria

Water management design standards are based on standard municipal wastewater and stormwater management methods for settling ponds, drainage ditches, and culverts. Pond storage capacity, hydraulic conveyance capacity of drainage ditches and culverts are all designed for the 1:100-year 24-hour rainfall event. Hydrological estimates of surface runoff generated from the catchment areas for sizing stormwater ponds and drainage structures were derived using the Rational Method, including peak design flow for the 1:100-year event of the post-development project area. The Rational Method was selected to comply with Sturgeon County service standards and to remain consistent with previous studies for the Sturgeon Rail Terminal that have already been approved by regulators. The hydraulic conveyance capacity of each ditch

was estimated using Manning's Equation for ditches. Culverts were sized using the Alberta Transportation (AT) Flow Profile Tool (AT, 2022).

The design standards for stormwater ponds included the following:

- Excavated below ground where possible to avoid creating a dam.
- Provide storage capacity for the 1:100 year 24-hour storm event.
- Provide 0.5 m minimum freeboard for containment.
- Provide an internal overflow spillway as needed to prevent an uncontrolled off-site flow during a 1:100-year design event.
- Pond configuration to achieve a minimum 85% removal of sediments of particle size 75 µm or greater based on the Alberta Stormwater Management Guidelines (1999) and Municipal Policies and Procedures Manual (2001), which requires a minimum pond settling length of 140 m for the particle size 75 µm or greater to settle.
- Stormwater releases in compliance with approval conditions for water quality based on a monitoring program and pumped releases.
- Stormwater releases to a maximum 7 L/s/ha as per Sturgeon County requirements, equivalent to pre-development peak runoff characteristics for a 1:100-year design event.
- Ditches specified to provide gravity outlets for lateral drains crossing under the rail line.
- Perimeter ditching to be gradual swales with tie-ins to road ditches.
- Erosion protection along new drainage channels and the outlet channel erosion protection as needed.

The stormwater release limit of 7 L/s/ha is based on the post-development recommended discharge rate for Drainage Basin 7 of the Sturgeon Industrial Heartland (Sameng, 2016) and confirmed by the Sturgeon County (personal communication with Chris Pullen, Sr. Industrial Engineering Officer, Transportation / Engineering Services, Sturgeon County dated 25 July 2023). This limit is equivalent to 1.56 m<sup>3</sup>/s peak flow for 223 ha, roughly the size of the entire Project including both the West and East Terminal. This limit does not account for the downstream ditch capacity along County ditch "Line 1-5" along RR 221.

The design criteria used for ditches and culverts are:

- 1:100-year flood minimum drainage ditch capacity, with a configuration allowing overland flow during extreme flood conditions but without inundating adjacent road and rail infrastructure.
- 1:100-year flood peak culvert capacity without submerging the inlet.
- Ditch minimum dimensions of 1 m depth, 1 m bottom width, and 0.2% slope.
- Ditch maximum side slope of 2H:1V with geotechnical approval.
- Culvert maximum headwater/depth ratio of 1.0 to avoid submerging the inlet and potentially blocking the culvert.

The ditch and culvert design basis exceeds the provincial guidelines but were chosen because the additional protection is not expected to result in significant additional cost. The ditch size provides a minimum size for constructability and maintenance purposes.

---

## 3.0 Existing Drainage

The Project is situated in Section 34-55-22-W4M about 1 km from the North Saskatchewan River (NSR) within Sturgeon County's Industrial Heartland Drainage Basin 7 (Sameng, 2016). The location is currently under agricultural production. The proposed new footprint area is bounded on the east by RR 222, on the west by RR 223, on the north by Township Road (TWP) 560 and a Pembina Pipelines Right-of-Way on the south. The proposed West Terminal and the existing East Terminal are separated by RR 222 but will be considered as one project with a common outlet for the purpose of this study. The natural flow direction is from northwest to southeast.

The Project will occupy a footprint of approximately 260 ha, consisting of 130 ha for the Proposed West Yard and 130 ha of the existing East Yard where additional tracks are proposed within the existing footprint.

The entire project area is about 14% of the Basin 7 area (260 ha out of 1,852 ha). The West Yard drains naturally to an unnamed tributary of the NSR that crosses RR 222. The East Yard drains southeast to the RR 221 road ditch and subsequent ditches to the TWP 560 ditch outlet to the NSR. Regional drainage is shown on Figure 3.1, adapted from a County drainage map (Sameng 2016).

The existing East Terminal has resulted in some changes to local drainage patterns shown in Area A2. The drainage has been diverted east along TWP 560 to the RR 221 ditch instead of draining through the East Terminal yard. This drainage will need to be diverted further east along TWP 560 to RR 221 along the east side of the East Terminal in Area A3 on Figure 3.1.

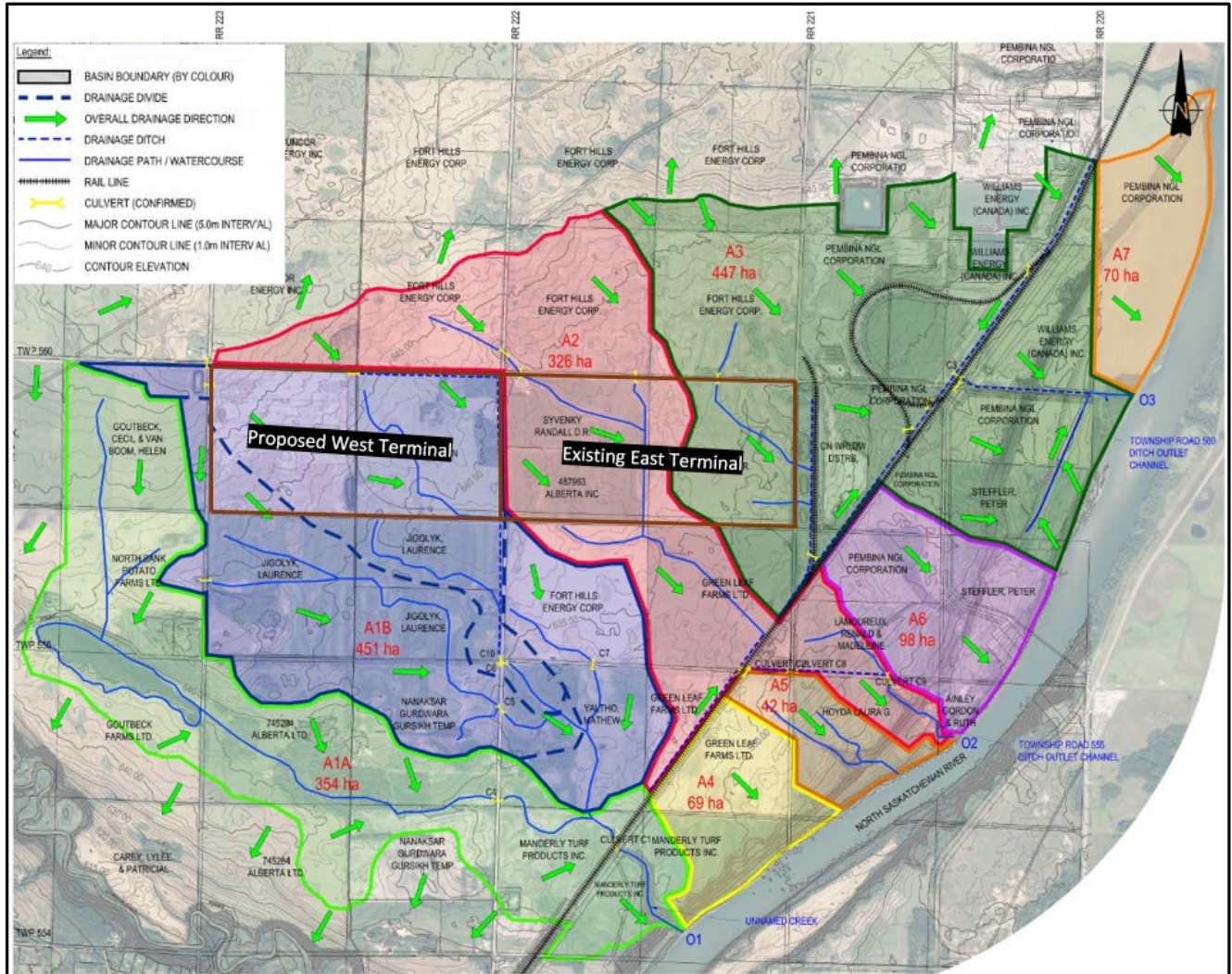


Figure 3.1 – Pre-Development Project Site Drainage within Basin 7

Drainage in the existing East Yard is controlled by the stormwater facility pond (SWMF) which releases stormwater at the allowable rate via 900 mm gated culvert to the county drainage ditch along RR 221.

The proposed West Yard is currently cropland (88%), plus a farmyard, a dugout, and a wooded area along RR 222. The topography is generally sloped from the northwest toward the southeast with an elevation change of approximately 15 m within the project footprint.

The Project does not cross any mapped creeks, based on the Alberta Land Information System (AltaLIS) hydrography.

## 4.0 Hydrology

### 4.1 Precipitation

Annual precipitation characteristics for the Project were estimated from combined precipitation records at Edmonton Blatchford climate station (Climate ID: 3012209, 1999-2023) and the inactive station Edmonton City Center Airport (Climate ID: 3012208, 1937-2005) at the same location. The Edmonton climate stations are located 35 km southwest of the Project, with similar elevation (671 m station elevation compared to 650 m project elevation).

The average annual precipitation for the combined data record 1937-2023 is 444 mm with over 70% of this recorded as rainfall (328 mm). Historical monthly precipitation is presented in Table 4.1.

**Table 4.1 – Monthly Precipitation (mm)**

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Precipitation	22.6	16.8	18.2	24.4	43.6	76.2	85.8	63.9	35.4	19.2	18.5	19.6	444
Rainfall	1.2	0.5	1.5	11.0	39.1	74.5	83.7	65.9	36.0	11.0	2.3	1.0	328
Extreme Daily Rainfall	38.6	15.0	18.5	43.4	41.6	66.3	114	69.5	60.5	30.4	14.2	16.2	n/a

### 4.2 Design Storm

The 1:100-year return period 24-hour duration design storm for the Project is 113 mm. This is comparable to the highest historical daily rainfall of 114 mm on 31 July 1953. The most recent large storm was 85.4 mm on 04 July 1990. The design storm is based on rainfall intensity-duration-frequency (IDF) statistics provided in Table 4.2 as derived using IDF\_CC (7.0), an online tool endorsed by the ECCC at the Government of Canada that uses nearby published statistics to interpolate local conditions at ungauged locations.

**Table 4.2 – Rainfall IDF**

Duration	Rainfall (mm)					
	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
5 min	5.7	8.2	9.9	12.0	13.5	15.1
10 min	7.7	11.3	13.6	16.5	18.6	20.8
15 min	9.6	14.1	17.1	20.9	23.9	26.8
30 min	12.1	17.7	21.5	26.2	29.8	33.3
1 h	15.6	22.4	27.0	32.7	37.0	41.3
2 h	20.4	28.6	33.9	40.7	45.7	50.7
6 h	28.0	38.7	45.7	54.7	61.4	68.0
12 h	36.8	51.4	61.2	73.4	82.5	91.6
24 h	46.1	64.0	75.8	90.8	101.9	112.9

### 4.3 Evaporation

Mean annual areal evapotranspiration of 382 mm and 677 mm lake evaporation are based on published rates from 1912-2009 for Edmonton City Center Airport (Alberta Government, 2013), located 35 km southwest of the Project.

### 4.4 Natural Runoff

Natural runoff characteristics were derived from the Water Survey of Canada (WSC) gauging station at Sturgeon River near Villeneuve, with consideration of other nearby stations such as Sturgeon River near Fort Saskatchewan and Pointe-Aux-Pins Tributary No. 2 near Ardrossan. The Sturgeon River station near Villeneuve is located 42 km southwest of the Project, while the station near Fort Saskatchewan is near the Sturgeon River mouth and 7 km northwest of the Project. Pointe-Aux-Pins Tributary No. 2 is a small tributary joining the North Saskatchewan River on the south side. All three stations have similar hydrology characteristics and are near the Project. Project runoff attributes were based on the Sturgeon River station near Villeneuve.

The station data includes the following:

- 05EA005 Sturgeon River near Villeneuve, with a drainage area (DA) of 1,890 km<sup>2</sup>, and a flow data record from 1914-2022.
- 05EA001 Sturgeon River near Fort Saskatchewan (DA = 2,320 km<sup>2</sup>, 1914-2022).
- 05EB910 Pointe-Aux-Pins Tributary No. 2 near Ardrossan (DA = 8.1 km<sup>2</sup>, 1981-2009).

The estimated annual runoff for the project area is 31 mm (about 7% of the 444 mm average annual precipitation). The average unit flow is 0.01 L/s/ha or 1 L/s/km<sup>2</sup>. Runoff varies from 10.4 mm in April to 0.5 mm in February. Runoff characteristics are shown on Figure 4.1 for monthly average conditions and reported as daily flow per unit area on Figure 4.2.

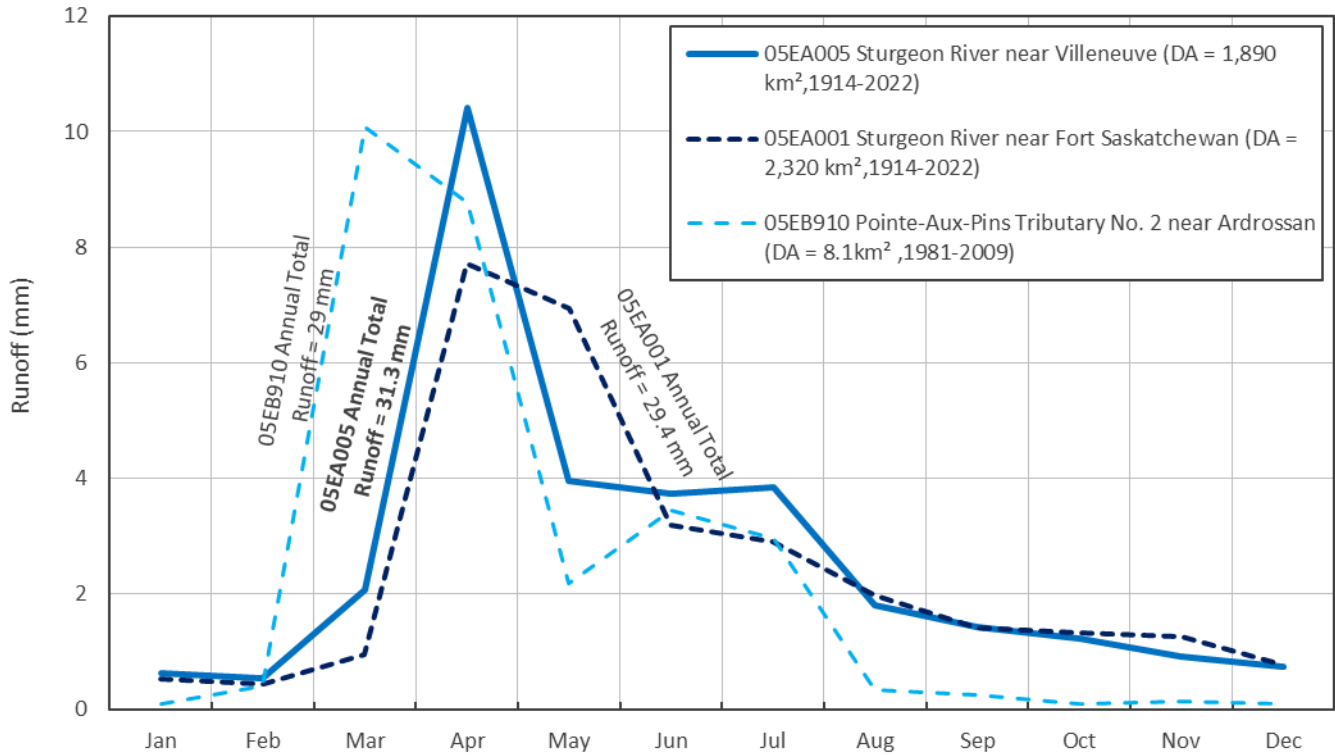


Figure 4.1 – Monthly Runoff (mm)

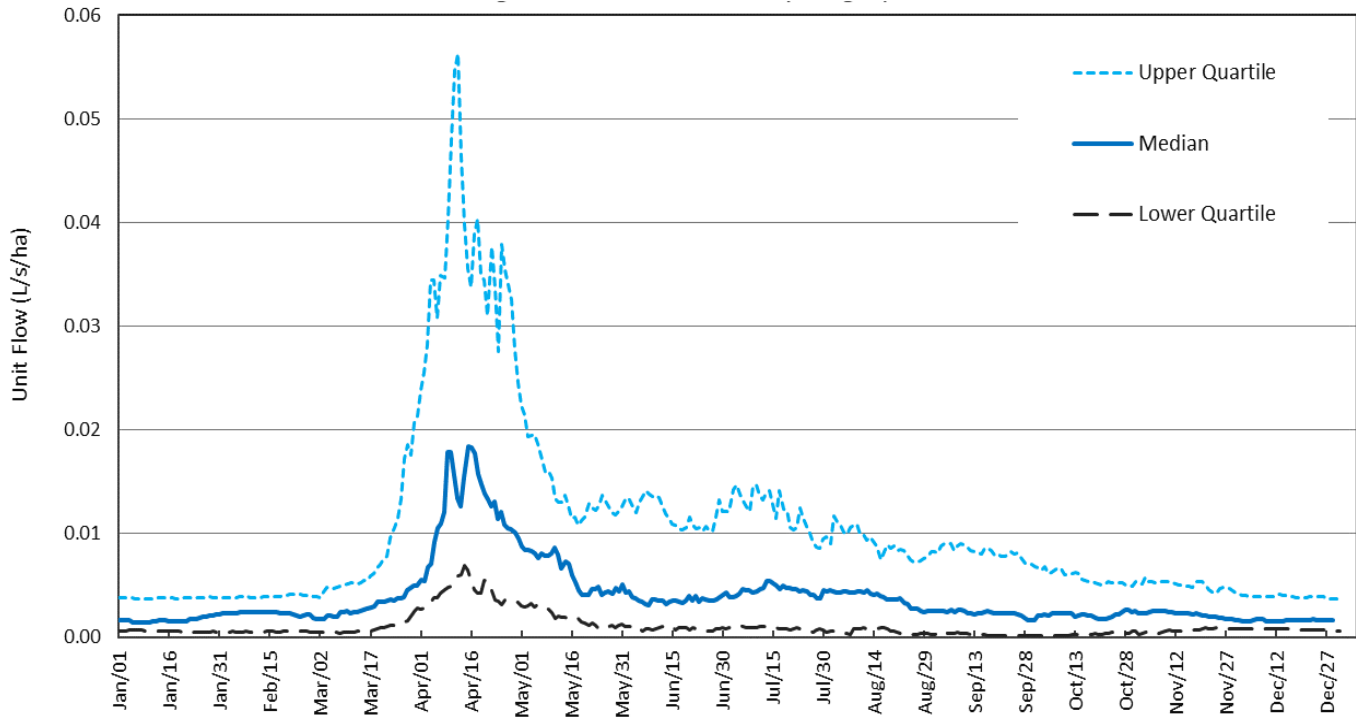


Figure 4.2 – Daily Unit Flow (L/s/ha)

**4.5 Post-Development Stormwater**

The hydrology characteristics for the developed Project were estimated based on the Rational Method in compliance with the Sturgeon County service standards, using assumptions consistent with the previous East Yard report by WSP that was subsequently accepted and approved by the County and the Province. Rational Method assumptions are provided as part of the analysis for each pond in the following sections describing the SWMP.

Rational Method assumptions selected for the design storm event are based on the Alberta stormwater guidelines as follows:

- Time of concentration = 30 minutes.
- Pond area = 100% of precipitation.
- Rail yard = 60% of precipitation.
- Undeveloped = 40% of precipitation.

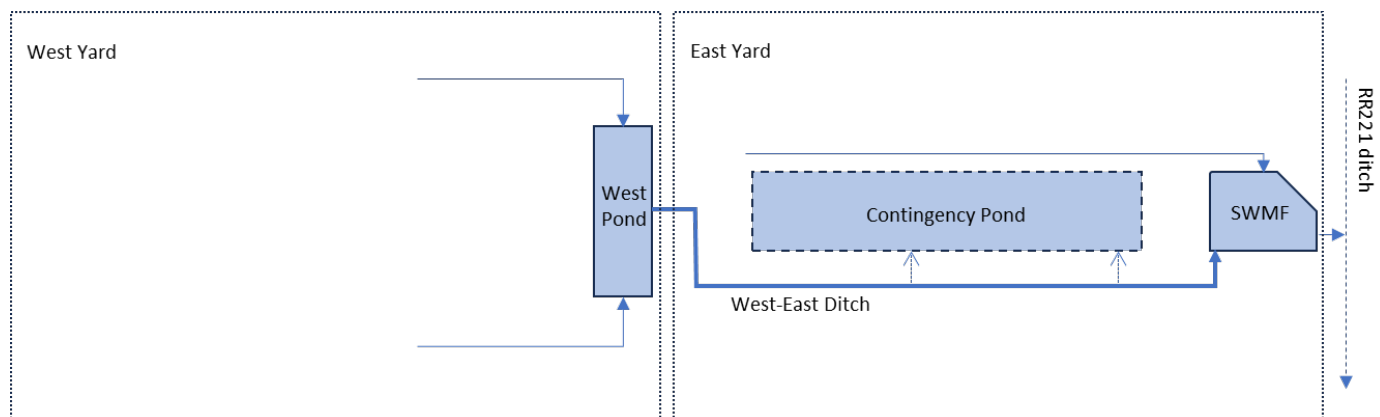
## 5.0 Stormwater Management Plan

### 5.1 Overview

Project stormwater will be managed at stormwater ponds as per Stormwater Management Guidelines (Alberta Government, 2009) and the General Municipal Servicing Standards (Sturgeon County, 2009) to construct pond containment sufficient for a 100-year storm event. Stormwater will remain onsite in the ponds and released in a controlled manner after the storm has ended. This approach exceeds the County expectations for post-development stormwater releases of 7 L/s/ha during the design storm. The Project releases will be less than this limit.

The Project will manage stormwater within each of the two rail terminal yards. Each yard will have a stormwater pond. Stormwater will then be conveyed by ditch from the West Yard to the East Yard (West-East Ditch), and all stormwaters will be released from the east side of the East Yard at the existing gated culvert outlet to the RR 221 ditch. In other words, the combined project will have a single stormwater release location at the existing Stormwater Management Facility (SWMF) in the East Yard.

The Stormwater Management Plan (SWMP) is illustrated on Figure 5.1. In the West Yard, the West Pond and culvert outlet are intended to attenuate the stormwater peak flow by providing a limited culvert capacity and temporary storage capacity. Some water will remain in the West Pond and be released after the storm. Stormwater will then be slowed along the West-East Ditch using check dams prior to discharging to the SWMF during small storm events, or to both the SWMF and Contingency Pond during large events. The Contingency Pond is a dry pond that will be utilized only during large storms.



**Figure 5.1 – Conceptual Stormwater Management Plan**

The stormwater management plan uses a large excavation area (borrow pit) in the East Yard to provide additional temporary storage during the largest stormwater events, including those exceeding the design storm. The excavation area is referred to in this report as the Contingency Pond. Inflow to the Contingency Pond will only occur during large events via spillways known as ‘wasteways’ along the West-East Ditch, but only after the ditch flow depth exceeds the spillway invert. In this way, normal runoff events will be discharged from the existing East Yard outlet while the Contingency Pond remains dry. The stormwater configuration allows for the Contingency Pond to attenuate the flood peak for the entire West Yard and about half of the East Yard. Releases from the Contingency Pond will need to be pumped.

Stormwater from the entire 223 ha facility (116 ha of West Yard and 107 ha of East Yard) will be conveyed by gravity or pumping to the SWMF where the water will be stored until the water quality is acceptable for release. All releases from the Project (West Yard plus East Yard) will occur at the SWMF via the existing gated culvert. The stormwater storage capacity of the ponds is greater than the 1:100-year stormwater volume. The available storage capacity is in excess of 261,000 m<sup>3</sup> while the stormwater volume for the entire facility (i.e., West and East Yards) is expected to be about 133,000 m<sup>3</sup>. This large storage capacity will allow for water management at multiple onsite locations, plus monitoring and release of the water from only one controlled location. The configuration to store the entire volume of the 1:100-year storm runoff relies on wasteways along the West-East Ditch to divert a portion of the design stormwater flow to the Contingency Pond. The water storage capacity is summarized in Table 5.1.

**Table 5.1 – Stormwater Storage Configuration**

Pond	1:100-year Storm Runoff Volume (m <sup>3</sup> )	Active Storage Capacity (m <sup>3</sup> )
SWMF (East Pond) 633 m normal operating level	62,700	74,000
West Pond 638.1 m	70,500	17,000 (43,000 during storm peak)
Contingency Pond (borrow area) <630 m	0	170,000 (1 m depth)
<b>Total</b>	<b>133,200</b>	<b>261,000</b>

By managing all stormwater drainage at the SWMF, the Project diverts a portion of the County Drainage Basin 7 from Sub-Basins A1B and A2 into Sub-Basin A3 where releases will occur after the storm to the Line 1-5 Drain along RR 221 to the Line 3 Drain which discharges to the North Saskatchewan River. The downstream Line 3 in the Sturgeon County Stormwater Management Plan for Drainage Basin 7

(Sameng 2016) is the receiving drain for all project stormwater plus the offsite drainage around the Project. With the project stormwater controls, the Line 3 stormwater peak flow is expected to be reduced because stormwater releases from the Project will be delayed.

Stormwater runoff from offsite areas will be diverted via existing road ditches. Along the north side of the Terminals, the TWP 560 ditch will be used to divert drainage from Sub-Basin A2 to Sub-Basin A3 on the east side of the Terminals where the drainage will flow into the RR 221 ditch. The TWP 560 ditch is also referred to as "Line 1" by Sturgeon County. Similarly, offsite drainage along the west side of the Terminal with sub-basin A1B will be diverted around the south side of the Terminal via a perimeter ditch between the rail loop and an existing Pembina Pipeline Corporation Right-of-Way. The perimeter ditch will daylight to RR 222 south of the Terminal. Together, these drainage diversions reduce the stormwater south of the Terminal within Sub-Basins A1B and A2.

Additional offsite stormwater drainage will be provided along a proposed road extension for TWP 555. This new road is intended as a traffic diversion around the Terminal. The new road will connect RR 223 and RR 222. The road ditch will convey local drainage within sub-basin A1B. With the local diversions and stormwater controls for the Project, the downstream drainage from A1B will be reduced by about 50% compared to pre-development conditions along TWP 555.

The SWMP drainage design drawings are provided in Appendix A. The SWMP consists of the following key components:

- Existing East Yard stormwater infrastructure:
  - Ditches plus cross drains below the rail lines.
  - Culvert drainage at access road crossings.
  - SWMF pond near the east outlet.
  - SWMF outlet gated control structure with a 900 mm diameter corrugated steel pipe (CSP) outfall to the RR 221 ditch.
- East Yard expansion ditches drain toward the inside portion of the rail loop to support the expanded tracks, consistent with the lateral drains.
- West Yard new stormwater infrastructure:
  - Ditches using the same design concepts and similar layout to direct all drainage toward the inside portion of the rail loop.
  - Culvert drainage at access road crossings.
  - Two stormwater ditches within the rail loop to direct drainage to an onsite stormwater pond (West Pond).
  - West Pond near the existing RR 222 between the West Yard and the East Yard.
- West Yard culvert outlet 1400 mm diameter CSP to discharge from the West Yard to the East Yard, including two separate culverts in series: one culvert for the RR 222 crossing, and another culvert for a rail crossing in the East Yard.
- West-East Ditch from the West Yard culvert outlet to the SWMF in the East Yard, along an alignment on the south side of the inner rail loop.

- Contingency Pond in the inner rail loop of the East Yard, to be pumped dry as needed after a storm has ended; this existing area is currently known as the borrow area for the East Yard.
- Two wasteway spillways along the West-East Ditch to divert high flow to the Contingency Pond but only during large events. The wasteway inverts are 0.5 m above the ditch bottom.
- West Perimeter Ditch around the west edge and south edge of the West Yard rail loop to the RR 222 road ditch, including a berm to avoid spilling to the adjacent landowner.
- TWP 560 road ditch along the north side of the road will require improvements to remove a sluice gate and install a culvert across RR 222 to direct offsite drainage to the RR 221 road ditch. Detailed engineering has not been completed for this portion of the plan.
- TWP 555 road ditch along the north side of the proposed road extension between RR 223 and RR 222 has been designed separately as an off-site road improvement (i.e., not included as part of the stormwater management plan drawings).
- Existing East Yard perimeter ditches.

Overall, the relatively large stormwater storage capacity of the SWMF, the West Pond, and the Contingency Pond is expected to exceed the stormwater requirements for Sturgeon County. Water will be released after the water quality is confirmed to be acceptable for release. Releases will be managed to be less than the 7 L/s/ha as requirement from the County.

The existing SWMF is approved to release 0.76 m<sup>3</sup>/s peak flow. The SWMP has the potential to manage releases to about 3.5 L/s/ha or about 0.7 m<sup>3</sup>/s, thereby utilizing onsite storage capacity to avoid a new release location for the Project, and to avoid additional peak flow from the existing SWMF to the County Line 1-5 ditch along RR 221.

Releases will occur after a storm has ended, based on SWMF gate operations. Therefore, the releases will occur after water quality requirements are met, and the timing of the releases is expected to be offset from the storm peak.

Potential stormwater management issues include potential spills at the repair facility within the West Yard. This is the most likely location for small spills to occur. Spills have the potential to affect the stormwater quality at the SWMF. Detailed engineering will mitigate this issue to the extent possible by supplying local drainage, tank storage, and a pump-out system near the repair facility. This is necessary to avoid contamination of other stormwater at the large onsite ponds.

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## 5.2 Perimeter Ditch

The Perimeter Ditch (Ditch) around the west and south side of the West Yard rail loop has variable slope of at least 0.3% and a nominal depth of 0.5 m to 1.0 m. Some overland inundation may occur during large floods. Containment is provided at key locations along the south side where the local topography naturally results in drainage towards the adjacent property to the south. At this location, the Ditch will be deeper and contained by a small berm about 1 m above existing ground. The Ditch also intersects an existing wetland along the west side of the rail loop, where the Ditch will tie-in to the edge of the wetland. The wetland is not expected to be disturbed.

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### 5.3 TWP 560 Ditch Improvements

Local drainage on the north side of the terminal yards naturally flows south across the terminal yards. This natural drainage will need to be diverted along TWP 560 to the RR 221 ditch at the east end of the terminal, known as “Line 1” in the Master Drainage Plan (Sameng 2016). The diversion requires two changes:

- A new culvert across RR 222 to facilitate drainage along TWP 560 to the existing RR 221 ditch.
- Removal of sluice gate structures along the TWP 560 north side ditch that are currently used by the local landowner (Ron Holmes) to divert water across TWP 560 to his property.

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### 5.4 TWP 555 Ditch Design

An extension to TWP 555 is proposed as part of the West Yard project, with drainage provided from west to east. The West Yard will reduce the natural catchment area for TWP 555 by about 50% due to the rail yard drainage and Perimeter Ditch. Standard ditching requirements for the County will apply along the TWP 555 extension. The standard design requirement is 1.0 L/s/ha. The catchment area for the ditch is about 130 ha, resulting in a ditch design flow of 0.13 m<sup>3</sup>/s.

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### 5.5 West Pond

The West Yard stormwater pond (West Pond) will attenuate stormwater runoff from the West Yard. The pond will be excavated below existing ground with a culvert outlet across RR 222 to the East Yard (West Culvert). Any overtopping of the pond will be contained within the West Yard, with conveyance to the East Yard via the West Culvert. Discharges to the East Yard will be partially controlled upstream of the existing SWMF at Wasteways that divert surplus stormwater to the Contingency Pond. Together, the West Pond and the Contingency Pond storage capacity exceeds the 1:100-year design flood volume. The pond will drain slowly to the culvert invert. Remaining water will be pumped to the East Yard after the storm has ended.

Pond information is listed below, and the pond water balance is provided in Table 5.2:

- 637 m dry pond bottom; 638.1 m culvert outlet; 639.5 m high water level (HWL).
- 1.8 ha West Pond surface area, 2.2 m average depth below the high-water level.
- 116 ha drainage area within the rail loop.
- 70,500 m<sup>3</sup> design storm volume for the 1:100-year 24-hour flood.
- 43,000 m<sup>3</sup> West Pond storage as measured from the culvert outlet top of pipe (obvert).
- 17,000 m<sup>3</sup> West Pond storage as measured from the culvert outlet bottom of pipe (invert).
- 1400 mm culvert outlet diameter.

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### 5.6 East Pond

The existing East Yard stormwater pond, or Stormwater Management Facility (SWMF) attenuates stormwater runoff from the East Yard and is the controlled outlet location for both the West and East Yards. The SWMF was designed as a wet pond, with a permanent pool to provide water quality control by allowing

store sedimentation to collect at the bottom of pond without being re-entrained during the next storm event (WSP, 2019). Inflow consists of local ditch drains within the East Yard, plus the West-East Ditch from the West Yard. Stormwater flow along the West-East ditch is limited by Wasteway diversions to the Contingency Pond. The outlet is provided by a 900 mm culvert to the RR 221 road ditch. The culvert has a limited capacity that forces additional water to be stored if inflow to the SWMF is high. The existing SWMF was previously approved and constructed.

Pond information is listed below, and the pond water balance is provided in Table 5.3:

- 633 m normal water level (NWL); 635 m HWL.
- 3.8 ha SWMF surface area, 2 m average depth below the high-water level.
- 107 ha total drainage area within the rail loop of the East Yard.
- 17 ha drainage area for the Contingency Pond within the rail loop of the East Yard.
- 90 ha contributing area within the East Yard rail loop, not including the Contingency Pond.
- 206 ha drainage area within the rail loop of both the West Yard and East Yard.
- 62,700 m<sup>3</sup> design storm volume for the 1:100-year 24-hour flood.
- 74,000 m<sup>3</sup> active pond capacity between NWL and HWL.

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### 5.7 Contingency Pond

The Contingency Pond is intended as a dry pond to store surplus water during large storms. The location is an excavated borrow source in the East Yard. This pond is not intended for frequent use. It is expected to be used only during large floods with a return period of about once in 5 years. The Contingency Pond is about 17 ha. Final grading is uncertain but the borrow area is about 9 m metres deep with a pond bottom lower than 630 m. The SWMP will rely on only 1 m of water storage, equivalent to a storage capacity of 170,000 m<sup>3</sup>. Inflow to the Contingency Pond occurs via Wasteways along the West-East Ditch on the south side of the Pond where ditch blocks will be used to split the flow from the West Pond to the SWMF. The pond water balance is provided in Table 5.4.

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### 5.8 Pond Releases

Releases from the SWMF to the environment (the RR 221 county ditch) will comply with the regulated limit of 7 L/s/ha (1.56 m<sup>3</sup>/s) associated with a 1:100-year design storm for the combined West plus East development. The onsite water storage capacity has the potential to limit the releases to 3.5 L/s/ha after the storm has ended, subject to the conveyance capacity of the Line 1-5 ditch capacity along RR221 at the SWMF outfall. A summary of the post-development stormwater volumes and target release rate is presented in Table 5.5.

Table 5.2 – Water Balance –West Pond

Parameter	Monthly Average												Annual Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
<b>A: Net Precipitation</b>													
Lake Evaporation <sup>1</sup> (mm)	0	2	24	69	113	128	145	114	56	23	3	0	677
Precipitation <sup>2</sup> (mm)	23	17	18	24	44	76	86	64	35	19	18	20	444
Net Precipitation (mm)	23	15	-6	-45	-69	-52	-59	-50	-21	-4	15	20	-233
Net Precipitation <sup>3</sup> (m <sup>3</sup> )	407	266	-104	-803	-1249	-932	-1066	-902	-371	-68	279	353	-4,191
<b>B: Inflow</b>													
Surface Runoff Rate (mm)	0.6	0.5	2.1	10.4	4.0	3.7	3.8	1.8	1.4	1.2	0.9	0.7	31.3
Inflow to Pond <sup>4</sup> (m <sup>3</sup> )	704	612	2373	11900	4517	4263	4393	2050	1635	1399	1056	835	35,739
<b>A+B: Water Balance</b>													
Water Balance Results (m <sup>3</sup> )													
(+) Inflow exceeds Outflow (net discharge in the month)	1,100	900	2,300	11,100	3,300	3,300	3,300	1,100	1,300	1,300	1,300	1,200	31,500
(-) Outflow exceeds Inflow no discharge in the month)													

<sup>1</sup> Gross evaporative loss is based on 1912-2009 Morton's mean annual shallow lake gross evaporation data at Edmonton City Center Airport. <https://agriculture.alberta.ca/acis/>.

<sup>2</sup> Average precipitation is estimated from combined record of Edmonton Blatchford climate station (climate ID:3012209, 1999-2023) and inactive station Edmonton City Center Airport (Climate ID: 3012208,1937-2005) at the same location with elevation of 671 m. Both stations were operated by Environment and Climate Change Canada. [https://climate.weather.gc.ca/historical\\_data/search\\_historic\\_data\\_e.html](https://climate.weather.gc.ca/historical_data/search_historic_data_e.html).

<sup>3</sup> Evaporation Loss calculations are for pond surface area 1.8 ha.

<sup>4</sup> Runoff rate calculations are for site drainage area 116 ha to the pond based on the flow data from WSC station 05EA005 Sturgeon River near Villeneuve (data record 1914-2022). Groundwater seepage 0 assumed.

Table 5.3 – Water Balance – East Pond (SWMF)

Parameter	Monthly Average												Annual Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
<b>A: Net Precipitation</b>													
Lake Evaporation <sup>1</sup> (mm)	0	2	24	69	113	128	145	114	56	23	3	0	677
Precipitation <sup>2</sup> (mm)	23	17	18	24	44	76	86	64	35	19	18	20	444
Net Precipitation (mm)	23	15	-6	-45	-69	-52	-59	-50	-21	-4	15	20	-233
Net Precipitation <sup>3</sup> (m <sup>3</sup> )	860	561	-220	-1695	-2636	-1968	-2251	-1904	-784	-143	588	744	-8,847
<b>B: Inflow</b>													
Surface Runoff Rate (mm)	0.6	0.5	2.1	10.4	4.0	3.7	3.8	1.8	1.4	1.2	0.9	0.7	31.3
Inflow to Pond <sup>4</sup> (m <sup>3</sup> )	531	462	1791	8983	3410	3218	3316	1548	1234	1056	797	631	26,976
<b>A+B: Water Balance</b>													
Water Balance Results (m <sup>3</sup> )													
(+) Inflow exceeds Outflow (net discharge in the month)	1,400	1,000	1,600	7,300	800	1,200	1,100	-400	500	900	1,400	1,400	18,100
(-) Outflow exceeds Inflow (no discharge in the month)													

<sup>1</sup> Gross evaporative loss is based on 1912-2009 Morton's mean annual shallow lake gross evaporation data at Edmonton City Center Airport. <https://agriculture.alberta.ca/acis/>.

<sup>2</sup> Average precipitation is estimated from combined record of Edmonton Blatchford climate station (climate ID:3012209, 1999-2023) and inactive station Edmonton City Center Airport (Climate ID: 3012208,1937-2005) at the same location with elevation of 671 m. Both stations were operated by Environment and Climate Change Canada. [https://climate.weather.gc.ca/historical\\_data/search\\_historic\\_data\\_e.html](https://climate.weather.gc.ca/historical_data/search_historic_data_e.html).

<sup>3</sup> Evaporation Loss calculations are for pond surface area 3.8 ha.

<sup>4</sup> Runoff rate calculations are for site drainage area 90 ha to the pond based on the flow data from WSC station 05EA005 Sturgeon River near Villeneuve (data record 1914-2022). Groundwater seepage 0 assumed.

Table 5.4 – Water Balance – Contingency Pond

Parameter	Monthly Average												Annual Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
<b>A: Net Precipitation</b>													
Lake Evaporation <sup>1</sup> (mm)	0	2	24	69	113	128	145	114	56	23	3	0	677
Precipitation <sup>2</sup> (mm)	23	17	18	24	44	76	86	64	35	19	18	20	444
Net Precipitation (mm)	23	15	-6	-45	-69	-52	-59	-50	-21	-4	15	20	-233
Net Precipitation <sup>3</sup> (m <sup>3</sup> )	3848	2509	-986	-7582	-11793	-8803	-10070	-8517	-3507	-639	2631	3329	-39,580
<b>B: Inflow</b>													
Surface Runoff Rate (mm)	0.6	0.5	2.1	10.4	4.0	3.7	3.8	1.8	1.4	1.2	0.9	0.7	31.3
Inflow to Pond <sup>4</sup> (m <sup>3</sup> )	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>A+B: Water Balance</b>													
Water Balance Results (m <sup>3</sup> )													
(+) Inflow exceeds Outflow (net discharge in the month)	3,800	2,500	-1,000	-7,600	-11,800	-8,800	-10,100	-8,500	-3,500	-600	2,600	3,300	-39,600
(-) Outflow exceeds Inflow no discharge in the month)													

<sup>1</sup> Gross evaporative loss is based on 1912-2009 Morton's mean annual shallow lake gross evaporation data at Edmonton City Center Airport. <https://agriculture.alberta.ca/acis/>.

<sup>2</sup> Average precipitation is estimated from combined record of Edmonton Blatchford climate station (climate ID:3012209, 1999-2023) and inactive station Edmonton City Center Airport (Climate ID: 3012208, 1937-2005) at the same location with elevation of 671 m. Both stations were operated by Environment and Climate Change Canada. [https://climate.weather.gc.ca/historical\\_data/search\\_historic\\_data\\_e.html](https://climate.weather.gc.ca/historical_data/search_historic_data_e.html).

<sup>3</sup> Evaporation Loss calculations are for pond surface area 17 ha.

<sup>4</sup> Runoff rate calculations are for site drainage area 17 ha to the pond (pond area only) based on the flow data from WSC station 05EA005 Sturgeon River near Villeneuve (data record 1914-2022). Groundwater seepage 0 assumed.

**Table 5.5 – Post Development Stormwater Summary**

Parameter	West Pond	East Pond (SWMF)
South Yard (ha)	37.5	45.7
North Yard (ha)	37.5	40.5
Undeveloped Site Area (ha)	39.2	17
Pond Surface Area (ha)	1.8	3.8
Runoff Coefficient <sup>1</sup> (C) for Yard Area		0.6
Runoff Coefficient <sup>1</sup> (C) for Undeveloped Area		0.4
Rainfall Intensity <sup>2</sup> @ Tc (i.e., mm/hr)		67.0
Total Rainfall (mm)		112.9
Total Runoff Volume (m <sup>3</sup> )	70,500	62,700
Peak Inflow <sup>3</sup> (m <sup>3</sup> /s)	11.6	11.6
Target Release Rate <sup>4</sup> (m <sup>3</sup> /s)		1.56
Time Required to Discharge the Total Runoff (days)		3

<sup>1</sup> Based on Stormwater Management Guidelines for Alberta (1999)

<sup>2</sup> Tc is equal to 30 min for both catchment areas (IDF data from IDF\_CC Tool for the project location)

<sup>3</sup> Calculated using the Rational Method.

<sup>4</sup> Based on allowed release rate 7 L/s/ha (Sturgeon County)

## 6.0 Operation and Maintenance

The stormwater management system will be operated in accordance with Stormwater Management Guidelines (Alberta Government, 1999) standards. Pond water level will be kept as low as possible by releasing water at least 1 day after each storm to allow for sedimentation. A log of pond water level and release rates will be recorded daily. Additional testing may be required for unusual conditions. Periodic testing and regular maintenance will be required to manage sediment in the ponds as per future Water Act approvals.

SWMF operations will be:

- Gate closed during normal operations.
- Gate open after a storm, after testing to ensure acceptable water quality.

West Pond operations will be:

- Culvert outlet is open and uncontrolled during normal operations.
- Pond will be pumped dry after a storm, subject to storage capacity and water quality conditions at the SWMF.

Contingency pond operations will be:

- No inflow during small storms, with local rainfall accumulation only.
- Uncontrolled inflow during large storms.
- Pond will be pumped dry after a storm, subject to storage capacity and water quality conditions at the SWMF.

The ponds will require maintenance, including periodic sediment removal during their operational life. This will be accomplished in the fall by drawing the pond down and using an excavator to remove deposited sediment as required.

Ditches may require maintenance each year to remove sediment, debris, and vegetation as needed to maintain the conveyance capacity of the ditch.

Culverts will be maintained by removing sediment after the conveyance capacity has been reduced by 30%.

Temporary pump systems will be deployed as needed to drain the Contingency Pond. The West Pond and East Pond are expected to drain slowly by gravity over a span of about 2 days or longer.

The Perimeter Ditch containment berm along the south side of the rail loop will be inspected each year.

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## 7.0 Water Quality Monitoring Plan

Water quality will be monitored as per approval conditions based on sampling of water quality at each of the ponds and borrow source area, assuming that there will be ponded water at each location. The preferred mitigation or combination of mitigations for dealing with high TSS concentrations will be developed based on ongoing operating experience. The first preference will be to hold the water until water quality is acceptable.

Water quality sample analysis (as per approval conditions) along with any inspection and maintenance records will be kept on site. Data will be managed in a consistent manner to allow for effective analysis and comparison to baseline conditions.

If water quality monitoring reporting is deemed necessary based on future regulatory approvals, this could take the form of monthly, quarterly, or annual reporting of all water quality monitoring records plus a summary.

---

## 8.0 Closure

This report was prepared by Clifton Engineering Group Inc. for the use of CANDO Rail & Terminals Ltd. for specific application to the CANDO Sturgeon West and East Terminal.

This report has been prepared in accordance with generally accepted engineering practice common to the local area. No other warranty, express or implied is made. The discussion and recommendations within this report were prepared in accordance with the standard care of stormwater management practice at the time of the report preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Clifton Engineering Group Inc. accepts no responsibility for damages, if any, suffered by any third party because of decisions made or actions based on this report.

Site information was obtained from the sources listed in the report and from interviews with individuals. Clifton Engineering Group Inc. accepts no responsibility for any deficiencies or inaccuracies in the information provided in this report that are the direct result of intentional or unintentional misrepresentations, errors or omissions of the persons interviewed or information reviewed.

