



March 13, 2025

Alberta Environment and Protected Areas

Re: Municipal District of Greenview, Greenview Industrial Gateway Alberta *Water Act* Application for Approval to Carry out Instream Activity of Constructing a Water Intake Structure in the Smoky River

Please find enclosed the Municipal District of Greenview No. 16's (Greenview's) application under Section 37(1) of the Alberta *Water Act* for an approval to carry out the instream activity of constructing a water intake structure in the Smoky River at SW 29-067-04-W6M. This intake is planned to divert water to support the [Greenview Industrial Gateway](#) (GIG), for which Greenview has applied for a licence to divert under File No. 00476030. The GIG is a large-scale eco-industrial zone, with the intake designed to support development within its boundaries, as designated by Greenview's Area Structure Plan. The GIG will host industrial and commercial facilities that will collectively add value to Alberta's natural gas resources. The development of the GIG supports the Government of Alberta's priority to increase value-added industrial growth in Alberta's natural gas supply chain. It aligns with the concept of a Designated Industrial Zone (DIZ), which will promote orderly development in the Smoky River Basin, most of which lies within Greenview's boundaries and is under Greenview's planning direction.

Greenview's diversion licence and infrastructure will support the operation of an industrial water utility for the facilities constructed within the GIG. This approach will provide water for the planned operations using a single water diversion licence and an integrated set of water management infrastructure, including an intake structure, pumps, transmission pipelines, and water storage. It will simplify permitting for the GIG and reduce cumulative environmental impacts by limiting the amount of infrastructure deployed on the landscape.

Greenview has prepared this application to satisfy all licence application requirements laid out in the *Water Act* and as communicated by Alberta Environment and Protected Areas. It is understood that additional approvals may be required for supporting infrastructure (e.g., water transmission pipelines); these approvals will be sought through separate processes. In addition, the required federal approvals for the intake structure (e.g., under Transport Canada) are also being sought in parallel for its construction and operation.

Should you have any additional questions about the application, please contact me at 780-558-9039 or via email at kyle.reiling@mdgreenvview.ab.ca.

Sincerely,

Kyle Reiling – Executive Director, Industrial Development

1.0 Executive Summary

In this application under Section 37(1) of the Alberta *Water Act*, the Municipal District of Greenview No. 16 (Greenview) is applying for an approval to carry out the instream activity of constructing a water intake structure in the Smoky River at SW 29-067-04-W6M. The intake structure will be used to supply water to the Greenview Industrial Gateway (GIG). The GIG is a large-scale eco-industrial zone, with multiple planned developments within it which will add value to Northwestern Alberta's natural gas resources, which is a stated priority of the Government of Alberta. Development of the GIG aligns with the Designated Industrial Zone (DIZ) concept and will promote orderly development in the Smoky River Basin, most of which is within Greenview's boundaries and under Greenview's direction for planning.

"The Designated Industrial Zone or (DIZ) is a local regulatory framework for designated industrial regions that provides certain and efficient approval processes and supports responsible industrial cluster development." (Alberta Government communication, March 2021)

The GIG's facilities will be serviced through an industrial water utility model, using a single licence and one set of water management infrastructure, including intake structure and pumps, transportation pipeline, and water storage. This approach will simplify permitting for the region and reduce cumulative environmental impacts by limiting the amount of infrastructure developed on the landscape. Greenview has prepared this application to satisfy all application requirements laid out in the *Water Act* and as communicated by Alberta Environment and Protected Areas. Greenview has completed environmental and engineering investigations to inform the design and operational plan for the intake, and to ensure that the infrastructure can be reliably operated into the future without causing negative environmental outcomes. In parallel, Greenview is working through other related application processes for required provincial and federal authorizations associated with the construction and operation of the intake structure.