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## 9.0 References

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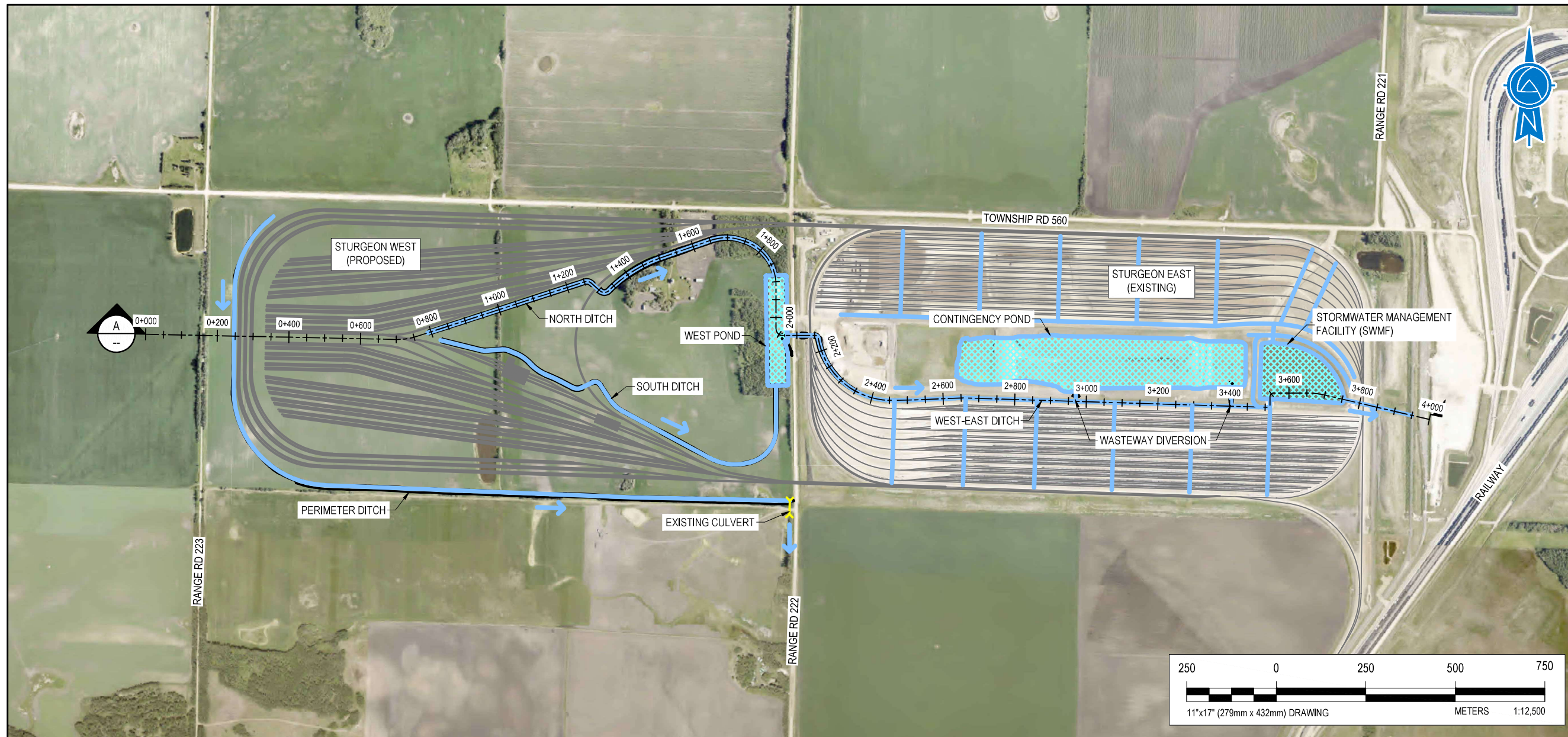
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# Appendix A

## Drawings



**Clifton**

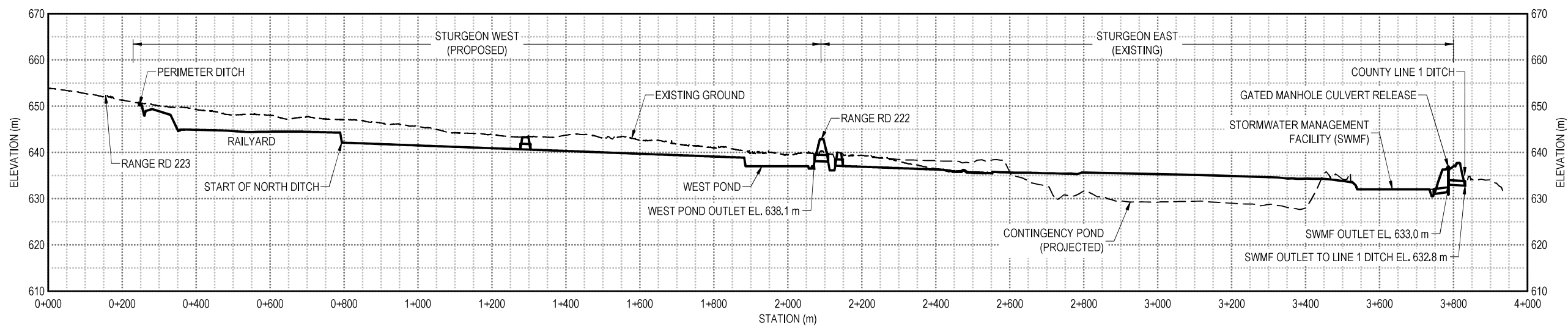


**LEGEND**  
 DRAINAGE NETWORK ———

**NOTE:**  
 STURGEON WEST STORMWATER MANAGEMENT TO BE INTEGRATED WITH THE EXISTING STURGEON EAST RAIL TERMINAL STORMWATER MANAGEMENT PLAN, RESULTING IN A SINGLE OUTLET AT THE EXISTING SWMF FOR BOTH THE WEST AND EAST RAIL TERMINALS.

REFERENCE(S):  
 • ESRI WORLD IMAGERY DATED JUNE 20, 2021.

DRAWING REVISIONS			
REV	DESCRIPTION	BY	DATE
B	ISSUED FOR REVIEW	MB	2024-02-16



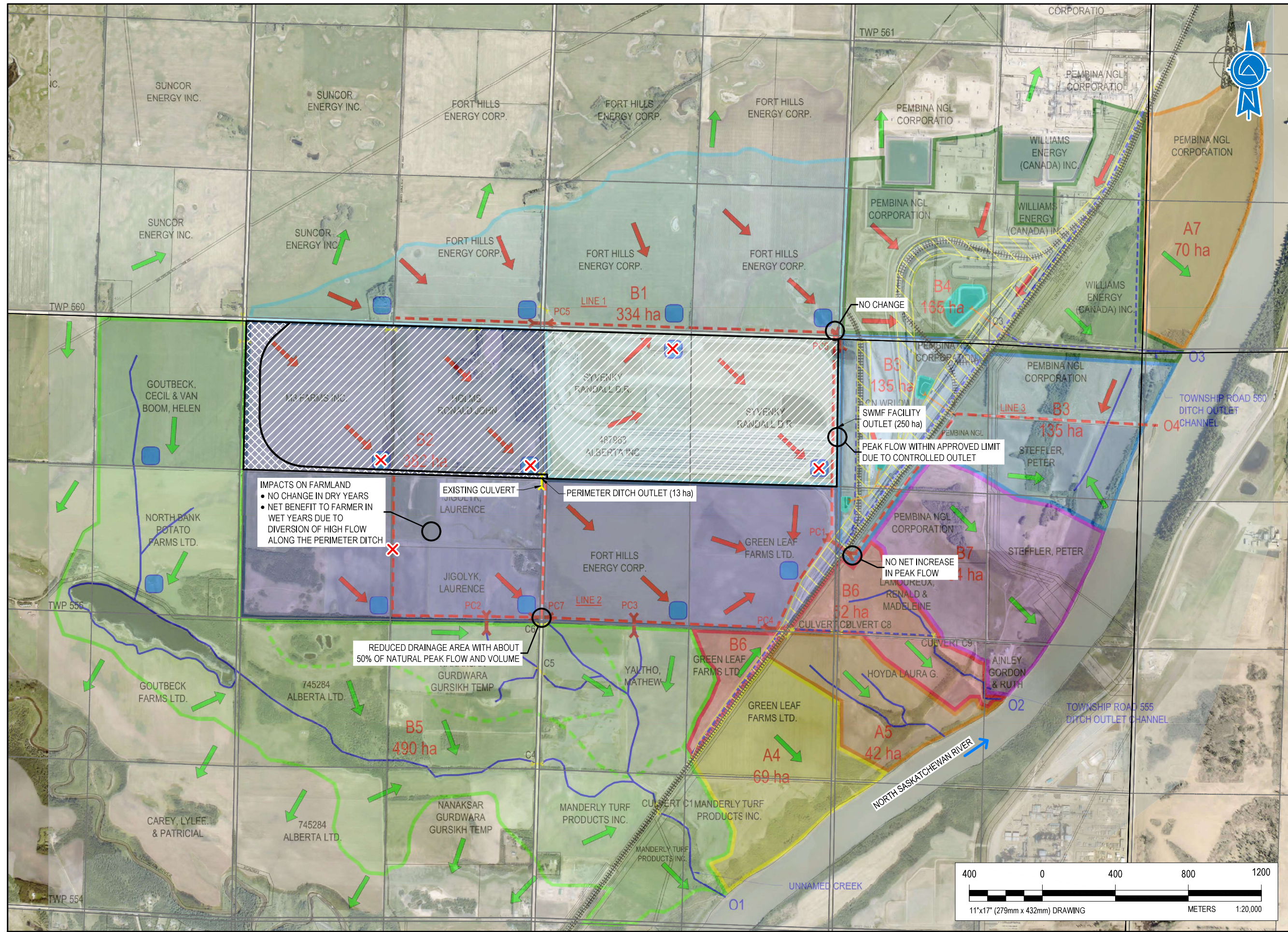
**DRAINAGE PROFILE** A  
 H 1:12,500  
 V 1:1,000

CLIENT: CANDO RAIL & TERMINALS

PROJECT: STURGEON WEST SURFACE WATER MANAGEMENT PLAN

DRAWING NAME: GENERAL ARRANGEMENT

DSGN. BY	MB	SCALE	AS SHOWN	DATE	2024-02-16
DWN. BY	ZS	PROJECT NO.	CG3821	DWG. NO.	CG3821,001
REV. BY	MB	FILE NO.	W-CG3821-DA	SHEET NO.	1 OF 7



**EXISTING COUNTY REGIONAL DRAINAGE PLAN**

- PROPOSED BASIN BOUNDARY (BY COLOUR)
- PROPOSED REDWATER SOUTH RAIL YARD EXPANSION
- PROPOSED DRAINAGE DIRECTION
- PROPOSED PEMBINA SWMF LOCATION
- RECOMMENDED SWMF LOCATION
- PROPOSED DRAINAGE DITCH
- PROPOSED CULVERT
- PROPOSED PEMBINA SITE CULVERT
- EXISTING DRAINAGE DIRECTION
- EXISTING DRAINAGE DITCH
- EXISTING DRAINAGE PATH
- EXISTING RAIL LINE
- EXISTING CULVERT

**IMPACTS ON THE EXISTING PLAN**

- NO LONGER REQUIRED
- STURGEON WEST AND EAST RAIL YARD AREA
- STURGEON WEST PERIMETER DITCH AREA

REFERENCE(S):  
 • ESRI WORLD IMAGERY DATED JUNE 20, 2021.  
 • SAMENG INC. "STORMWATER MANAGEMENT PLAN FOR DRAINAGE BASIN 7 OF STURGEON INDUSTRIAL HEARTLAND" DATED APRIL 12, 2016, FIGURE 4-1 PROPOSED POST-DEVELOPMENT DRAINAGE MANAGEMENT PLAN.

DRAWING REVISIONS			
REV	DESCRIPTION	BY	DATE
B	ISSUED FOR REVIEW	MB	2024-02-16

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CLIENT: CANDO RAIL & TERMINALS

PROJECT: STURGEON WEST SURFACE WATER MANAGEMENT PLAN

DRAWING NAME: IMPACTS ON REGIONAL DRAINAGE

DSGN. BY: MB	SCALE: 1:20,000	DATE: 2024-02-16
DWN. BY: ZS	PROJECT NO.: CG3821	DWG. NO.: CG3821.002
REV. BY: MB	FILE NO.: W-CG3821-DA	SHEET NO.: 2 OF 7



**LEGEND**

EXISTING GROUND (1 m MINOR, 5 m MAJOR)	
DESIGN GRADE (1 m MINOR, 5 m MAJOR)	

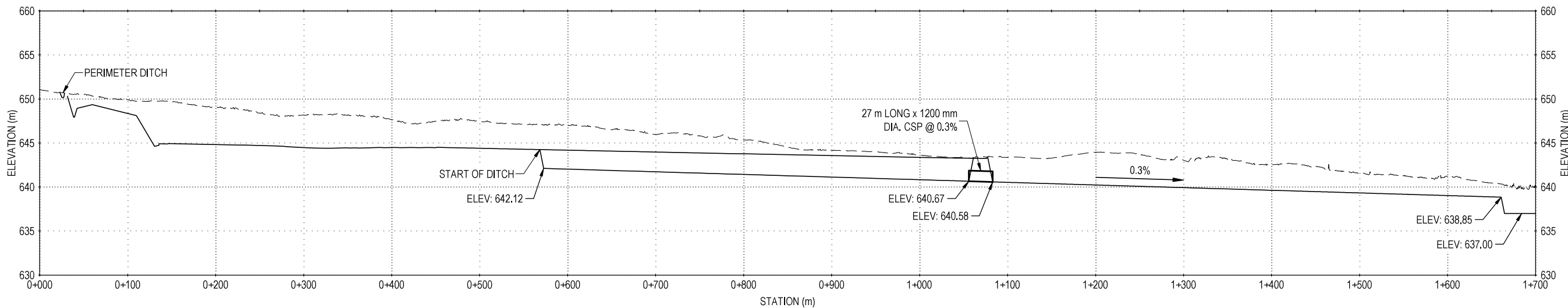
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- ESRI WORLD IMAGERY DATED JUNE 20, 2021.
  - EXISTING GROUND TOPOGRAPHY DATED 2023.

**DRAWING REVISIONS**

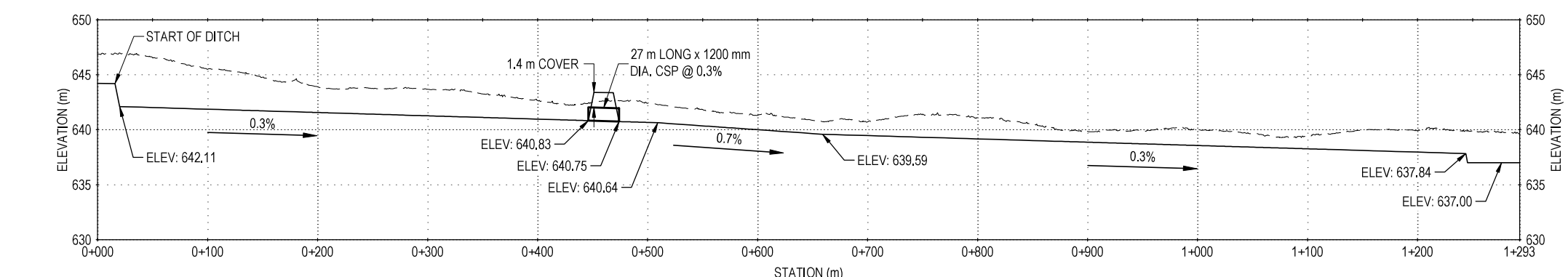
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B	ISSUED FOR REVIEW	MB	2024-02-16
A	ISSUED FOR REVIEW	MB	2023-11-16



CLIENT	CANDO RAIL & TERMINALS		
PROJECT	STURGEON WEST SURFACE WATER MANAGEMENT PLAN		
DRAWING NAME	GENERAL ARRANGEMENT		
DSGN. BY	MB	SCALE	1:5000
DWN. BY	ZS	PROJECT NO.	CG3821
REV. BY	MB	FILE NO.	W-CG3821-GA
		DWG. NO.	CG3821,003
		SHEET NO.	3 OF 7



**NORTH DITCH**  
 H 1:5000  
 V 1:500



**SOUTH DITCH**  
 H 1:5000  
 V 1:500

GRADATION		HEAVY ROCK RIPRAP CLASS
REQUIRED PROPERTIES	UNITS	1M
NOMINAL MASS	KG	7
NOMINAL DIAMETER	mm	175
NONE GREATER THAN	KG	40
	mm	300
20% TO 50%	KG	10
	mm	200
50% TO 80%	KG	7
	mm	175
100% GREATER THAN	KG	3
	mm	125

**LEGEND**

EXISTING GROUND

DESIGN GRADE

RIPRAP

**DEFINITIONS**

RIPRAP = CLASS 1M RIPRAP AS PER ALBERTA TRANSPORTATION.

**NOTE:**

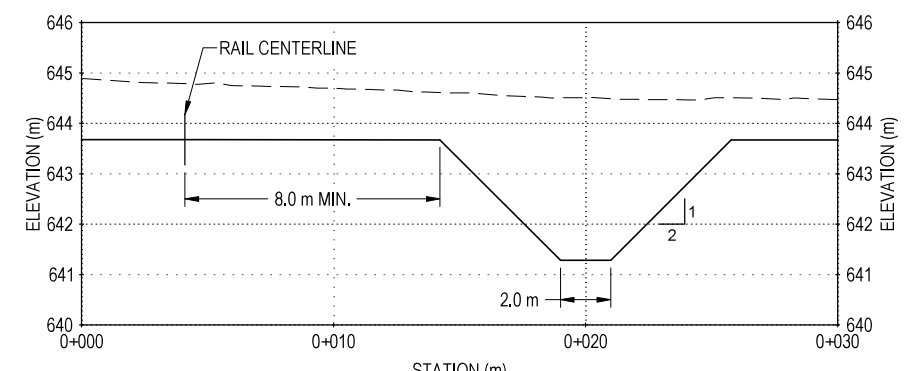
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**REFERENCE(S):**

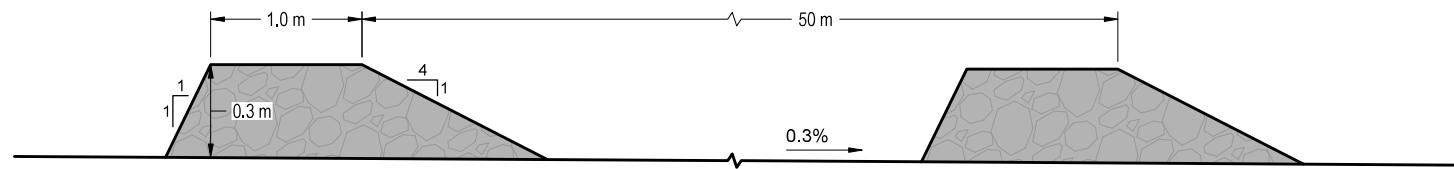
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- ALBERTA TRANSPORTATION SPECIFICATIONS FOR BRIDGE CONSTRUCTION, SECTION 10, HEAVY ROCK RIPRAP.

**DRAWING REVISIONS**

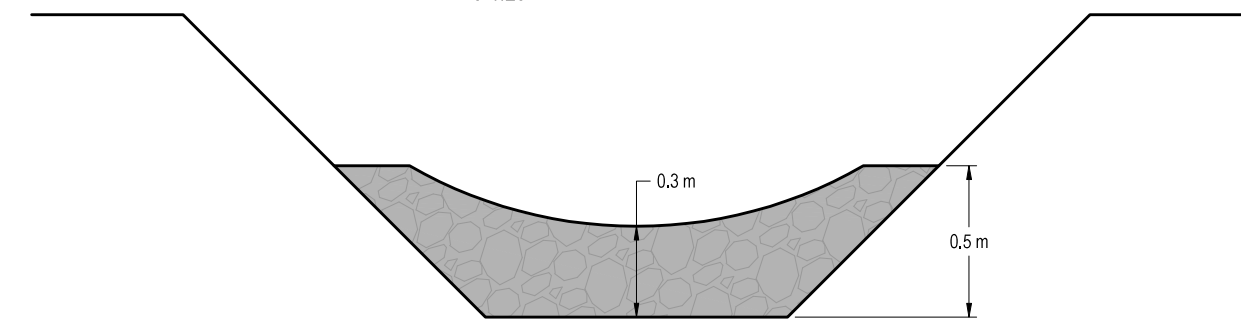
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B	ISSUED FOR REVIEW	MB	2024-02-16
A	ISSUED FOR REVIEW	MB	2023-11-16



**TYPICAL DITCH SECTION**  
 H 1:300  
 V 1:150



**TYPICAL ROCK CHECK PROFILE**  
 H 1:50  
 V 1:25



**TYPICAL ROCK CHECK SECTION**  
 H 1:50  
 V 1:25

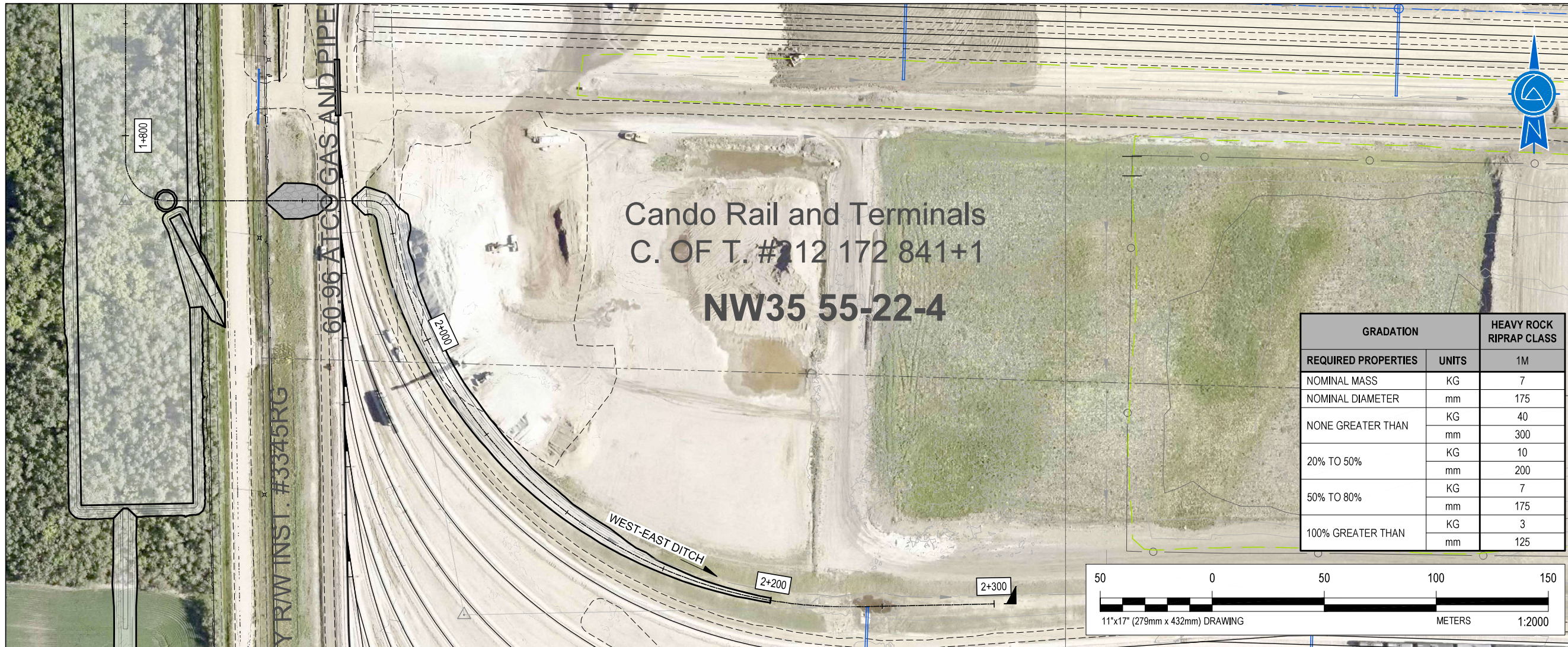


**CLIENT**  
 CANDO RAIL & TERMINALS

**PROJECT**  
 STURGEON WEST SURFACE WATER MANAGEMENT PLAN

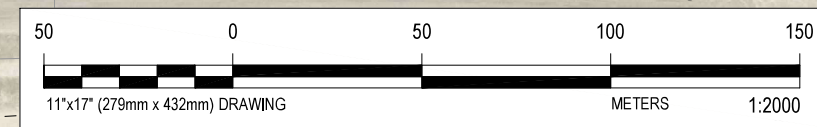
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DWN BY	PROJECT NO.	DWG. NO.	
ZS	CG3821	CG3821.004	
REV BY	FILE NO.	SHEET NO.	
MB	W-CG3821-GA	4 OF 7	



Cando Rail and Terminals  
C. OF T. #212 172 841+1  
**NW35 55-22-4**

GRADATION		HEAVY ROCK RIPRAP CLASS
REQUIRED PROPERTIES	UNITS	1M
NOMINAL MASS	KG	7
NOMINAL DIAMETER	mm	175
NONE GREATER THAN	KG	40
	mm	300
20% TO 50%	KG	10
	mm	200
50% TO 80%	KG	7
	mm	175
100% GREATER THAN	KG	3
	mm	125



**LEGEND**

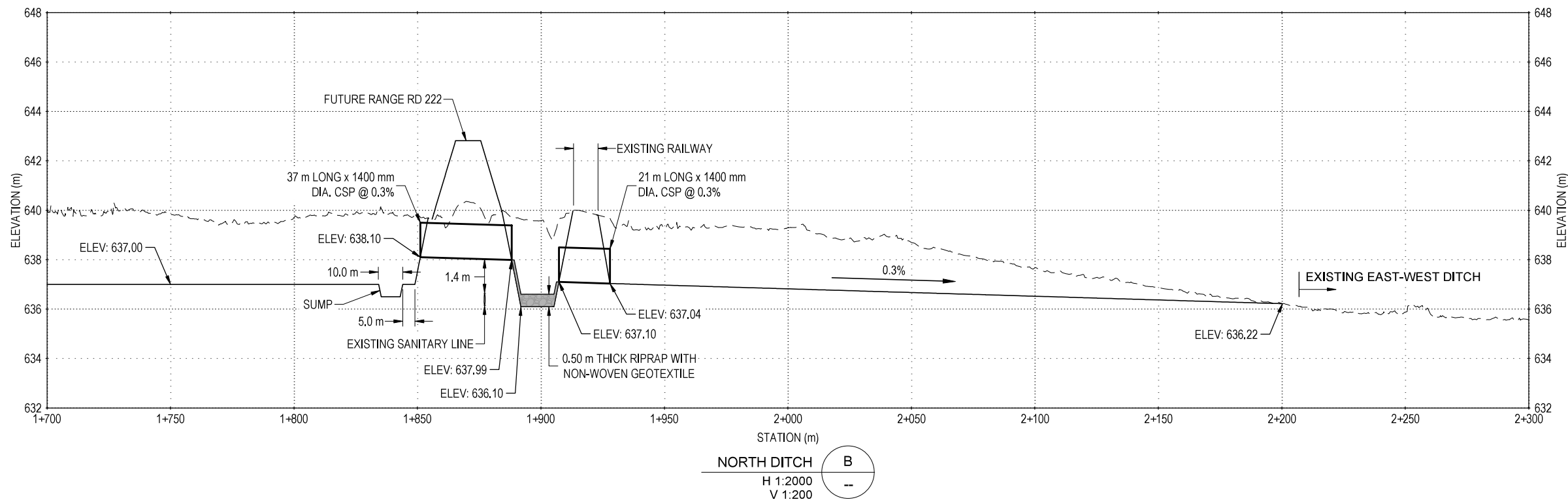
EXISTING GROUND (1 m MINOR, 5 m MAJOR)	
DESIGN GRADE (1 m MINOR, 5 m MAJOR)	
RIPRAP	
EXISTING SUBDRAIN	
EXISTING GROUND	
DESIGN GRADE	

**DEFINITIONS**  
RIPRAP = CLASS 1M RIPRAP AS PER ALBERTA TRANSPORTATION.

- REFERENCE(S):**
- ESRI WORLD IMAGERY DATED JUNE 20, 2021.
  - STURGEON WEST EXISTING GROUND TOPOGRAPHY DATED 2023.
  - STURGEON EAST EXISTING GROUND TOPOGRAPHY DATED 2022.
  - ALBERTA TRANSPORTATION SPECIFICATIONS FOR BRIDGE CONSTRUCTION, SECTION 10, HEAVY ROCK RIPRAP.

**DRAWING REVISIONS**

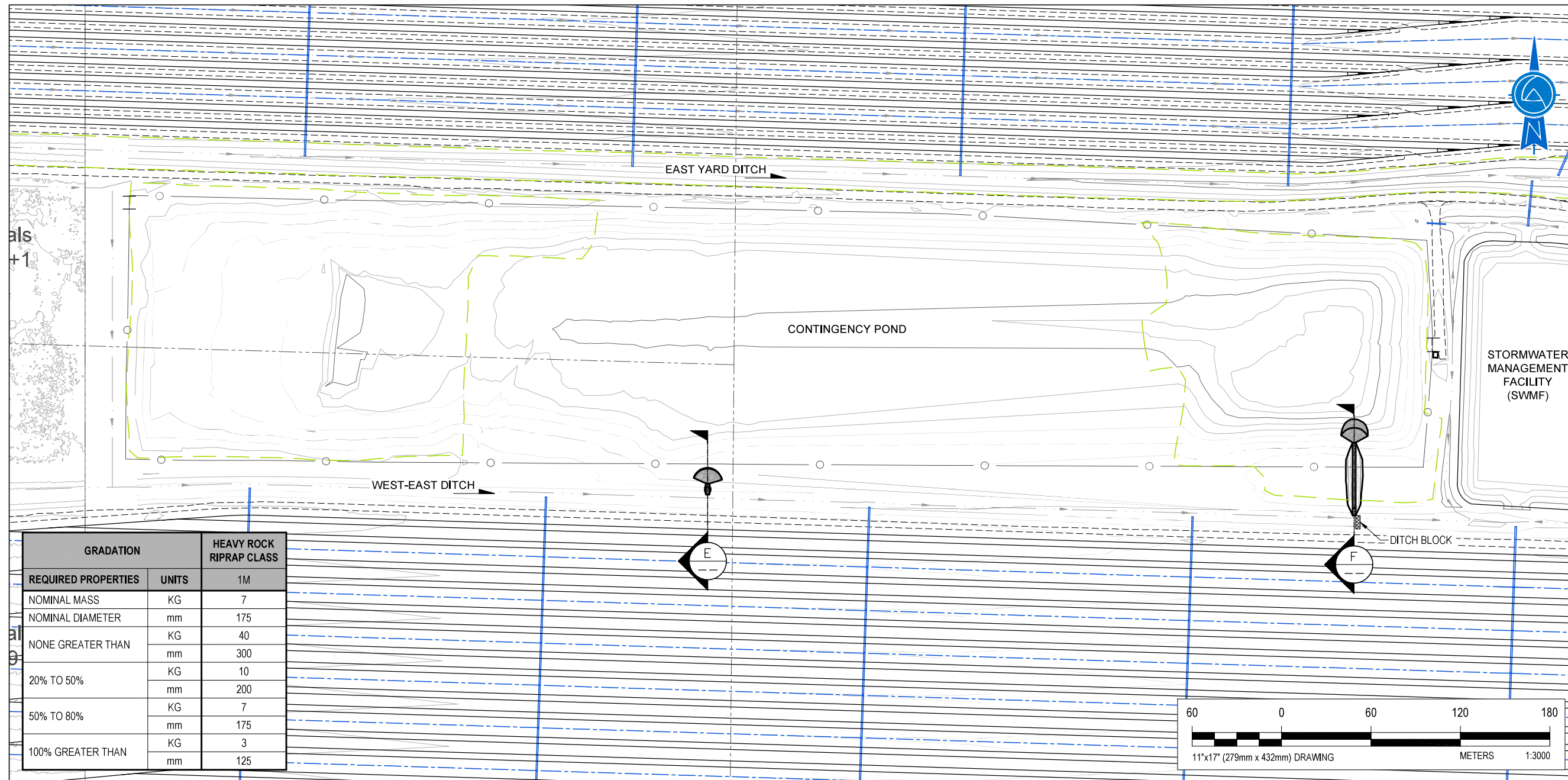
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A	ISSUED FOR REVIEW	MB	2023-11-16



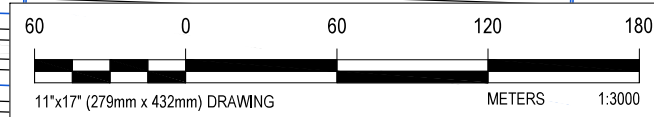
**NORTH DITCH**  
H 1:2000  
V 1:200



<b>CLIENT</b> CANDO RAIL & TERMINALS			
<b>PROJECT</b> STURGEON WEST SURFACE WATER MANAGEMENT PLAN			
<b>DRAWING NAME</b> RANGE RD 222 CROSSING			
DSGN. BY	MB	SCALE	AS SHOWN
DWN. BY	ZS	PROJECT NO.	CG3821
REV. BY	MB	FILE NO.	W-CG3821-GA
		DATE	2024-02-16
		DWG. NO.	CG3821,005
		SHEET NO.	5 OF 7



GRADATION		HEAVY ROCK RIPRAP CLASS
REQUIRED PROPERTIES	UNITS	1M
NOMINAL MASS	KG	7
NOMINAL DIAMETER	mm	175
NONE GREATER THAN	KG	40
	mm	300
20% TO 50%	KG	10
	mm	200
50% TO 80%	KG	7
	mm	175
100% GREATER THAN	KG	3
	mm	125

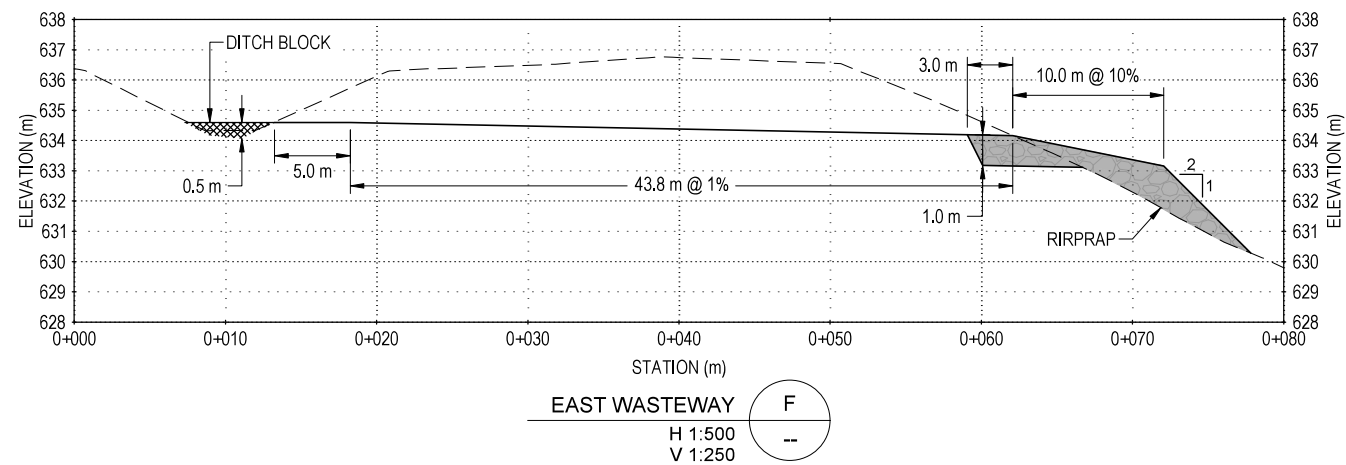
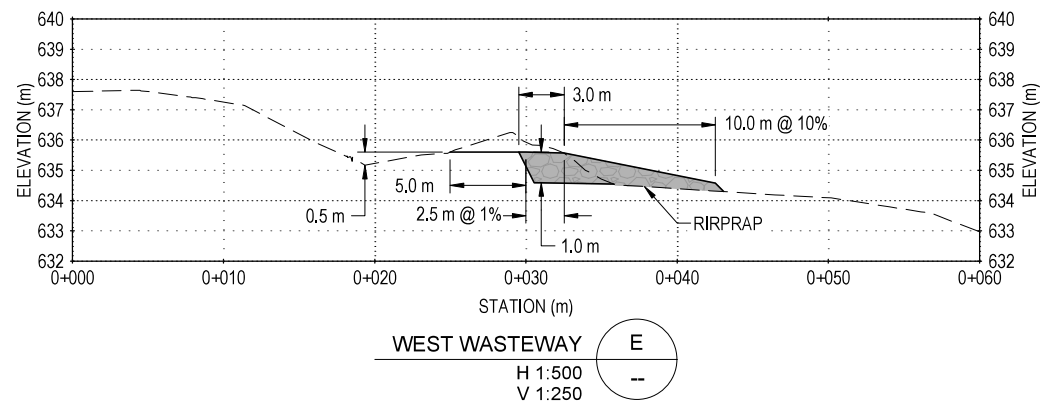


- LEGEND**
- EXISTING GROUND (1 m MINOR, 5 m MAJOR)
  - RIPRAP
  - EXISTING SUBDRAIN
  - EXISTING GROUND
  - DESIGN GRADE
- DEFINITIONS**
- RIPRAP = CLASS 1M RIPRAP AS PER ALBERTA TRANSPORTATION.

- REFERENCE(S):**
- ESRI WORLD IMAGERY DATED JUNE 20, 2021.
  - EXISTING GROUND TOPOGRAPHY DATED 2022.
  - ALBERTA TRANSPORTATION SPECIFICATIONS FOR BRIDGE CONSTRUCTION, SECTION 10, HEAVY ROCK RIPRAP.

**DRAWING REVISIONS**

REV	DESCRIPTION	BY	DATE
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A	ISSUED FOR REVIEW	MB	2023-11-16

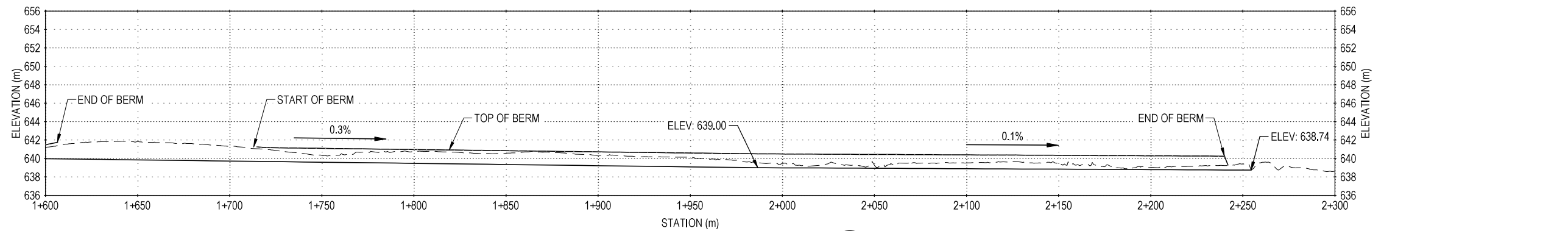
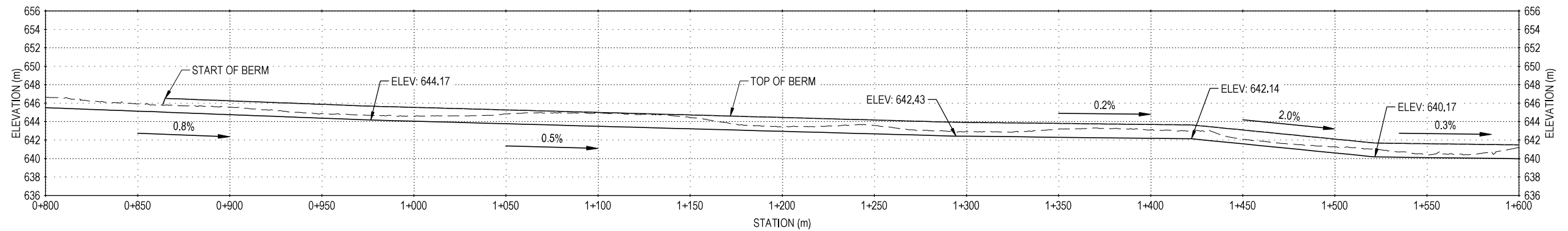
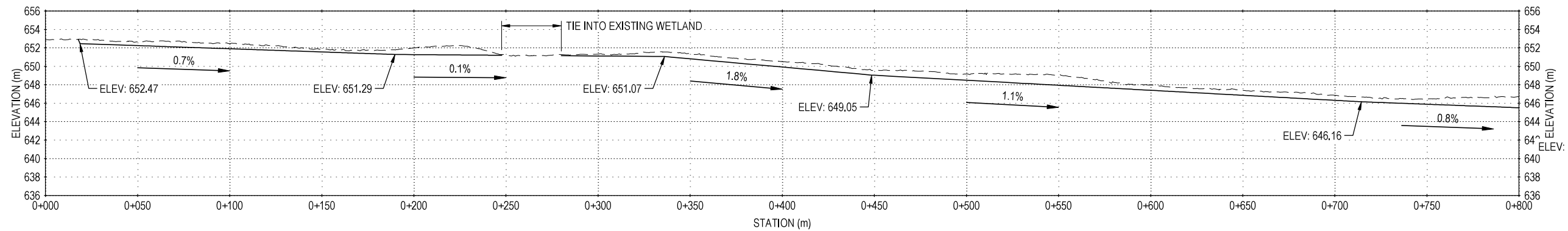


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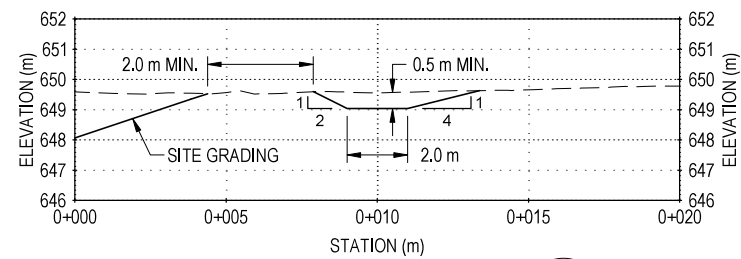
**PROJECT** STURGEON WEST SURFACE WATER MANAGEMENT PLAN

**DRAWING NAME** CONTINGENCY POND DETAILS

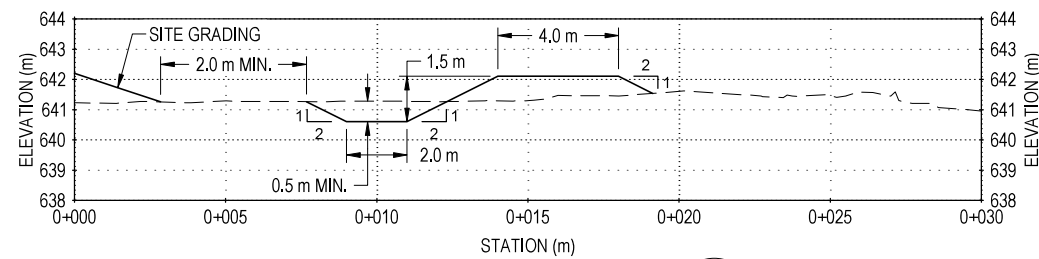
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REV BY	MB	FILE NO.	W-CG3821-GA	SHEET NO.	6 OF 7



PERIMETER DITCH G  
3  
H 1:2500  
V 1:250



WEST PERIMETER DITCH SECTION H  
3  
1:250



SOUTH PERIMETER DITCH SECTION I  
3  
1:250

LEGEND

EXISTING GROUND (1 m MINOR, 5 m MAJOR)	
DESIGN GRADE (1 m MINOR, 5 m MAJOR)	
EXISTING GROUND	
DESIGN GRADE	

REFERENCE(S):  
• STURGEON WEST EXISTING GROUND TOPOGRAPHY DATED 2023.

DRAWING REVISIONS			
REV	DESCRIPTION	BY	DATE
B	ISSUED FOR REVIEW	MB	2024-02-16
A	ISSUED FOR REVIEW	MB	2023-11-16



CLIENT	CANDO RAIL & TERMINALS		
PROJECT	STURGEON WEST SURFACE WATER MANAGEMENT PLAN		
DRAWING NAME	PERIMETER DITCH PROFILE AND SECTION		
DSGN. BY	MB	SCALE	AS SHOWN
DWN. BY	ZS	PROJECT NO.	CG3821
REV. BY	MB	FILE NO.	W-CG3821-GA
		DWG. NO.	CG3821.007
		SHEET NO.	7 OF 7
		DATE	2024-02-16



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**Regina Office**

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**Saskatoon Office**

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T (306) 975-0401

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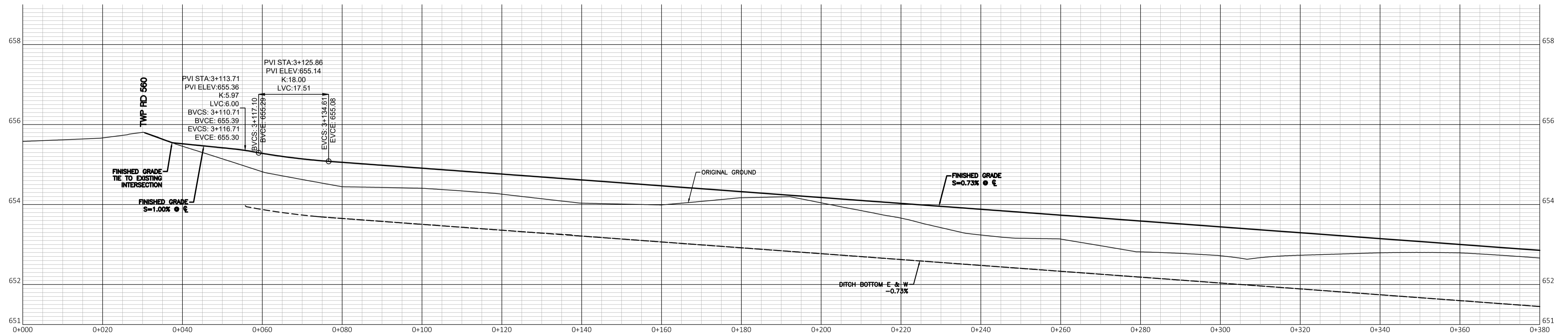
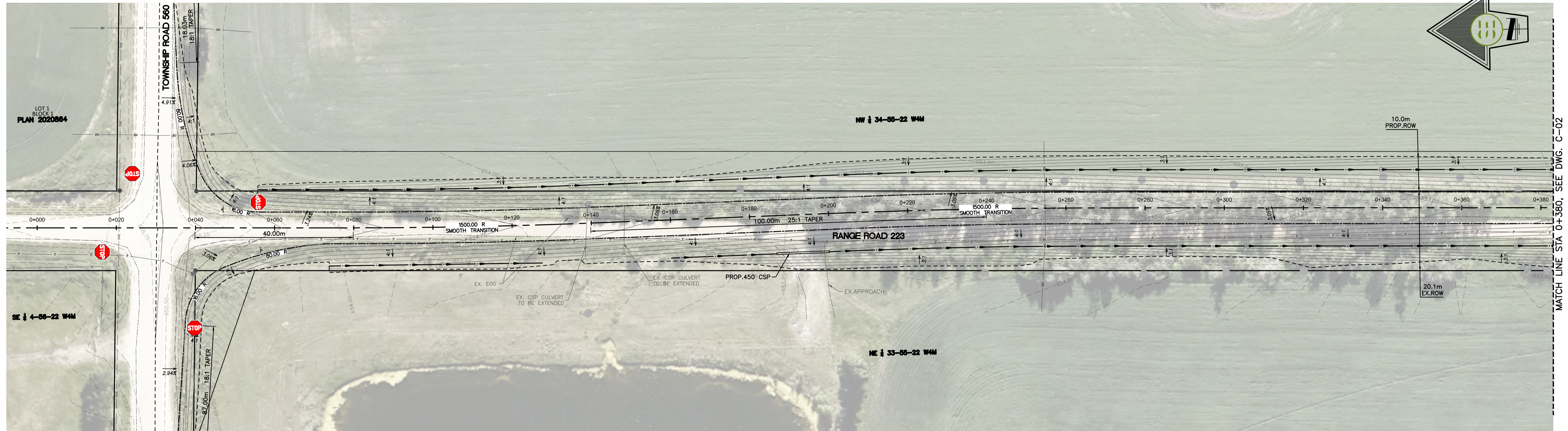
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# Appendix C

## Preliminary Bypass Road Design



Clifton



**LEGEND**

- |       |  |   |                                    |       |  |
|-------|--|---|------------------------------------|-------|--|
| —     | INDICATES EXISTING PROPERTY LINE               | — | INDICATES EXISTING CULVERT         | —     | INDICATES PROPOSED RIGHT OF WAY                |
| - - - | INDICATES EXISTING RIGHT OF WAY                | — | INDICATES EXISTING UTILITY BOX     | - - - | INDICATES PROPOSED DAYLIGHT LINE               |
| - - - | INDICATES EXISTING GROUND CONTOURS & ELEVATION | — | INDICATES EXISTING SIGN            | - - - | INDICATES PROPOSED EDGE OF GRAVEL              |
| - - - | INDICATES EXISTING EDGE OF GRAVEL              | — | INDICATES EXISTING GUY ANCHOR POLE | - - - | INDICATES PROPOSED DITCH FLOWLINE              |
| - - - | INDICATES EXISTING BARBED WIRE FENCE           | — | INDICATES EXISTING POWER POLE      | - - - | INDICATES PROPOSED GROUND CONTOURS & ELEVATION |
| - - - | INDICATES EXISTING TREE/BUSH LINE              | — | INDICATES EXISTING FOUND IRON PIN  | - - - |  |
| - - - | INDICATES EXISTING OVERHEAD POWER LINE         | — | INDICATES EXISTING TREE            |       |  |
| - - - | INDICATES EXISTING HIGH PRESSURE GAS LINE      |   |                                    |       |  |
| - - - | INDICATES EXISTING TELECOMMUNICATION LINE      |   |                                    |       |  |

**ISSUED FOR CLIENT REVIEW**

**NOT FOR CONSTRUCTION**

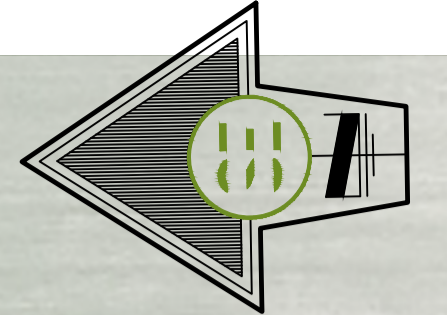
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No.	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	DES	CHK	APP'D
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
C	23/12/14	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
B	23/11/24	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
A	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL

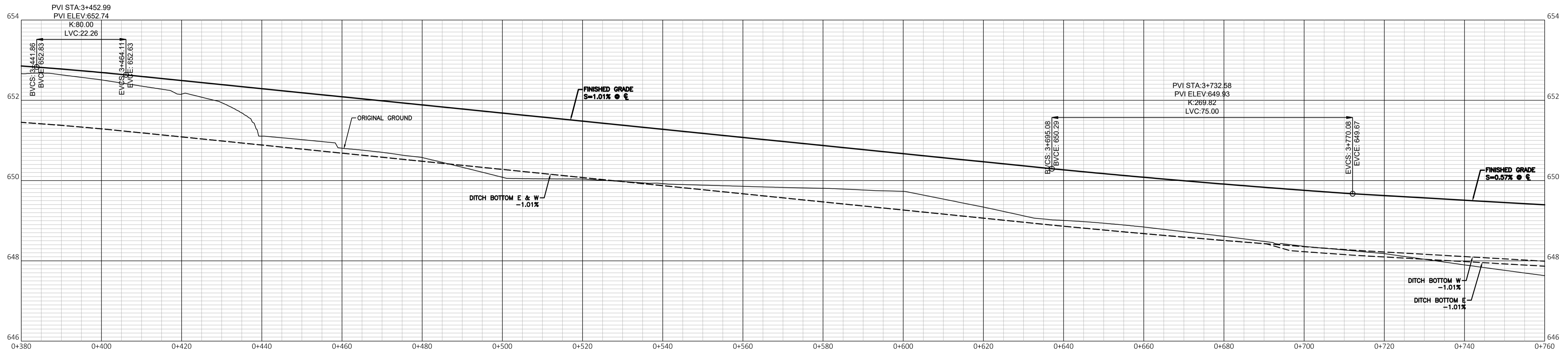
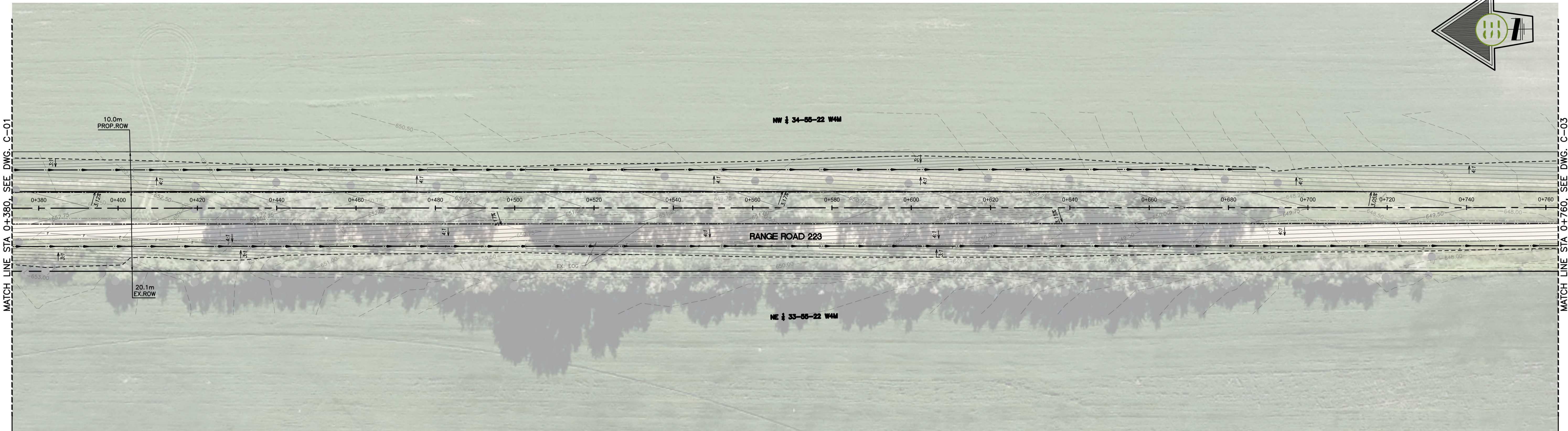


<b>CANDO RANGE ROAD 222 BYPASS</b> STURGEON COUNTY, ALBERTA PLAN & PROFILE STATION 0+000 TO 0+380			ISSUE/REVISION C
SCALE: H=1:500 V=1:50			DRAWING NO. <b>C-1</b>
PROJECT NO: SEI.23.128	FILE NAME: SEI.23.128 - 30%.dwg	SHEET 01 OF 11	



MATCH LINE STA 0+380, SEE DWG. C-01

MATCH LINE STA 0+760, SEE DWG. C-03



**LEGEND**

—	INDICATES PROPERTY LINE	—	INDICATES EXISTING CULVERT	—	INDICATES PROPOSED RIGHT OF WAY
- - -	INDICATES EXISTING RIGHT OF WAY	■	INDICATES EXISTING UTILITY BOX	- - -	INDICATES PROPOSED DAYLIGHT LINE
- - - 10.36.25	INDICATES EXISTING GROUND CONTOURS & ELEVATION	+	INDICATES EXISTING SIGN	- - -	INDICATES PROPOSED EDGE OF GRAVEL
- - -	INDICATES EXISTING EDGE OF GRAVEL	⊙	INDICATES EXISTING GUY ANCHOR POLE	- - -	INDICATES PROPOSED DITCH FLOWLINE
x x x	INDICATES EXISTING BARBED WIRE FENCE	●	INDICATES EXISTING POWER POLE	- - -	INDICATES PROPOSED GROUND CONTOURS & ELEVATION
~ ~ ~	INDICATES EXISTING TREE/BUSH LINE	○	INDICATES EXISTING FOUND IRON PIN		
- - -	INDICATES EXISTING OVERHEAD POWER LINE	●	INDICATES EXISTING TREE		
- - -	INDICATES EXISTING HIGH PRESSURE GAS LINE				
- - -	INDICATES EXISTING TELECOMMUNICATION LINE				

**ISSUED FOR CLIENT REVIEW**

**NOT FOR CONSTRUCTION**

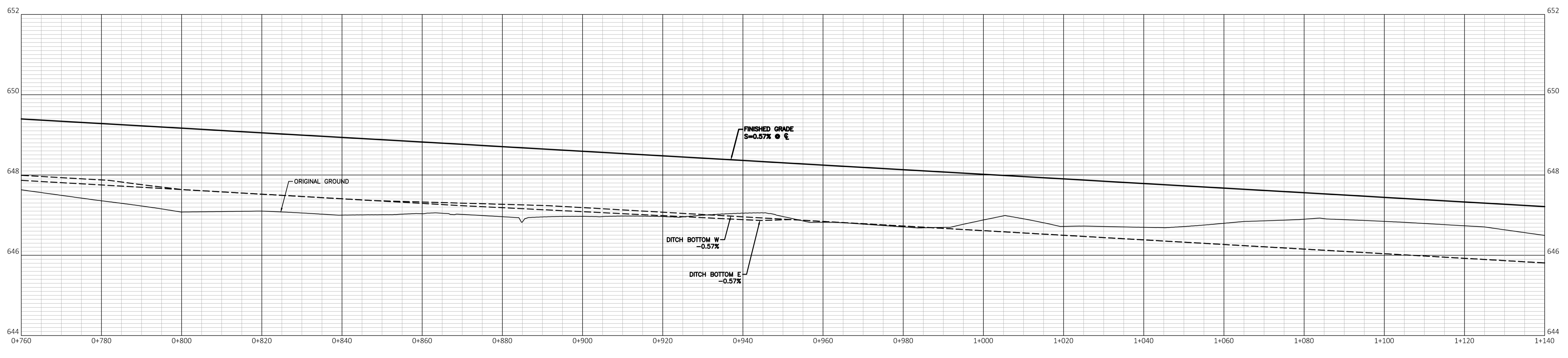
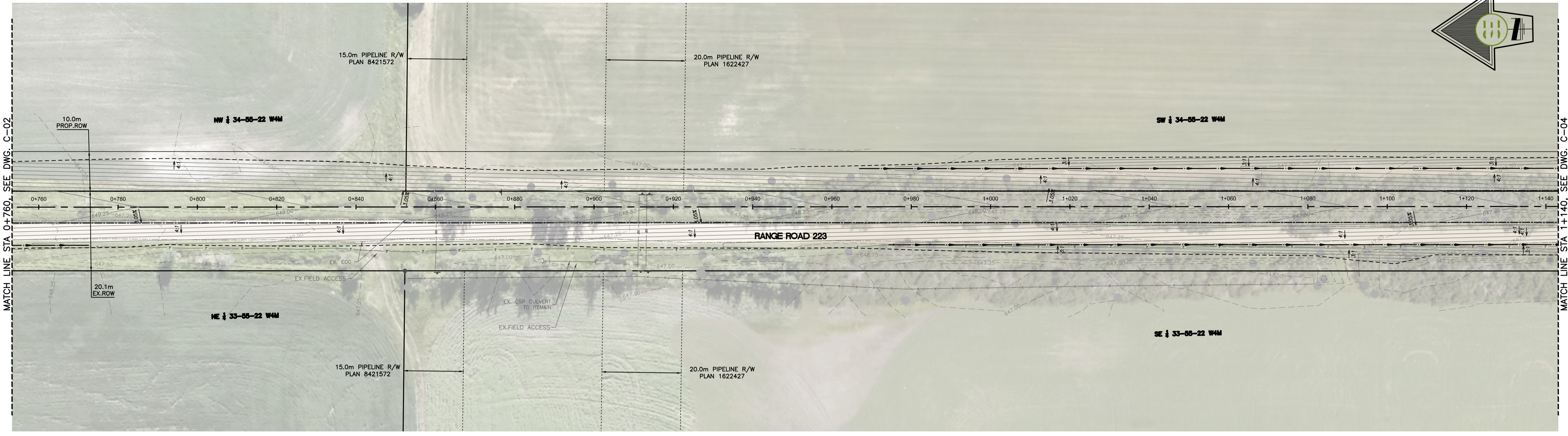
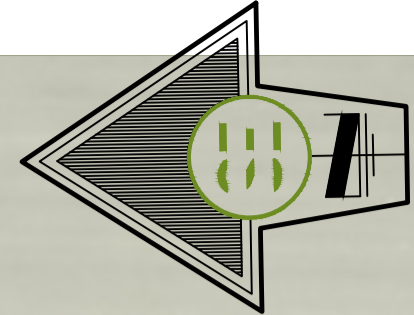
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C	23/12/14	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
B	23/11/24	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
A	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL



<b>CANDO RANGE ROAD 222 BYPASS</b> STURGEON COUNTY, ALBERTA PLAN & PROFILE STATION 0+380 TO 0+760			ISSUE/REVISION C
			DRAWING NO. <b>C-02</b>
SCALE: H=1:500 V=1:50	PROJECT NO: SEI.23.128	FILE NAME: SEI.23.128 - 30%.dwg	SHEET 02 OF 11

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**LEGEND**

—	INDICATES PROPERTY LINE	—	INDICATES EXISTING CULVERT	—	INDICATES PROPOSED RIGHT OF WAY
- - -	INDICATES EXISTING RIGHT OF WAY	■	INDICATES EXISTING UTILITY BOX	- - -	INDICATES PROPOSED DAYLIGHT LINE
- - - 10.36.25 - - -	INDICATES EXISTING GROUND CONTOURS & ELEVATION	+	INDICATES EXISTING SIGN	- - -	INDICATES PROPOSED EDGE OF GRAVEL
- - -	INDICATES EXISTING EDGE OF GRAVEL	3	INDICATES EXISTING GUY ANCHOR POLE	- - -	INDICATES PROPOSED DITCH FLOWLINE
x x x x x	INDICATES EXISTING BARBED WIRE FENCE	●	INDICATES EXISTING FOUND POLE	- - -	INDICATES PROPOSED GROUND CONTOURS & ELEVATION
~ ~ ~	INDICATES EXISTING TREE/BUSH LINE	●	INDICATES EXISTING FOUND IRON PIN		
- - -	INDICATES EXISTING OVERHEAD POWER LINE	●	INDICATES EXISTING TREE		
- - -	INDICATES EXISTING HIGH PRESSURE GAS LINE	●			
- - -	INDICATES EXISTING TELECOMMUNICATION LINE				

**ISSUED FOR CLIENT REVIEW**

**NOT FOR CONSTRUCTION**

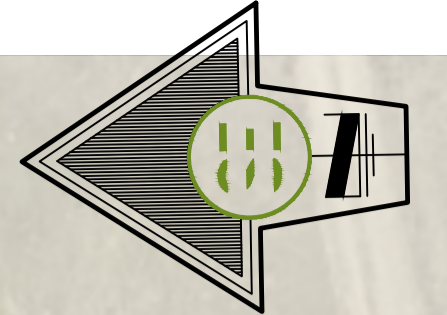
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B	23/11/24	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
A	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL



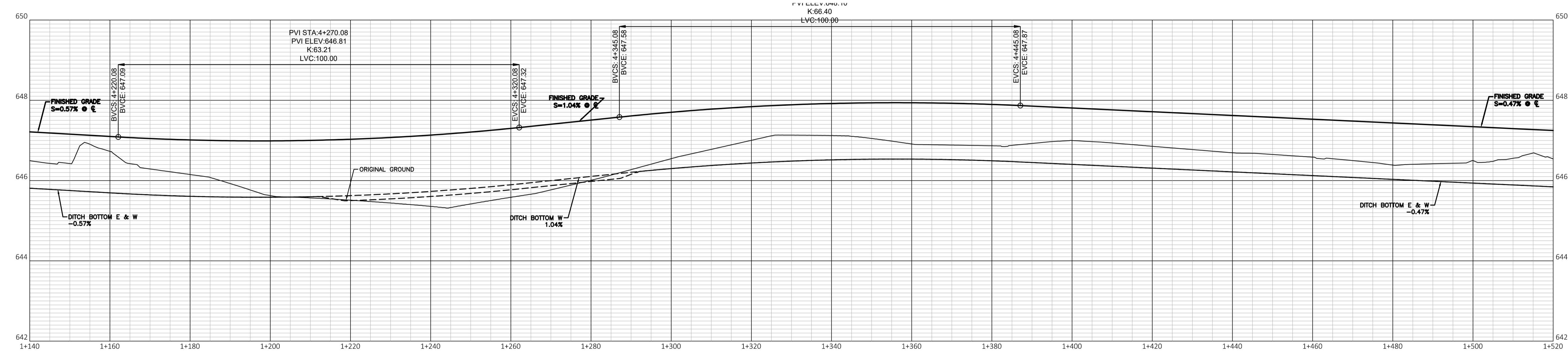
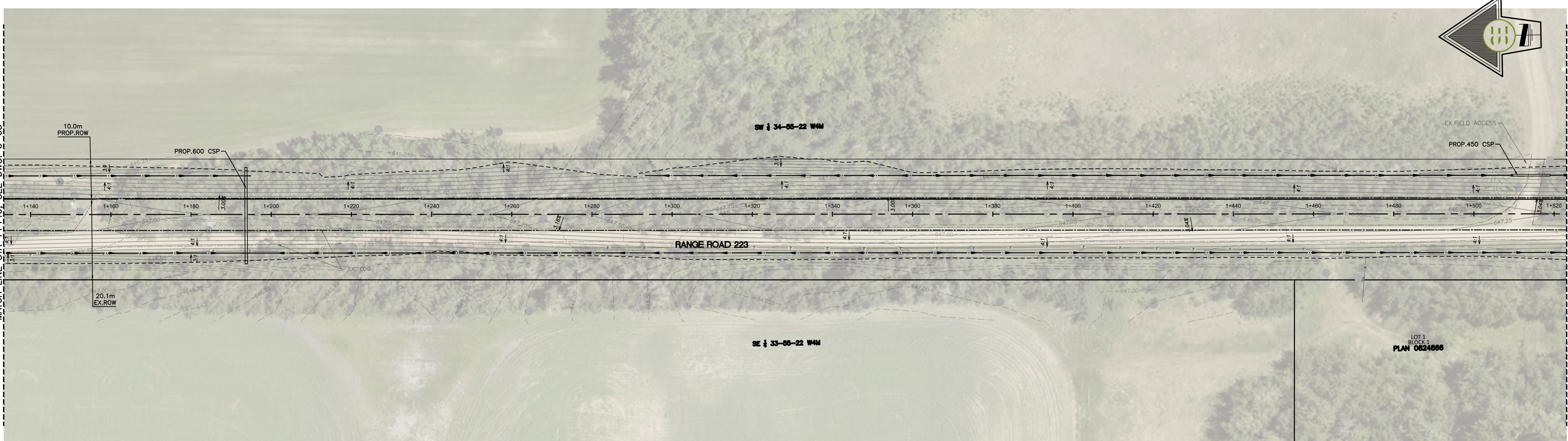
<b>CANDO RANGE ROAD 222 BYPASS</b> STURGEON COUNTY, ALBERTA PLAN & PROFILE STATION 0+760 TO 1+140			ISSUE/REVISION <b>C</b>
SCALE: H=1:500 V=1:50			DRAWING NO. <b>C-03</b>
PROJECT NO: SEI.23.128		SHEET 03 OF 11	
FILE NAME: SEI.23.128 - 30%.dwg			

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MATCH LINE STA 1+140, SEE DWG. C-03

MATCH LINE STA 1+520, SEE DWG. C-05



**LEGEND**

—	INDICATES PROPERTY LINE	—	INDICATES EXISTING CULVERT	—	INDICATES PROPOSED RIGHT OF WAY
- - - -	INDICATES EXISTING RIGHT OF WAY	■	INDICATES EXISTING UTILITY BOX	- - - -	INDICATES PROPOSED DAYLIGHT LINE
- - - - 10.36.25 - - - -	INDICATES EXISTING GROUND CONTOURS & ELEVATION	+	INDICATES EXISTING SIGN	- - - -	INDICATES PROPOSED EDGE OF GRAVEL
- - - -	INDICATES EXISTING EDGE OF GRAVEL	○	INDICATES EXISTING GUY ANCHOR POLE	- - - -	INDICATES PROPOSED DITCH FLOWLINE
x x x x	INDICATES EXISTING BARBED WIRE FENCE	●	INDICATES EXISTING POWER POLE	- - - -	INDICATES PROPOSED GROUND CONTOURS & ELEVATION
~ ~ ~ ~	INDICATES EXISTING TREE/BUSH LINE	○	INDICATES EXISTING FOUND IRON PIN		
- - - -	INDICATES EXISTING OVERHEAD POWER LINE	●	INDICATES EXISTING TREE		
—	INDICATES EXISTING HIGH PRESSURE GAS LINE				
- - - -	INDICATES EXISTING TELECOMMUNICATION LINE				

**ISSUED FOR CLIENT REVIEW**

**NOT FOR CONSTRUCTION**

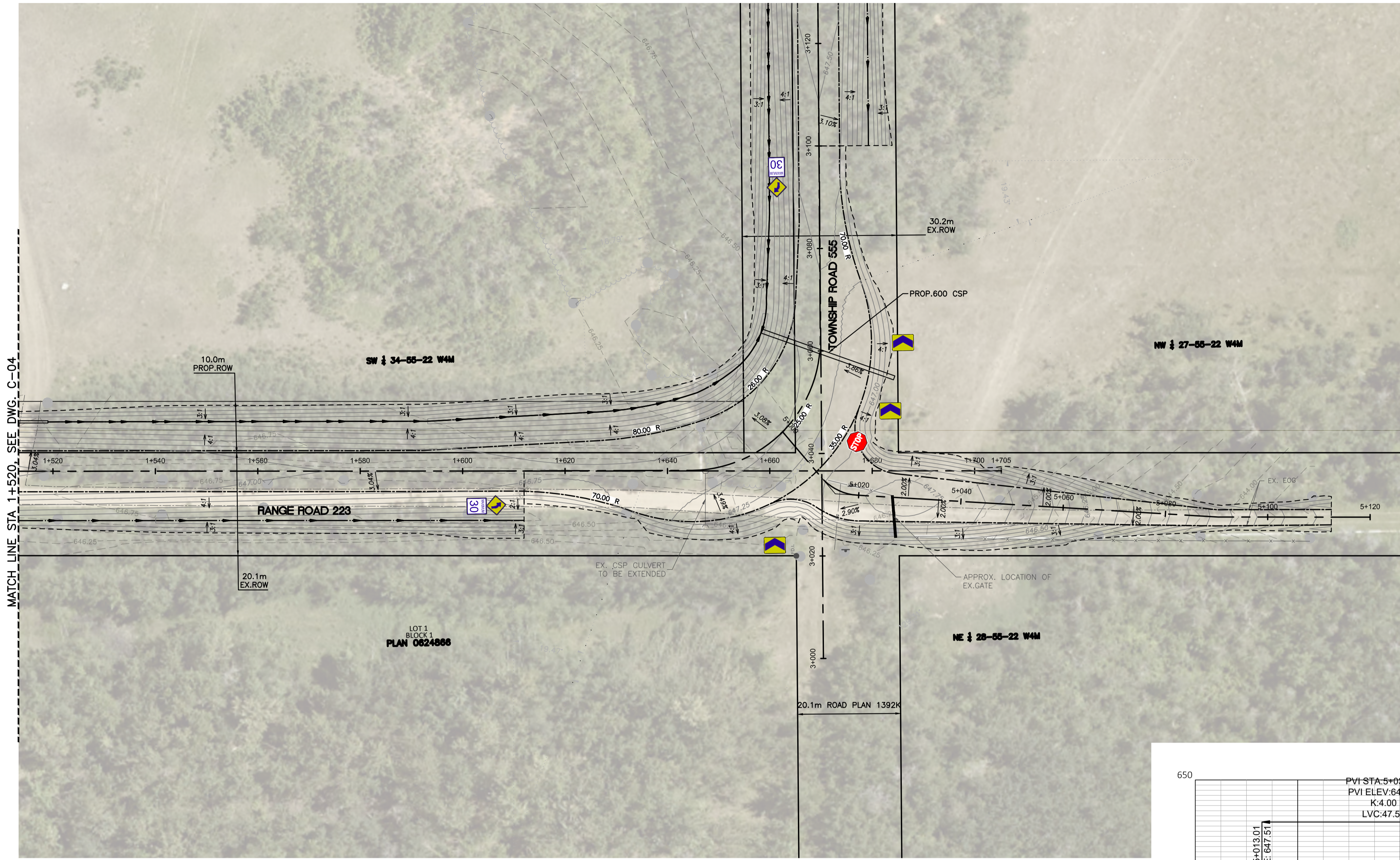
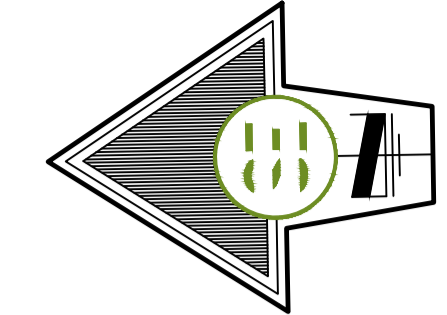
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B	23/11/24	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
A	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL

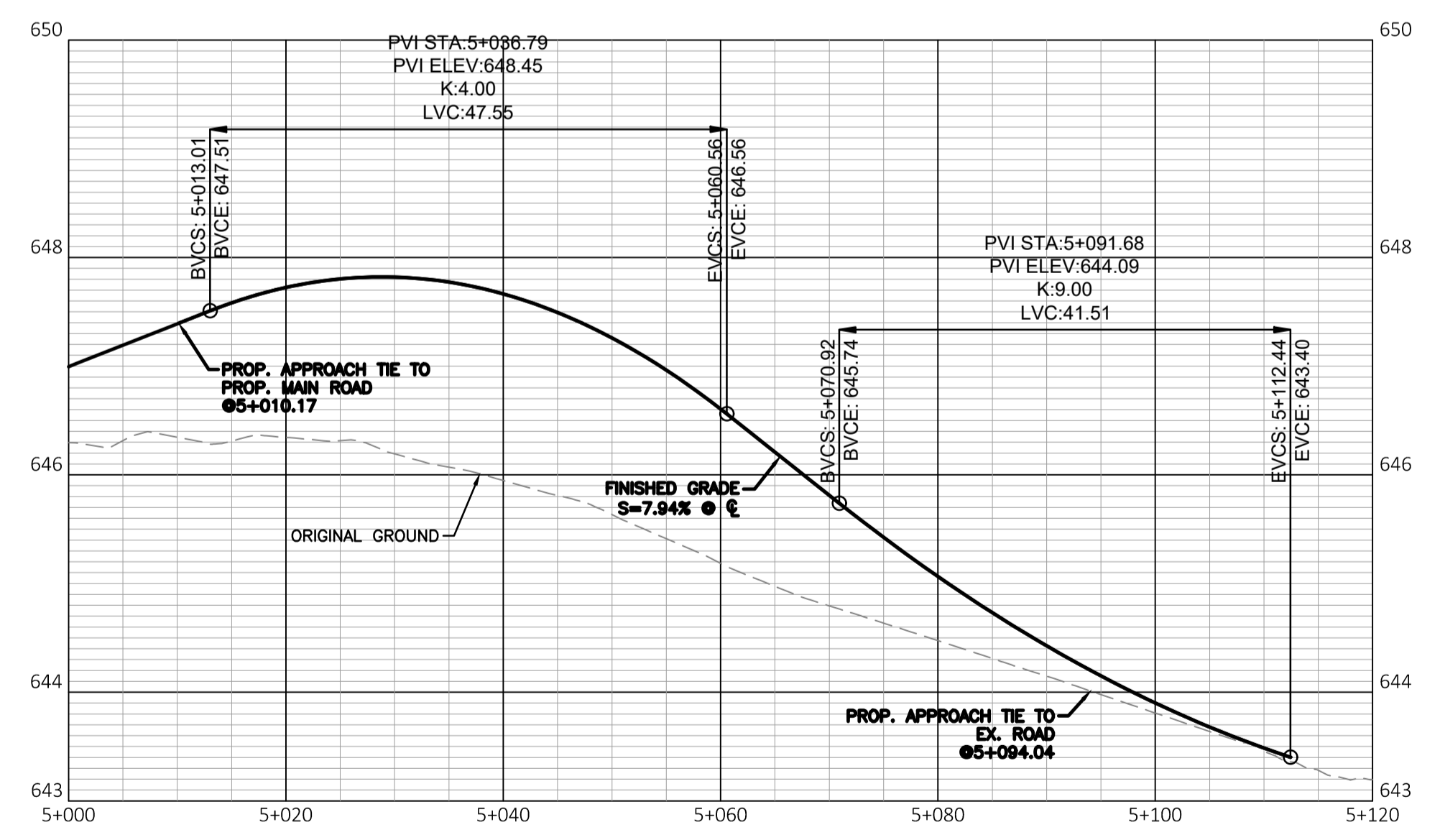
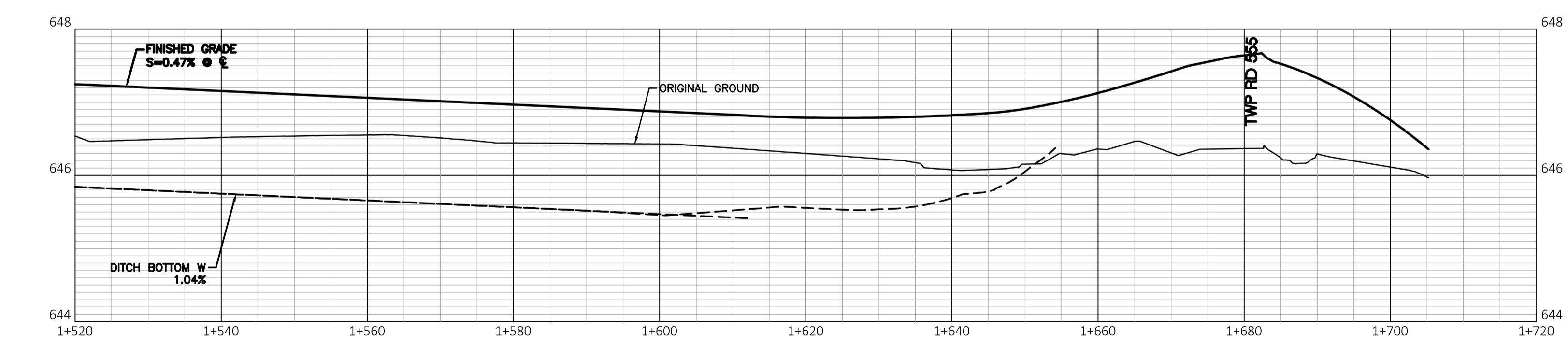


<b>CANDO RANGE ROAD 222 BYPASS</b> STURGEON COUNTY, ALBERTA PLAN & PROFILE STATION 1+140 TO 1+520			ISSUE/REVISION C
SCALE: H=1:500 V=1:50			DRAWING NO. <b>C-04</b>
PROJECT NO: SEI.23.128	FILE NAME: SEI.23.128 - 30%.dwg	SHEET 04 OF 11	



**LEGEND**

- INDICATES PROPERTY LINE
- - - - - INDICATES EXISTING RIGHT OF WAY
- - - - - 1036.25 INDICATES EXISTING GROUND CONTOURS & ELEVATION
- - - - - INDICATES EXISTING EDGE OF GRAVEL
- x - x - x - INDICATES EXISTING BARBED WIRE FENCE
- - - - - INDICATES EXISTING TREE/BUSH LINE
- - - - - INDICATES EXISTING OVERHEAD POWER LINE
- - - - - INDICATES EXISTING HIGH PRESSURE GAS LINE
- - - - - INDICATES EXISTING TELECOMMUNICATION LINE
- - - - - INDICATES EXISTING CULVERT
- INDICATES EXISTING UTILITY BOX
- ▲ INDICATES EXISTING SIGN
- INDICATES EXISTING GUY ANCHOR POLE
- INDICATES EXISTING POWER POLE
- FDI/FDIP INDICATES EXISTING FOUND IRON PIN
- INDICATES EXISTING TREE
- - - - - INDICATES PROPOSED RIGHT OF WAY
- - - - - INDICATES PROPOSED DAYLIGHT LINE
- - - - - INDICATES PROPOSED EDGE OF GRAVEL
- - - - - INDICATES PROPOSED DITCH FLOWLINE
- - - - - 1036.25 INDICATES PROPOSED GROUND CONTOURS & ELEVATION



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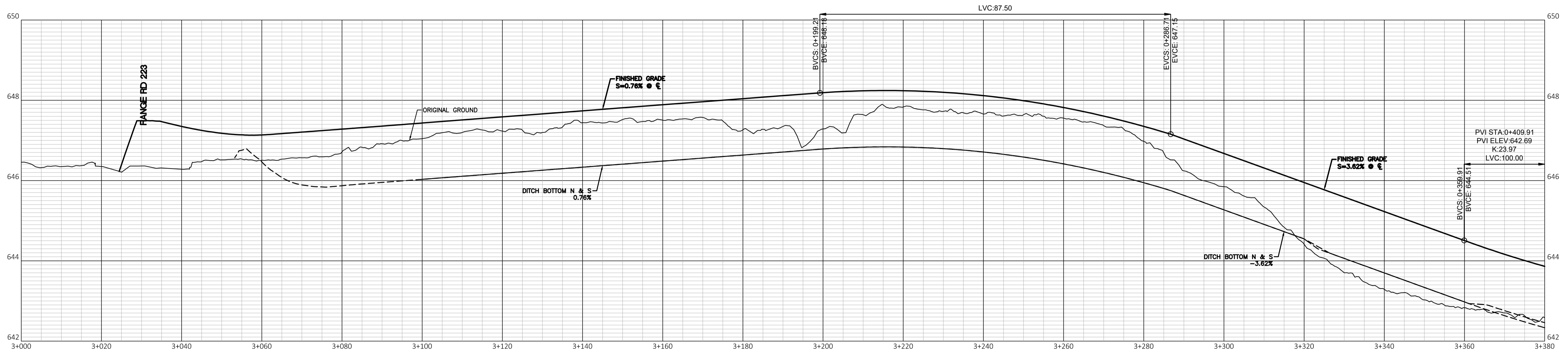
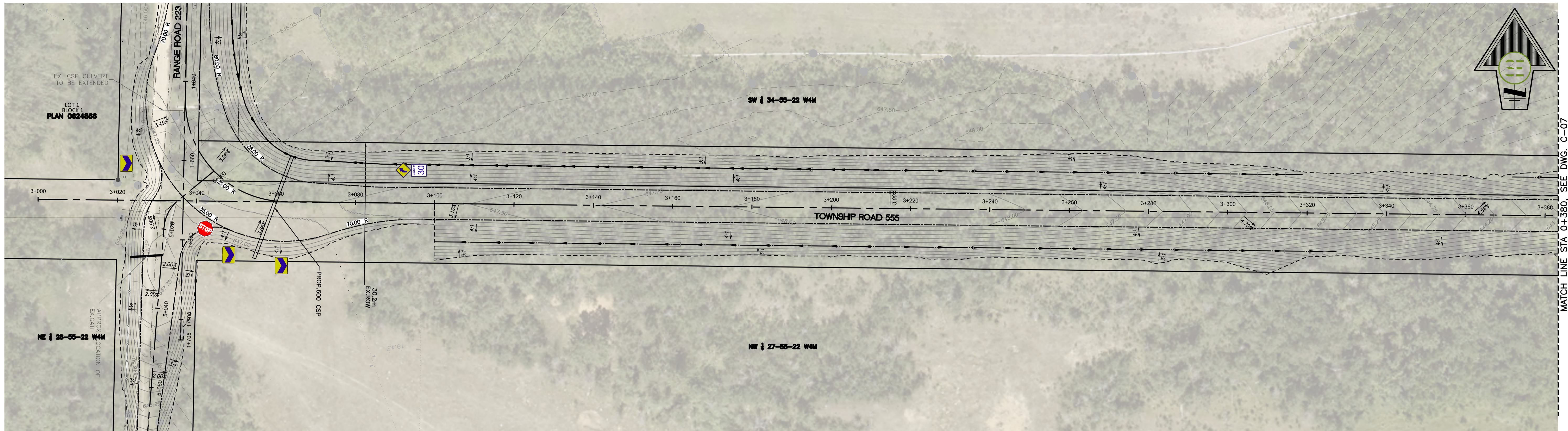
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C	23/12/14	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
B	23/11/24	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
A	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL



**CANDO RANGE ROAD 222 BYPASS**  
**STURGEON COUNTY, ALBERTA**  
**PLAN & PROFILE**  
**STATION 1+520 TO 1+720 & 5+000 TO 5+100**

SCALE: H=1:500 V=1:50	PROJECT NO: SEI.23.128	FILE NAME: SEI.23.128 - 30%.dwg	ISSUE/REVISION C
			DRAWING NO. <b>C-05</b>
			SHEET 05 OF 11

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**LEGEND**

—	INDICATES PROPERTY LINE	—	INDICATES EXISTING CULVERT	—	INDICATES PROPOSED RIGHT OF WAY
- - -	INDICATES EXISTING RIGHT OF WAY	■	INDICATES EXISTING UTILITY BOX	- - -	INDICATES PROPOSED DAYLIGHT LINE
- - -	INDICATES EXISTING GROUND CONTOURS & ELEVATION	▲	INDICATES EXISTING SIGN	- - -	INDICATES PROPOSED EDGE OF GRAVEL
- - -	INDICATES EXISTING EDGE OF GRAVEL	○	INDICATES EXISTING GUY ANCHOR POLE	- - -	INDICATES PROPOSED DITCH FLOWLINE
x x x	INDICATES EXISTING BARBED WIRE FENCE	●	INDICATES EXISTING POWER POLE	- - -	INDICATES PROPOSED GROUND CONTOURS & ELEVATION
- - -	INDICATES EXISTING TREE/BUSH LINE	●	INDICATES EXISTING FOUND IRON PIN		
- - -	INDICATES EXISTING OVERHEAD POWER LINE	●	INDICATES EXISTING TREE		
- - -	INDICATES EXISTING HIGH PRESSURE GAS LINE				
- - -	INDICATES EXISTING TELECOMMUNICATION LINE				

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B	23/11/24	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
A	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL

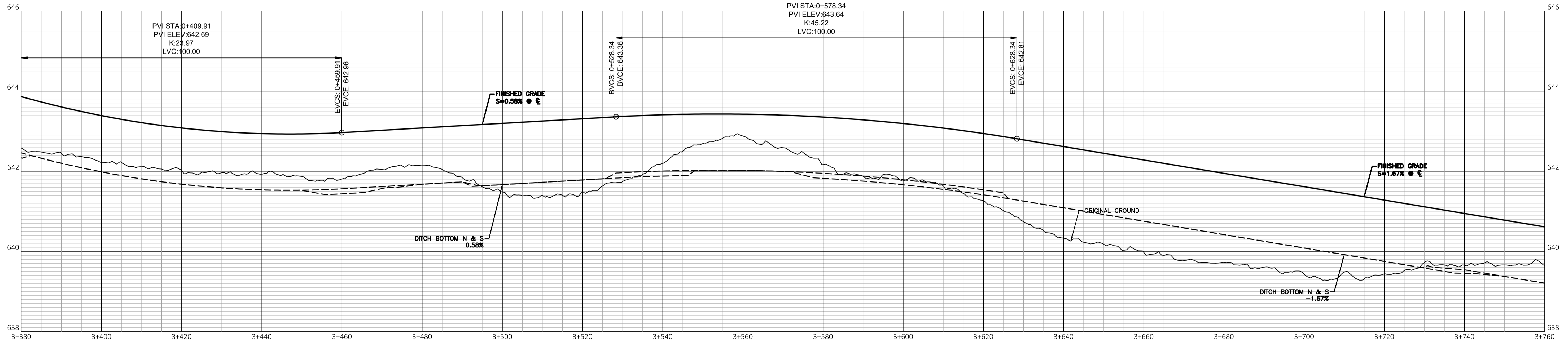
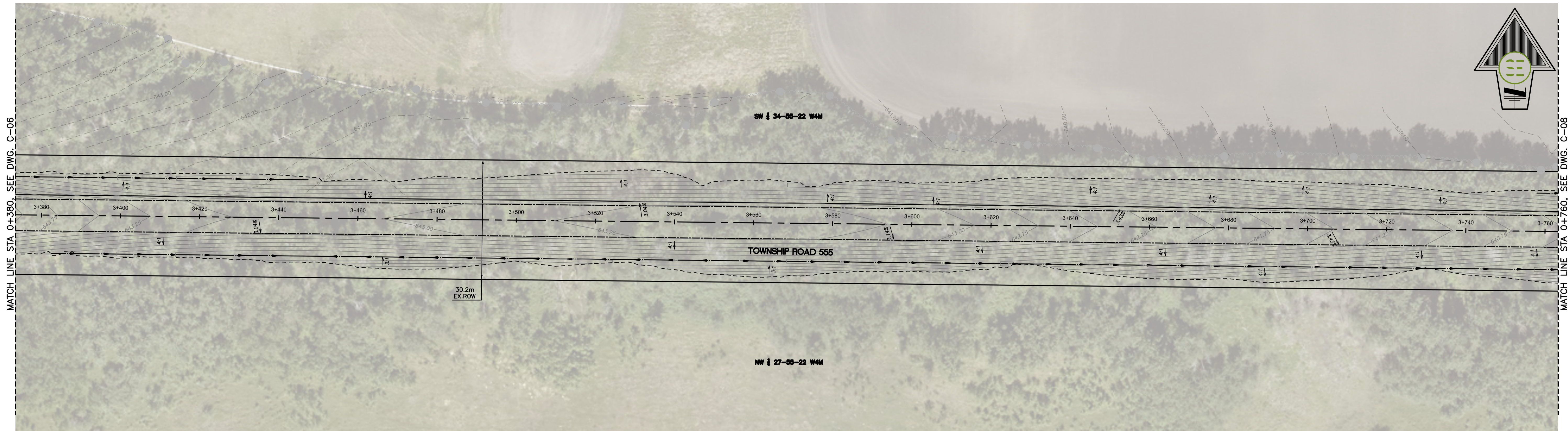
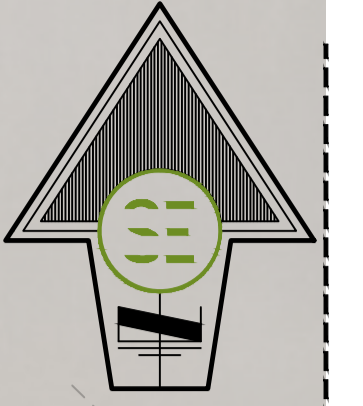


**CANDO RANGE ROAD 222 BYPASS**  
**STURGEON COUNTY, ALBERTA**  
**PLAN & PROFILE**  
**STATION 3+000 TO 3+380**

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			DRAWING NO. <b>C-06</b>
			SHEET 06 OF 11

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MATCH LINE STA 0+380, SEE DWG. C-07



**LEGEND**

- INDICATES PROPERTY LINE
- - - - - INDICATES EXISTING RIGHT OF WAY
- - - - - 10.36.25 INDICATES EXISTING GROUND CONTOURS & ELEVATION
- - - - - INDICATES EXISTING EDGE OF GRAVEL
- x x x x INDICATES EXISTING BARBED WIRE FENCE
- ~ ~ ~ ~ INDICATES EXISTING TREE/BUSH LINE
- - - - - INDICATES EXISTING OVERHEAD POWER LINE
- — — — INDICATES EXISTING HIGH PRESSURE GAS LINE
- - - - - INDICATES EXISTING TELECOMMUNICATION LINE
- — — — INDICATES PROPOSED RIGHT OF WAY
- - - - - INDICATES PROPOSED DAYLIGHT LINE
- - - - - INDICATES PROPOSED EDGE OF GRAVEL
- - - - - INDICATES PROPOSED DITCH FLOWLINE
- - - - - 10.36.25 INDICATES PROPOSED GROUND CONTOURS & ELEVATION
- — — — INDICATES EXISTING CULVERT
- INDICATES EXISTING UTILITY BOX
- ▲ INDICATES EXISTING SIGN
- INDICATES EXISTING GUY ANCHOR POLE
- PP INDICATES EXISTING POWER POLE
- FDI/FDIP INDICATES EXISTING FOUND IRON PIN
- INDICATES EXISTING TREE