Contents

1.0	Executive Summary.....	i
2.0	Definitions.....	1
3.0	Introduction	1
3.1	Planned water infrastructure.....	2
3.2	Application contents	3
4.0	Site Assessments.....	5
4.1	Environmental site assessment	5
4.2	Hydrotechnical assessment	6
4.3	Geotechnical assessment.....	7
4.4	Historical Resources Impact Assessment.....	8
5.0	Intake Structure Preliminary Design	9
5.1	Intake structure design	9
5.1.1	Civil and structural	9
5.2	Cofferdam design.....	9
5.3	Intake and cofferdam construction	13
6.0	Supporting Infrastructure Conceptual Design	13
6.1	Pump station.....	13
6.2	Water transmission pipeline	14
6.3	Raw water storage ponds	15
6.4	Water management within the GIG boundary	15
7.0	Construction and Operation Plan	16
7.1	Construction phasing	16
7.2	Operation plan	16
8.0	Engagement and Consultation Plan.....	17
9.0	Monitoring, Reporting, and Performance Management.....	18
10.0	Additional Regulatory Considerations	18
	References	20
	Appendices.....	21

2.0 Definitions

ACO = Aboriginal Consultation Office

ASP = Area Structure Plan

DIZ = Designated Industrial Zone

EPA = Alberta Environment and Protected Areas

FNC = First Nations Consultation

GIG = Greenview Industrial Gateway

HEC-RAS = Hydrological Engineering Center's River Analysis System

HRA = *Historical Resources Act*

HRIA = Historical Resources Impact Assessment

PC = Preliminary Certificate

RAP = Restricted Activity Period

WSC = Water Survey of Canada

3.0 Introduction

This application is submitted to Alberta Environment and Protected Areas (EPA) by the Municipal District of Greenview No. 16 (Greenview) under Section 37(1) of the Alberta *Water Act* to request approval to carry out the instream activity of constructing a water intake structure in the Smoky River at SW 29-067-04-W6M. Note that the required federal approvals (e.g., under Transport Canada) are also being sought in parallel for the construction and operation of this intake structure.

The structure is designed to divert water under a water diversion licence which has been applied for by Greenview (File No. 00476030), in support of the Greenview Industrial Gateway (GIG). The GIG is a large scale eco-industrial zone which will increase the value of Alberta's natural resources through petrochemical operations and other value-added industrial and commercial activities. Developing the GIG is consistent with the Government of Alberta's concept of the Designated Industrial Zone (DIZ), which will encourage orderly development in the Smoky River Basin, and supports the Government of Alberta's aim to stimulate value-added industrial growth in Alberta's natural gas supply chain.

An overview map of the GIG is provided in Figure 1, including the location of the water intake structure and potential locations of related infrastructure (e.g., water transmission pipeline and water storage ponds). Note that these locations are preliminary based on engineering completed to date and are included for information only. An interim water supply intake location is also identified on this map ("Temporary Water Intake Location"); this intake is being managed as part of a separate regulatory approval process.

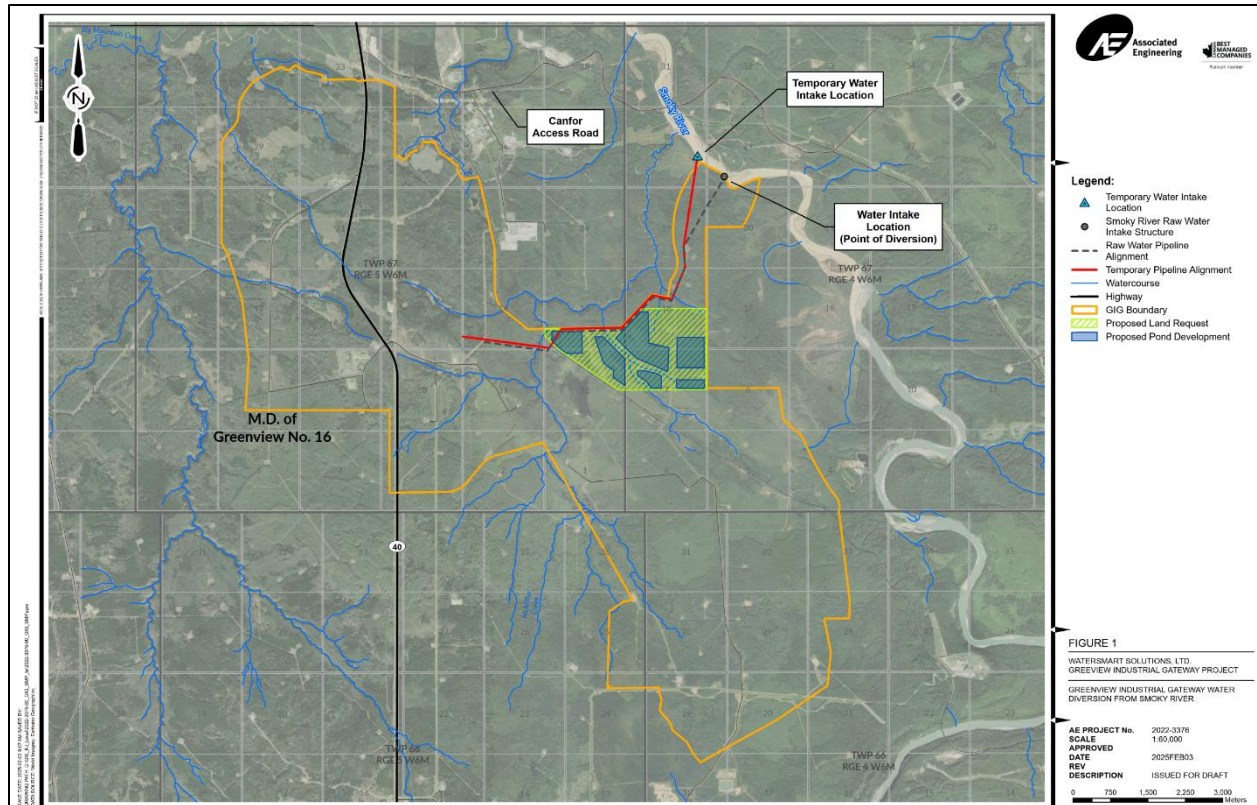


Figure 1: Overview of the GIG, including the planned location for the permanent intake structure. Final pipeline alignment and storage pond location have not been confirmed at the time of application submission and are included in this figure for illustrative purposes.

The GIG will utilize an industrial water utility model to service the facilities operating therein. This approach will use a single water diversion licence and one set of water management infrastructure, including intake structure, pumps, transmission pipelines, and water storage. It will simplify permitting for the GIG and reduce cumulative environmental impacts by limiting the amount of infrastructure deployed on the landscape.

3.1 Planned water infrastructure

Greenview is planning to construct, operate, and maintain the infrastructure required to supply water to the GIG. The critical infrastructure associated with this project, which will be described throughout this document, includes:

- Raw water intake and raw water pump station.
 - A new intake structure will be constructed on the bank of the Smoky River and connected to a pump station on the shore. Together, this infrastructure will have an ultimate diversion capacity of 24,000,000 m³/yr to supply water to the GIG.
 - The intake structure will be constructed, in full, at the outset of the project to reduce long-term impacts on the river (e.g., from repeated entries for construction), with pumps added within the structure as development progresses for all phases of development in the GIG.

- Raw water transmission pipelines.
 - Multiple water transmission pipelines are planned for the GIG, with operation to commence in conjunction with successive development phases in the GIG. These will be built in parallel through a phasing approach which optimizes for economics, constructability, redundancy of water supply, and cumulative impacts.
- Raw water storage ponds.
 - Several raw water storage ponds are planned, with ultimate capacity of at least 7,652,000 m³, to provide water security to the GIG during low-flow periods in the Smoky River.
 - Several locations for the storage ponds are being explored currently; one potential location is included in Figure 1 for illustrative purposes.
- Water management infrastructure within the GIG boundary.
 - A pond supply line, booster stations, and water distribution lines will be required to transport water from storage to each industrial lot within the GIG.
 - Stormwater collection ditches will be constructed with each lot to manage stormwater within the common areas inside the GIG.

This infrastructure will be constructed and operated in accordance with all regulatory requirements. In addition to the infrastructure directly related to the water intake, Greenview will require additional servicing assets, such as roads and power infrastructure, to access and operate the required water infrastructure. The appropriate approvals for these assets will be sought separately from this application.