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B	23/11/24	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
A	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL



CANDO RANGE ROAD 222 BYPASS  
STURGEON COUNTY, ALBERTA  
PLAN & PROFILE  
STATION 3+380 TO 3+760

ISSUE/REVISION	C
DRAWING NO.	C-07
SHEET	07 OF 11

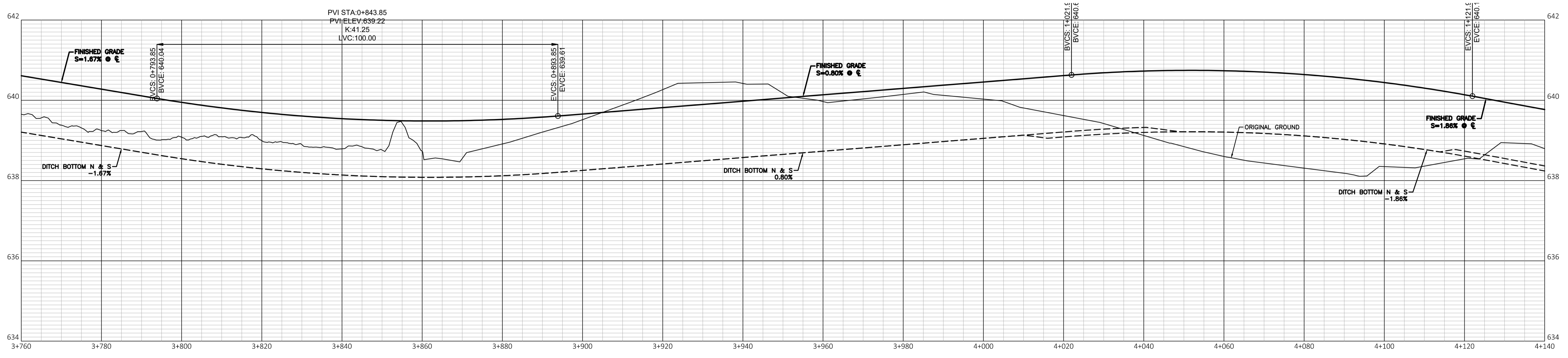
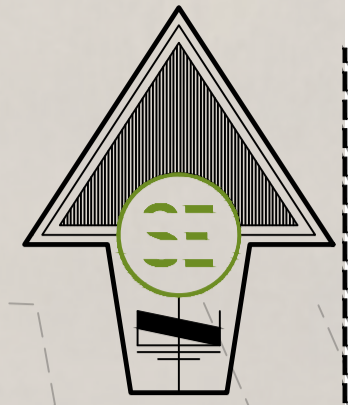
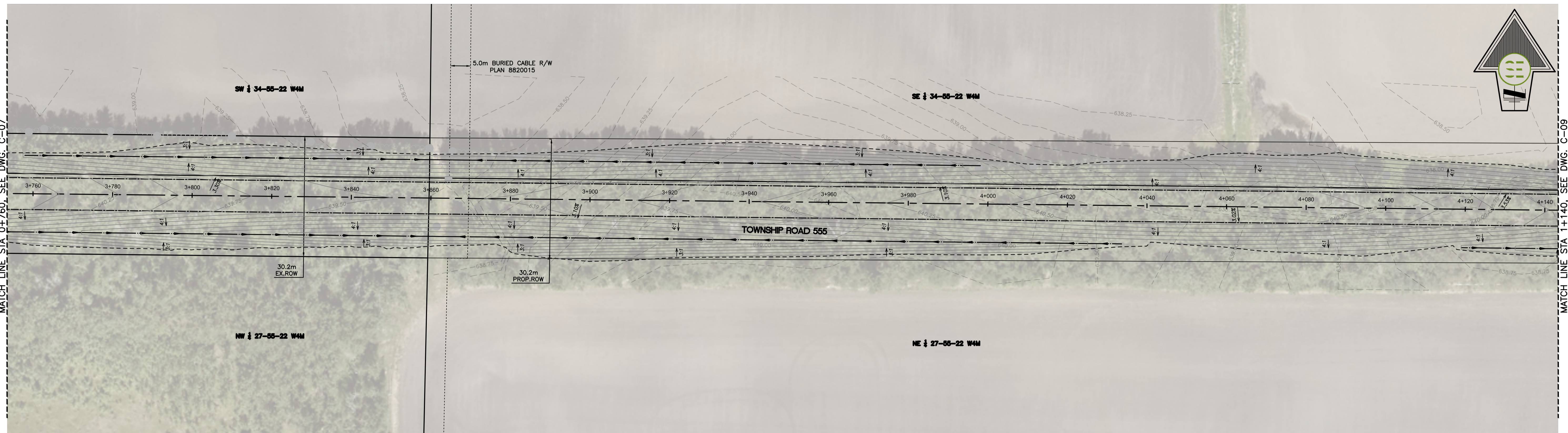
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MATCH LINE STA 0+760, SEE DWG. C-07

MATCH LINE STA 1+140, SEE DWG. C-09



**LEGEND**

—	INDICATES PROPERTY LINE	—	INDICATES EXISTING CULVERT	—	INDICATES PROPOSED RIGHT OF WAY	
- - -	INDICATES EXISTING RIGHT OF WAY	■	INDICATES EXISTING UTILITY BOX	- - -	INDICATES PROPOSED DAYLIGHT LINE	
- - -	INDICATES EXISTING GROUND CONTOURS & ELEVATION	▲	INDICATES EXISTING SIGN	- - -	INDICATES PROPOSED EDGE OF GRAVEL	
- - -	INDICATES EXISTING EDGE OF GRAVEL	○	INDICATES EXISTING GUY ANCHOR POLE	- - -	INDICATES PROPOSED DITCH FLOWLINE	
- - -	INDICATES EXISTING BARBED WIRE FENCE	●	INDICATES EXISTING POWER POLE	- - -	—	INDICATES PROPOSED GROUND CONTOURS & ELEVATION
- - -	INDICATES EXISTING TREE/BUSH LINE	○	INDICATES EXISTING FOUND IRON PIN	—		
- - -	INDICATES EXISTING OVERHEAD POWER LINE	●	INDICATES EXISTING TREE			
- - -	INDICATES EXISTING HIGH PRESSURE GAS LINE					
- - -	INDICATES EXISTING TELECOMMUNICATION LINE					

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B	23/11/24	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
A	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL



CANDO RANGE ROAD 222 BYPASS  
STURGEON COUNTY, ALBERTA  
PLAN & PROFILE  
STATION 3+760 TO 4+140

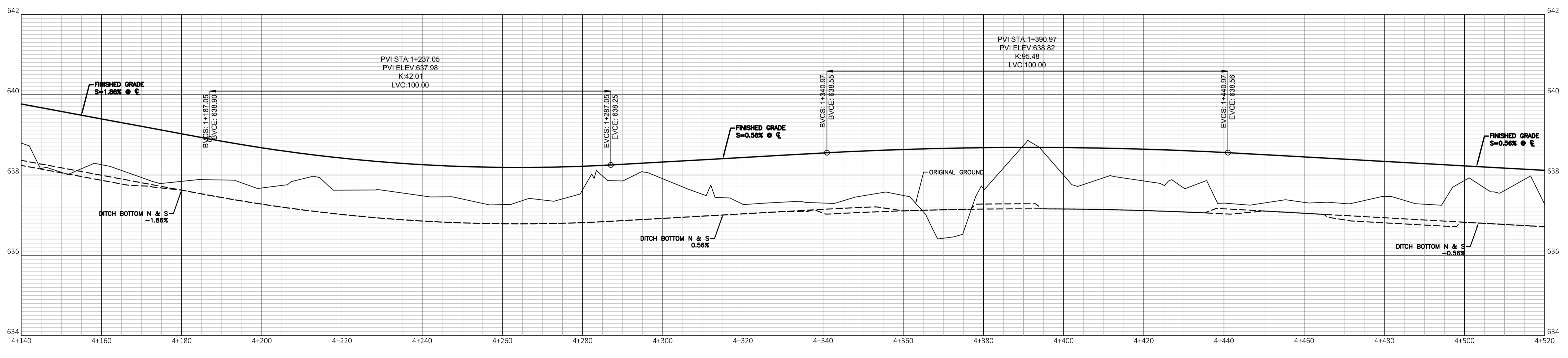
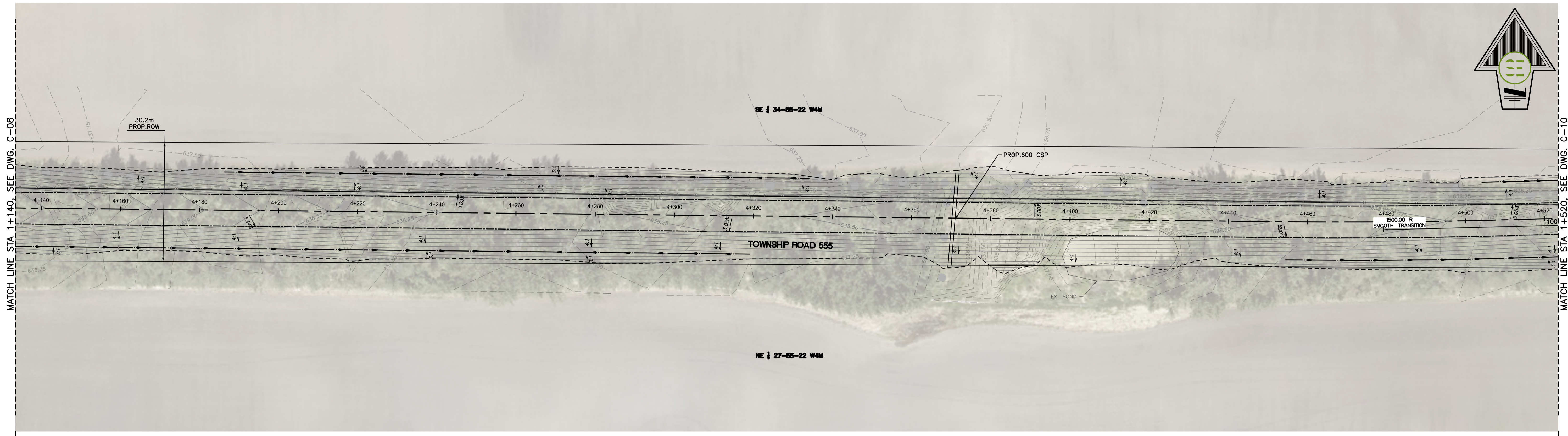
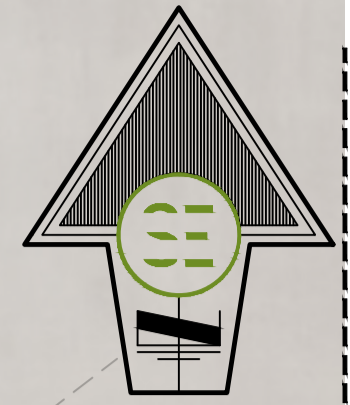
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DRAWING NO.	C-08
SHEET	08 OF 11

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MATCH LINE STA 1+140, SEE DWG. C-08

MATCH LINE STA 1+520, SEE DWG. C-10



**LEGEND**

—	INDICATES PROPERTY LINE	—	INDICATES PROPOSED RIGHT OF WAY	
- - - -	INDICATES EXISTING RIGHT OF WAY	—	INDICATES PROPOSED DAYLIGHT LINE	
- - - - 10.36.25	INDICATES EXISTING GROUND CONTOURS & ELEVATION	—	INDICATES PROPOSED EDGE OF GRAVEL	
- - - -	INDICATES EXISTING EDGE OF GRAVEL	—	INDICATES PROPOSED DITCH FLOWLINE	
x x x x	INDICATES EXISTING BARBED WIRE FENCE	—	10.36.25	INDICATES PROPOSED GROUND CONTOURS & ELEVATION
~ ~ ~ ~	INDICATES EXISTING TREE/BUSH LINE	—		
—	INDICATES EXISTING OVERHEAD POWER LINE	—		
—	INDICATES EXISTING HIGH PRESSURE GAS LINE	—		
—	INDICATES EXISTING TELECOMMUNICATION LINE	—		
—	INDICATES EXISTING CULVERT	—		
—	INDICATES EXISTING UTILITY BOX	—		
—	INDICATES EXISTING SIGN	—		
—	INDICATES EXISTING GUY ANCHOR POLE	—		
—	INDICATES EXISTING POWER POLE	—		
—	INDICATES EXISTING FOUND IRON PIN	—		
—	INDICATES EXISTING TREE	—		

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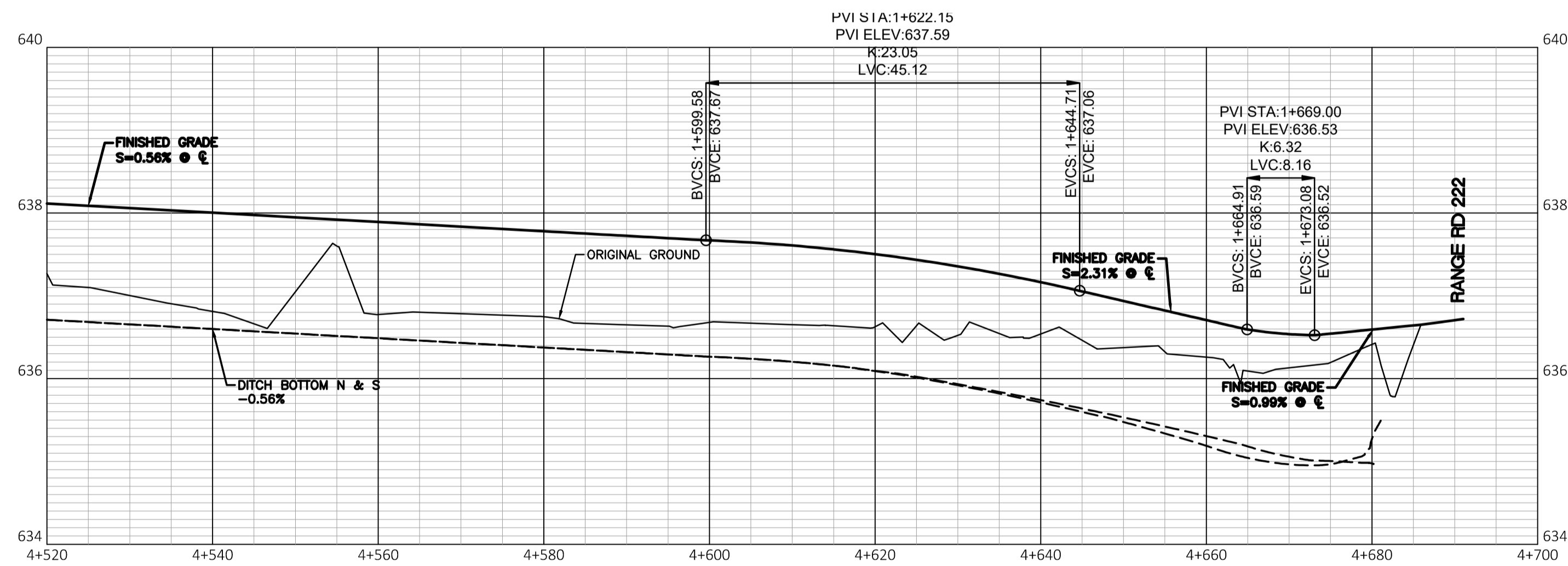
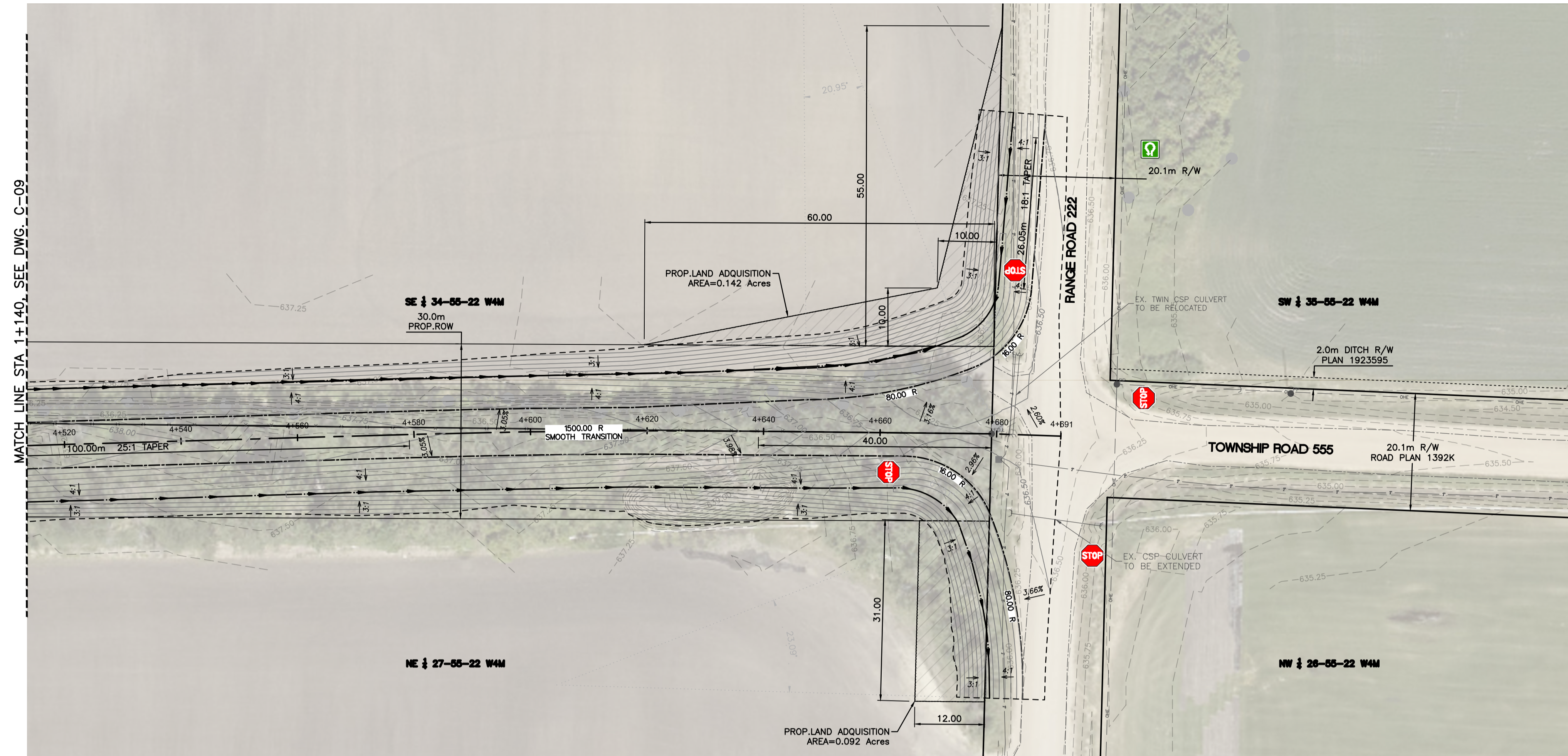
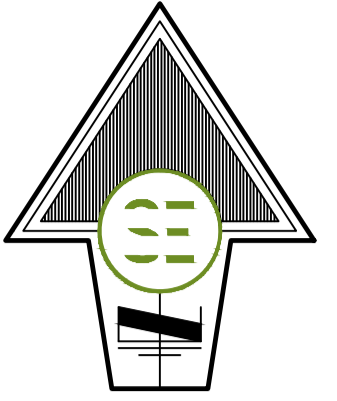
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CANDO RANGE ROAD 222 BYPASS  
STURGEON COUNTY, ALBERTA  
PLAN & PROFILE  
STATION 4+140 TO 4+520

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	INDICATES EXISTING GROUND CONTOURS & ELEVATION		INDICATES EXISTING SIGN		INDICATES PROPOSED EDGE OF GRAVEL
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CANDO RANGE ROAD 222 BYPASS  
STURGEON COUNTY, ALBERTA  
PLAN & PROFILE  
STATION 4+520 TO 4+700

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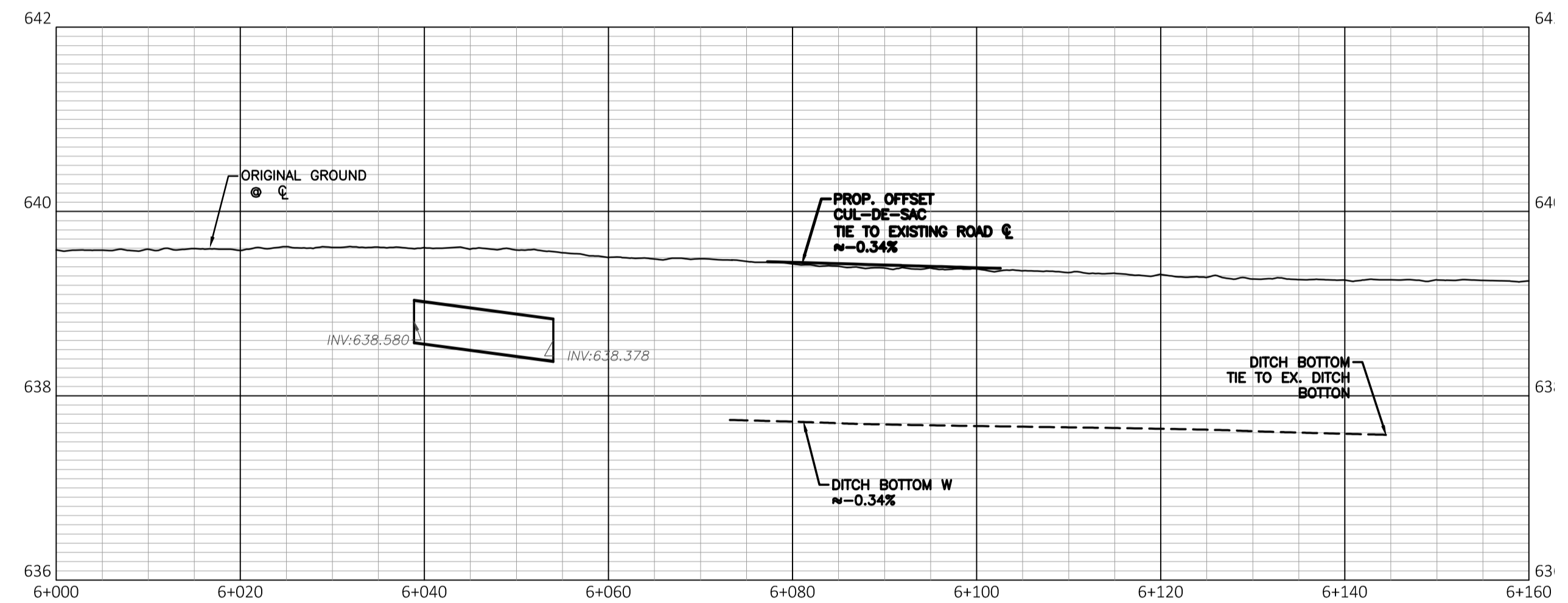
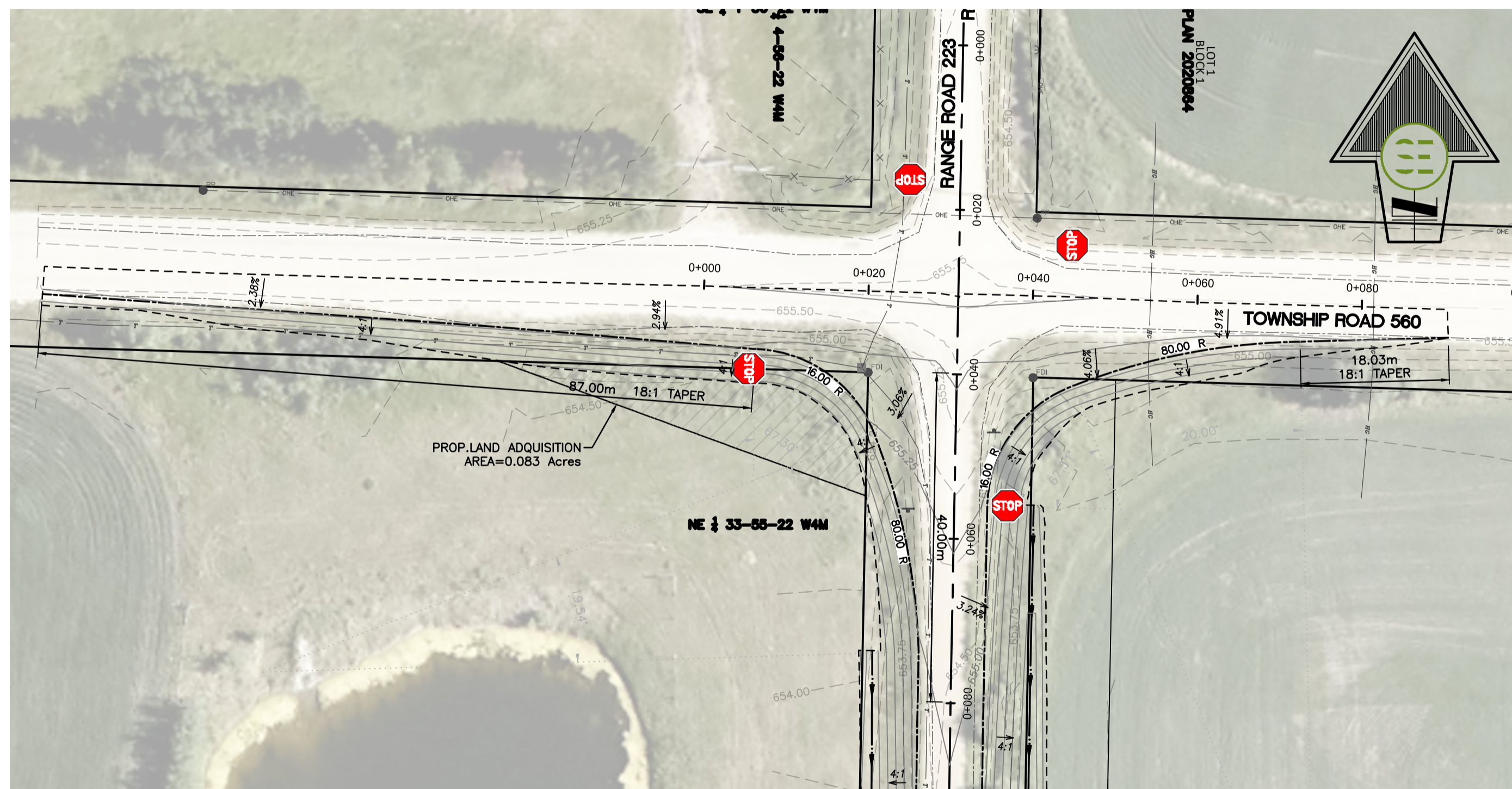
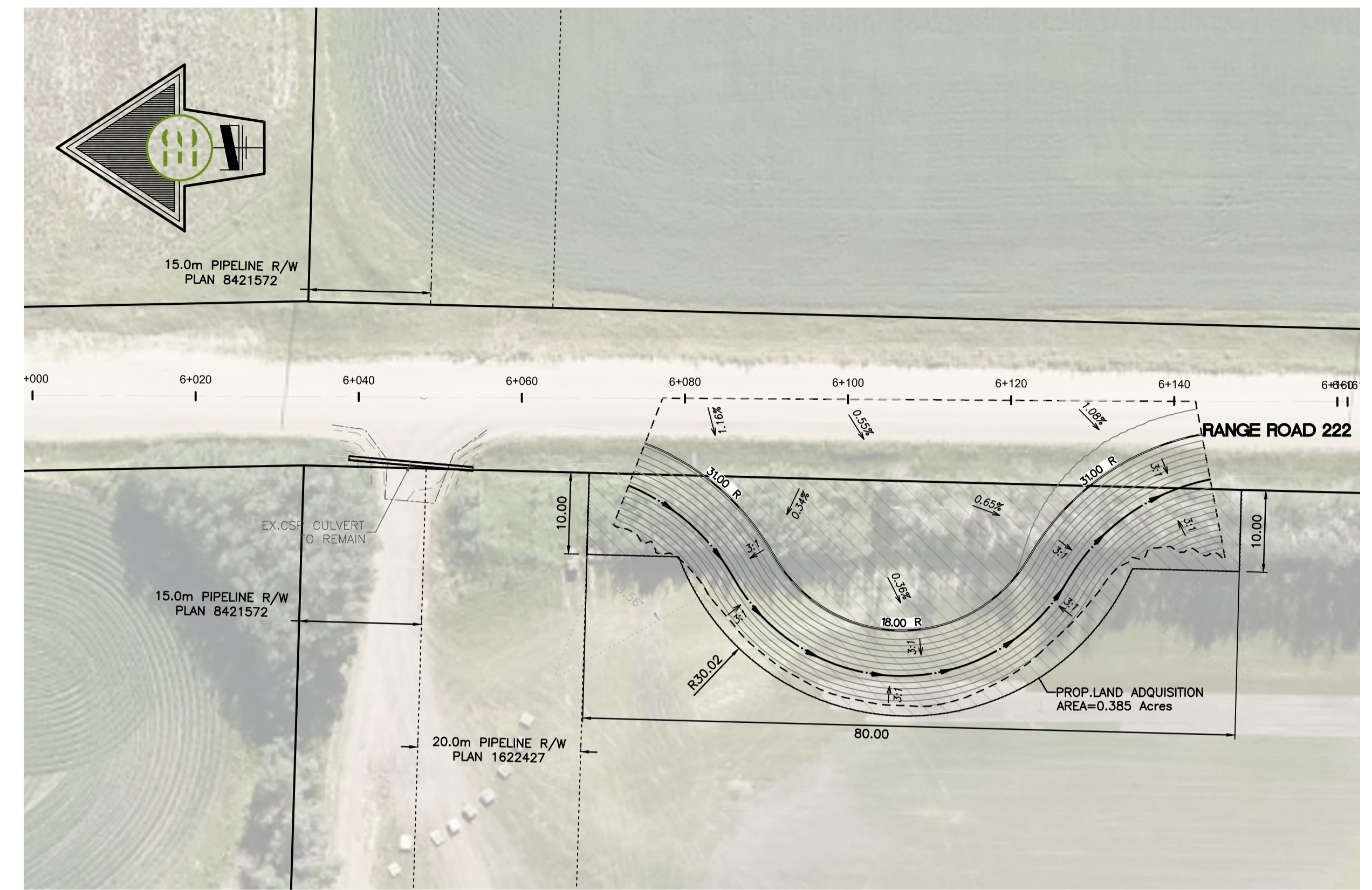
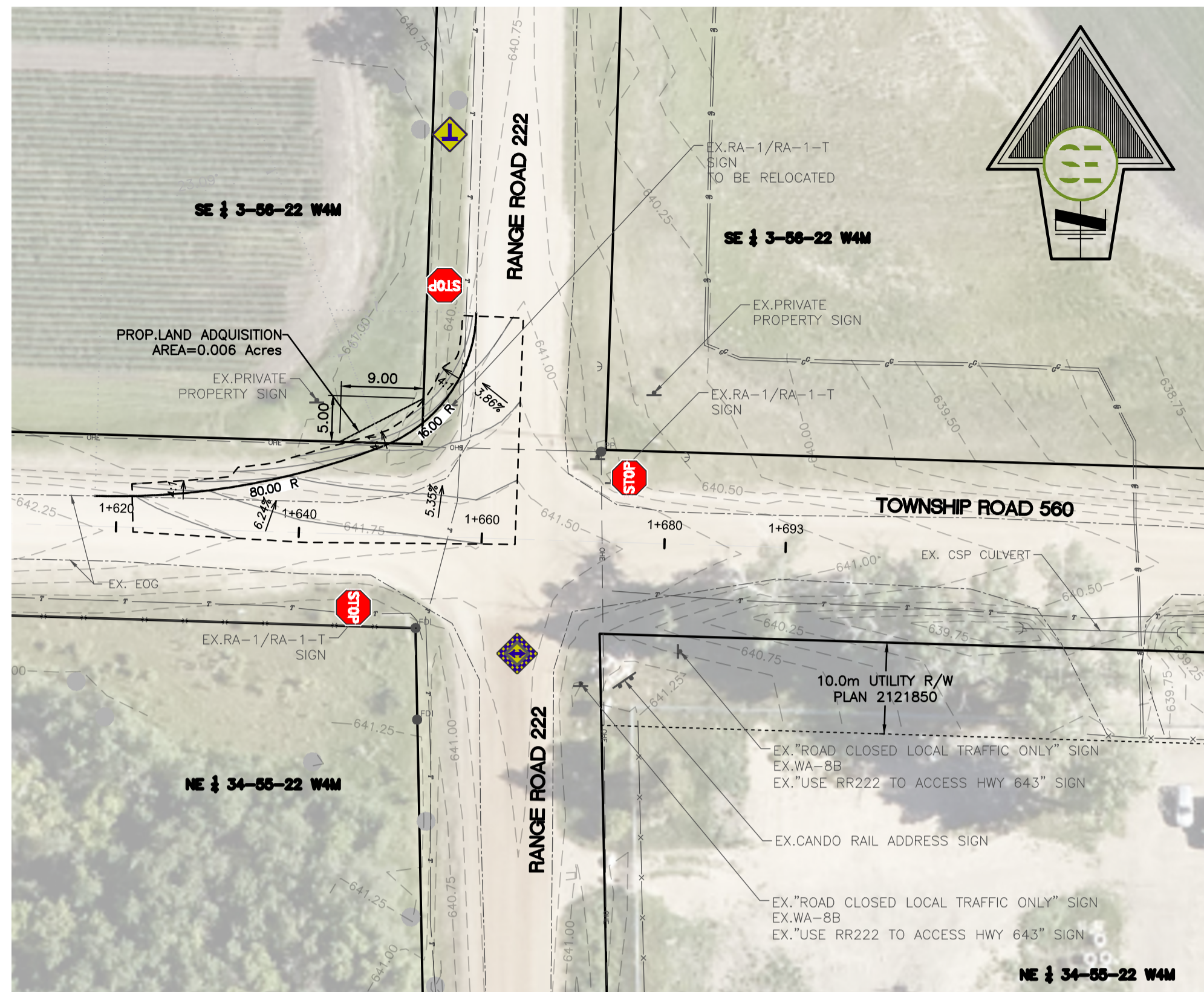
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CANDO RANGE ROAD 222 BYPASS  
STURGEON COUNTY, ALBERTA  
PLAN & PROFILE  
TWP 560 INTERSECTIONS & RR222 CUL-DE-SAC

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# Appendix D

## Biophysical Report



Clifton

# CANDO STURGEON TERMINAL WEST Biophysical Baseline Report



## Prepared For

**Clifton Engineering Group Inc.**  
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## Prepared By

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## EDI Project

23C0181  
Version 2  
January 2024



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## 1 INTRODUCTION

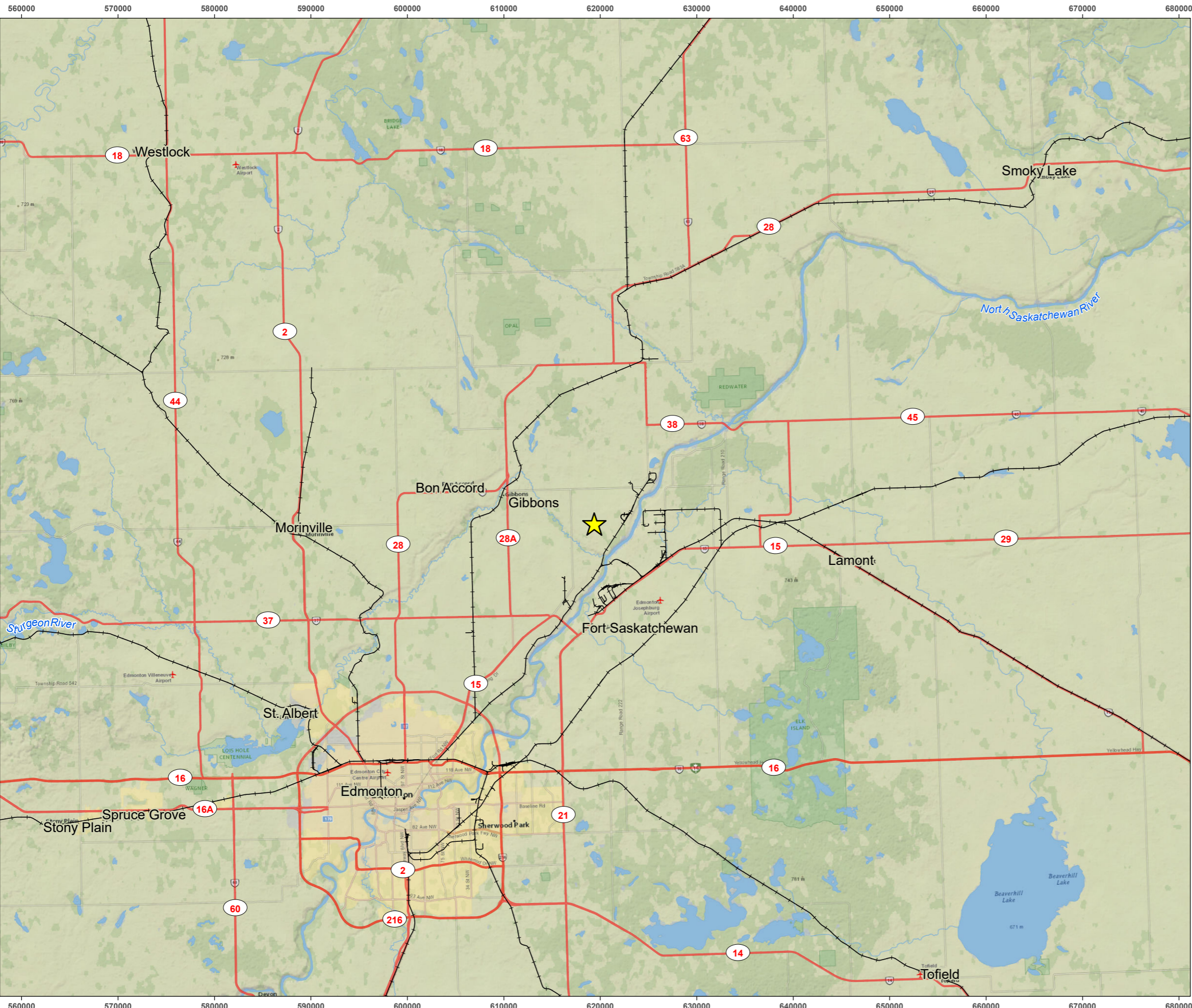
Cando Rail & Terminals (Cando) is planning to develop the Sturgeon Terminal West railyard (the Railyard) located in N<sup>1</sup>/<sub>2</sub> 34-55-22 W4M, in Sturgeon County near Fort Saskatchewan, Alberta (AB) (Figure 1). The Railyard is located adjacent to the Sturgeon Terminal East railyard located in N<sup>1</sup>/<sub>2</sub> 35-55-22 W4M, and will be of a similar size and capacity. The Railyard will be connected to the Sturgeon Terminal East, including portions of the existing Range Road 222. As such, a Bypass Road (the Bypass) will also be constructed as part of the Project to facilitate and maintain local traffic around the Railyard. The Railyard and the Bypass are collectively referred to as the Project. Design drawings are provided in Appendix A.

EDI Environmental Dynamics Inc. (EDI) was retained by Clifton Engineering Group Inc. (Clifton) to prepare a biophysical assessment to document baseline conditions including land use, vegetation, wetlands, and surface waterbodies, identify environmental sensitivities, and support the preparation of an Initial Project Description to the Impact Assessment Agency of Canada (IAAC) for the Project. Stormwater management and groundwater are addressed under a separate cover (Clifton Engineering Group Ltd. 2023).

### 1.1 PROJECT DESCRIPTION

EDI understands that the Railyard will be a full-service, multi-purpose rail terminal, that will facilitate the storage, marshalling, maintenance, and transloading of rail cars from various industries to consolidate rail staging operations in one area. It will be comprised of an arrival/departure yard that includes multiple tracks that will wrap around the entire property, and that have connections to the existing Sturgeon Terminal East. The Railyard will also include a classification yard comprised of four smaller yards for breaking down, sorting, and assembling unit trains to meet local customer needs, as well as a mechanical area to service and repair locomotives and rollingstock. The expansion rail terminal is required to meet the local needs for handling and servicing unit trains and to maintain connections via the Canadian National Railway Company (CN) and rest of the North American market.

A secondary component to the Project consists of the creation of the Bypass (Figure 2). The connection between the existing rail terminal and the expansion rail terminal will cross Range Road 222. These connections may be in use at almost any time of the day for long periods of time with railcar crossings. For the safety and convenience of the surrounding residents, Cando is working with Sturgeon County to permanently close Range Road 222 between the two rail terminals. The bypass will include upgrades to the existing Sturgeon County operated Range Road 223 to the west of the W<sup>1</sup>/<sub>2</sub> 34-55-22-W4M and the intersection of Range Road 222 and Township Road 560 to the northeast of the property. To complete the bypass, roadways will also be constructed to the south of the S<sup>1</sup>/<sub>2</sub> 34-55-22-W4M and a cul-de-sac will be constructed to the south of the expansion rail terminal on Range Road 222. Once the road is constructed Sturgeon County will take over ownership and be responsible for the operation and maintenance.

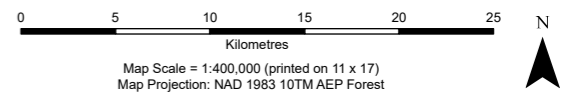


**Project location**

**CLIFTON ENGINEERING GROUP INC.**

**Legend**

-  Project Location
-  Highway
-  Railway



**Data Sources**

- Main map and inset map. National Geographic World Map. National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
- Highway and railway. AltaLIS 20K Base Features

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Drawn: C. Tennant	Checked: J. Mischkolz	<b>Figure 1</b>	Date: 2023-12-18
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Upon commencement of construction, the entire Project footprint is anticipated to be cleared and graded; however, Project components will be developed in multiple stages, with the first stage including construction of the arrival/departure yard, classification yards for sorting railcars, and the mechanical area for locomotive and railcar repairs. Project construction is anticipated to commence in Q4 2024.

## 1.2 REGULATORY SETTING

It is EDI's understanding that the Project requires a submission of an Initial Project Description to the IAAC, and may trigger an assessment under the federal *Impact Assessment Act* (2019). Additionally, the Project is subject to numerous environmental regulatory considerations, including (but not limited to):

- *Alberta Municipal Government Act*;
- *Alberta Historical Resources Act* (HRA);
- *Alberta Environmental Protection and Enhancement Act* (EPEA);
- *Alberta Water Act* and *Alberta Wetland Policy*;
- *Alberta Wildlife Act* and Regulations,
- *Alberta Weed Control Act* and Regulation.
- *Federal Species at Risk Act* (SARA);
- *Federal Migratory Birds Convention Act*; and,
- *Federal Fisheries Act*.



## 2 METHODS

The existing baseline environmental setting was characterized based on an initial desktop review of publicly available data sources followed by field assessments to verify land use, soils, vegetation, and potential for wildlife, wetlands, and surface waterbodies. The Project Footprint is defined as the extent of the Railyard in N½ 34-55-22 W4M and the extent of disturbance anticipated to result from proposed road infrastructure works along Range Road 222, Township Road 560, Range Road 223, and Township Road 555 for the Bypass (both of which are illustrated in the Design Drawings included in Appendix A). The Study Area is defined as a 100 m buffer from the Project Footprint as shown on Figure 2.