3.2 Application contents

This document summarizes information prepared on behalf of Greenview in support of the *Water Act* approval application process. Specifically, the following summary sections are included in the body of the document, with corresponding detailed reports provided in the identified appendices:

- 4.0 Site Assessments – summarizes environmental, hydrotechnical, geotechnical, and Historical Resources Impact assessments.
 - 4.1 Environmental site assessment (Appendix I and Appendix II) – aquatic and terrestrial habitat studies were completed to assess the suitability of the potential intake area and the upland area where water storage is planned.
 - 4.2 Hydrotechnical assessment (Appendix III and Appendix IV) – a hydrotechnical assessment was completed using surveys, site visits, data from eight Water Survey of Canada (WSC) streamflow gauges, and aerial and satellite images. The Hydrological Engineering Center's River Analysis System (HEC-RAS) was used in conjunction with WSC and LiDAR data to undertake a hydraulic analysis to estimate design water levels and confirm the optimal location for the intake structure.
 - 4.3 Geotechnical assessment (Appendix V) – work included engineering analysis, field drilling, sample collection, and laboratory testing to study the geotechnical characteristics of the intake location and potential water storage locations within the GIG boundary.
 - 4.4 Historical Resources Impact (Appendix VI) – per the *Historical Resources Act* requirements, the HRIA covered lands with high potential to contain historic resources, employing shovel testing and pedestrian scouting.

- 5.0 Intake Structure Preliminary Design (Appendix VII) – summarizes preliminary design drawings, general materials specifications, isolation details during construction, hydrotechnical components (i.e., ice loads, erosion protections work, channel morphology, and construction hydraulics), and takes into consideration the findings from the site assessments that were completed.
 - 5.1 Intake structure design – preliminary engineering design and construction planning has been completed for the intake structure, which will sit on the banks of the Smoky River.
 - 5.2 Cofferdam design – hydrotechnical analysis and construction planning has occurred for the cofferdam, which will need to be installed in the river to allow construction of the intake structure.
 - Note that Appendix VII, the Intake Structure Preliminary Design Report, itself contains several appendices. Appendix III, IV, and V to this application are also included as appendices to Appendix VII. They have been extracted as standalone appendices to this application for clarity and ease of reference during regulatory review.
- 6.0 Supporting Infrastructure Conceptual Design – provides highlights of the conceptual level engineering which was completed for the pump station, water transmission pipeline, water storage, and ancillary infrastructure which Greenview will use to provide water to the GIG in association with the water intake structure.
 - 6.1 Pump station (also included in Appendix VII) – outlines the design criteria, conceptual pumping design, conceptual civil design, regulatory approval and permitting overview, and estimated costs for the pump station.
 - 6.2 Water transmission pipeline (Appendix VIII) – summarizes the conceptual alignment of the transmission pipeline and pipeline size.
 - 6.3 Raw water storage ponds (Appendix IX and Appendix X) – provides an overview of the conceptual water storage options for the GIG.
 - 6.4 Water management within the GIG boundary (Sections 6 to 8 of Appendix IX) – summarizes potential considerations for Greenview’s future planning of on-site water management, with reference to additional supporting infrastructure which will be located within the GIG boundary.
- 7.0 Construction and Operation Plan – summarizes Greenview’s preliminary planning for phasing construction of the GIG’s water infrastructure and how the infrastructure will be operated to provide industrial users with water.
- 8.0 Engagement and Consultation Plan – summarizes Greenview’s planned approach for stakeholder engagement and First Nations Consultation related to the GIG’s water infrastructure and water use.
- **Error! Reference source not found. Error! Reference source not found.** – summarizes Greenview’s plans for monitoring and reporting water-related data to EPA and continuous improvement in the operations and maintenance of the associated infrastructure.
- 10.0 Additional Regulatory Considerations – summarizes the other regulatory processes Greenview is completing related to the intake structure. In addition to this *Water Act* Approval Application, approvals are being sought through separate processes under the *Fisheries Act*, *Canadian Navigable Waters Act*, *Historical Resources Act*, and *Public Lands Act*.