### 2.1 DESKTOP REVIEW

The following datasets and publicly available literature sources were reviewed to gather information within the Study Area:

- Topography (AltaLIS 1:20k contours) (AltaLIS Ltd. 2023);
- Natural Regions and Subregions of Alberta (Natural Regions Committee 2006);
- Alberta Conservation Information Management System (Alberta Environment and Protected Areas 2023a);
- Agricultural Regions of Alberta Soil Inventory Database (AGRASID) (Government of Alberta and Alberta Agriculture and Forestry 2023);
- Alberta Land Suitability Descriptors (Alberta Agriculture and Forestry 2017, Government of Alberta and Alberta Agriculture and Forestry 2023);
- Cumulative Clubroot Infestations (Alberta Government 2021);
- Wildlife Sensitivity Maps (Government of Alberta 2022);
- Fish and Wildlife Management Information System (FWMIS) (Alberta Environment and Protected Areas 2023b);
- General Status of Alberta's Wild Species (Alberta Environment and Parks 2022a);
- Species at Risk Public Registry (Government of Canada 2023);
- Environmentally Significant Areas (Fiera Biological Consulting 2014);
- Parks and Protected Areas (Alberta Environment and Parks 2022b);
- Important Bird Areas (IBAs) (Birds Canada and Nature Canada 2023);
- Migratory Bird Sanctuaries (Environment and Climate Change Canada 2022a); and,
- National Wildlife Areas (Environment and Climate Change Canada 2019).
- Federally designated Critical Habitats (Environment and Climate Change Canada 2022b).
- Critical Habitats for aquatic species at risk (Fisheries and Oceans Canada 2022);
- Historical climate data (Alberta Agriculture and Irrigation 2023);
- Satellite Imagery – ESRI (2021), Google (2010, 2013, 2017, and 2020);
- Aerial Photographic Record System historical aerial photographs (1950, 1967, 1973, 1979, 1987, 1993, 2001, and 2003) (Government of Alberta 2023a);



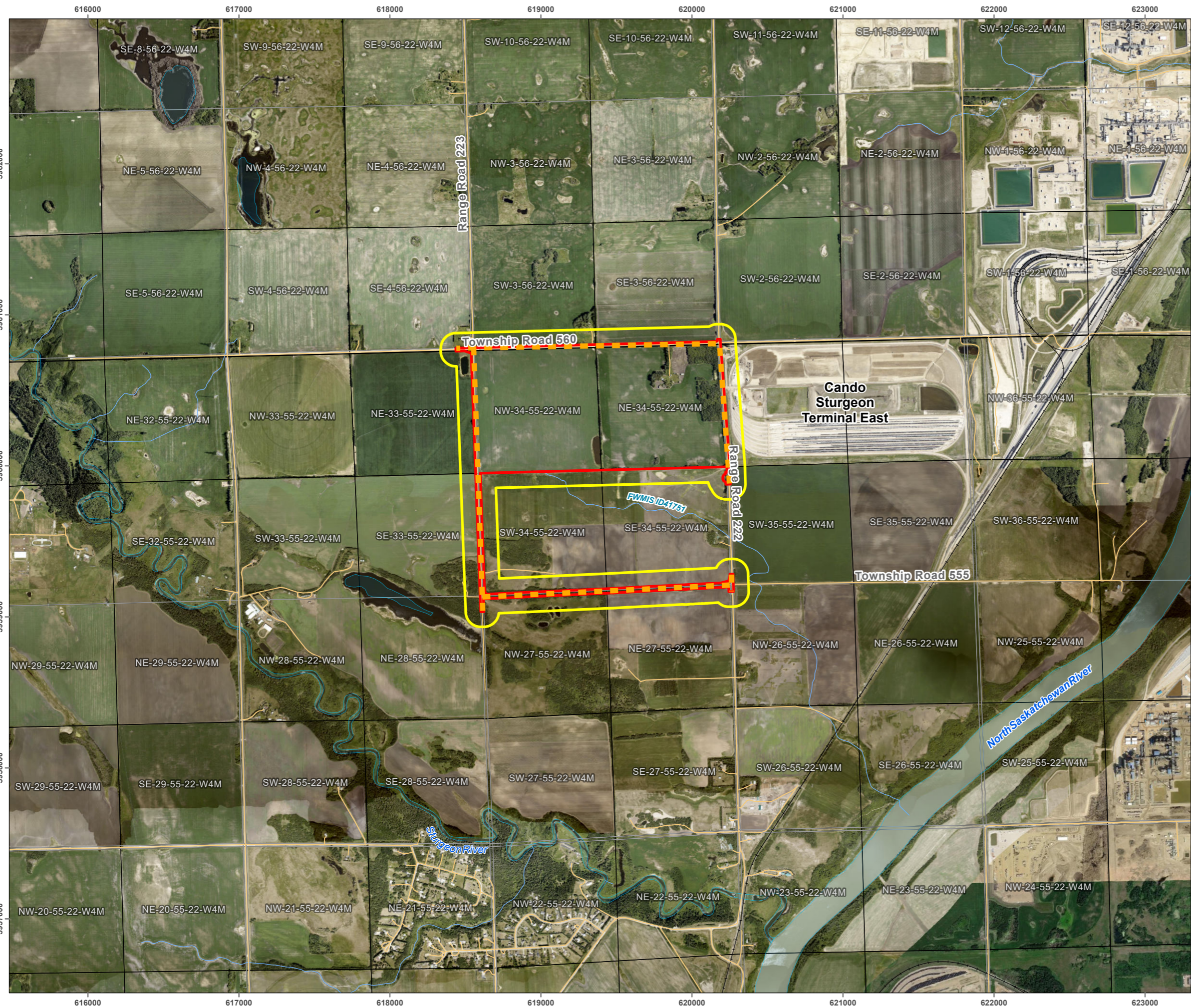
- Alberta Biodiversity Monitoring Institute (ABMI) Wetland Inventory Data (ABMI 2022) and Predictive Landcover (ABMI 2019);
- Alberta Merged Wetland Inventory (Alberta Environment and Parks 2020a); and,
- Historic Resources Listings (Government of Alberta 2023b).

A wetland assessment with field verification was completed by a qualified wetland practitioner to identify, classify, and delineate wetlands and surface waterbodies potentially affected by the Project; detailed methods are provided under separate cover within the Wetland Assessment and Impact Reports (WAIRs) (EDI Environmental Dynamics Inc. 2023a, b) prepared to support Project *Water Act* applications.

## 2.2 FIELD PROGRAM

Results of the desktop review were field verified to document pre-disturbance environmental conditions, including land use, vegetation, wetlands, and surface waterbodies, and identify the presence of environmental sensitivities with the potential to be directly affected by the Project (i.e., within or adjacent to the Project Footprint). The field program included the following.

- A wildlife reconnaissance was conducted on July 13, 2023, on foot within the Railyard, as well as from roadways within a 1 km buffer of the Railyard to characterize wildlife habitat and identify any potential wildlife habitat features of concern (e.g., leks, dens, raptor nests).
- A biophysical assessment of land use, soils, vegetation, and wetlands was completed within the Project Footprint between August 9 to 11 for the Railyard, and September 27 to 29 for the Bypass. The biophysical assessment included pedestrian surveys to document the following:
  - land use and plant communities (to characterize vegetation);
  - late season listed plant surveys (conducted as per Alberta Native Plant Council 2012) with a focus on habitats with moderate to high potential for listed plants (e.g., wetlands, uncommon microsites);
  - invasive plants designated by the Alberta Weed Control Regulation;
  - wetland classifications and delineation (verified in accordance with the Alberta Wetland Policy (Government of Alberta 2013) and implementation directives and guidance documents (e.g., Alberta Environment and Sustainable Resource Development 2015, Government of Alberta 2015, Alberta Environment and Parks 2016); and,
  - surface waterbodies, including ephemeral waterbodies, ephemeral drainages and surface water-related anthropogenic features.

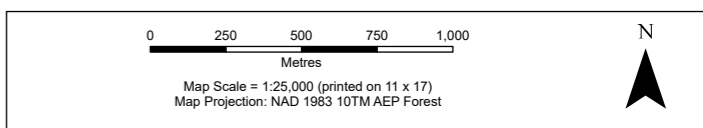
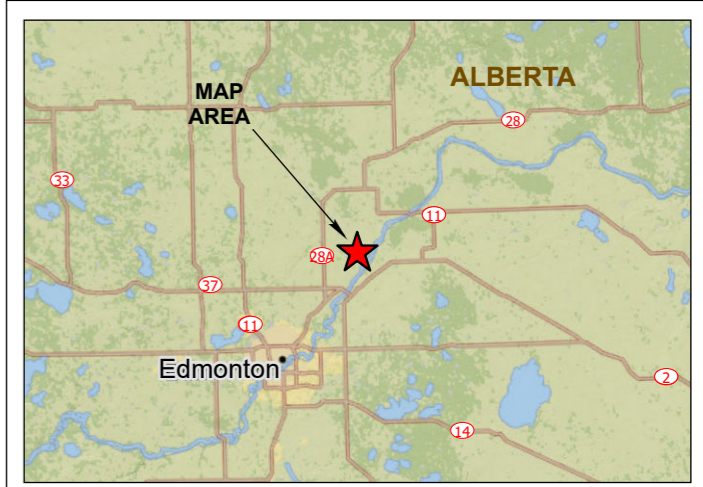


**Project overview**

**Clifton Engineering Group Inc.**

**Legend**

Road	Township
Highway	Section
Railway	Quarter Section
Bypass Modifications	
Project Footprint	
Study Area	



**Data Sources**

- Main map, World Imagery, Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
- Inset map, National Geographic, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
- Roads, rail, and ATS grid, AltaLIS 20K Base Features
- Waterbodies and watercourses, FWMS, Government of Alberta.

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## 3 RESULTS

### 3.1 SITING, LANDSCAPE, AND LAND USE

The Study Area is located within the Dry Mixedwood Natural Subregion of the Boreal Natural Region (Natural Regions Committee 2006), in Alberta's Industrial Heartland within an area zoned for heavy industry and increasingly dominated by industrial land uses. The Railyard has been sited adjacent to heavy industrial facilities to the east and northeast (CN Rail line, Pembina Redwater Fractionation Facility and Rail Yard, North West Redwater Partnership Sturgeon Refinery) and southeast (Shell Scotford Manufacturing Centre east of the North Saskatchewan River). The Project Footprint does not overlap with any Environmentally Significant Areas in Alberta (Fiera Biological Consulting 2014).

The Project is surrounded by agricultural land on all sides except for its eastern boundary, which is adjacent to Sturgeon Terminal East. Land cover within the Study Area is predominantly comprised of cultivated fields, with small remnant deciduous treed upland along the field margins, and at the northeast portion of the Study Area associated with an existing residence. Representative photos are provided in Appendix D.

### 3.2 HISTORICAL RESOURCES

Within the Study Area, four land parcels have been assigned a Historic Resource Value (HRV) of 5a (Government of Alberta 2023b). An HRV of 5a is assigned to an area with high potential to contain an archaeological resource (Government of Alberta 2023c). An application for Clearance under the *Historical Resources Act* has been submitted for the Project; results will be provided under a separate cover.

### 3.3 TERRAIN AND SOILS

Terrain within the southern Dry Mixedwood Natural Subregion is typically characterized by undulating or hummocky surface expression with variable relief, with some level (low-relief) to inclined (high-relief) areas (Natural Regions Committee 2006). Local topography within the Study Area is generally flat with gentle, gradual slopes to the south towards the Sturgeon River and east toward the North Saskatchewan River (Figure 3).

Terrain and soil characteristics identified during desktop review within the Study Area are summarized in Table 1, including the following soil series:

- Hobbema – common on mid-slopes with well-drained Eluviated Black Chernozem with loam, silt loam, and very fine sandy loam till.
- Ponoka – common on mid-slopes with well-drained Eluviated Black Chernozem with loam to silty loam sediments deposited by wind and water;
- Peace Hills – common on mid-slopes with well-drained Orthic Black Chernozem with sandy loam and fine sandy loam texture;



- Primula – common on mid-slopes with rapidly-drained Eluviated Eutric Brunisols of sand and loamy sand sediments deposited by wind or water; and,
- Gleyed Peace Hills – common on depressions with imperfectly-drained Gleyed Black Chernozems with sandy loam and fine sandy loam sediments deposited by wind or water (Government of Alberta and Alberta Agriculture and Forestry 2023).

**Table 1. Predominant terrain and soil characteristics occurring within the Study Area.**

Attribute	Soils and Land Suitability Results <sup>1</sup>		
	14093	14124	14129
Surface Expression	Undulating, High Relief		
Soil Series (% of polygon)	Hobbema (50%), Ponoka (50%)	Peace Hills (60%), Primula (20%), Peace Hills - Gleyed (20%)	Ponoka (100%)
Land Suitability Ratings <sup>2</sup>	2H (100%)	2M (80%) - 5M (20%)	2H (100%)
Project Footprint Area (ha)	139.755	6.082	3.236

<sup>1</sup> Based on AGRASID data (Government of Alberta and Alberta Agriculture and Forestry 2023) and Alberta Land Suitability Descriptors (Alberta Agriculture and Forestry 2017).

<sup>2</sup> Land Suitability Descriptors within the Project Study Area:

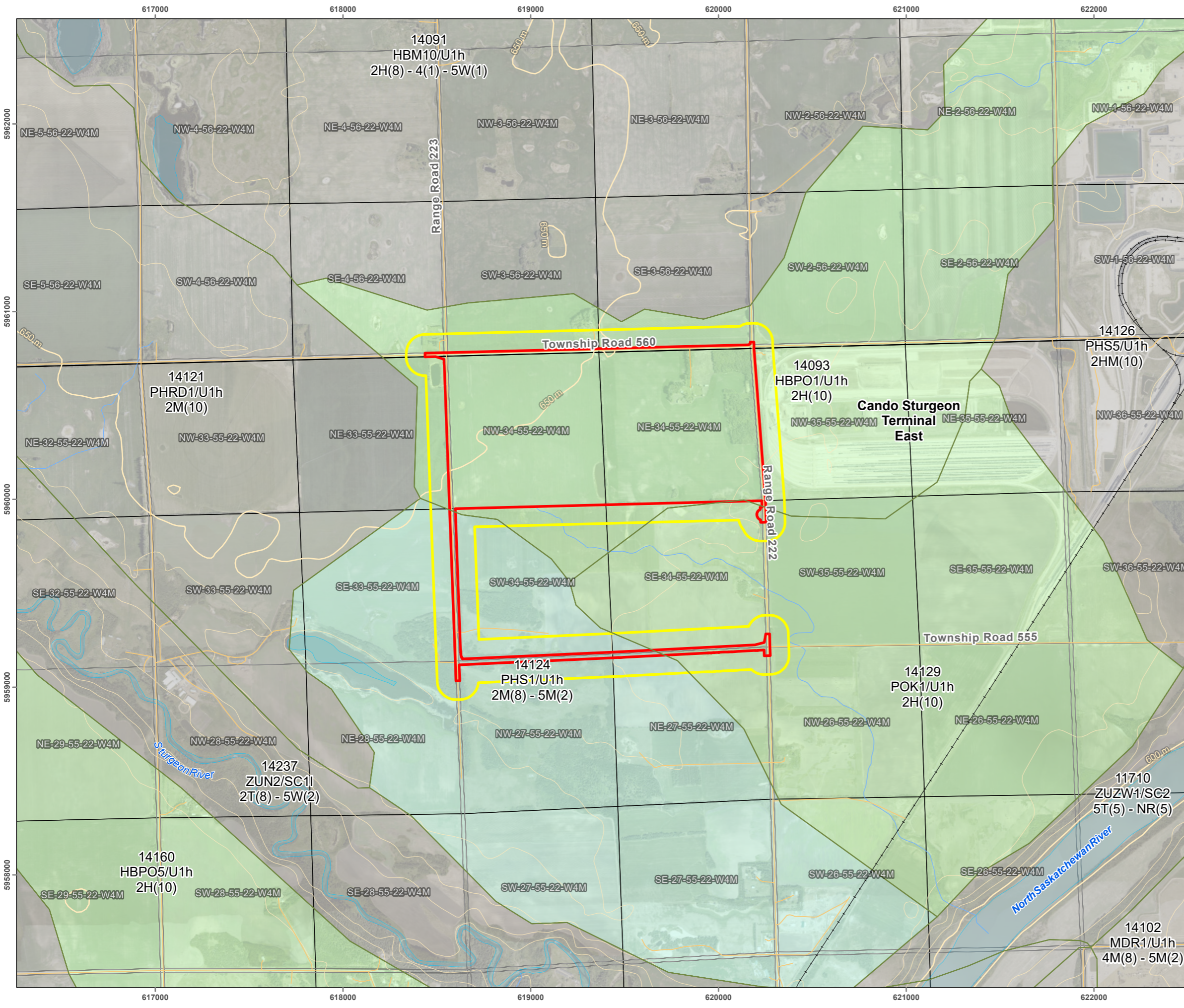
Class 2: Holds slight limitations to crop growth.

Class 5: Holds very severe limitations to crop growth.

Subclass H (Temperature): Inadequate heat units for the optimal growth.

Subclass M (Soil Drainage): Lack of Water.

Clubroot — a serious soil-borne disease of canola, mustard, and other crops in the cabbage family — is closely monitored and managed in Alberta. Sturgeon County has had more than 50 confirmed cases of clubroot (Alberta Government 2021).

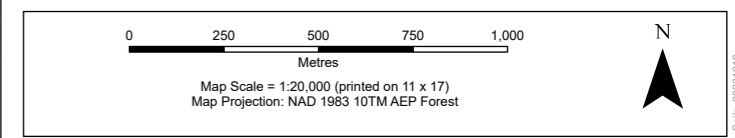
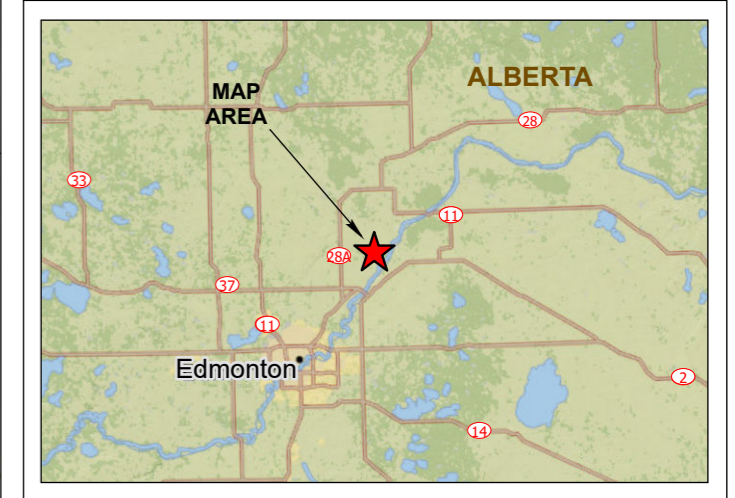


# Soil characteristics within the Study Area

Clifton Engineering Group Inc.

**Legend**

	Road		Township
	Highway		Section
	Railway		Quarter Section
	Project Footprint	<b>Soil Characteristics</b>	
	Study Area		2H(10)
			2M(8)
			Other



**Data Sources**

- Main map, World Imagery, Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
- Inset map, National Geographic, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
- Roads, rail, and ATS grid, Altalis 20K Base Features
- Waterbodies and watercourses, FWMS, Government of Alberta.
- Soil data, Agricultural Regions of Alberta Soil Inventory Database (AGRASID 4.1), of Alberta.

**Disclaimer**  
 EDI Environmental Dynamics Inc. has made every effort to verify this map is free of errors. Data has been derived from a variety of digital sources and, as such, EDI does not warrant the accuracy, completeness, or reliability of this map or its data.

Drawn: C. Tennant	Checked: J. Mischkolz	<b>Figure 3</b>	Date: 2023-12-19
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## 3.4 VEGETATION

### 3.4.1 DESKTOP REVIEW

The Dry Mixedwood Natural Subregion is characterized by aspen forests and cultivated lands, with wetlands in low-lying areas (Natural Regions Committee 2006). Agriculture is the primary land use in the southern portion of the Dry Mixedwood Natural Subregion.

Review of the ACIMS database (Alberta Environment and Protected Areas 2023a) indicates that no documented listed vegetation species, listed ecological communities, parks, protected areas, Crown reservations or notations have been historically observed within the Study Area (Appendix B).

### 3.4.2 FIELD ASSESSMENT

Vegetation field assessments were completed between August 9 to 11 for the Railyard and September 27 to 29 for the Bypass, in conjunction with wetland field assessments. Vegetation within cultivated lands observed to be dominated by crop species (i.e., barley) and tame grass species (e.g., Kentucky bluegrass [*Poa pratensis*], red fescue [*Festuca rubra*]) for the purposes of sod farming). Native vegetation communities were restricted to remnant areas characterized as deciduous treed upland, graminoid marshes, and deciduous swamps.

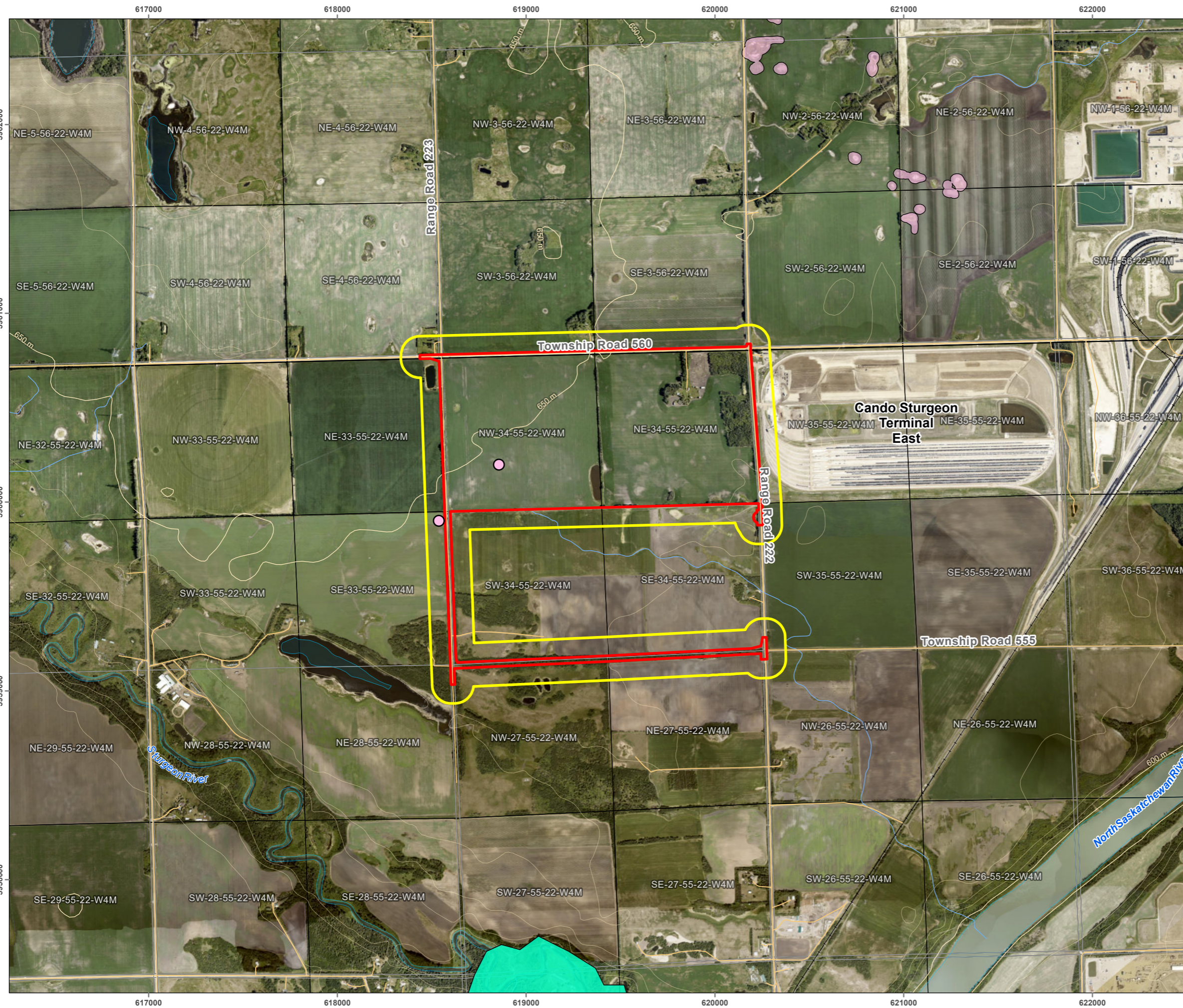
- **Deciduous Treed Upland** communities were comprised of a canopy of aspen (*Populus tremuloides*) and balsam poplar (*Populus balsamifera*), with a shrub layer dominated by snowberry (*Symphoricarpos albus*), prickly rose (*Rosa acicularis*), wild black currant (*Ribes americanum*), wild red raspberry (*Rubus idaeus*), red-osier dogwood (*Cornus sericea*), Saskatoon (*Amelanchier alnifolia*), pin cherry (*Prunus pennsylvanica*), beaked hazelnut (*Corylus cornuta*) and low-bush cranberry (*Viburnum edule*). The understory was characterized by veiny meadow rue (*Thalictrum venulosum*), northern bedstraw (*Galium boreale*), wild vetch (*Vicia americana*), Canada anemone (*Anemonastrum canadense*), sweet-scented bedstraw (*Galium triflorum*), common pink wintergreen (*Pyrola asarifolia*), three-leaved Solomon's-seal (*Maianthemum trifolium*), star-flowered Solomon's-seal (*Maianthemum stellatum*), woodland agrimony (*Agrimonia striata*), rayless aster (*Symphyotrichum ciliatum*), large-leaved yellow avens (*Geum macrophyllum*), cream-colored vetchling (*Lathyrus ochroleucus*), dewberry (*Rubus pubescens*), tall lungwort (*Mertensia paniculata*), common fireweed (*Chamaenerion angustifolium*), prairie sagewort (*Artemisia ludoviciana*), and red and white baneberry (*Actaea rubra*). A representative Deciduous Treed Upland is shown in Appendix Photo D-2.
- **Graminoid Marsh** communities were observed to exhibit shallow wetland plant community zones which were characterized by common cattail (*Typha latifolia*), awned sedge (*Carex atherodes*), small bottle sedge (*Carex utriculata*), slough grass (*Beckmannia syzigachne*), common tall manna grass (*Glyceria grandis*), western dock (*Rumex occidentalis*); and wet meadow plant community zones characterized by fowl bluegrass (*Poa palustris*), needle spike-rush (*Eleocharis acicularis*), foxtail barley (*Hordeum jubatum*), pale persicaria (*Persicaria lapathifolia*), marsh yellow cress (*Rorippa palustris*), and mudwort (*Limosella aquatica*). A representative Graminoid Marsh is shown in Appendix Photo D-6.



- **Deciduous Swamp** communities (i.e., wetlands with >25% woody cover) had deciduous wooded forms dominated by balsam poplar, shrubby forms characterized by red-osier dogwood, shining willow (*Salix lasiandra* var. *lasiandra*), and pussy willow (*Salix discolor*), and herbaceous cover including small bottle sedge, arrow-leaved coltsfoot (*Petasites frigidus* var. *sagittatus*), awned sedge, western dock, wild mint (*Mentha canadensis*), and common nettle (*Urtica dioica*). A representative Graminoid Marsh is shown in Appendix Photo D-7.

The following are designated noxious invasive plants that were observed within the Project Footprint: creeping (Canada) thistle (*Cirsium arvense*), perennial sow-thistle (*Sonchus arvensis*), scentless chamomile (*Tripleurospermum inodorum*), common (yellow) toadflax (*Linaria vulgaris*), and white cockle (*Silene latifolia* ssp. *alba*). Invasive plants were present primarily along cultivated field margins with fairly uniform presence of creeping thistle and perennial sow thistle, and a few discrete populations of scentless chamomile, common toadflax, and white cockle. Additionally, designated exotic species included absinthe wormwood (*Artemisia absinthium*), biennial sagewort (*Artemisia biennis*), common dandelion (*Taraxacum officinale*), common hempnettle (*Galeopsis tetrahit*), large barnyard grass (*Echinochloa crus-galli*), and smooth brome (*Bromus inermis*).

Two observations of the listed plant clammy hedge-hyssop (*Gratiola neglecta*) were observed within wetlands WL10 and WL146 within the Project Footprint (Figure 4, Appendix Photo D-8). Clammy hedge-hyssop is not listed federally, but is listed provincially on the tracking list as S3 (vulnerable; Alberta Environment and Protected Areas 2023a), occurring in wet sites and along wetland edges in both natural and disturbed sites, including cultivated fields (Fryer et al. 2022). The species appears to be locally abundant, and the occurrence information was reported to the ACIMS on October 19, 2023.



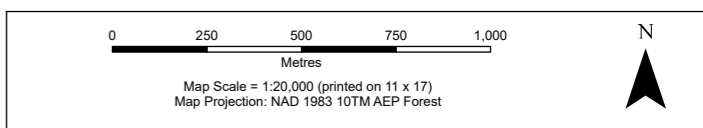
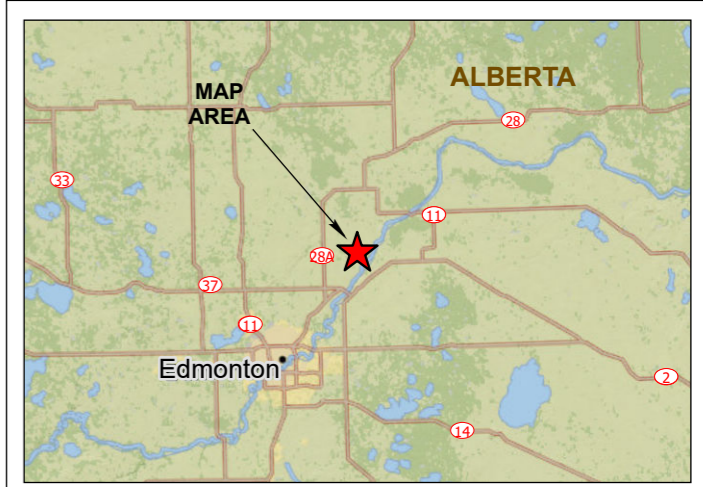
## Listed plant locations near the Study Area

Clifton Engineering Group Inc.

**Legend**

- Road
- Highway
- Railway
- Project Footprint
- Study Area
- clammy hedge-hyssop (*Gratiola neglecta*)
- flat-topped white aster (*Doellingeria umbellata* var. *pubens*)
- Field Identified Occurrence
- clammy hedge-hyssop (*Gratiola neglecta*)

Township  
 Section  
 Quarter Section



**Data Sources**

- Main map, World Imagery, Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
- Inset map, National Geographic, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
- Roads, rail, and ATS grid, AltaLIS 20K Base Features
- Waterbodies and watercourses, FWMS, Government of Alberta.
- Listed Plant Occurrence, Alberta Conservation Information Management System (ACIMS), 2022, Alberta Parks.

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Drawn: C. Tennant	Checked: J. Mischkolz	<b>Figure 4</b>	Date: 2023-12-18
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## 3.5 FISH, WILDLIFE AND WILDLIFE HABITAT

### 3.5.1 DESKTOP REVIEW

Based on the desktop review, the Study Area is not located within any provincially designated wildlife sensitivity zones (Government of Alberta 2022), however, the Project Footprint is located:

- approximately 280 m from a Key Wildlife and Biodiversity Zone associated with the Sturgeon River and North Saskatchewan River valleys;
- approximately 200 m from a Sharp-tailed Grouse Survey Area, and
- approximately 200 m from a Sensitive Raptor Range for Bald Eagle (Government of Alberta 2022).

The Study Area does not overlap with any federally designated critical habitats (Fisheries and Oceans Canada 2022, Environment and Climate Change Canada 2022b), Important Bird Areas, Migratory Bird Sanctuaries, or National Wildlife Areas (Government of Alberta 2022). Wildlife associated with the Dry Mixedwood Natural Subregion is varied and includes ungulates such as mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), moose (*Alces alces*), small mammals such as rodents and rabbits, as well as many bird species. Within 2 km of the Project Footprint, three bird species have historically been reported, and there is documented fish presence within the Sturgeon River and the North Saskatchewan River (Alberta Environment and Protected Areas 2023b), none of which are federally or provincially listed species; the FWMIS report is provided in Appendix C.

**Table 2. Fish and wildlife species reported within 2 km of the Project Footprint.**

Common Name	Scientific Name	SARA Listing <sup>1</sup>	COSEWIC Status <sup>1</sup>	Alberta General Status <sup>2</sup>	Alberta <i>Wildlife Act</i> Listing <sup>3</sup>
<b>Fish Species</b>					
Emerald Shiner	<i>Notropis atherinoides</i>	Not Listed	Not Listed	Secure	Not Listed
Goldeye	<i>Hiodon alosoides</i>	Not Listed	Not Listed	Secure	Not Listed
Longnose Sucker	<i>Catostomus catostomus</i>	Not Listed	Not Listed	Secure	Not Listed
Shorthead Redhorse	<i>Moxostoma macrolepidotum</i>	Not Listed	Not Listed	Secure	Not Listed
White Sucker	<i>Catostomus commersonii</i>	Not Listed	Not Listed	Secure	Not Listed
<b>Bird Species</b>					
Baltimore Oriole	<i>Icterus galbula</i>	Not Listed	Not Listed	Secure	Not Listed
Eastern Phoebe	<i>Sayornis phoebe</i>	Not Listed	Not Listed	Sensitive	Not Listed
Least Flycatcher	<i>Empidonax minimus</i>	Not Listed	Not Listed	Secure	Not Listed

<sup>1</sup> Species at Risk Public Registry (Government of Canada 2023).

<sup>2</sup> Alberta Wild Species General Status (Alberta Environment and Parks 2022a).

<sup>3</sup> Species at Risk Assessed in Alberta (Government of Alberta 2023e).



### 3.5.2 FIELD RECONNAISSANCE

A wildlife reconnaissance survey was completed on July 13, 2023. Pedestrian surveys were completed on representative portions of the Railyard, while accessible roadways within 1 km of the Railyard were used to characterize adjacent habitats. Species observed during the field survey are listed in Table 3.

Cultivated fields may provide habitat for deer, small mammals (e.g., rabbits, rodents), and birds, although the remnant deciduous treed uplands provide these species valuable habitat for forage, cover, and breeding. Foraging cavities made by smaller woodpecker species were noted in larger trembling aspen and balsam poplar trees. An unoccupied stick nest was noted within NE-34-55-22 W4M (Figure 5). Trees within the deciduous treed uplands were observed to be large enough to have the potential to support raptor nests and Pileated Woodpecker (*Dryocopus pileatus*) nesting cavities; however, no active nests or nest cavities were noted at the time of the site visit.

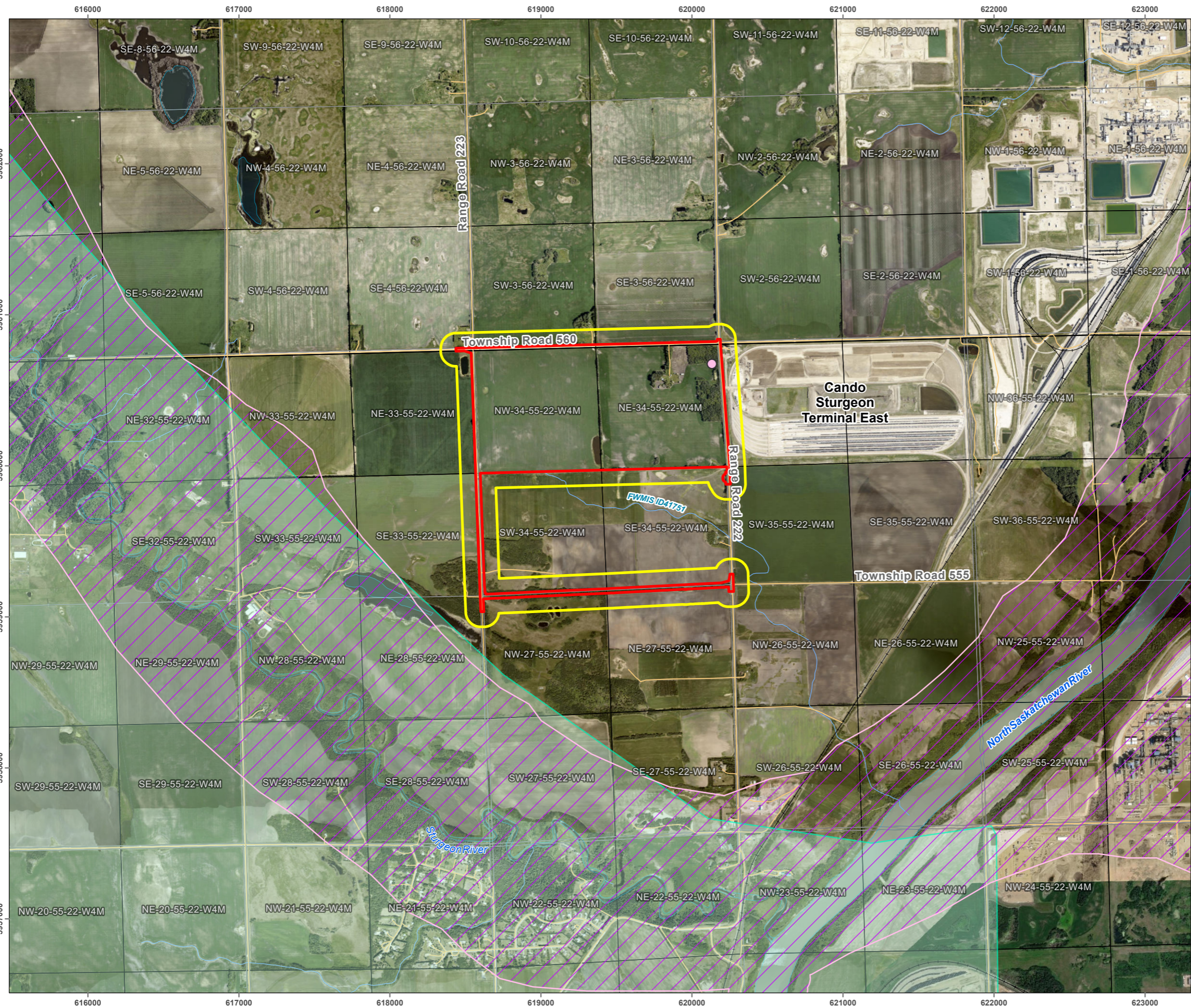
**Table 3. Wildlife species observed during field assessment, July 13, 2023.**

Common Name	Scientific Name	SARA Listing <sup>1</sup>	COSEWIC Status <sup>1</sup>	Alberta General Status <sup>2</sup>	Alberta Wildlife Act Listing <sup>3</sup>
American Crow	<i>Corvus brachyrhynchos</i>	Not Listed	Not Listed	Secure	Not Listed
American Robin	<i>Turdus migratorius</i>	Not Listed	Not Listed	Secure	Not Listed
Black-capped Chickadee	<i>Poecile atricapillus</i>	Not Listed	Not Listed	Secure	Not Listed
Clay-coloured Sparrow	<i>Spizella pallida</i>	Not Listed	Not Listed	Secure	Not Listed
Mule Deer or White-tailed Deer (tracks)	<i>Odocoileus hemionus</i> or <i>Odocoileus virginianus</i>	Not Listed	Not Listed	Secure	Not Listed
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Not Listed	Not Listed	Sensitive	Not Listed
Franklin's Gull	<i>Leucophaeus pipixcan</i>	Not Listed	Not Listed	Secure	Not Listed
LeConte's Sparrow	<i>Ammodramus lecontei</i>	Not Listed	Not Listed	Secure	Not Listed
Marbled Godwit	<i>Limosa fedoa</i>	Not Listed	Not Listed	Secure	Not Listed
Mule Deer	<i>Odocoileus hemionus</i>	Not Listed	Not Listed	Secure	Not Listed
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	Not Listed	Not Listed	Secure	Not Listed
Red-eyed Vireo	<i>Vireo olivaceus</i>	Not Listed	Not Listed	Secure	Not Listed
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Not Listed	Not at Risk	Secure	Not Listed
Savannah Sparrow	<i>Passerculus sandwichensis</i>	Not Listed	Not Listed	Secure	Not Listed
Song Sparrow	<i>Melospiza melodia</i>	Not Listed	Not Listed	Secure	Not Listed
Woodpecker (sp)	<i>Dryobates sp.</i>	NA	NA	NA	NA

<sup>1</sup> Species at Risk Public Registry (Government of Canada 2023).

<sup>2</sup> Alberta General Status (Alberta Environment and Parks 2022a).

<sup>3</sup> Species at Risk Assessed in Alberta (Government of Alberta 2023e).

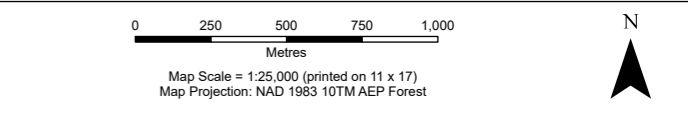
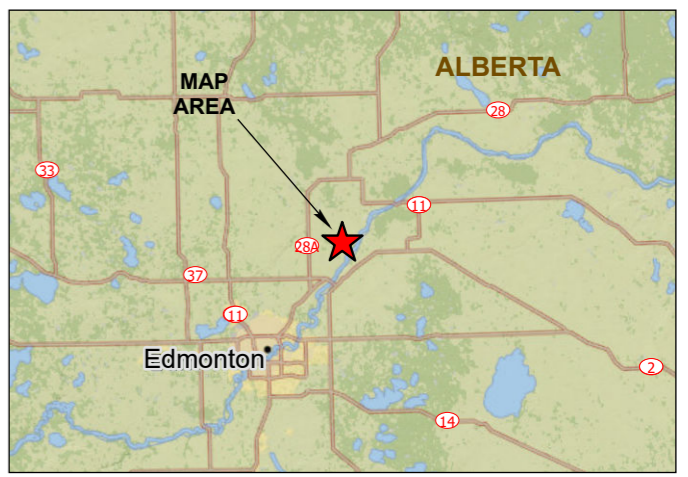


### Key wildlife areas near the Study Area

Clifton Engineering Group Inc.

#### Legend

- Unoccupied Stick Nest
- Township
- Section
- Quarter Section
- Road
- Highway
- Railway
- Project Footprint
- Study Area
- Key Wildlife and Biodiversity Zone
- Sharp-tailed Grouse Survey Area and Sensitive Raptor Range for Bald Eagle



**Data Sources**

- Main map, World Imagery, Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
- Inset map, National Geographic, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
- Roads, rail, and ATS grid, Altalis 20K Base Features
- Waterbodies and watercourses, FWMIS, Government of Alberta.
- Wildlife areas, Government of Alberta.

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Drawn: C. Tennant	Checked: J. Mischkolz	<b>Figure 5</b>	Date: 2023-12-19
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## 3.6 SURFACE WATER, HYDROLOGY, AND WETLANDS

### 3.6.1 SURFACE WATER AND HYDROLOGY

The Project is situated within the North Saskatchewan River watershed (Hydrologic Unit Code 2), and specifically in the North Saskatchewan River Beaverhill Basin (Hydrologic Unit Code 4) and the North Saskatchewan Above Beaverhill Sub-basin (Hydrologic Unit Code 8) (Alberta Environment and Protected Areas 2023b). Generally, the Study Area generally receives surface water from the northwest and water moves downgradient to the south and east. All watercourses, wetlands, ephemeral waterbodies, and ephemeral drainages identified within the Study Area are presented in Figure 6 to Figure 9. Surrounding the Project, surface hydrology and drainage patterns have been historical disturbed by roads, cultivation, irrigation, ditches, and berms.

Two known fish-bearing watercourses are located within 2 km of the Project Footprint (Alberta Environment and Protected Areas 2023b) (Figure 2). The Sturgeon River, located approximately 1 km southwest of the Project Footprint, flows southeast approximately 3 km to its confluence with the North Saskatchewan River, which then flows northeast. The North Saskatchewan River is located approximately 1.7 km southeast of the Project Footprint. The Sturgeon River is a large permanent Class C watercourse with a Restricted Activity Period (RAP) from April 16 to June 30, and the North Saskatchewan River is a large permanent Class C watercourse with a RAP from April 16 to July 31 (Alberta Environment and Sustainable Resource Development 2012). Within the Study Area (but outside the Project Footprint), one potential watercourse is indicated by FWMIS (Waterbody ID 41751) which appears to flow southeast from the southern extent of the Study Area south of the Railyard to the southeast 1.8 km to its confluence with the North Saskatchewan River (Figure 2). However, no evidence of this watercourse (Waterbody ID 41751) was observed within 100 m of the Project Footprint during the field assessments.

### 3.6.2 WETLANDS

Wetlands are defined as land saturated with water for long enough to promote the formation of water altered soils, growth of water tolerant vegetation, and biological activity adapted to a wet environment (Government of Alberta 2013). Ephemeral waterbodies are low-lying areas where water is briefly ponded in the spring or after heavy precipitation, but not long enough to meet the requirements of a wetland; as such, they are not recognized as wetlands in Alberta (Government of Alberta 2015).

Wetlands identified within the Study Area are presented in Figure 6 to Figure 9. Detailed results of the wetland assessment completed for the Project are included in the Project-specific WAIRs (EDI Environmental Dynamics Inc. 2023a, b). Representative wetland photos are shown in Appendix D. A total of 41 wetlands were identified within the Project Footprint, which will be disturbed by the Project, including the following:

- Within the Railyard, 32 wetlands were identified including: 27 temporary graminoid marshes, four seasonal graminoid marshes, and one wooded deciduous swamp.
- Within the Bypass, nine wetlands were identified including: one seasonal graminoid marsh, four temporary graminoid marshes, and four wooded deciduous swamps.



### 3.6.3 OTHER WATERBODIES

Ephemeral waterbodies, and ephemeral drainages identified within the Study Area are presented in Figure 6 to Figure 9. Of these, 18 ephemeral waterbodies (1.330 ha), and 13 ephemeral drainages (1,962 m in length and 0.196 ha conservatively assuming an average width of 1 m) were identified within the Project Footprint.

Additionally, the following surface water-related anthropogenic features were noted during field assessments:

- A sluice gate is located along the north ditch of Township Road 560, across from the lane entrance to the rural residence in NE 34-55-22 W4M. When the sluice gate is closed to the south, water flows east along the north side of Township Road 560. When the sluice gate is open to the south, water flows south along an ephemeral drainage (EPH-23) adjacent to the entrance lane of the rural residence then east across the Project Footprint towards a dugout (Dugout-03) (Figure 6).
- A 400-m irrigation pipeline running north-south was observed within SE-34-55-22 W4M (Figure 9).
- An 80-m shallow ditch running north-south was observed within SE-34-55-22 W4M (Figure 9).
- An irrigation pipeline with intermittent ditch is located along the Township Road 555 portion of the Bypass (Figure 9).
- Three dugouts (Dugout-09, Dugout-02, and Dugout-03) are located within the Study Area (Figure 6 and Figure 7).

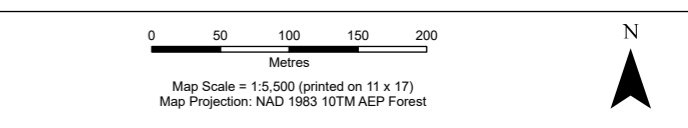
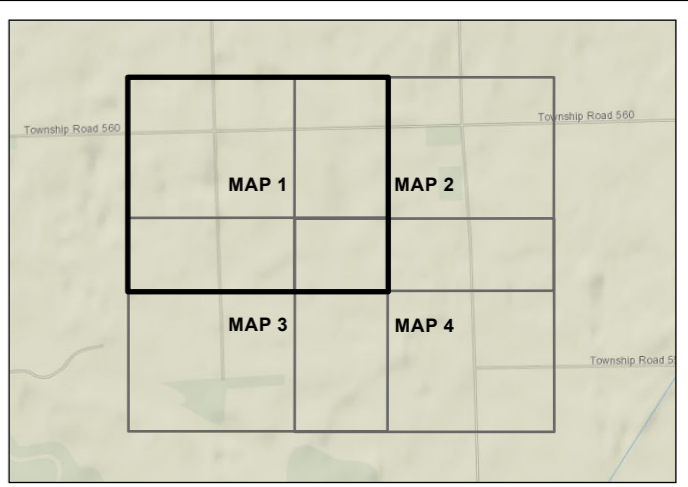


### Waterbodies within the Study Area (Map 1 of 4)

Clifton Engineering Group Inc.

**Legend**

Road	FWMIS Potential Watercourse
Highway	Ditch/Irrigation Pipeline
Railway	Ephemeral Drainage
Project Footprint	Dugout
Study Area	Ephemeral Waterbody
Township	Wetland
Section	
Quarter Section	



**Data Sources**

- Main map, World Imagery, Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
- Inset map, National Geographic, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
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- Waterbodies and watercourses, FWMIS, Government of Alberta.

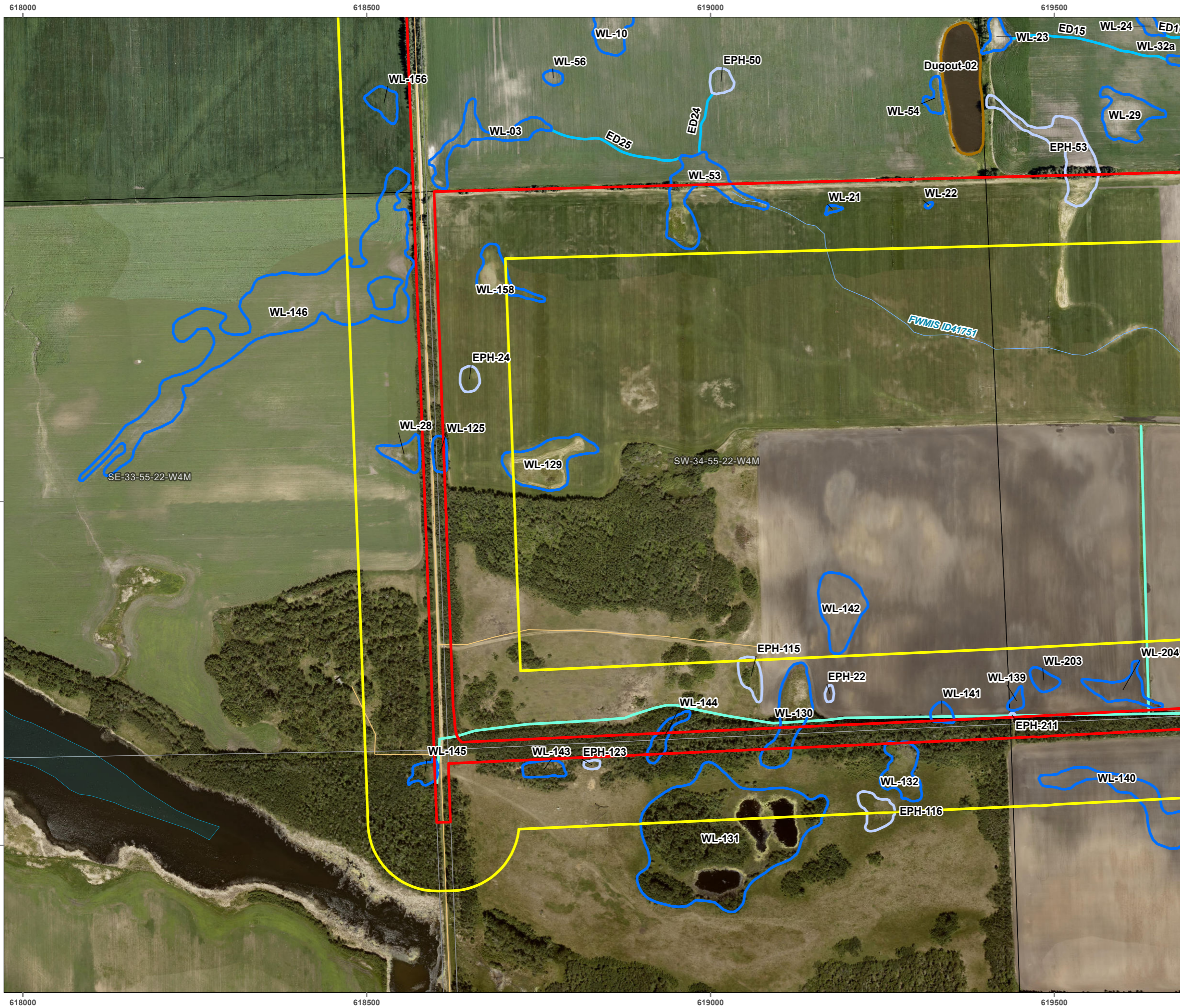
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Drawn: C. Tennant	Checked: J. Mischkolz	<b>Figure 6</b>	Date: 2023-12-19
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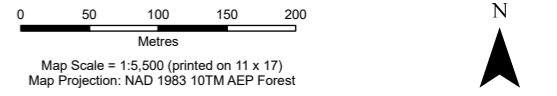
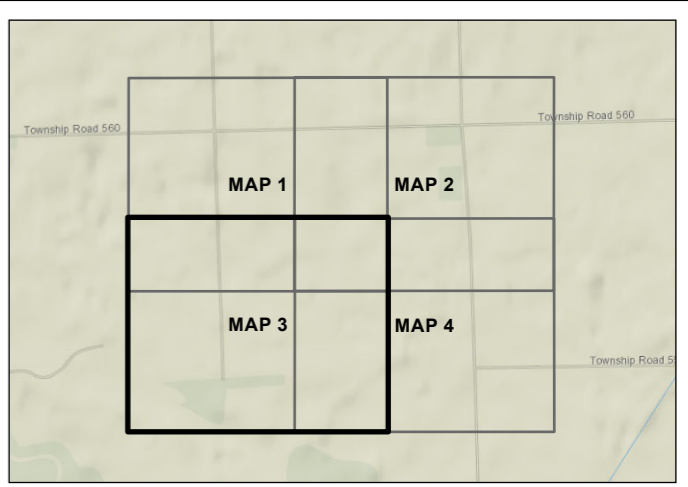




## Waterbodies within the Study Area (Map 3 of 4)

Clifton Engineering Group Inc.

- Legend**
- Road
  - Highway
  - Railway
  - Project Footprint
  - Study Area
  - Township
  - Section
  - Quarter Section
  - FWMIS Potential Watercourse
  - Ditch/Irrigation Pipeline
  - Ephemeral Drainage
  - Dugout
  - Ephemeral Waterbody
  - Wetland



**Data Sources**

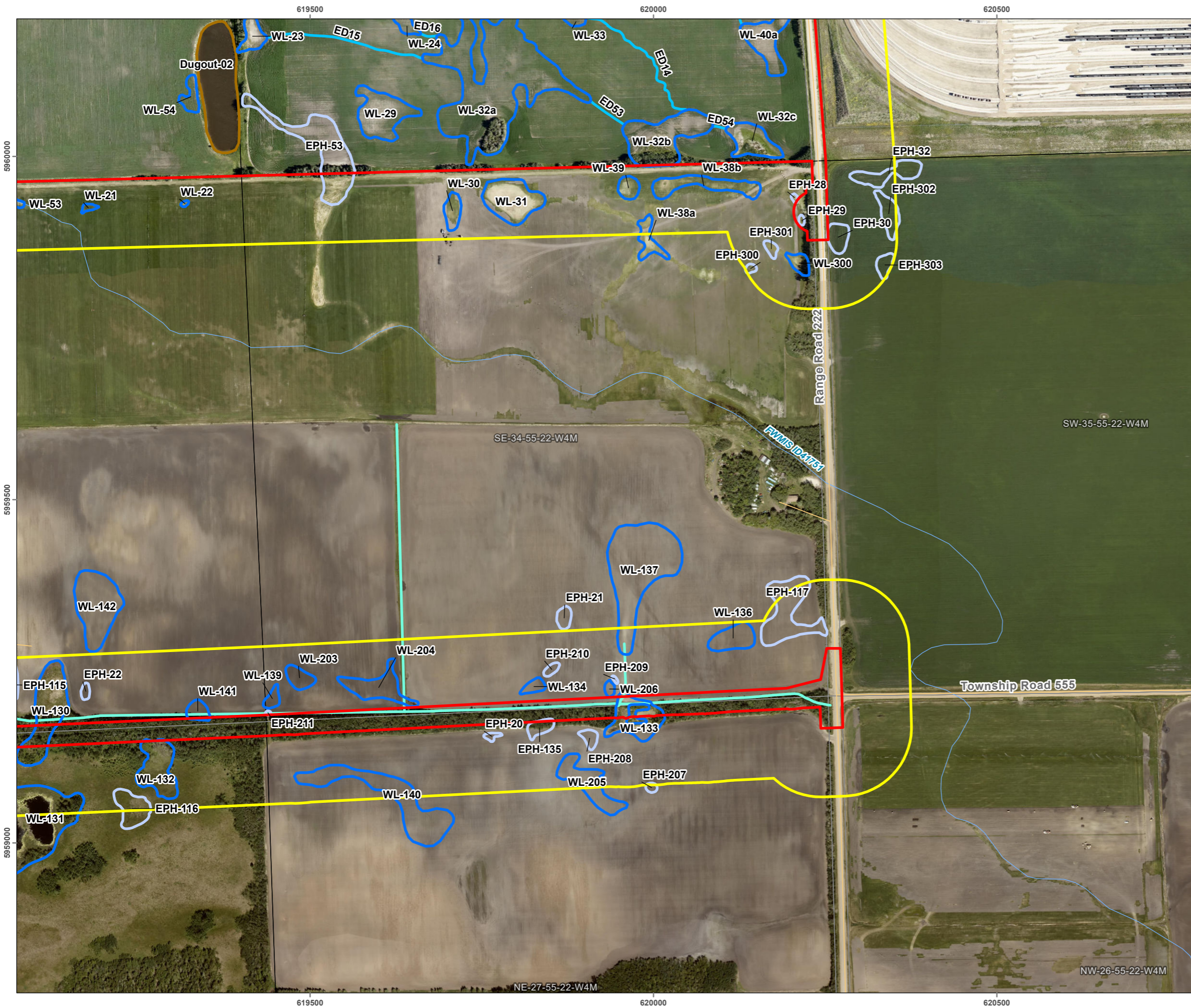
- Main map, World Imagery, Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
- Inset map, National Geographic, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
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Drawn: C. Tennant	Checked: J. Mischkolz	<b>Figure 8</b>	Date: 2023-12-19
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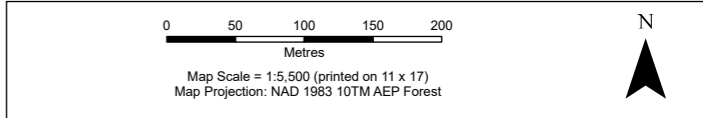
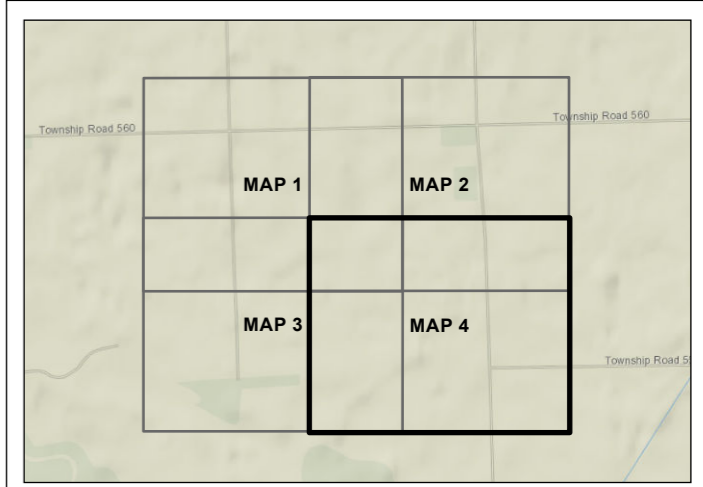


## Waterbodies within the Study Area (Map 4 of 4)

Clifton Engineering Group Inc.

**Legend**

Road	FWMIS Potential Watercourse
Highway	Ditch/Irrigation Pipeline
Railway	Ephemeral Drainage
Project Footprint	Dugout
Study Area	Ephemeral Waterbody
Township	Wetland
Section	
Quarter Section	



**Data Sources**

- Main map, World Imagery, Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
- Inset map, National Geographic, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
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- Waterbodies and watercourses, FWMIS, Government of Alberta.

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Drawn: C. Tennant	Checked: J. Mischkolz	<b>Figure 9</b>	Date: 2023-12-19
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## 4 REFERENCES

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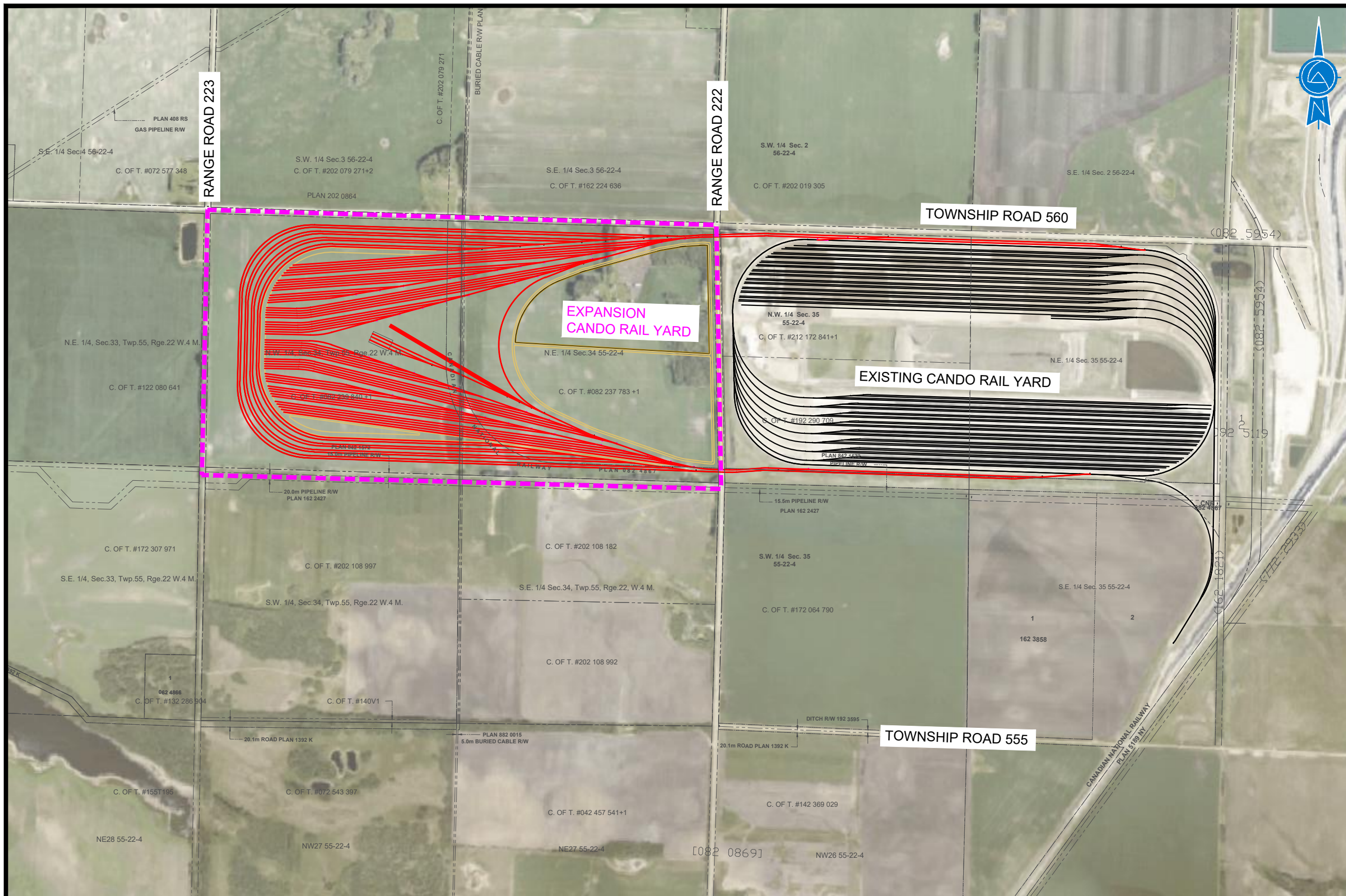
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# APPENDICES

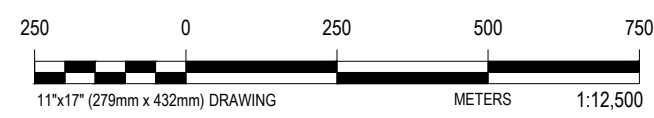


## APPENDIX A DESIGN DRAWINGS



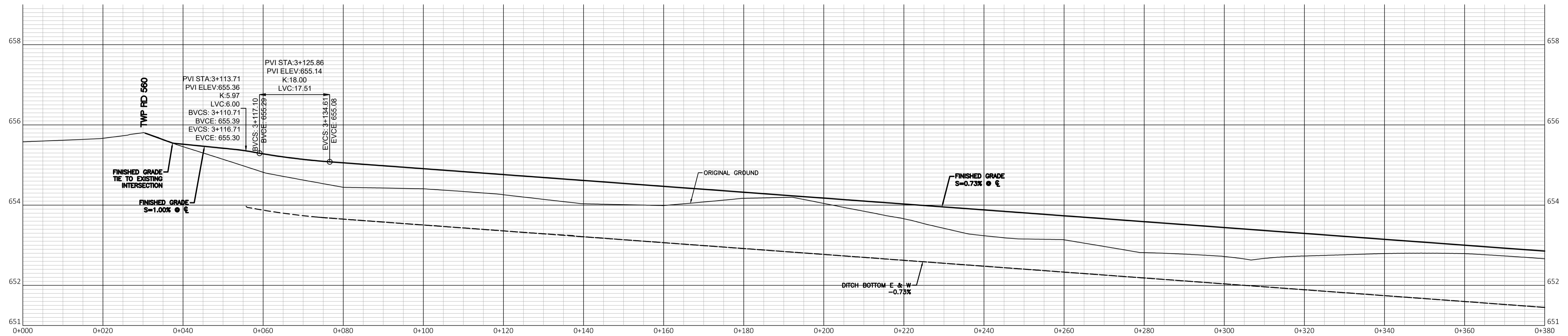
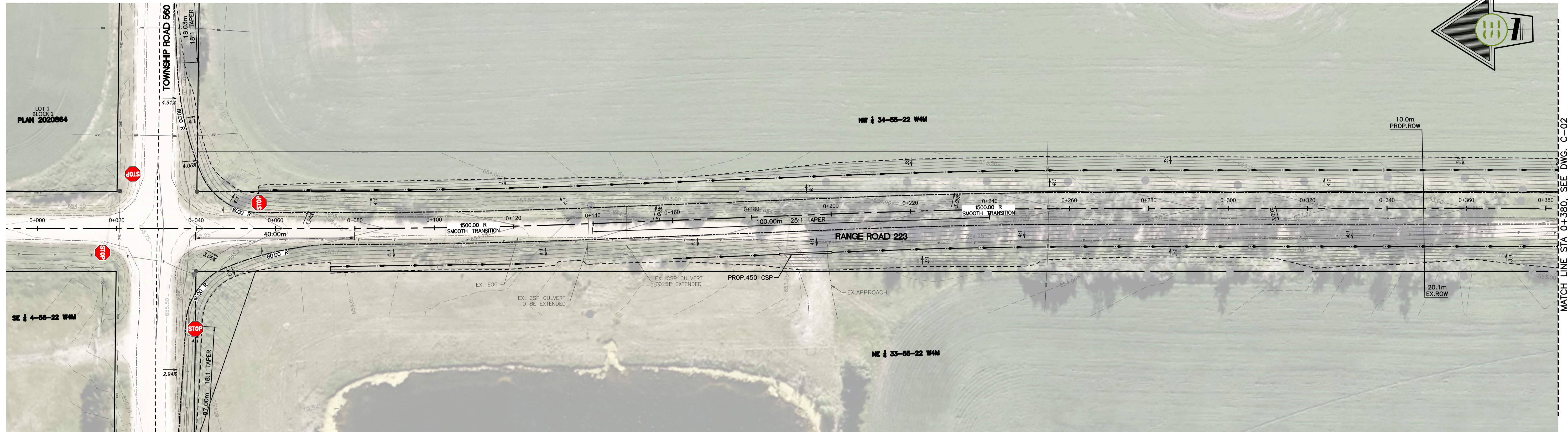
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EXISTING TRACK	
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STUDY AREA	



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CLIENT			
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FIGURE NAME	TRACK LAYOUT		
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**LEGEND**

- INDICATES EXISTING PROPERTY LINE
- - - - - INDICATES EXISTING RIGHT OF WAY
- - - - - 10.36.25 INDICATES EXISTING GROUND CONTOURS & ELEVATION
- - - - - INDICATES EXISTING EDGE OF GRAVEL
- x x x x x INDICATES EXISTING BARBED WIRE FENCE
- ~ ~ ~ ~ ~ INDICATES EXISTING TREE/BUSH LINE
- — — — — INDICATES EXISTING OVERHEAD POWER LINE
- — — — — INDICATES EXISTING HIGH PRESSURE GAS LINE
- — — — — INDICATES EXISTING TELECOMMUNICATION LINE
- — — — — INDICATES EXISTING CULVERT
- INDICATES EXISTING UTILITY BOX
- — — — — INDICATES EXISTING SIGN
- INDICATES EXISTING GUY ANCHOR POLE
- INDICATES EXISTING POWER POLE
- FD/FDIP INDICATES EXISTING FOUND IRON PIN
- INDICATES EXISTING TREE
- — — — — INDICATES PROPOSED RIGHT OF WAY
- - - - - INDICATES PROPOSED DAYLIGHT LINE
- - - - - INDICATES PROPOSED EDGE OF GRAVEL
- - - - - INDICATES PROPOSED DITCH FLOWLINE
- - - - - 10.36.25 INDICATES PROPOSED GROUND CONTOURS & ELEVATION

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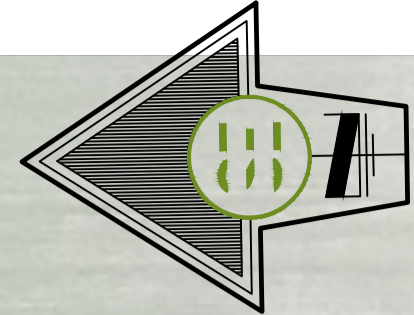
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B	23/11/24	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
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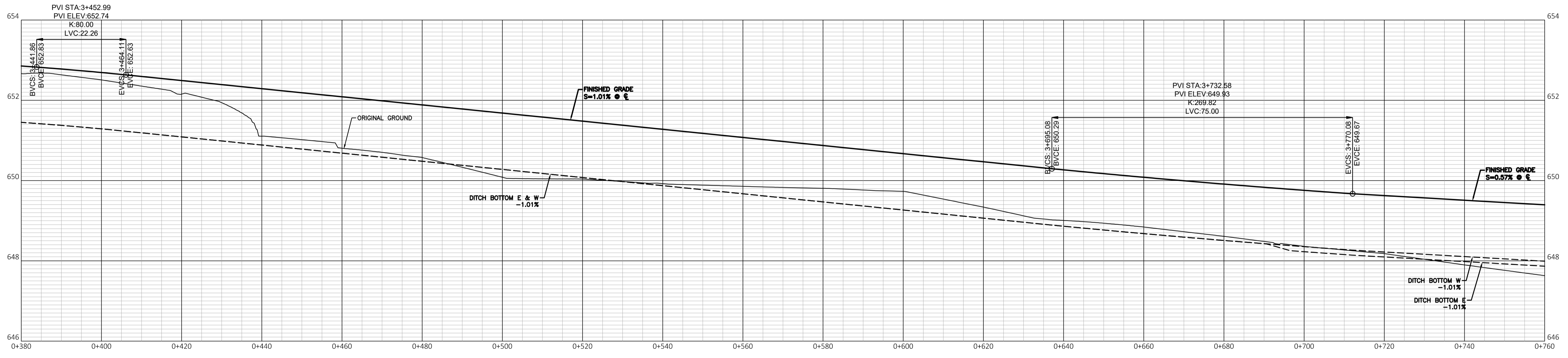
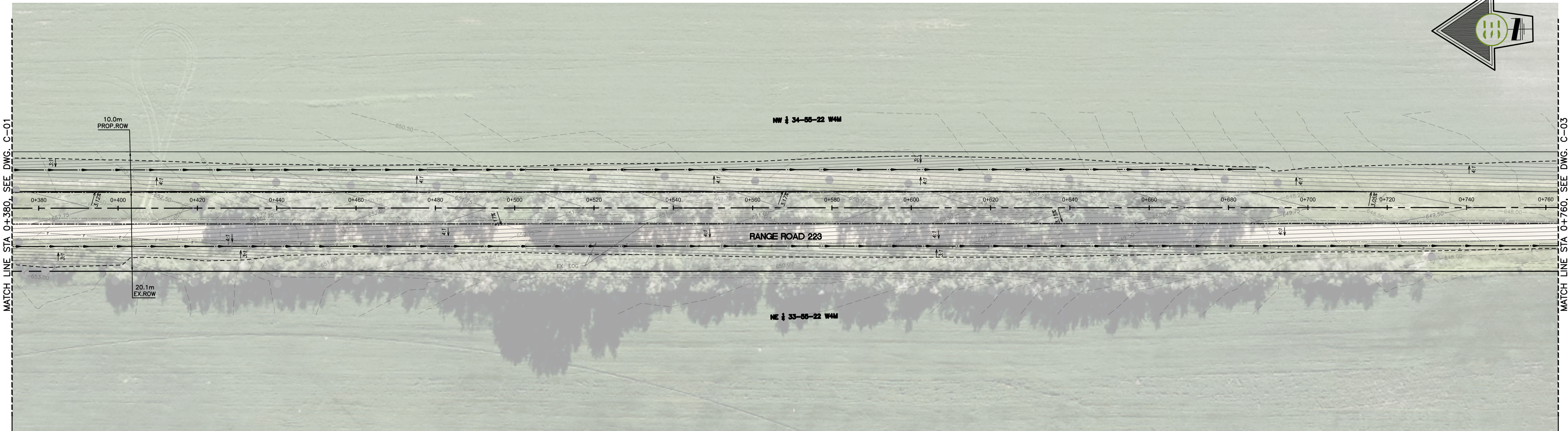


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MATCH LINE STA 0+380, SEE DWG. C-01

MATCH LINE STA 0+760, SEE DWG. C-03



**LEGEND**

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- - -	INDICATES EXISTING RIGHT OF WAY	■	INDICATES EXISTING UTILITY BOX	- - -	INDICATES PROPOSED DAYLIGHT LINE
- - - 10.36.25	INDICATES EXISTING GROUND CONTOURS & ELEVATION	+	INDICATES EXISTING SIGN	- - -	INDICATES PROPOSED EDGE OF GRAVEL
- - -	INDICATES EXISTING EDGE OF GRAVEL	o	INDICATES EXISTING GUY ANCHOR POLE	- - -	INDICATES PROPOSED DITCH FLOWLINE
x x x	INDICATES EXISTING BARBED WIRE FENCE	●	INDICATES EXISTING POWER POLE	- - -	INDICATES PROPOSED GROUND CONTOURS & ELEVATION
~ ~ ~	INDICATES EXISTING TREE/BUSH LINE	○	INDICATES EXISTING FOUND IRON PIN		
- - -	INDICATES EXISTING OVERHEAD POWER LINE	●	INDICATES EXISTING TREE		
- - -	INDICATES EXISTING HIGH PRESSURE GAS LINE				
- - -	INDICATES EXISTING TELECOMMUNICATION LINE				

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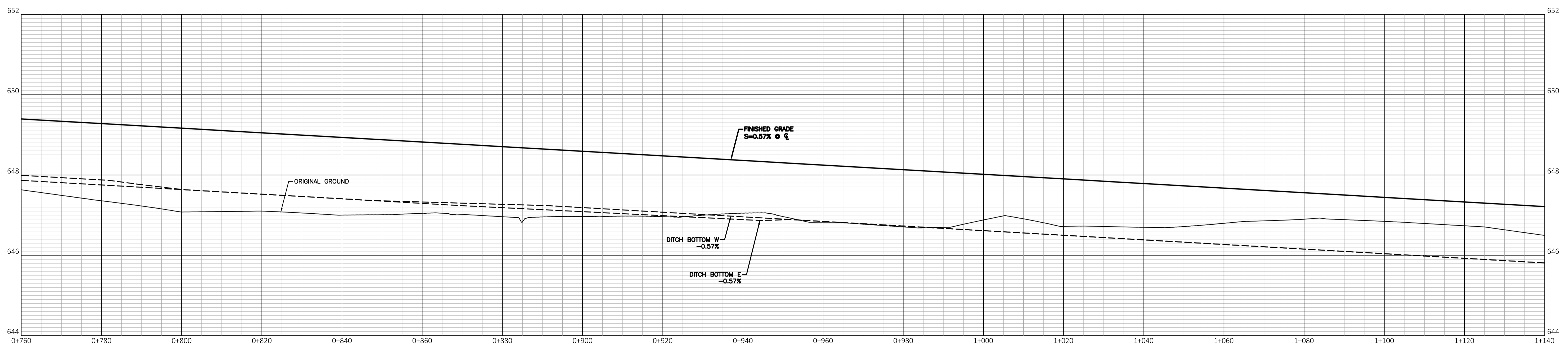
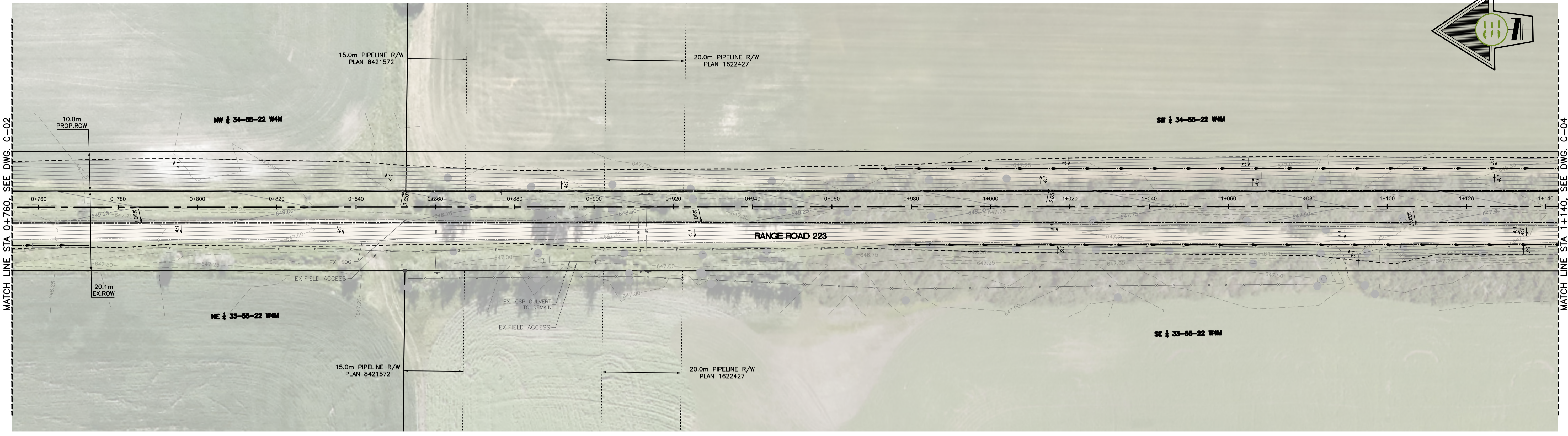
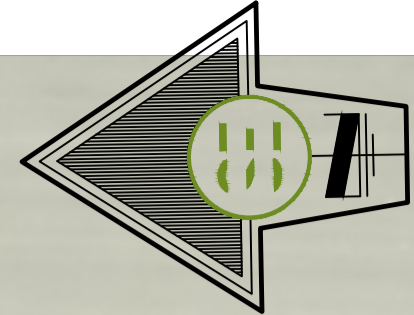
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A	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL



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- - -	INDICATES EXISTING RIGHT OF WAY	■	INDICATES EXISTING UTILITY BOX	- - -	INDICATES PROPOSED DAYLIGHT LINE
- - - 10.36.25'	INDICATES EXISTING GROUND CONTOURS & ELEVATION	+	INDICATES EXISTING SIGN	- - -	INDICATES PROPOSED EDGE OF GRAVEL
- - -	INDICATES EXISTING EDGE OF GRAVEL	⊙	INDICATES EXISTING GUY ANCHOR POLE	- - -	INDICATES PROPOSED DITCH FLOWLINE
x x x	INDICATES EXISTING BARBED WIRE FENCE	●	INDICATES EXISTING FOUND POLE	- - -	INDICATES PROPOSED GROUND CONTOURS & ELEVATION
~ ~ ~	INDICATES EXISTING TREE/BUSH LINE	○	INDICATES EXISTING FOUND IRON PIN		
- - -	INDICATES EXISTING OVERHEAD POWER LINE	●	INDICATES EXISTING TREE		
- - -	INDICATES EXISTING HIGH PRESSURE GAS LINE	○			
- - -	INDICATES EXISTING TELECOMMUNICATION LINE				

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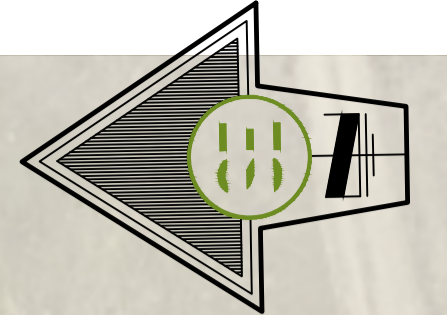
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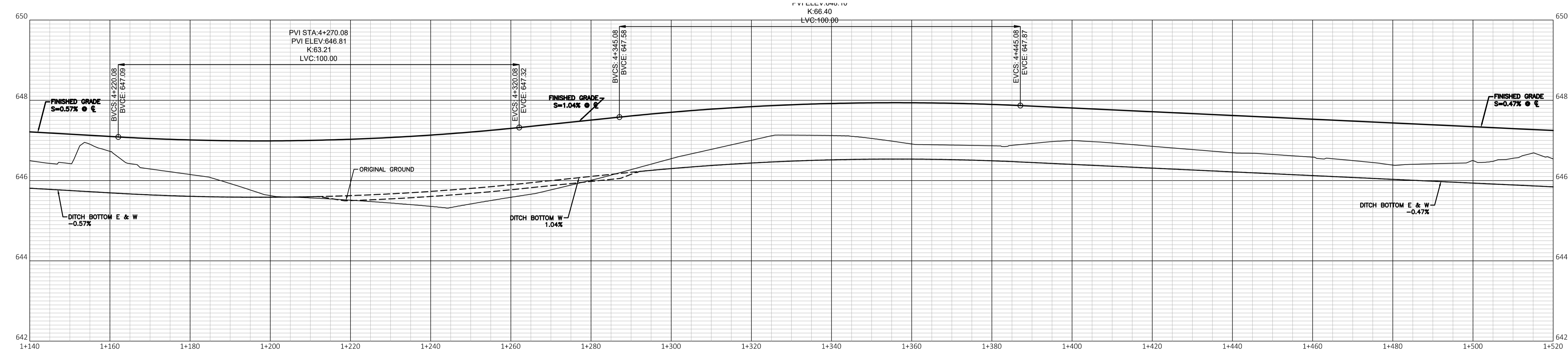
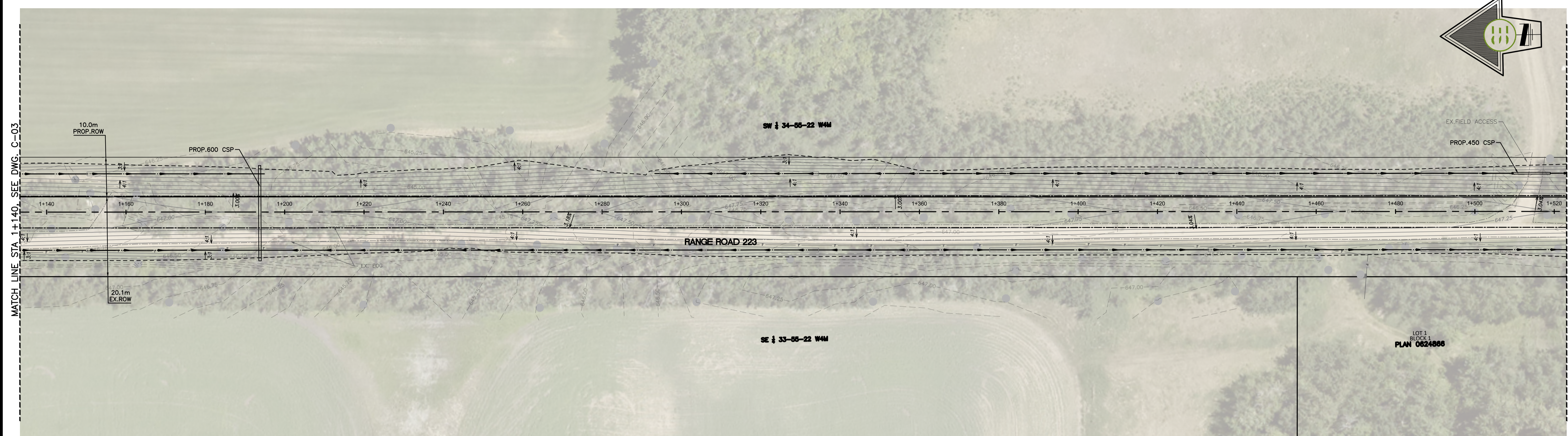
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MATCH LINE STA 1+140, SEE DWG. C-03

MATCH LINE STA 1+520, SEE DWG. C-05



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- - - -	INDICATES EXISTING RIGHT OF WAY	■	INDICATES EXISTING UTILITY BOX	- - - -	INDICATES PROPOSED DAYLIGHT LINE
- - - - 10.36.25'	INDICATES EXISTING GROUND CONTOURS & ELEVATION	+	INDICATES EXISTING SIGN	- - - -	INDICATES PROPOSED EDGE OF GRAVEL
- - - -	INDICATES EXISTING EDGE OF GRAVEL	⊙	INDICATES EXISTING GUY ANCHOR POLE	- - - -	INDICATES PROPOSED DITCH FLOWLINE
x x x x	INDICATES EXISTING BARBED WIRE FENCE	●	INDICATES EXISTING POWER POLE	- - - -	INDICATES PROPOSED GROUND CONTOURS & ELEVATION
~ ~ ~ ~	INDICATES EXISTING TREE/BUSH LINE	○	INDICATES EXISTING FOUND IRON PIN		
- - - -	INDICATES EXISTING OVERHEAD POWER LINE	●	INDICATES EXISTING TELECOMMUNICATION LINE		
—	INDICATES EXISTING HIGH PRESSURE GAS LINE				
- - - -	INDICATES EXISTING TELECOMMUNICATION LINE				

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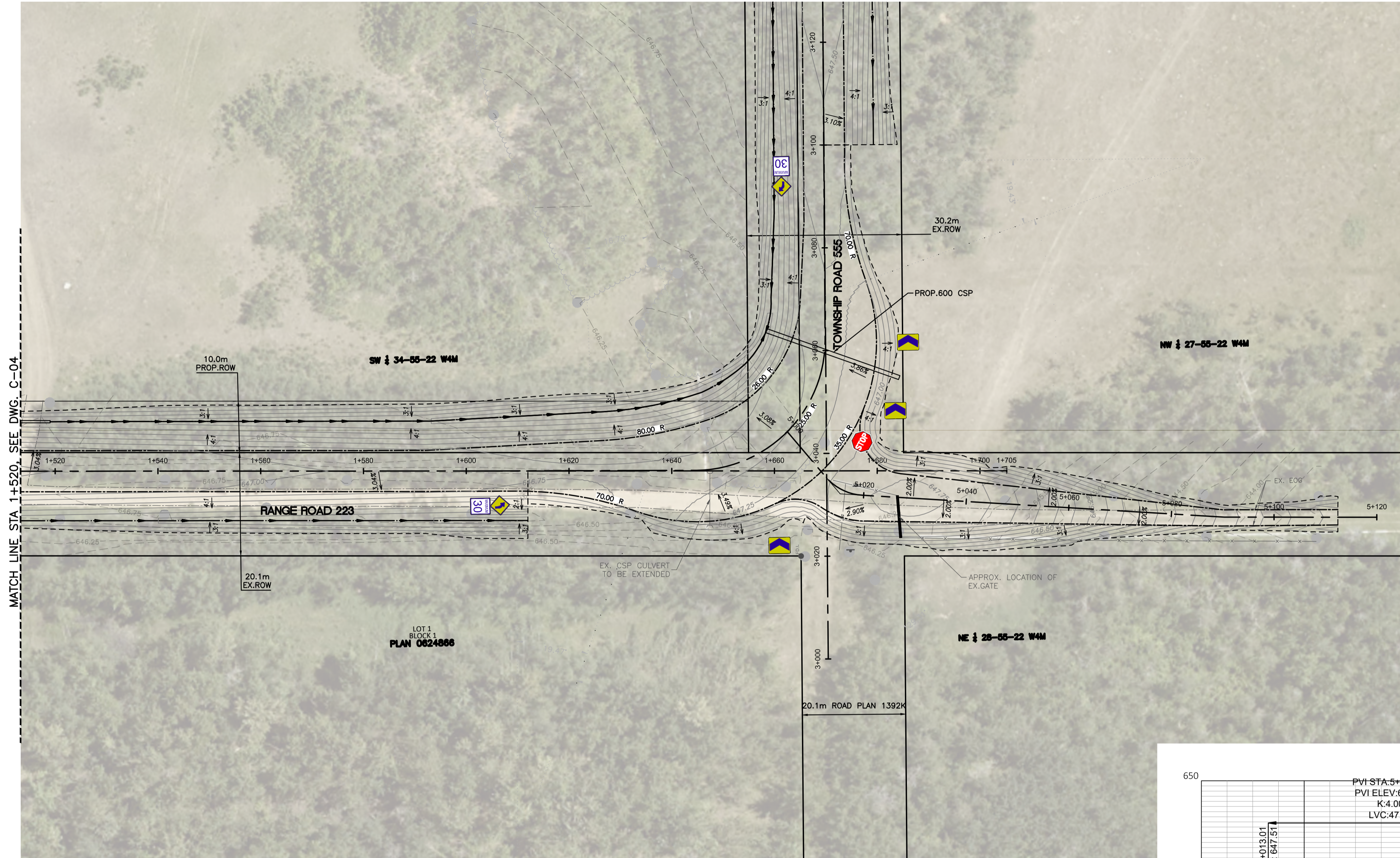
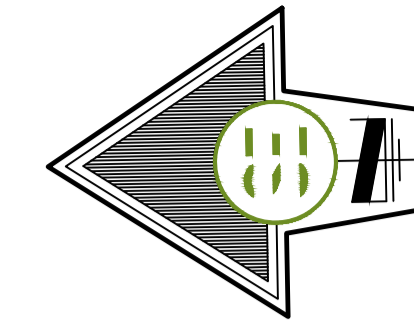
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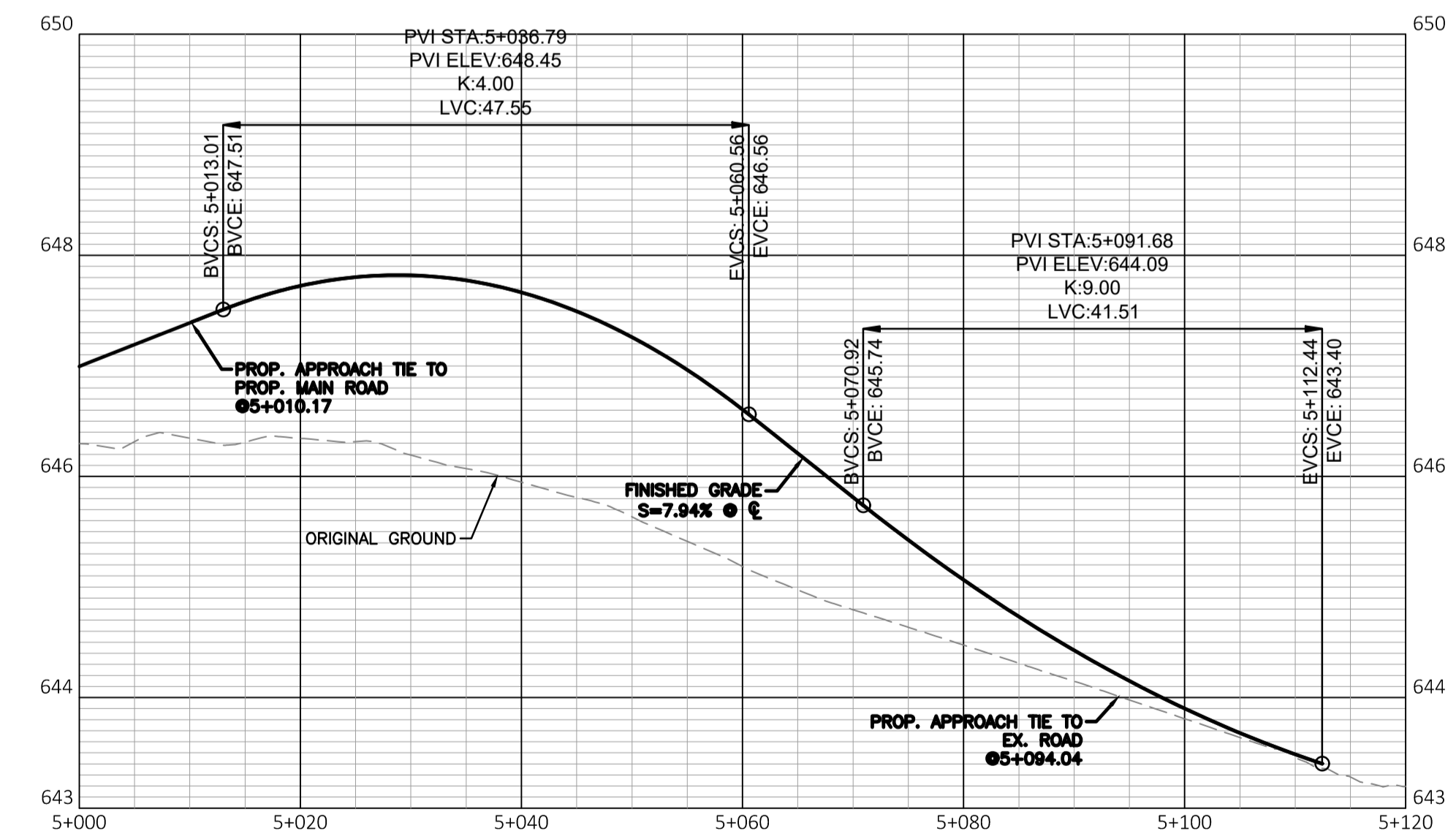
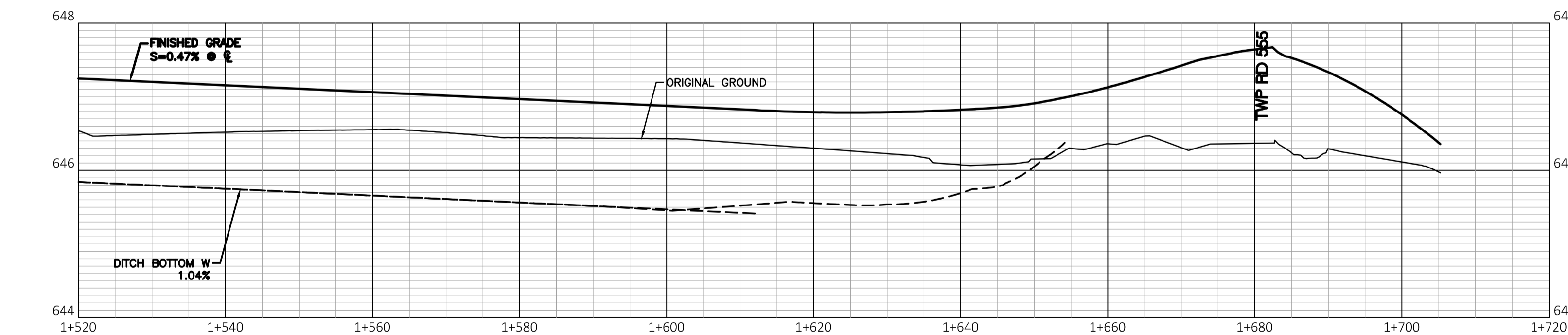
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**LEGEND**