4.0 Site Assessments

During previous work preparing the application for the water diversion licence (File No. 00476030), a potential intake location at the coordinates SW 29-067-04-W6M was identified on the Smoky River, proximate to the GIG boundary. Environmental, hydrotechnical, geotechnical, and HRIAs have been undertaken to review this area for environmental sensitivities, technical suitability, and potential constraints. These assessments also provide recommendations for regulatory and compliance requirements to support the intake structure design. Key findings from the reports are included below, and the full reports are appended to this application for reference.

4.1 Environmental site assessment

For the full reports, refer to Appendix I and Appendix II.

The environmental site assessments consisted of aquatic and terrestrial habitat assessments. These assessments were completed to better understand the potential environmental impact of the intake infrastructure, along with those associated with the planning and construction of the upland industrial area (i.e., the GIG).

The aquatic assessment, which was completed on July 6, 2022, included a habitat and bathymetric survey 500 m upstream and 1,300 m downstream of the proposed point of diversion. It was found that the habitat at the proposed intake location is not limited in area and does not provide critical function for any resident species that is not otherwise readily available nearby.

The terrestrial assessment, completed on July 7, 2022, identified plant community types and incidental wildlife observations nearby to the GIG and the intake site. No rare plants, as defined by the Alberta Conservation Information Management System database, were found during the field assessment; however, fine-scale surveys are required to confirm their absence prior to construction. Three wildlife species have been previously recorded within or near the study area which are identified as of conservation concern under the provincial *Wildlife Act* and/or the Federal *Species at Risk Act*. These species are the Canada warbler (*Wilsonia canadensis*), grizzly bear (*Ursus arctos*), and trumpeter swan (*Cygnus buccinator*). Therefore, setback distances from den sites or nesting areas will have to be determined relative to the impact of construction and duration of operations of the activity. No records of contamination have been recorded in the Environmental Site Assessment Repository, but contamination is possible along roadways and train tracks (Government of Alberta, 2022).

Areas along the Smoky River have been assigned a historic resource value listing. Therefore, in accordance with the *Historical Resources Act*, pursuant to section 37(2), an HRIA was completed (see Section 4.4). Intake construction will also need to comply with the requirements of the federal *Fisheries and Canadian Navigable Waters Act*, as well as the provincial *Public Lands and Water Act*, as explained in Section 10.0.

Between May 6 and 10, 2024, additional terrestrial and wetland field assessments were conducted, focused on the potential effects of upland development in previously undisturbed areas. Based on the upland field assessment and desktop review, upland construction may require the following regulatory authorizations and activities:

- Pre-construction sweep for migratory bird nests before tree-clearing as per the *Migratory Birds Convention Act*.

- Approval under the Alberta *Water Act* due to tree clearing or disturbances in wetland areas.
- Pre-construction sweep for grizzly bear dens within a buffer of 200 – 750 m if work occurs between October 1 and April 30 as per the *Public Lands Act*.

Key conclusions and recommendations from the environmental site assessments include:

- The proposed location of the intake is adequate if access routes avoid potentially valuable wildlife habitat and the intake generates run habitat.
- Greenview must obtain all regulatory permits prior to construction and revisit their requirements as design progresses through engagement with regulators and First Nations.
- Restricted Activity Periods must be considered for construction.
- The intake design should include appropriate screens to adhere to end-of-pipe fish protective measures.
- Where possible, placement and construction of the intake should avoid impacting wetlands, watercourses, and vegetated areas that provide habitat. A setback should be maintained otherwise.

4.2 Hydrotechnical assessment

For the full report, refer to Appendix III.

A hydrotechnical assessment was completed to study the hydrology of the Smoky River around the proposed intake location. The assessment relied on WSC data from eight streamflow gauges; air photos and satellite imagery from 1950 to 2022; and surveys and site inspections, which were carried out from July 25 to 28, 2022.