- INDICATES PROPERTY LINE
- - - - - INDICATES EXISTING RIGHT OF WAY
- - - - - 1036.25 INDICATES EXISTING GROUND CONTOURS & ELEVATION
- - - - - INDICATES EXISTING EDGE OF GRAVEL
- x - x - x - INDICATES EXISTING BARBED WIRE FENCE
- - - - - INDICATES EXISTING TREE/BUSH LINE
- - - - - INDICATES EXISTING OVERHEAD POWER LINE
- - - - - INDICATES EXISTING HIGH PRESSURE GAS LINE
- - - - - INDICATES EXISTING TELECOMMUNICATION LINE
- - - - - INDICATES EXISTING CULVERT
- INDICATES EXISTING UTILITY BOX
- ▲ INDICATES EXISTING SIGN
- INDICATES EXISTING GUY ANCHOR POLE
- PP INDICATES EXISTING POWER POLE
- FDI/FDIP INDICATES EXISTING FOUND IRON PIN
- INDICATES EXISTING TREE
- - - - - INDICATES PROPOSED RIGHT OF WAY
- - - - - INDICATES PROPOSED DAYLIGHT LINE
- - - - - INDICATES PROPOSED EDGE OF GRAVEL
- - - - - INDICATES PROPOSED DITCH FLOWLINE
- - - - - 1036.25 INDICATES PROPOSED GROUND CONTOURS & ELEVATION



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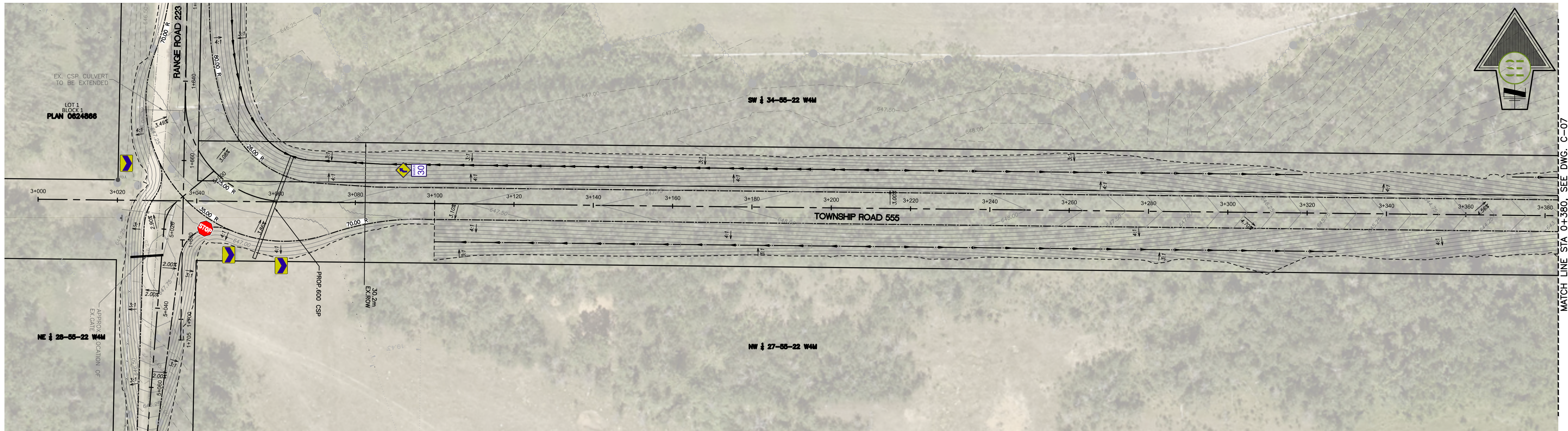
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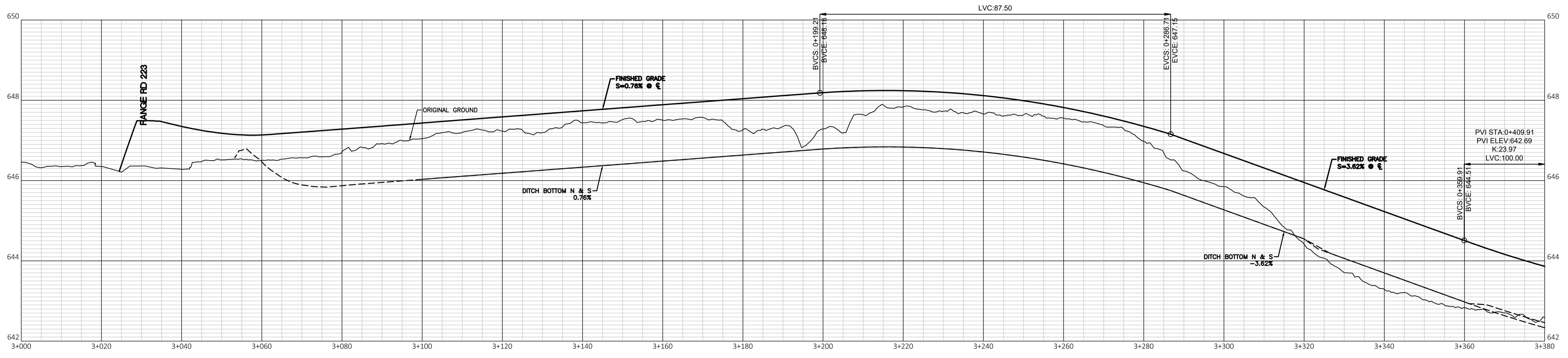
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- - - - - 10.36.25	INDICATES EXISTING GROUND CONTOURS & ELEVATION
- - - - -	INDICATES EXISTING EDGE OF GRAVEL
x x x x x	INDICATES EXISTING BARBED WIRE FENCE
~ ~ ~ ~ ~	INDICATES EXISTING TREE/BUSH LINE
— — — — —	INDICATES EXISTING OVERHEAD POWER LINE
— — — — —	INDICATES EXISTING HIGH PRESSURE GAS LINE
— — — — —	INDICATES EXISTING TELECOMMUNICATION LINE
— — — — —	INDICATES EXISTING CULVERT
■	INDICATES EXISTING UTILITY BOX
▲	INDICATES EXISTING SIGN
○	INDICATES EXISTING GUY ANCHOR POLE
●	INDICATES EXISTING POWER POLE
●	INDICATES EXISTING FOUND IRON PIN
●	INDICATES EXISTING TREE
— — — — —	INDICATES PROPOSED RIGHT OF WAY
- - - - -	INDICATES PROPOSED DAYLIGHT LINE
- - - - -	INDICATES PROPOSED EDGE OF GRAVEL
— — — — —	INDICATES PROPOSED DITCH FLOWLINE
- - - - - 10.36.25	INDICATES PROPOSED GROUND CONTOURS & ELEVATION

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B	23/11/24	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
A	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL



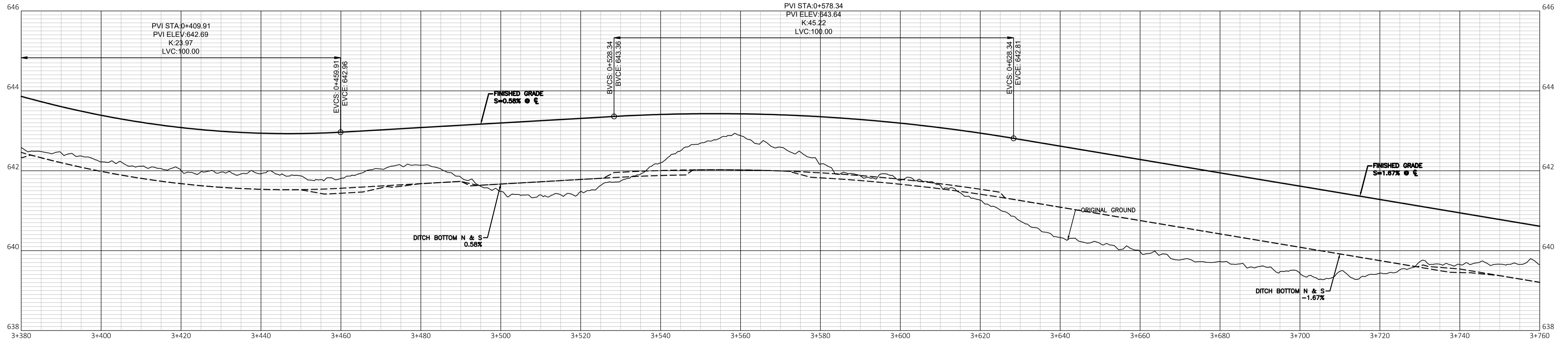
**CANDO RANGE ROAD 222 BYPASS**  
 STURGEON COUNTY, ALBERTA  
 PLAN & PROFILE  
 STATION 3+000 TO 3+380

ISSUE/REVISION
C
DRAWING NO.
<b>C-06</b>
SHEET
06 OF 11

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**LEGEND**

- INDICATES PROPERTY LINE
- - - - - INDICATES EXISTING RIGHT OF WAY
- - - - - 10.36.25 INDICATES EXISTING GROUND CONTOURS & ELEVATION
- - - - - INDICATES EXISTING EDGE OF GRAVEL
- x x x x x INDICATES EXISTING BARBED WIRE FENCE
- ~ ~ ~ ~ ~ INDICATES EXISTING TREE/BUSH LINE
- - - - - INDICATES EXISTING OVERHEAD POWER LINE
- — — — — INDICATES EXISTING HIGH PRESSURE GAS LINE
- - - - - INDICATES EXISTING TELECOMMUNICATION LINE
- — — — — INDICATES EXISTING CULVERT
- INDICATES EXISTING UTILITY BOX
- ▲ INDICATES EXISTING SIGN
- INDICATES EXISTING GUY ANCHOR POLE
- PP INDICATES EXISTING POWER POLE
- FDI/FDIP INDICATES EXISTING FOUND IRON PIN
- INDICATES EXISTING TREE
- — — — — INDICATES PROPOSED RIGHT OF WAY
- - - - - INDICATES PROPOSED DAYLIGHT LINE
- - - - - INDICATES PROPOSED EDGE OF GRAVEL
- - - - - INDICATES PROPOSED DITCH FLOWLINE
- - - - - 10.36.25 INDICATES PROPOSED GROUND CONTOURS & ELEVATION

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B	23/11/24	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
A	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL



CANDO RANGE ROAD 222 BYPASS  
STURGEON COUNTY, ALBERTA  
PLAN & PROFILE  
STATION 3+380 TO 3+760

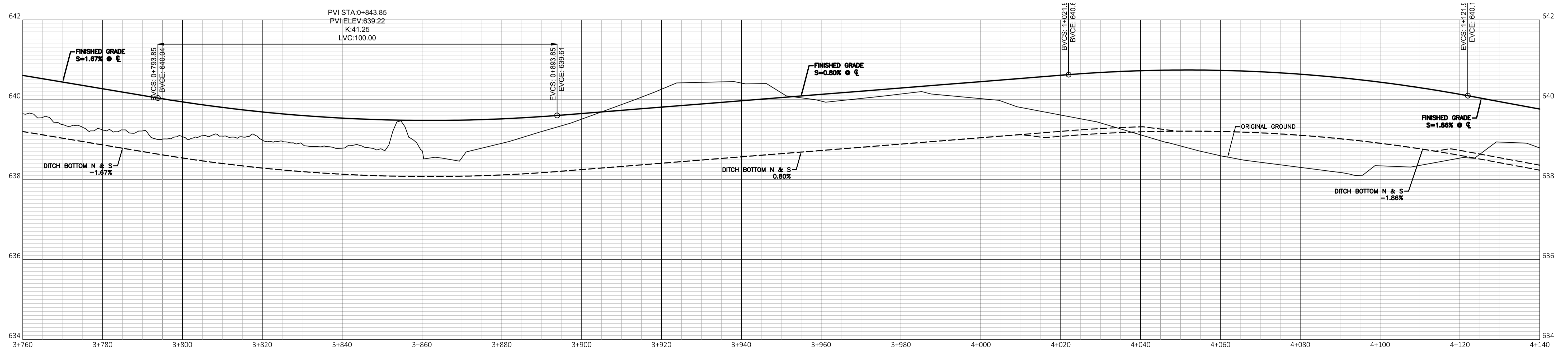
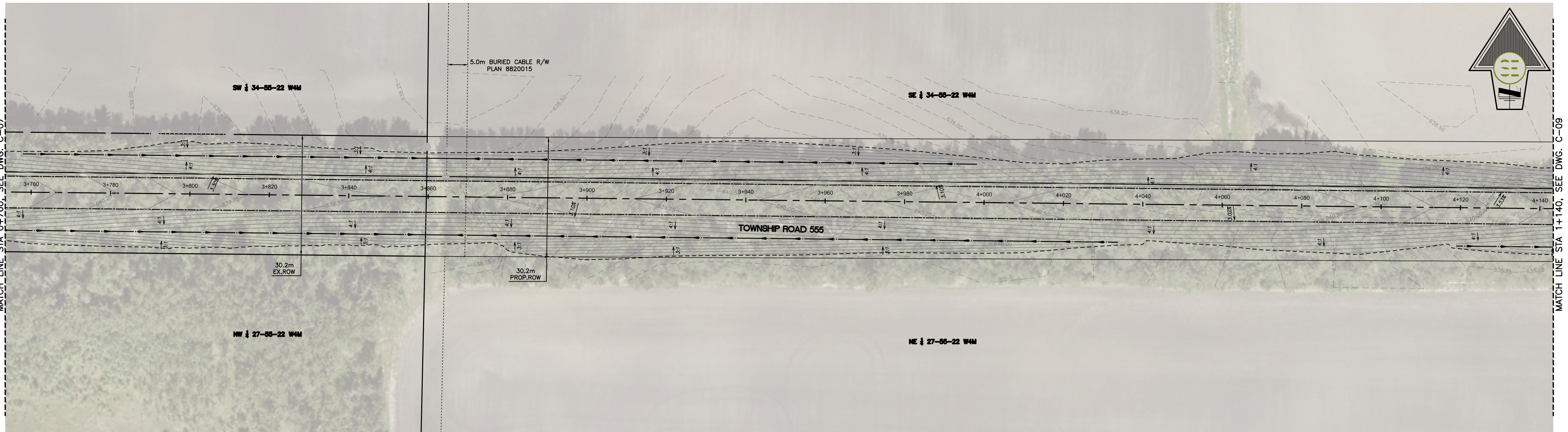
ISSUE/REVISION
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C-07
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MATCH LINE STA 0+760, SEE DWG. C-07

MATCH LINE STA 1+140, SEE DWG. C-09



**LEGEND**

- |           |  |   |                                    |       |  |
|-----------|--|---|------------------------------------|-------|--|
| —         | INDICATES PROPERTY LINE                        | — | INDICATES EXISTING CULVERT         | —     | INDICATES PROPOSED RIGHT OF WAY                |
| - - -     | INDICATES EXISTING RIGHT OF WAY                | ■ | INDICATES EXISTING UTILITY BOX     | - - - | INDICATES PROPOSED DAYLIGHT LINE               |
| - - -     | INDICATES EXISTING GROUND CONTOURS & ELEVATION | ▲ | INDICATES EXISTING SIGN            | - - - | INDICATES PROPOSED EDGE OF GRAVEL              |
| - - -     | INDICATES EXISTING EDGE OF GRAVEL              | ○ | INDICATES EXISTING GUY ANCHOR POLE | - - - | INDICATES PROPOSED DITCH FLOWLINE              |
| - x - x - | INDICATES EXISTING BARBED WIRE FENCE           | ● | INDICATES EXISTING POWER POLE      | - - - | INDICATES PROPOSED GROUND CONTOURS & ELEVATION |
| - x - x - | INDICATES EXISTING TREE/BUSH LINE              | ● | INDICATES EXISTING FOUND IRON PIN  | —     |  |
| - - -     | INDICATES EXISTING OVERHEAD POWER LINE         | ● | INDICATES EXISTING TREE            |       |  |
| - - -     | INDICATES EXISTING HIGH PRESSURE GAS LINE      |   |                                    |       |  |
| - - -     | INDICATES EXISTING TELECOMMUNICATION LINE      |   |                                    |       |  |

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B	23/11/24	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
A	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL



CANDO RANGE ROAD 222 BYPASS  
STURGEON COUNTY, ALBERTA  
PLAN & PROFILE  
STATION 3+760 TO 4+140

SCALE:  
H=1:500 V=1:50

PROJECT NO:  
SEI.23.128

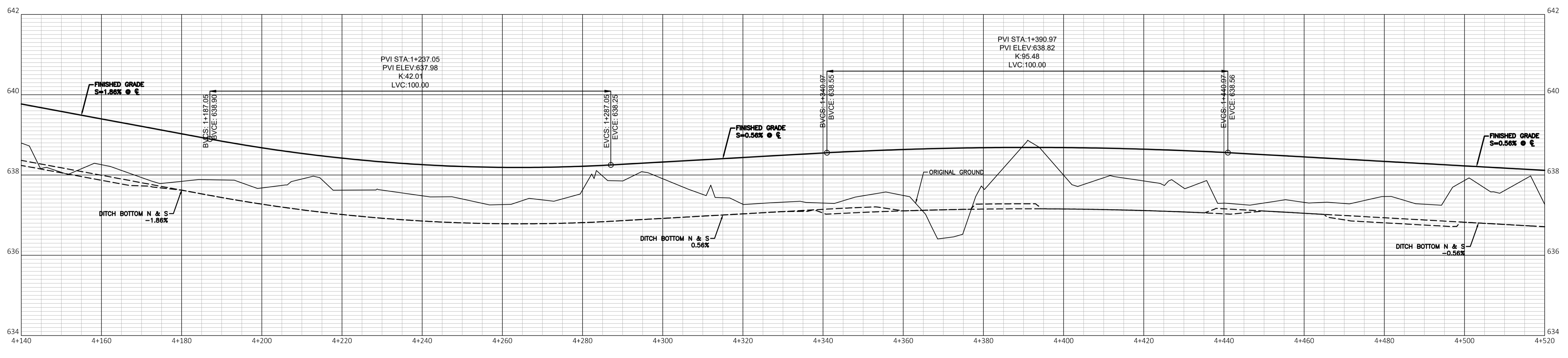
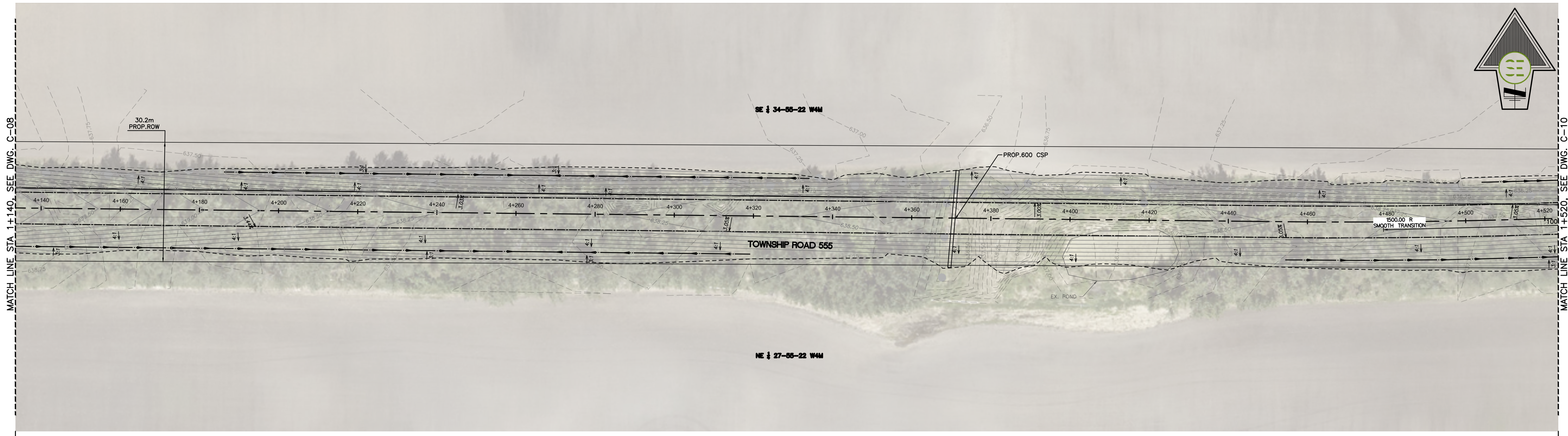
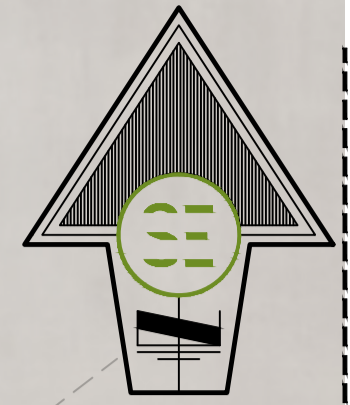
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MATCH LINE STA 1+140, SEE DWG. C-08

MATCH LINE STA 1+520, SEE DWG. C-10



**LEGEND**

—	INDICATES PROPERTY LINE	—	INDICATES PROPOSED RIGHT OF WAY	
- - - -	INDICATES EXISTING RIGHT OF WAY	—	INDICATES PROPOSED DAYLIGHT LINE	
- - - - 10.36.25	INDICATES EXISTING GROUND CONTOURS & ELEVATION	—	INDICATES PROPOSED EDGE OF GRAVEL	
- - - -	INDICATES EXISTING EDGE OF GRAVEL	—	INDICATES PROPOSED DITCH FLOWLINE	
x x x x	INDICATES EXISTING BARBED WIRE FENCE	—	10.36.25	INDICATES PROPOSED GROUND CONTOURS & ELEVATION
~ ~ ~ ~	INDICATES EXISTING TREE/BUSH LINE	—		
—	INDICATES EXISTING OVERHEAD POWER LINE	—		
—	INDICATES EXISTING HIGH PRESSURE GAS LINE	—		
—	INDICATES EXISTING TELECOMMUNICATION LINE	—		
—	INDICATES EXISTING CULVERT	—		
—	INDICATES EXISTING UTILITY BOX	—		
—	INDICATES EXISTING SIGN	—		
—	INDICATES EXISTING GUY ANCHOR POLE	—		
—	INDICATES EXISTING POWER POLE	—		
—	INDICATES EXISTING FOUND IRON PIN	—		
—	INDICATES EXISTING TREE	—		

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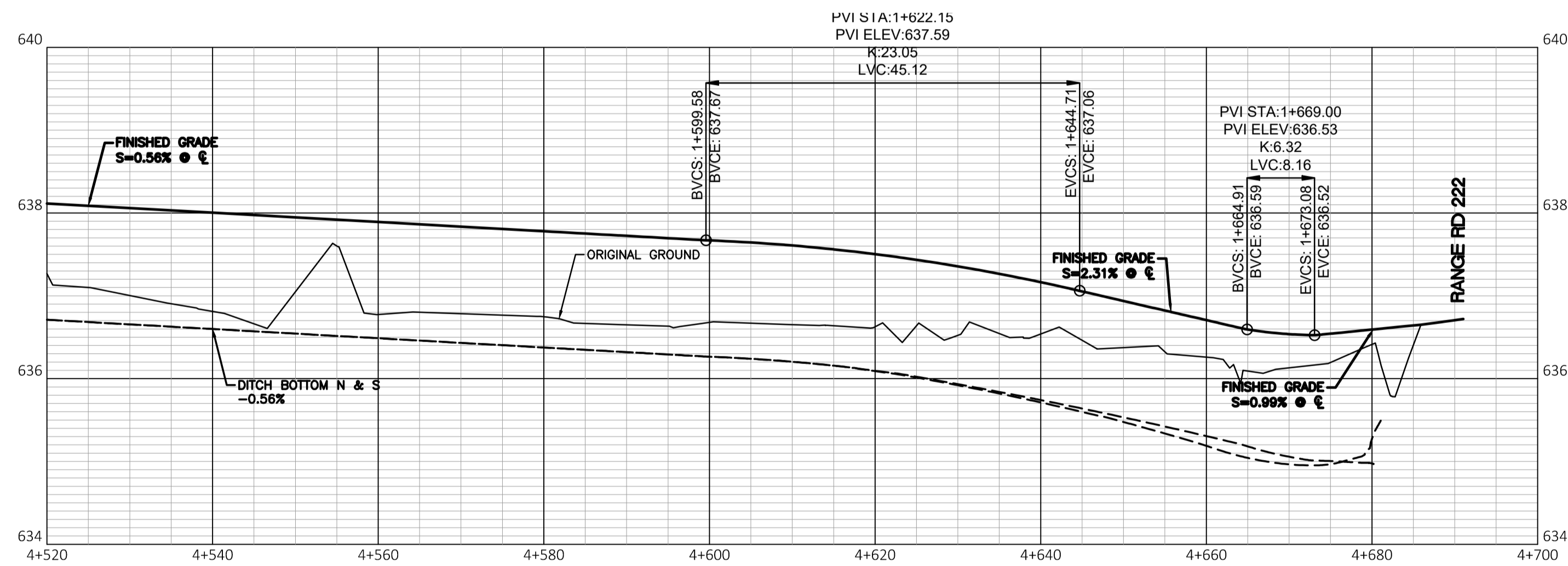
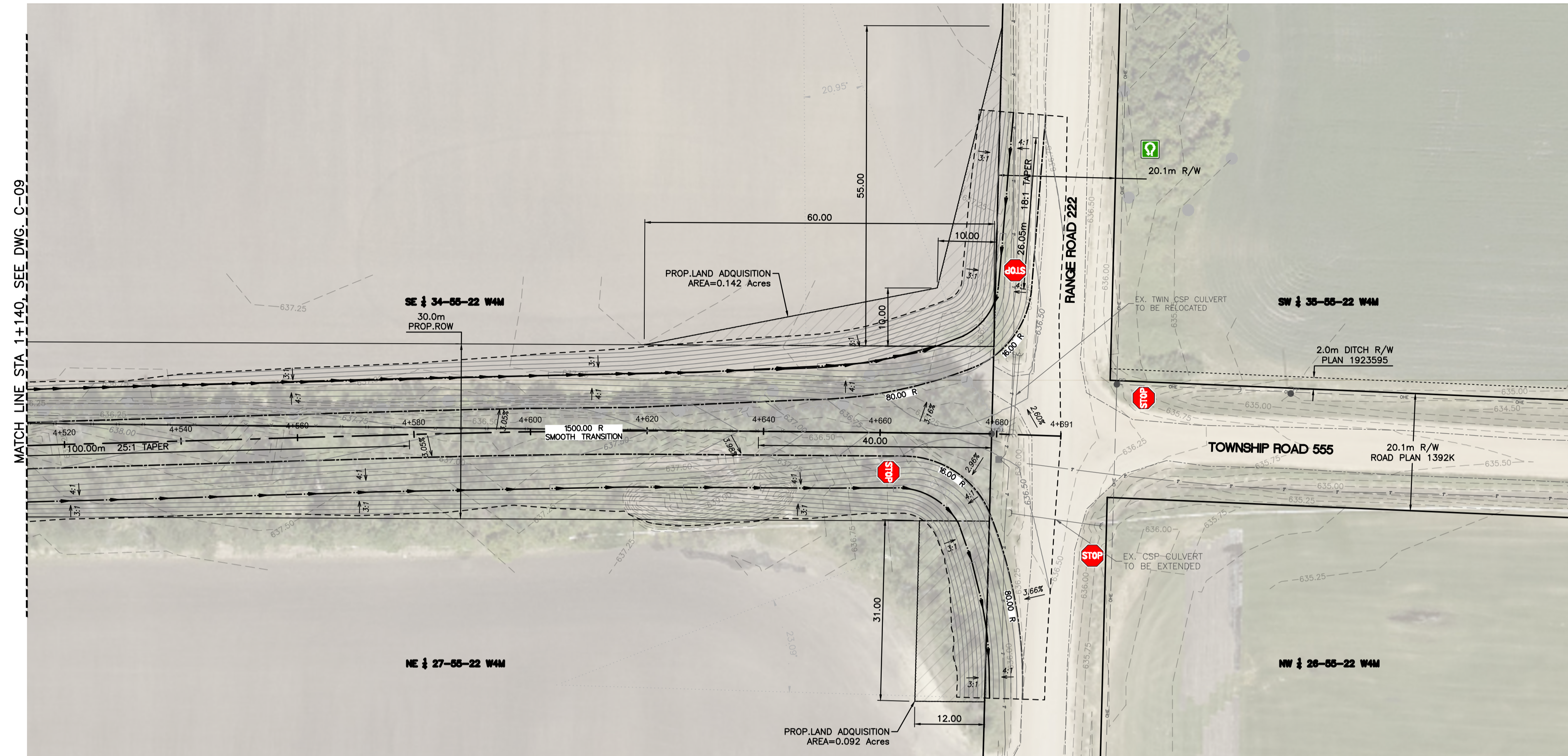
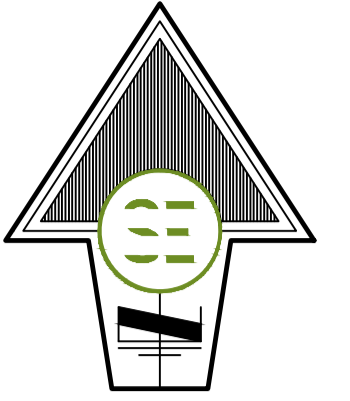
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B	23/11/24	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL
A	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL



CANDO RANGE ROAD 222 BYPASS  
STURGEON COUNTY, ALBERTA  
PLAN & PROFILE  
STATION 4+140 TO 4+520

ISSUE/REVISION	C
DRAWING NO.	C-09
SHEET	09 OF 11

SCALE: H=1:500 V=1:50	PROJECT NO: SEI.23.128	FILE NAME: SEI.23.128 - 30%.dwg
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**LEGEND**

	INDICATES PROPERTY LINE		INDICATES EXISTING CULVERT		INDICATES PROPOSED RIGHT OF WAY
	INDICATES EXISTING RIGHT OF WAY		INDICATES EXISTING UTILITY BOX		INDICATES PROPOSED DAYLIGHT LINE
	INDICATES EXISTING GROUND CONTOURS & ELEVATION		INDICATES EXISTING SIGN		INDICATES PROPOSED EDGE OF GRAVEL
	INDICATES EXISTING EDGE OF GRAVEL		INDICATES EXISTING GUY ANCHOR POLE		INDICATES PROPOSED DITCH FLOWLINE
	INDICATES EXISTING BARBED WIRE FENCE		INDICATES EXISTING POWER POLE		INDICATES PROPOSED GROUND CONTOURS & ELEVATION
	INDICATES EXISTING TREE/BUSH LINE		INDICATES EXISTING FOUND IRON PIN		
	INDICATES EXISTING OVERHEAD POWER LINE		INDICATES EXISTING TREE		
	INDICATES EXISTING HIGH PRESSURE GAS LINE				
	INDICATES EXISTING TELECOMMUNICATION LINE				

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A	23/11/24	30% DESIGN - RE-ISSUED FOR CLIENT REVIEW	GC	GC	JI	JI
B	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JI	JI



CANDO RANGE ROAD 222 BYPASS  
STURGEON COUNTY, ALBERTA  
PLAN & PROFILE  
STATION 4+520 TO 4+700

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PROJECT NO:  
SEI.23.128

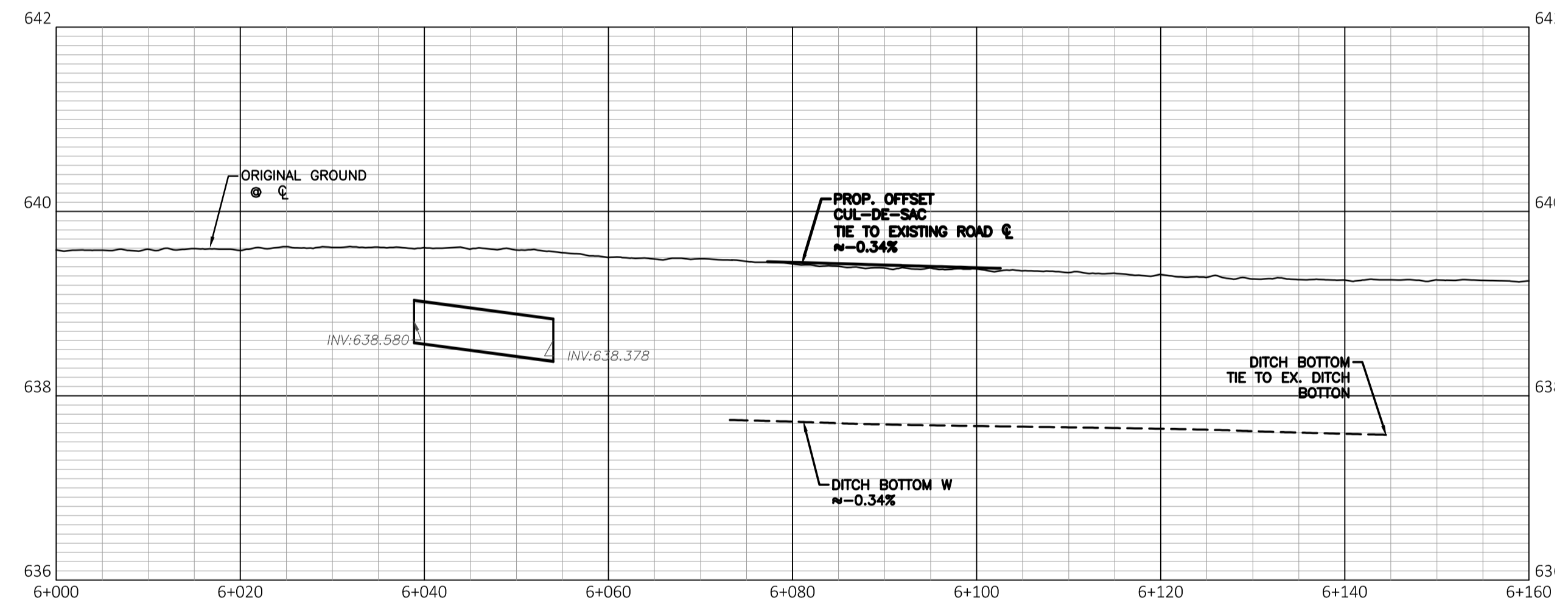
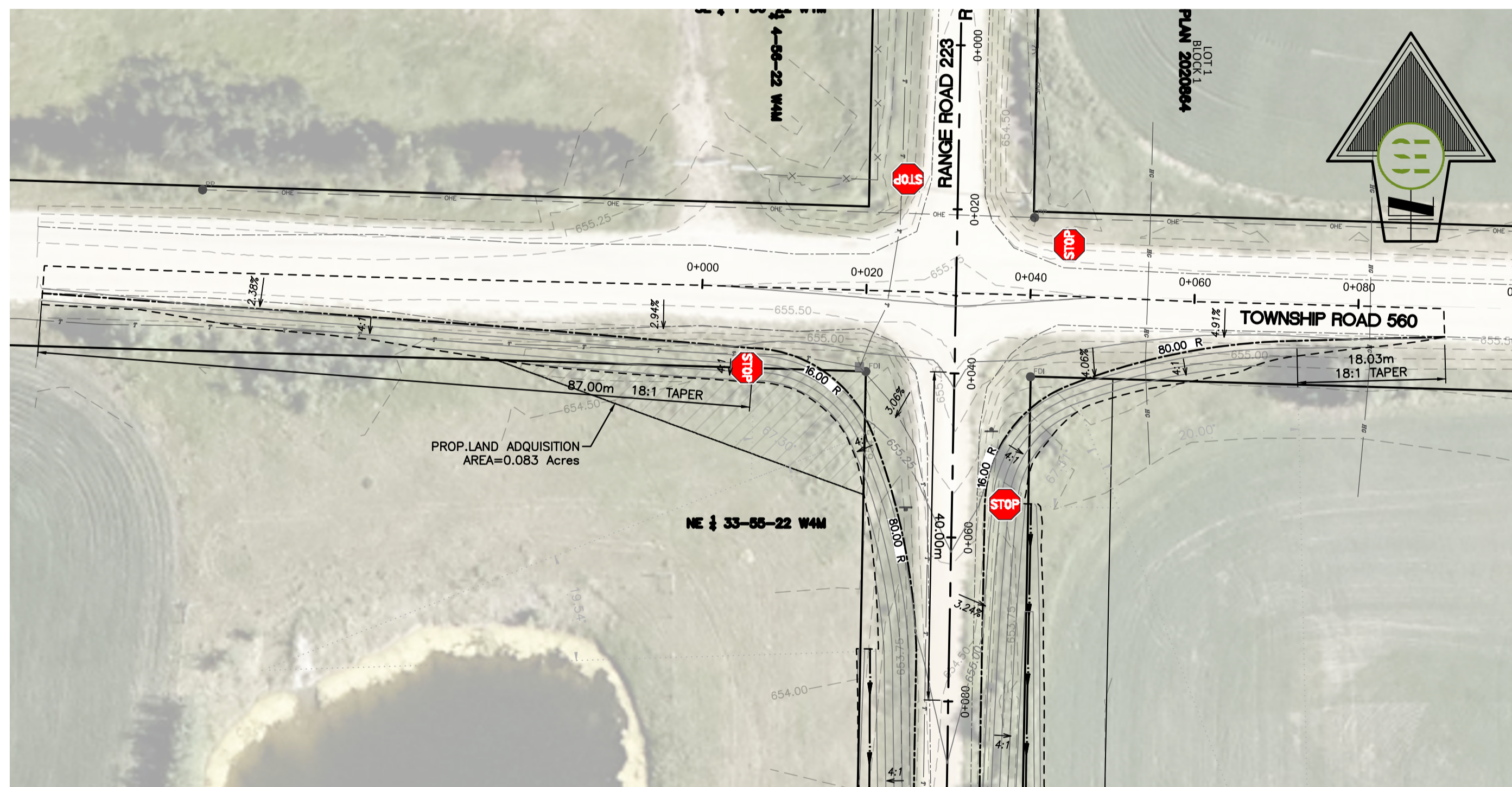
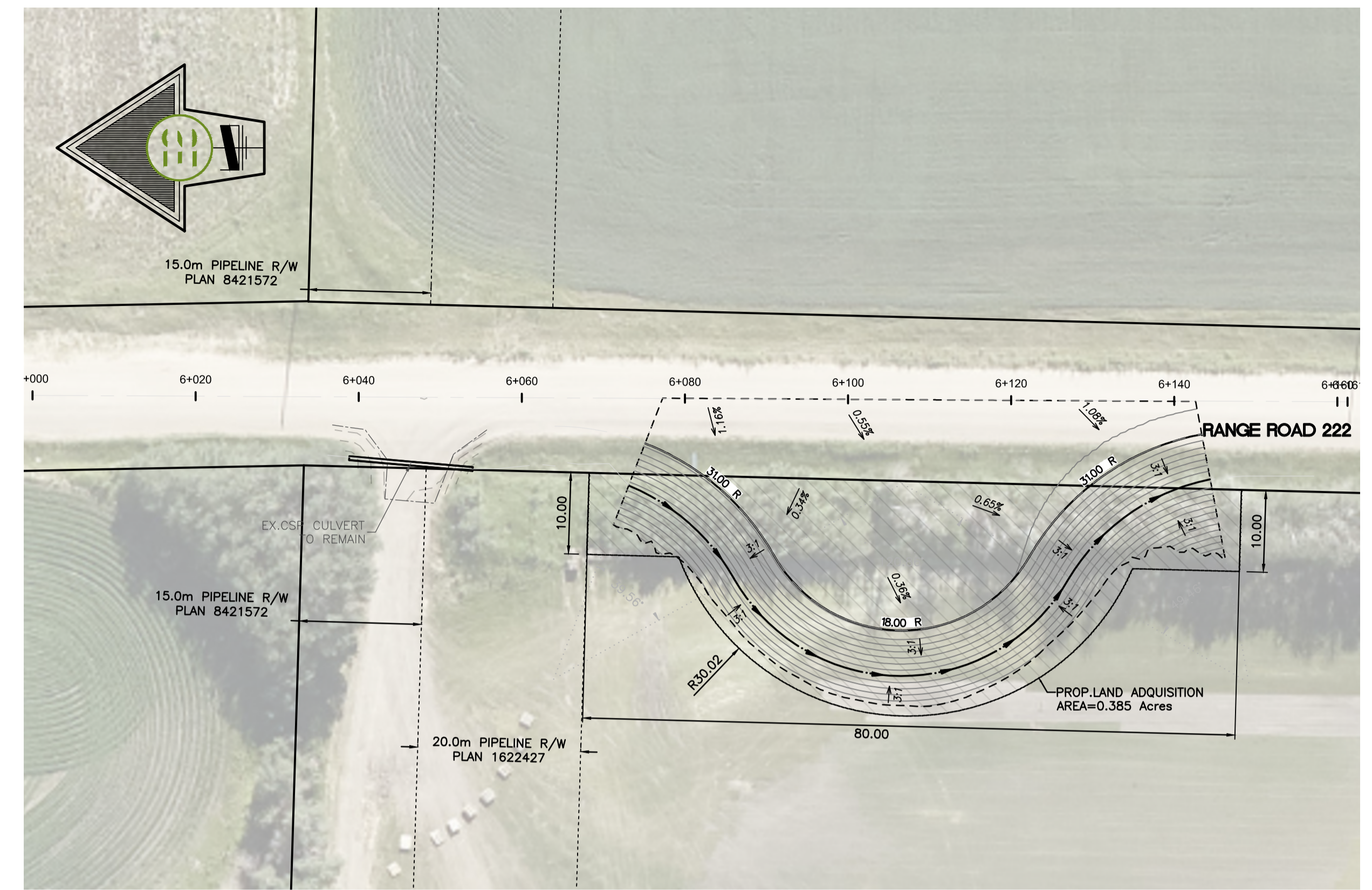
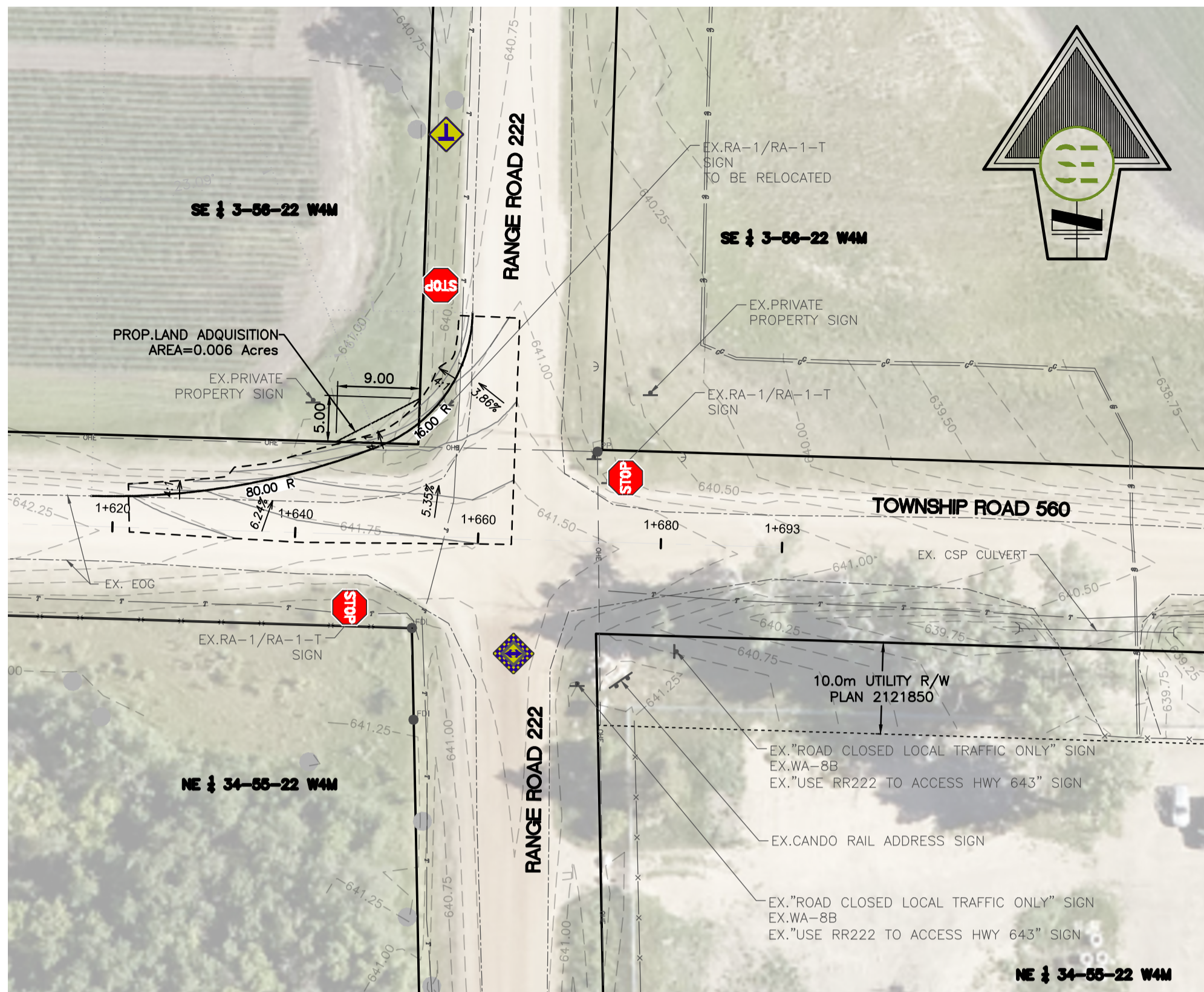
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10 OF 11



**LEGEND**

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| —       | INDICATES PROPERTY LINE                        | — | INDICATES EXISTING CULVERT         | — | INDICATES PROPOSED RIGHT OF WAY                |
| - - -   | INDICATES EXISTING RIGHT OF WAY                | — | INDICATES EXISTING UTILITY BOX     | — | INDICATES PROPOSED DAYLIGHT LINE               |
| 1036.25 | INDICATES EXISTING GROUND CONTOURS & ELEVATION | — | INDICATES EXISTING SIGN            | — | INDICATES PROPOSED EDGE OF GRAVEL              |
| x-x-x-x | INDICATES EXISTING EDGE OF GRAVEL              | — | INDICATES EXISTING GUY ANCHOR POLE | — | INDICATES PROPOSED DITCH FLOWLINE              |
| x-x-x-x | INDICATES EXISTING BARBED WIRE FENCE           | — | INDICATES EXISTING POWER POLE      | — | 1036.25  |
| ~       | INDICATES EXISTING TREE/BUSH LINE              | — | INDICATES EXISTING FOUND IRON PIN  | — | INDICATES PROPOSED GROUND CONTOURS & ELEVATION |
| —       | INDICATES EXISTING OVERHEAD POWER LINE         | — | INDICATES EXISTING TREE            |   |  |
| —       | INDICATES EXISTING HIGH PRESSURE GAS LINE      |   |                                    |   |  |
| —       | INDICATES EXISTING LOW PRESSURE GAS LINE       |   |                                    |   |  |
| —       | INDICATES EXISTING TELECOMMUNICATION LINE      |   |                                    |   |  |

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A	23/11/16	30% DESIGN - ISSUED FOR CLIENT REVIEW	GC	GC	JL	JL



<b>CANDO RANGE ROAD 222 BYPASS</b> <b>STURGEON COUNTY, ALBERTA</b> <b>PLAN &amp; PROFILE</b> <b>TWP 560 INTERSECTIONS &amp; RR222 CUL-DE-SAC</b>			ISSUE/REVISION <b>C</b>
<b>SCALE:</b> H=1:500 V=1:50			DRAWING NO. <b>C-11</b>
PROJECT NO: SEI.23.128	FILE NAME: SEI.23.128 - 30%.dwg	SHEET 11 OF 11	



## APPENDIX B ACIMS REPORT

**Date:** 13/10/2023  
**Requestor:** Consultant  
**Reason for Request:** Environmental Reporting  
**SEC:** 27 **TWP:** 055 **RGE:** 22 **MER:** 4



**■ Non-sensitive EOs (updated: June 2022)**

M_RR_TTT_SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
4-22-055-27	7609	PDASTE022	S3	Doellingeria umbellata var. pubens	flat-topped white aster	1942-07-30
4-22-055-27	7610	PDASTE022	S3	Doellingeria umbellata var. pubens	flat-topped white aster	1942-08-07

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**Next Steps:** See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process)

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**■ Sensitive EOs (updated: June 2022)**

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
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**No Sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).**

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**Date:** 13/10/2023  
**Requestor:** Consultant  
**Reason for Request:** Environmental Reporting  
**SEC:** 28 **TWP:** 055 **RGE:** 22 **MER:** 4



■ Non-sensitive EOs (updated: June 2022)

M_RR_TTT_SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
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**No Non-sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).**

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■ Sensitive EOs (updated: June 2022)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
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**No Sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).**

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**Date:** 13/10/2023  
**Requestor:** Consultant  
**Reason for Request:** Environmental Reporting  
**SEC:** 03 **TWP:** 056 **RGE:** 22 **MER:** 4



■ Non-sensitive EOs (updated: June 2022)

M_RR_TTT_SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
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**No Non-sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).**

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■ Sensitive EOs (updated: June 2022)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
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**No Sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).**

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**Date:** 13/10/2023  
**Requestor:** Consultant  
**Reason for Request:** Environmental Reporting  
**SEC:** 33 **TWP:** 055 **RGE:** 22 **MER:** 4



■ Non-sensitive EOs (updated: June 2022)

M_RR_TTT_SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
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**No Non-sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).**

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■ Sensitive EOs (updated: June 2022)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
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**No Sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).**

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**Date:** 13/10/2023  
**Requestor:** Consultant  
**Reason for Request:** Environmental Reporting  
**SEC:** 34 **TWP:** 055 **RGE:** 22 **MER:** 4



■ Non-sensitive EOs (updated: June 2022)

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**No Non-sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).**

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■ Sensitive EOs (updated: June 2022)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
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**No Sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).**

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## APPENDIX C FWMIS REPORT

# Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

## Species Summary Report

**Report Date:** 18-Dec-2023 18:36

### Species present within the current extent

#### Fish Inventory

EMERALD SHINER  
 GOLDEYE  
 LONGNOSE SUCKER  
 SHORHEAD REDHORSE  
 WHITE SUCKER

#### Wildlife Inventory

BALTIMORE ORIOLE  
 EASTERN PHOEBE  
 LEAST FLYCATCHER

#### Stocked Inventory

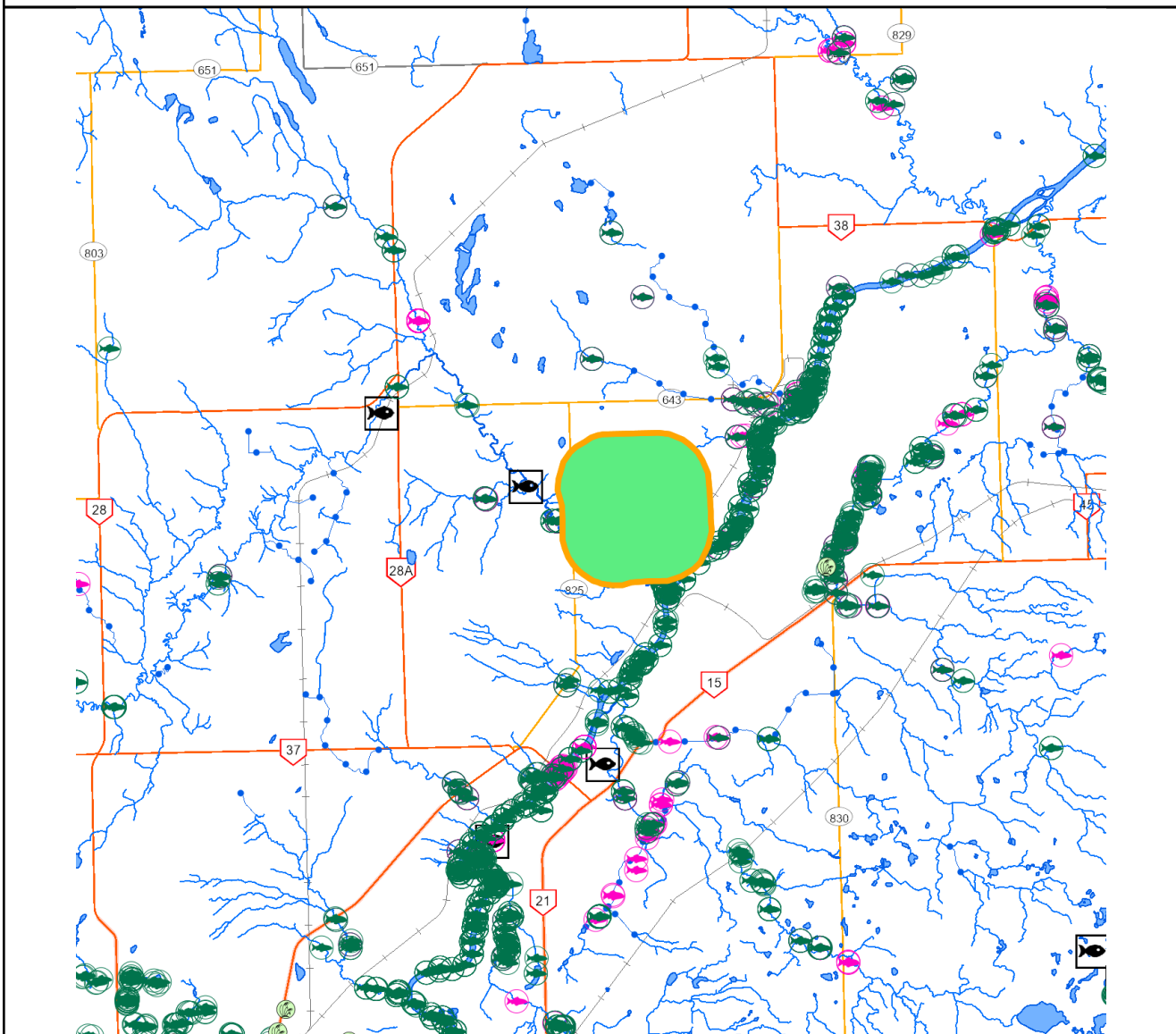
No Species Found in Search Extent

### Buffer Extent

Centroid (X,Y)	Projection	Centroid (Qtr Sec Twp Rng Mer)	Radius or Dimensions
619352, 5959933	10-TM AEP Forest	SW 34 55 22 4	5867, 5800 meters

### Contact Information

For contact information, please visit:  
<https://www.alberta.ca/fisheries-and-wildlife-management-contacts.aspx>



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## APPENDIX D REPRESENTATIVE PHOTOGRAPHS



Appendix Photo D-1. View north within the Railyard footprint showing cropland and wetland WL10, August 11, 2023.



Appendix Photo D-2. View north within the Railyard footprint showing deciduous treed upland, August 9, 2023.



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Appendix Photo D-9. View east along Township Road 555 along the northern boundary of the Bypass footprint showing irrigation pipeline and deciduous treed upland, September 28, 2023.



Appendix Photo D-10. View east along Township Road 555 along the northern boundary of the Bypass footprint showing sod field, ditch, and deciduous treed upland, September 29, 2023.

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# Appendix E

## Ambient Air, Noise & Greenhouse Gas (GHG) Assessment



Clifton

# Cando Rail & Terminals Ltd. Ambient Air Quality, Noise & Greenhouse Gas (GHG) Assessment Sturgeon Railyard West Expansion Sturgeon County, Alberta

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# **Cando Rail & Terminals Ltd. Ambient Air Quality, Noise & Greenhouse Gas (GHG) Assessment Sturgeon Railyard West Expansion Sturgeon County, Alberta**

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## Executive Summary

Clifton Engineering Group Inc. (Clifton) was retained by Cando Rail & Terminals Ltd. to complete an Ambient Air Quality, Noise and Greenhouse Gas (GHG) Assessment (Assessment) for the proposed Sturgeon Railyard West Expansion project (Project) located in Sturgeon County, Alberta (Site). The presented Assessment was prepared as a part of the environmental documentation package for the Project required by the approving regulatory authority.

The main objectives of the presented Assessment can be summarized as follows:

- Evaluate potential impacts of the proposed Project on the ambient air quality in the area and outline applicable emissions management measures;
- Evaluate potential impacts of the proposed Project on the noise levels in the area and outline applicable management strategies;
- Establish the GHG emissions inventory for both construction and operation phases of the Project based on the available design information;
- Quantify estimated GHG emissions in all applicable categories;
- Calculate the estimated carbon intensity of the Project; and
- Outline potential GHG mitigation measures and road map towards carbon neutrality applicable to the Project.

Air quality in the region of the Project is monitored by the Fort Air Partnership, which currently operates ten continuous and sixty-three passive air monitoring stations in the Capital Region. Data is compared to provincial AAQOs by the Government of Alberta and used to calculate the Air Quality Health Index. Air contaminant emissions are expected to be negligible, or minimal during all Project phases. Expected emissions during the construction phase will be transient in nature.

Noise receptors are expected to be occupied residences within a 5 km radius of the Project. It is not expected that increased noise levels from the Project will adversely affect these receptors as the overall increase in noise levels over background is expected to be minor. Cando will implement the recommended noise management measures to reduce noise and limit its potential effects on nearby residents and their activities to the extent possible.

GHG emissions were estimated both for the construction and operation phase of the Project in all applicable categories. Net GHG emission summaries are presented in Section 5.0 of this Assessment. Section 6.0 describes carbon sink mitigation measures to be implemented and outlines a long-term carbon neutrality plan for the Project.

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## Definitions

**Acquired Energy GHG Emissions** - GHG emissions associated with the generation of electricity, heat, steam or cooling, purchased or acquired from a third party for the project.

**Biogenic Carbon** - carbon derived from biogenic (plant or animal) sources excluding fossil carbon.

**Carbon Sink** – the ability of a forest, ocean or other natural environment to absorb carbon dioxide from the atmosphere.

**Direct GHG Emissions** - GHG emissions generated by activities that are within the defined scope of the project.

**Forested Land** – includes all areas of trees of 1 ha or more, with a minimum tree crown cover of 25% and trees of 5 m in height— or having the potential to reach this height, as defined by the 2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories (IPCC 2006, Volume 4, Chapter 3).

**Greenhouse gases (GHG)** – Gases that possess global warming potential, as identified in Schedule 3 of the Greenhouse Gas Pollution Pricing Act (GGPPA).

**Industrial processes** - processes that involve a chemical or physical reaction, the primary purpose of which is to produce a product.

**Project lifetime** – the period encompassing all phases of the project, including construction, operation and decommissioning phases.

**Significant sources** – groups of equipment (or bundle of technologies and practices) or activities that contribute 1% or more of the total direct GHG emissions of the project.

**Wetlands** – includes areas of peat extraction and land that is covered or saturated by water for all or part of the year and that does not fall into the Forest Land, Cropland, Grassland or Settlements categories as defined by the 2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories (IPCC 2006, Volume 4, Chapter 3).

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## Acronyms

**AEPA:** Alberta Environment and Protected Areas  
**AER:** Alberta Energy Regulator  
**AF:** Activity Factor  
**BAT/BEP:** Best Available Technologies / Best Environmental Practices  
**CH<sub>4</sub>:** Methane  
**CF:** Conversion Factor  
**CO:** Carbon Monoxide  
**CO<sub>2</sub>:** Carbon Dioxide  
**CO<sub>2e</sub>:** Carbon Dioxide Equivalent  
**db:** decibel  
**ECCE:** Environment and Climate Change Canada  
**EF:** Emission Factor  
**EIA:** The United States Energy Information Agency  
**GHG:** Greenhouse Gas  
**GWP:** Global Warming Potential  
**ha:** Hectare  
**HC:** Hydrocarbons  
**HP:** Horsepower  
**IPCC:** Intergovernmental Panel on Climate Change  
**km:** kilometer  
**kV:** Kilovolt  
**kWh:** Kilowatt hour  
**LUC:** Land Use Change  
**Mt:** Million metric tonnes  
**MW:** Megawatt  
**MWh:** Megawatt hour  
**NCIA:** Northeast Capital Industrial Association  
**NG:** Natural Gas  
**NO<sub>x</sub>:** Nitrous oxides  
**N<sub>2</sub>O:** Nitrous oxide  
**PM<sub>2.5</sub>:** Fine Particulate Matter  
**PM<sub>10</sub>:** Particulate Matter  
**scf:** Standard Cubic Feet  
**SO<sub>2</sub>:** Sulphur Dioxide  
**t:** metric tonne  
**U.S. EPA:** The United States Environmental Protection Agency

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# 1.0 Introduction

Clifton Engineering Group Inc. (Clifton) was retained by Cando Rail & Terminals Ltd. (Cando) to complete an Ambient Air Quality, Noise and Greenhouse Gas (GHG) Assessment (Assessment) for the proposed Sturgeon Railyard West Expansion (SWRT) project (Project) located in Sturgeon County, Alberta (Site). The presented Assessment was prepared as a part of the environmental documentation package for the Project required by the approving regulatory authority.

The Project intends an expansion of Cando's current railyard with a capacity of approximately 1900 rail car spots to achieve an enhanced capacity of 5000 rail car spots.

The main objectives of the Assessment can be summarized as follows:

- Evaluate potential impacts of the proposed Project on the ambient air quality in the area and outline applicable emissions management measures;
- Evaluate potential impacts of the proposed Project on the noise levels in the area and outline applicable management strategies;
- Establish the GHG emissions inventory for both construction and operation phases of the Project based on the available design information;
- Quantify estimated GHG emissions in all applicable categories;
- Calculate the estimated carbon intensity of the Project; and
- Outline potential GHG mitigation measures and a road map towards carbon neutrality applicable to the Project.

The presented Assessment follows guidance, protocols, scientific rationale and best practices as outlined in the following documents:

- Government of Canada: *Canadian Net-Zero Emissions Accountability Act, S.C. 2021, c-22; 2021*;
- Alberta Environment and Protected Areas (AEPA): *Alberta's Ambient Air Quality Objectives and Guidelines, 2016*;
- AEPA: *The Air Monitoring Directive, 2016*;
- Environment and Climate Change Canada (ECCC): *Technical Guide Related to the Strategic Assessment of Climate Change, August 2021*;
- Intergovernmental Panel on Climate Change: *Guidelines for National Greenhouse Gas Inventories, 2006*;
- ISO 14064-1:2018: *Greenhouse Gas Inventories & Measuring Carbon Footprint*; and
- Alberta Energy Regulator (AER): *Directive 038, Noise Control, 2023*.

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## 2.0 Project Description

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### 2.1 Project Location

The two quarter sections to be used for the Cando Sturgeon Railyard West Expansion are the northeastern and northwestern quarters of section 34, township 55, region 22, west of the 4<sup>th</sup> meridian (N ½ 34-55-22-W4M). The approximate latitude and longitude of the project are 53°47'59.43"N and 113°11'11.97"W, respectively. The total area to be used for the railyard expansion is approximately 130 ha.

The secondary component to the project consists of the creation of a bypass road. The bypass will include upgrades to the existing Sturgeon County operated Township Road 560 to the north of the Cando Sturgeon Railyard West Expansion and Range Road 223 to the west of the section 34-55-22-W4M. To complete the bypass roadways will be constructed to the south of the S ½ 34-55-22-W4M.

The Project is in the Sturgeon County portion of Alberta's Industrial Heartland and a Designated Industrial Zone. Alberta's Industrial Heartland consists of 533 km<sup>2</sup> of land within the City of Fort Saskatchewan and the Counties of Lamont, Strathcona, and Sturgeon as well as 49 km<sup>2</sup> within the City of Edmonton. The entirety of the region is zoned for industrial land use and offers a concentrated location for chemical, petrochemical, and oil and gas facilities. The region offers an attractive location for industrial development and investment as well as provincial regulatory streamlining and cumulative environmental management.

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### 2.2 Project Purpose

The purpose of the proposed Project is to provide an enhanced transportation support facility, providing options and flexibility, for industry directly within Sturgeon County, Strathcona County, and other adjacent municipalities where needed. Due to the growth of industry within Alberta's Industrial Heartland, additional rail capacity is required for industry to prosper and grow.

A rail yard facility requires connection to existing railway infrastructure to be functional and limited opportunities are available for development of this type of facility. Cando has identified this site within Sturgeon County as a best fit considering industry requirements, railway connections, and Sturgeon County zoning and infrastructure. The Project location is adjacent to an existing Canadian National (CN) Rail line, a spur line providing frequent train service to industry in the area.

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### 2.3 Existing Rail Terminal

The Cando-owned and operated Sturgeon Rail Terminal utilizes a loop-track system to enable storage of up to 1900 railcars. The terminal offers services for railcar staging and storage, including unit-train storage capability, for short or long-term, loaded or empty railcars. Additional value-added services include railcar switching, air testing, railcar repair and cleaning, transloading, material handling, inventory management, car stenciling, placard replacement, inspections and graffiti touch-ups.

Existing terminal includes the following surface infrastructure:

- Rail yards – a loop track and series of parallel storage tracks;

- Rail connection to an existing CN Rail spur southeast of the Site;
- Access roads;
- Internal roads – gravel roads beside the tracks to allow for inspections and light maintenance of rail cars;
- Water management infrastructure – ditches and culverts for the stormwater management;
- Office building;
- Locomotive storage building;
- Storage tanks and containers for potable, liquid waste, propane and solid waste; and
- Perimeter fencing.

The Site is connected to the public electric grid. Propane is used for heating office building and locomotive storage. Produced waste is hauled in regular intervals to an external processing facility.

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## 2.4 Proposed Expansion

The proposed expansion would increase railcars storage and maintenance capacity up to 5000 units. The new facility will link to the existing facility via “C-shaped” arrival/departure tracks that will tie into the northwest and southwest corners of the existing loop track and extend around the perimeter of the new parcel. Yard tracks will branch off from the connection tracks in the east and dead end to the west, inside the arrival/departure tracks.

---

## 2.5 Tentative Schedule

The proposed Project construction is tentatively scheduled to start in late 2024, or early 2025. Construction will be phased, lasting 6 to 7 years, depending on the demand for the rail services in the area. As a result, construction should be completed in 2031 or 2032. The expanded terminal is expected to be operated indefinitely, i.e., beyond 2050.

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# 3.0 Potential Ambient Air Quality Impacts

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## 3.1 Regulatory Framework

The air quality in Alberta’s Industrial Heartland is managed on a regional basis. The purpose of the Capital Region Air Quality Management Framework is to regulate air emissions on a regional basis, rather than regulating emissions from individual facilities. Four concentration level limits have been established for four contaminants of concern: nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), fine particulate matter (PM<sub>2.5</sub>) and ozone (O<sub>3</sub>). These limits are based on the Alberta Ambient Air Quality Objectives (AAQO) for NO<sub>2</sub> and SO<sub>2</sub>, and Canada Wide Standards for PM<sub>2.5</sub> and O<sub>3</sub> and are reviewed on an annual basis. Mitigative management actions are to be implemented as needed in response to triggering of limit thresholds.

Air quality in the region of the Project is monitored by the Fort Air Partnership, which currently operates ten continuous and sixty-three passive air monitoring stations in the Capital Region. Data is compared to provincial AAQOs by the Government of Alberta and used to calculate the Air Quality Health Index. The Air Quality Health Index is a publicly accessible report which provides daily risk ratings (on a scale from low to

very high risk) related to outdoor activity. The closest continuous monitor to the Project site is located southeast of the Project at the Scotford Shell Refinery. The closest passive monitor lies approximately 65 km east of the Project site. The Air Quality Trend Health Index for 2019-2021 indicates that hourly readings are in the low risk range for 85 to 90 percent of monitoring period.

There are four proactive ambient air quality levels for each contaminant of concern. Triggers at each level lead to management actions that range from baseline monitoring and data gathering to a mandatory plan to reduce the ambient levels below the applicable air quality standard (AEPA 2016).

The interaction between the Project and air quality is discussed in the following Section. Air contaminant emissions are expected to be negligible, or minimal during all Project phases. Expected emissions during the construction phase will be transient in nature.

### 3.2 Estimated Emissions - Construction Phase

During the Project construction phase, the major sources of atmospheric emissions are expected to be exhausts from the onsite mobile equipment and fugitive dust. The key contaminants from mobile equipment combustion will be sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), hydrocarbons (HC), and particulate matter (PM). The construction phase is planned to extend for a period of up to seven years (12 hours/day, 6 days/week). The presented emissions estimates are for one construction year for the onsite mobile equipment and are presented in Table 3.1. Diesel fuel is assumed to be used in the mobile equipment. The emissions estimation was based on the emission factors available in the U.S. Environmental Protection Agency (U. S. EPA) MOVES database.

Equipment	Units	Horsepower (HP)	Compound in Air				
			SO <sub>2</sub> (kg)	NO <sub>x</sub> (kg)	CO (kg)	HC (kg)	PM (kg)
Excavator	8	290	21.8	5729	3039	1169	2278
Loader	8	217	16.3	4287	3236	874.3	192
Bulldozer	4	121	3.3	2391	1268	488.6	339.4
Compactor	2	150	2.1	2964	1572	605.1	210.9
Truck 10 ton	2	600	9.4	11854	8950	531.4	972
Spike gauger	2	140	0.7	2765	2088	123.4	72
Track regulator	2	240	1.2	4939	3590	1258	96
Track tamper	2	250	1.2	4939	3730	1271	102.1
Speed swing	2	160	0.9	3161	1676	644.6	241.7
Pickup truck	5	410	7.9	8100	4287	1652	248.6
<b>Estimated Emissions Total</b>			<b>64.8</b>	<b>51129</b>	<b>33436</b>	<b>8617.4</b>	<b>4752.7</b>

### 3.3 Estimated Emissions - Operation Phase

During Project operation, the main source of air emissions will be the combustion of diesel fuel in the locomotives. These emissions are expected to be predominately SO<sub>2</sub>, NO<sub>x</sub>, CO, HC and PM from the locomotive exhaust. A total of eighteen GP-38 locomotives will be in use after the Project expansion.

Air emissions from the locomotives were estimated based on the emission factors published in the Railway Association of Canada: *Locomotive Emissions Monitoring Report, 2021*. Table 3.2 presents the preliminary expected emissions from the Project during the operation over the course of one year:

Source	Type	Units	Compound in Air (tonnes/year)				
			SO <sub>2</sub>	NO <sub>x</sub>	CO	PM <sub>10</sub>	PM <sub>2.5</sub>
Locomotive	GP-38	18	0.0036	55.08	10.02	1.55	1.17
NPRI Reporting Threshold (tonnes/year)			20	20	20	0.5	0.3

Additional sources of emissions during the operations can be summarized as follows:

- Fugitive emissions from the loaded rail cars;
- Fugitive emissions from the fuel storage at the Site; and
- Fugitive dust resulting from the traffic on unpaved internal roads.

The above emissions sources are expected to be negligible compared to the locomotives operation and will be transient in nature.

### 3.4 Applicable Air Quality Management Measures

Applicable air quality management measures are summarized in the following Table 3.3:

Issue	Mitigation Measures
Fugitive Dust	Limit the area of disturbance by earthworks as far as practically possible. Implement reduced vehicle speed limits or other speed control measures on the Project site. Suppress dust as necessary using water trucks. Conduct visual monitoring of dust to determine when suppression is needed.
Air Emissions	Avoiding unnecessary vehicle and equipment idling. Implement the regular maintenance program of vehicles, locomotives and equipment to reduce combustion emissions and maximize fuel efficiency.

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## 4.0 Potential Noise Impacts

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### 4.1 Regional Noise Management

Noise levels in the Project area are managed for member companies under the Northeast Capital Industrial Association (NCIA) Regional Noise Management Plan. The development of the Regional Noise Management Plan was based on a predictive computer noise model (NCIA Regional Noise Model) which incorporated noise models from various facilities in the region, as well as road and rail traffic noise levels. The model is publicly accessible via Google Earth and displays four modelled cases. Case 3D shows 'Existing Facilities plus main Road and Rail Contributions' using 2019 roadway traffic data and estimated rail traffic volume on the main lines over a 24-hour period in 2020. The industrial facilities model assumes all equipment is running at 100% capacity 100% of the time. The regional model is updated every few years and considers significant changes in noise levels at industrial facilities and new data provided by Alberta Transportation and Alberta Infrastructure and Rail Companies (if available). The current model predicts sound levels at the Project site to be 43 to 48 dBA.

The nearest noise monitoring stations to the Project site are located at the southwest fence line of the Pembina Redwater Fractionation facility to the east of the Project, with another located more than 1,500 m from the Project. Measured noise levels at most locations were shown to be generally consistent with model predictions. The field validation annual NCIA report also indicated that noise levels at most locations consisted of low frequency components with occasional mid/high frequency components. Trend analysis indicated no significant increasing or decreasing trends over baseline sound levels. Regarding rail transport activities, noise from train passages through the monitoring regions dominated the noise climate, although there had not been an increase of rail passages over 2019 observations.

During the construction phase of the Project, noise will result from vehicles and equipment conducting activities including earthworks, material deliveries, and rail installation. Construction noise will be transient in nature. The primary noise sources throughout the Project operation will be train shunting, coupling of rail cars and the operation of locomotives. These activities will continue daily over the life of the Project. The Project will result in increased noise levels in the vicinity of the Project; however, the increased noise during either construction or operation is not expected to contribute significantly to increasing trends at a regional level.

Noise receptors are expected to be occupied residences within a 5 km radius of the Project. It is not expected that increased noise levels from the Project will adversely affect these receptors as the overall increase in noise levels over background is expected to be minor. Cando will implement management measures outlined in Table 4.1 to reduce noise and limit its potential effects on nearby residents and their activities to the extent possible.

---

### 4.2 Applicable Noise Management Measures

Applicable noise management measures are summarized in the following Table 4.1:

**Table 4.1 - Applicable Noise Management Measures**

Issue	Mitigation Measures
Potentially Disturbing Noise	Notify nearby residents (landowners and lessees) of the intended Project schedule before the start of construction to prevent or reduce the impact on their operations or activities. Maintain equipment, machinery and locomotives in good working order, including noise abatement equipment, to limit noise. Schedule operations to occur during daytime hours, whenever practical. Reduce the number of switchers used at nighttime if nighttime operations are unavoidable. Reduce the amount of time that switchers are left idling at the yard.

## 5.0 GHG Emissions Assessment

### 5.1 General GHG Quantification Approach

If not stated otherwise, a general GHG Emissions quantification equation used in this Assessment is using the following equation:

$$CO_{2e} \text{ (tonnes/year)} = AF * EF * GWP * CF$$

Where:

- CO<sub>2e</sub> (tonnes/year) – estimated GHG emissions expressed as CO<sub>2e</sub> equivalent in metric tonnes per year;
- AF – Activity Factor;
- EF – Emission Factor;
- GWP – Global Warming Potential for an evaluated GHG gas; and
- CF – Units Conversion Factor.

Applied GWP conversion factors based on the IPCC 5<sup>th</sup> Protocol are summarized in the following Table:

**Table 5.1 – Applied GWP Conversion Factors**

GHG Gas	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O
GWP Factor	1	28	265

## 5.2 GHG Emission Sources – Construction Phase

Identified significant (i.e., more than 1 % of the overall GHG emissions) GHG emission sources for the construction phase of the proposed Project (excluding any GHG emissions from the existing terminal operation) can be summarized as follows:

- **Direct GHG Emissions;**
  - Mobile Combustion;
    - Mobile Diesel Combustion;
  - Land Use Change;
    - Biomass Oxidation.
- **Indirect GHG Emissions;**
  - Construction Personnel Travel by Road.

## 5.3 Mobile Combustion – Diesel

Estimated GHG emissions contribution during the construction phase of the Project as a result of the diesel mobile combustion at the Site were quantified using the general equation. Used Emission Factors (EF) for diesel fuel were published in the *ECCC: Emission Factors and Reference Values, Version 1.1*, June 2023, document.

Activity Factors (AF) were calculated using the estimated requirements for the diesel-powered construction and auxiliary vehicles and equipment utilization based on the information provided by Cando and construction subcontractors. An average diesel fuel consumption for the vehicles and equipment was estimated using the data from the U.S. EPA MOVES Database.

Estimated GHG emissions for the category for a construction year are shown in the following Table:

Equipment	Units	Assumed Horsepower (HP)	CO <sub>2e</sub> (tonnes/year)
Excavator	8	290	2278
Loader	8	217	1704
Bulldozer	4	121	339.4
Compactor	2	150	210.9
Truck 10 ton	2	600	972
Spike gauger	2	140	72
Track regulator	2	240	125.1
Track tamper	2	250	130.3
Speed swing	2	160	82.3
Pickup truck	5	410	829.7

<b>Estimated GHG Emissions Total</b>	<b>6743.7</b>
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### 5.4 Land Use Change – Biomass Oxidation

Estimated GHG emissions contribution to the overall Project’s GHG emission profile as a result of the Land Use Change (LUC) contains two types of the carbon-related impacts:

- Emissions caused by the removal and oxidation of biomass during construction; and
- The carbon not trapped by native vegetation that would have remained at the Site should the Project not have been constructed referred to as the lost carbon sequestration potential.

The presented calculations are based on the general equation published in the *IPCC: Forest Land, Cropland, Grassland, Wetlands and Other Lands*, 2006 and Tier 1 approach:

$$CSI = \sum_{i,j} ((NatFlux - PostDFlux)_{i,j} * T_{i,j} * A_{i,j})$$

Where:

CSI – The estimated carbon sink impact

NatFlux – The natural annual carbon accumulation of the land being impacted (t C ha<sup>-1</sup> y<sup>-1</sup>)

PostDFlux – The post-disturbance carbon flux rate impacted by the project (t C ha<sup>-1</sup> y<sup>-1</sup>)

T – The time interval (years)

A - The land area (ha)

i – The land use class

j – The disturbance activity for each phase of the project

Calculations assumed a permanent removal of approximately 25 hectares (ha) of the forest and 7.505 ha of the wetlands in the expansion area of the Project during the construction phase. Estimated LUC-related GHG emissions for the construction phase of the Project are summarized in Table 5.3:

Area Classified As	Estimated Removal Area (ha)	CO <sub>2e</sub> (tonnes)
Forest	25	7500
Wetlands	7.505	960.64
<b>Estimated GHG Emissions Total</b>		<b>8460.64</b>

### 5.5 Construction Personnel Travel by Road

Estimated GHG emissions released during the construction phase of the Project as a result of the construction personnel travel between the Site and Fort Saskatchewan were quantified using the general

equation. Used Emission Factors (EF) for gasoline were published in the *ECCC: Emission Factors and Reference Values, Version 1.1*, June 2023, document.

Activity Factor (AF) was calculated using the estimated average construction personnel count based on the information provided by Cando and construction subcontractors (35), assuming 6 days a week construction schedule and a road distance between the Site and Fort Saskatchewan (about 30 km round trip). An average gasoline fuel consumption for the light pickup truck road travel, 2015 or newer, was estimated using the data from the U.S. EPA MOVES Database.

Estimated GHG emissions for the category for a construction year are shown in the following Table:

Average Construction Staff Count	Estimated Number of Personnel Trucks	Estimated Emissions CO <sub>2e</sub> (tonnes/year)
35	20	109.29

## 5.6 Estimated Net Total GHG Emissions – Construction Phase

Estimated net total GHG emissions throughout the duration of the construction phase are shown in Table 5.5. Estimated total assumes construction phase lifespan six years.

Construction Year	Estimated GHG Emissions CO <sub>2e</sub> (tonnes)	
	Mobile Diesel Combustion	Biomass Oxidation
Y-6	6743.7	8460.64
Y-5	6743.7	
Y-4	6743.7	
Y-3	6743.7	
Y-2	6743.7	
Y-1	6743.7	
<b>Subtotal</b>	40462.2	8460.64
<b>Estimated Net Total GHG Emissions</b>		<b>48922.84</b>

## 5.7 GHG Emission Sources – Operation Phase

Identified significant GHG emission sources for the operation phase of the proposed Project (including GHG emissions from the existing terminal operation) can be summarized as follows:

- **Direct GHG Emissions;**
  - Static Combustion;
    - Propane Combustion.
  - Mobile Combustion;
    - Mobile Diesel Combustion – Locomotives; and
    - Mobile Diesel Combustion – Auxiliary Vehicles and Equipment.

- **Indirect GHG Emissions** (Formerly Scope 2 GHG Emissions);  
Acquired Energy GHG Emissions.
- **Indirect GHG Emissions;**
  - Employees Travel by Road.

### 5.8 Static Combustion – Propane Combustion

Estimated GHG emissions contribution to the overall Project's GHG emission profile as a result of the propane combustion used for heating at the Site were quantified using the general equation. Used Emission Factors (EF) for propane were published in the *Environment Canada and Climate Change (ECCC): Emission Factors and Reference Values, Version 1.1, June 2022*, guidance.

The proposed expansion does not require new propane-burning emission sources, and therefore, Activity Factor is based on the average propane usage at the existing terminal. Estimated GHG emissions for the category are presented in Appendix A, Table 5.6.

Average Propane Volume (L/year)	Emission Factors (g/L)			CO <sub>2</sub> e (tonnes/year)
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	
7280.5	1515	0.024	0.108	11.24

### 5.9 Mobile Combustion – Diesel Combustion, Locomotives

Estimated GHG emissions contribution during the operation phase of the Project as a result of the diesel mobile combustion by locomotives at the Site were quantified using the general equation. Used Emission Factors (EF) for the locomotives were published in the Railway Association of Canada: *Locomotive Emissions Monitoring Report, 2021*.

Activity Factor (AF) was calculated using the estimated requirements for the diesel-powered locomotives at the Site and utilization based on the information provided by Cando.

Estimated GHG emissions for the category for an operation year are shown in the following Table:

Combustion Source	Type	Number of Units	CO <sub>2</sub> e (tonnes/year)
Locomotive	GP-38	18	4068

### 5.10 Mobile Combustion – Diesel Combustion, Auxiliary Vehicles and Equipment

Estimated GHG emissions contribution during the operation phase of the Project as a result of the diesel mobile combustion by auxiliary vehicles and equipment at the Site were quantified using the general equation. Used Emission Factors (EF) for diesel fuel were published in the *ECCC: Emission Factors and Reference Values, Version 1.1, June 2023*, document.

Activity Factors (AF) were calculated using the estimated requirements for the diesel-powered auxiliary vehicles and equipment utilization based on the information provided by Cando. An average diesel fuel

consumption for the vehicles and equipment was estimated using the data from the U.S. EPA MOVES Database.

Estimated GHG emissions for the category for a construction year are shown in the following Table:

Equipment	Assumed Horsepower (HP)	Number of Units	CO <sub>2</sub> e (tonnes/year)
Kubota SBS	121	3	84
Pickup Truck	410	20	3319
Skid Steere	121	1	28
Loader	217	1	213
Backhoe	160	1	41.2
Telehandler	140	1	36
<b>Estimated GHG Emissions Total</b>			<b>3721.2</b>

### 5.11 Acquired Energy GHG Emissions

Estimated GHG emissions contribution during the operation phase of the Project as a result of the acquired energy imports to the Site from the public electric grid were quantified using the general equation. Used Emission Factors (EF) for the electricity consumption intensity applicable for Alberta were published in the *ECCC: Emission Factors and Reference Values, Version 1.1, June 2023*, document.

Activity Factor (AF) was calculated using the estimated requirements for the acquired energy following the terminal expansion provided by Cando. Estimated GHG emissions for the category for a construction year are shown in Table 5.9:

Average Energy Consumption (kWh/year)	Emission Factor for Alberta (g CO <sub>2</sub> e/kWh)	Estimated Emissions CO <sub>2</sub> e (tonnes/year)
305397	540	<b>164.91</b>

### 5.12 Employees Travel by Road

Estimated GHG emissions released during the construction phase of the Project as a result of the Site personnel travel between the Site and Fort Saskatchewan were quantified using the general equation. Used Emission Factors (EF) for gasoline were published in the *ECCC: Emission Factors and Reference Values, Version 1.1, June 2023*, document.

Activity Factor (AF) was calculated using the estimated average railyard terminal personnel count based on the information provided by Cando (90), assuming 3 rotating shifts, 7 days a week operations schedule and a road distance between the Site and Fort Saskatchewan (about 30 km round trip). An average gasoline fuel consumption for the light pickup truck road travel, 2015 or newer, was estimated using the data from the U.S. EPA MOVES Database. Estimated GHG emissions for the category for a construction year are shown in Table 5.10:

Average Terminal Staff Count	Estimated Number of Personnel Trucks	Estimated Emissions CO <sub>2e</sub> (tonnes/year)
90	50	318.76

### 5.13 Estimated Net Total GHG Emissions – Operation Phase

Estimated net total GHG emissions for an average operation year of the proposed Project is summarized in Table 5.11:

Static Combustion	Estimated GHG Emissions CO <sub>2e</sub> (tonnes/year)			Estimated Net Operation GHG Emissions CO <sub>2e</sub> (tonnes/year)
	Mobile Combustion Diesel-Locomotives	Mobile Combustion Diesel-Vehicles	Acquired Energy	
11.24	4068	3721	164.91	7965

### 5.14 Estimated Carbon Intensity of the Project

Estimated carbon intensity of the project per a year of the operation phase is presented as a ratio between calculated net GHG emissions and railcars spots capacity after the terminal expansion as follows:

Estimated Net Operation GHG Emissions CO <sub>2e</sub> (tonnes/year)	Projected Capacity (railcars spots)	Estimated Carbon Intensity (t CO <sub>2e</sub> /railcars spots per a year)
7965	5000	1.59

## 6.0 Additional Considerations

### 6.1 Carbon Sinks Impact

Carbon sinks impacts related to the LUC/vegetation removal as a part of the Project Scope of Work were quantified using the methodology described in Section 5.4. Estimated GHG emissions resulting from a loss of carbon sequestration are summarized in Table 6.1:

Area Classified As	Estimated Removal Area (ha)	CO <sub>2e</sub> (tonnes/year)
Forest	25	319.5
Wetlands	7.505	23.2
<b>Estimated GHG Emissions Total</b>		<b>342.7</b>

### 6.2 Carbon Sinks Mitigation Measures

Under the Alberta Wetland Mitigation Directive (Government of Alberta 2018b), a Wetland Mitigation Hierarchy outlines the management approach to wetland impacts in Alberta. The primary preferred wetland response is to avoid and, secondarily, to minimize impacts to a wetland. Based on the

conceptual Project footprint options, a total area of 7.505 ha of wetlands will be removed entirely during Project development.

In accordance with the Alberta Wetland Policy (Government of Alberta 2013), Cando has submitted an application to AEPA for Water Act approval to provide compensation for loss of wetlands as a result of Project development.

Wetlands will not be disturbed and vegetation clearing in the vicinity of the wetland will not be conducted until Water Act approval for wetland removal has been received. Mitigation will include the applicable compensation for the affected wetlands.

Proposed wetland mitigation is summarized in Table 6.2:

Area Classified As	Estimated Removal/Restoration Area (ha)	CO <sub>2e</sub> (tonnes/year)
Forest	25	319.5
Wetlands	7.505	23.2
<b>Estimated GHG Emissions Total (Before Mitigation)</b>		<b>342.7</b>
Wetlands	18.617	- 57.5
<b>Estimated GHG Emissions Total (After Mitigation)</b>		<b>285.2</b>

### 6.3 Estimation of Uncertainty

Qualitative estimation of the impact of uncertainties on the accuracy of the presented GHG Assessment is presented in the following Table:

<b>Propane Combustion</b>	<b>Low Uncertainty</b> – Propane consumption is based on the quantity of fuel purchased. Minimal loss is expected from storage or leakages. Propane emission factors are consistent and accurate.
<b>Diesel Combustion</b>	<b>Medium Uncertainty</b> – Diesel consumption is based on the utilization rates estimated by Cando and power rating. Minimal loss is expected from storage or leakages. Diesel emission factors are consistent and accurate.
<b>Acquired Energy</b>	<b>Low Uncertainty</b> – Electricity consumption is based on the metered electricity data purchased that is calibrated. The emission factor is based on an annual provincial grid average that includes all the province's controllable fuel sources.
<b>Road Travel</b>	<b>High Uncertainty</b> – Annual road transport is an estimate based on available information regarding future staffing levels. Gasoline emission factors are consistent and accurate.

### 6.4 Net-Zero Plan

The presented net-zero plan is based on the Best Applicable Technology/Best Environmental Practices (BAT/BEP) as outlined in the Delphi Group: *Towards Net Zero: Developing a Rail Decarbonization Roadmap for Canada*, December 2022, document. The proposed decarbonization path applicable to the Project consists of the following implementation steps:

**Efficiency improvements:** Efficiency improvements to existing and new equipment and infrastructure have been the focus of railway decarbonization efforts to date and will continue to be prioritized. All efficiency improvements will serve to reduce the decarbonization burden placed on fuels and propulsion technologies.

**Description:** There are numerous ways to continue to enhance rail efficiency including further enhancing aerodynamics of locomotives and rail cars, automation and data-driven solutions, among others.

**Carbon Reduction Potential:** less than 7 %

**Implementation Timeframe:** Available immediately

**Low-carbon fuels:** Through low-carbon/renewable fuel regulations, federal and provincial governments have already mandated minimum blending requirements of up to 5% renewable content in diesel, and these will continue to increase. Efficiency improvements may be supplemented by the blending of renewable and low-carbon fuels beyond what is regulated.

**Description:** Biodiesel is a renewable fuel that can be manufactured from vegetable oils, animal fats, or recycled cooking oil for use in diesel vehicles or any equipment that operates on diesel fuel. Biodiesel's physical properties are like those of petroleum diesel, with some notable exceptions including inferior cold weather properties and reduced energy content. B20 refers to a blend of 20% biodiesel and 80% petroleum diesel.

**Carbon Reduction Potential:** up to 16 %

**Implementation Timeframe:** Estimated around 2030

**Alternative propulsion:** As railways seek to move past the limits of what low-carbon fuels and combustion engines can offer, electrification via battery, or hydrogen fuel cells are likely to prevail in the long-term.

**Description:** Battery powered trains are electric multiple units and locomotives which carry batteries in order to provide traction power for in-service use. The traction system of a battery powered train is based on that of an electric train but with the addition of on-board battery storage and supporting power converters and temperature management for the battery if required.

**Carbon Reduction Potential:** up to 100 %

**Implementation Timeframe:** Estimated around 2035 (provided further technology development and successful testing).

Cando, in cooperation with Emissions Reduction Alberta, is a leading participant in the Li-On battery-powered locomotive initiative.

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## 7.0 Closure

This Assessment has been prepared by Clifton Engineering Group Inc. for the sole benefit of Cando Rail & Terminals Ltd. and the pertinent regulatory authorities. The report may not be relied upon by any other person, entity, other than for its intended purposes, without the express written consent of Clifton Engineering Group Inc. and Cando Rail & Terminals Ltd.

This Assessment was undertaken exclusively for the purpose outlined herein and is limited to the scope and purpose specifically expressed in this Assessment. This Assessment cannot be used or applied under any circumstances to another location or situation or for any other purpose without further evaluation of the data and related limitations. Any use of this Assessment by a third party, or any reliance on decisions made based upon it, are the responsibility of such third parties. Clifton accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this Assessment.

Clifton makes no representation or warranty with respect to this report, other than the work was undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. Any information or facts provided by others and referred to or used in the preparation of this report should not be construed as legal advice.

This report presents the best professional judgment of Clifton personnel available at the time of its preparation. Clifton reserves the right to modify the contents of this report, in whole or in part, to reflect any new information that becomes available. If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions provided herein.

Yours truly,

**Clifton**

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