A hydraulic analysis was performed to determine design water levels and identify potential intake locations between 800 m downstream and 3,760 m upstream of the Canfor Access Road bridge in Figure 1. This analysis used HEC-RAS in combination with WSC and LiDAR data. The model yielded two potential intake locations, labeled 1716 and 2624 in Appendix III (i.e., Options 1 and 2, respectively). Various types of intake designs, such as gallery, off-stream channel, mid-channel, and bank, were considered at both potential locations. Relevant findings and recommendations from the assessment are:

- The intake structure should be located where natural bed scouring provides the ability for the river to maintain greater depth during low flow periods.
 - For this reason, and others detailed in the appended report, Option 2 is the recommended intake location.
- The intake structure should be at least 1 m below the 2-year low flow water level, or above the 2-year peak flow water level. Higher elevation is recommended as it allows for easier maintenance.
- A wedge-shaped bank intake is recommended, as it provides a smoother flow pattern in front of intake ports and promotes scour near the intake face.
- The intake needs to provide a total annual volume of 24,000,000 m³, requiring continuous pumping at 0.761 m³/s (with a maximum diversion rate of 1.27 m³/s). Four pumps with withdrawal capacity of 0.355 m³/s would allow for redundancy in case of pump failure and have additional capacity for periods when pumping is required for both operations and filling storage. Each pump should be housed in a separate chamber of the overall intake structure.

- Two design alternatives were prepared for the Option 2 location. Tee-screens (Option 2A) minimize the port intake size, but fish pumps will be necessary to remove fish that cannot swim back out of the port. Rectangular fish screens inside intake ports (Option 2B) would prevent fish from entering the intake chamber but are susceptible to freeze-up.
 - Based on the overall footprint, Option 2A is the preferred design as it is 1.7 times smaller than Option 2B, which will reduce environmental impacts during construction and operations. A more detailed comparison of Option 2A and 2B is included in Appendix IV.
- Four 457 mm conductor pipes should conduct water to the pump station.
- Erosion protection should be provided around the intake structure and on the opposite bank.

4.3 Geotechnical assessment

For the full report, refer to Appendix V.

A preliminary geotechnical assessment was conducted at both the proposed river intake location and the potential raw water storage site within the GIG boundary¹. The scope of the assessment included three components: a field program comprising a total of five boreholes, testing of recovered soil samples, and engineering analysis.

A field investigation was carried out from January 14 to 16, 2023. Soil samples were retrieved at 0.6 m intervals (with standard penetration testing performed at 1.5 m intervals where applicable). All recovered rock core was retained, visually examined in the field, and transported for further analysis at a material testing laboratory. Sloughing was not encountered in any of the boreholes.

Analysis and recommendations specific to the intake location include the following:

- The groundwater table is expected to fluctuate seasonally, with variation on the order of 1 m or more. This must be considered during construction.
- Surficial geology is expected to have sufficient bearing capacity for the wet well foundations, granted an adaptive design approach is utilized.
 - A sloped excavation is considered the simplest option. Its feasibility is dependent on the strength of the weakest layer.
 - Anchors with shotcrete facing are considered feasible reinforcement from existing grade to the base of the excavation.
 - Full depth secant pile wall would be exposed to less degradation and reduced anchor rows, with the downside of increased cost.
- An access road is required to the intake location, as it is currently accessed using an oil lease road, pipeline rights-of-way, and other geographical features.

For the proposed raw water storage site, the following recommendations were made:

- Clay tills encountered are likely to be suitable for use as impermeable clay liners and dam fill material.
 - If there is an insufficient volume of suitable clay, a synthetic liner could be considered.
- Groundwater is a potential issue in the central pond region.

¹ Note that this potential storage site is within 15-067-05-W6M, and is distinct from the potential storage location indicated in Figure 1.

- If the ponds are to be greater than 2.5 m in height or contain more than 30,000 m³ of water, they will be considered dams and regulated by the Alberta Dam and Canal Safety Directive.
- Further investigation is required to adequately characterize the geological variability in the area. Boreholes should be completed to sufficient depth every 100 m along the 8 km proposed pond perimeter.
- Groundwater monitoring wells should be installed.

4.4 Historical Resources Impact Assessment

For the full report, refer to Appendix VI.

An HRIA was conducted for the proposed intake following the receipt of archaeological research permit 23-142 on August 2, 2023. The methods of investigation included an in-field survey, subsurface investigation, and the technical report incorporating the permit obligations set out by the Guidelines for Archaeological Permit Holders in Alberta, the Archaeological and Paleontological Research Permit Regulation (Alberta Regulation 254/2002), the *Historical Resources Act*, and associated Requirements letter (HRA Number: 4970-22-0064-001).

The field portion of the HRIA, conducted from August 9 to 10, 2023 under frost-free and snow-free conditions, focused on the identification of any new archaeological and historic sites, as well as revisiting known sites to assess the potential impact of the proposed development. During the investigations, a total of 36 shovel tests were completed across the development area, with no new sites being identified and no previously recorded sites revisited.

Key findings are summarised below for the study area, which was divided into an upper and lower terrace based on elevation and proximity to the Smoky River (see Figure 7 in Appendix VI):

- Lower terrace:
 - Location: Lenticularly-shaped area running northwest to southeast immediately west of the Smoky River. It is roughly 80 m long and 30 m at its widest.
 - Subsurface testing consisted of eight shovel tests, limited due to the low deposition rate and its elevated position relative to the Smoky River.
 - The shovel tests were shallow, hitting either bedrock or gravel at about 20 – 35 cm below the surface.
- Upper terrace:
 - Location: Roughly triangular area with the long side (200 m) parallel to the river and the apex pointing inland (90 m).
 - Subsurface testing consisted of 28 shovel tests.
 - All tests on the north and south of the existing constructed road were negative for cultural material.

Given the results of the HRIA, it was recommended that the proposed GIG water intake project be granted *Historical Resources Act* approval in fulfilment of the *Historical Resources Act* Requirements, subject to approval of Alberta Arts, Culture and Status of Women. On December 15, 2023, Greenview received an approval with conditions for HRA Number: 4970-22-0064-001. Based on this approval, it is understood that monitoring must occur during construction for activities greater than 1 m below surface within specific areas.

5.0 Intake Structure Preliminary Design

For the full report, see Appendix VII.

At Greenview's direction, preliminary engineering design was completed for: a) the water intake structure, which will be located on the banks of the Smoky River for the life of the GIG; and b) for the cofferdam, which will be installed temporarily within the Smoky River to create a dry and safe workspace for the intake structure's construction. This design work, detailed in Appendix VII, was informed and supported by several underlying assessments, some of which are summarized in Section 4.0. For example, the preliminary hydrotechnical design formed the basis for the water intake concept design. The on-land geotechnical report provides conceptual requirements for the pump station construction and the intake civil/landscape finishes.

5.1 Intake structure design

As described in Section 4.2, the water intake structure was designed to divert 24,000,000 m³/yr from the Smoky River with a four-pump design to provide redundancy. Each pump will be located within its own chamber, and each chamber will be equipped with a trash bar and fish screen (see Figure 2). The trash bars will prevent large debris from entering the pump chamber and serve as the first barrier to fish entry. Any fish smaller than the trash bar spacing of 75 mm (3") will enter the intake chamber but will be prevented from entering the wet well by a fish screen, which have been designed per the requirements of Fisheries and Oceans Canada. In addition, any fish within the intake chamber will be guided to a fish pump which will return fish to the Smoky River downstream of the intake structure. Finally, sluice gates will be mounted on the inside of the port opening at each intake chamber to allow for isolating from the river for maintenance and downtime.

5.1.1 Civil and structural

Civil siteworks for the intake infrastructure is expected to include:

- Permanent erosion protection with class 2 rock riprap on the east bank of the Smoky River (at the opposite side of the intake).
- Permanent scour erosion protection with class 3 rock riprap around the intake structure base.
- Permanent erosion protection around the banks downstream and upstream.
- Imported fill material from the raw water pond site, for the space between the intake and the bank up to the intake access elevations.
- The top of the fill designed to have a smooth cemented surface sloped towards the river.

The proposed intake design is currently planned to be constructed with cast-in-place concrete, although this may be adjusted during detailed design and construction planning. The overall footprint of the concrete intake structure is approximately 126 m², with concrete walls that extend from the south and north sides of the structure towards the banks of the river.

5.2 Cofferdam design

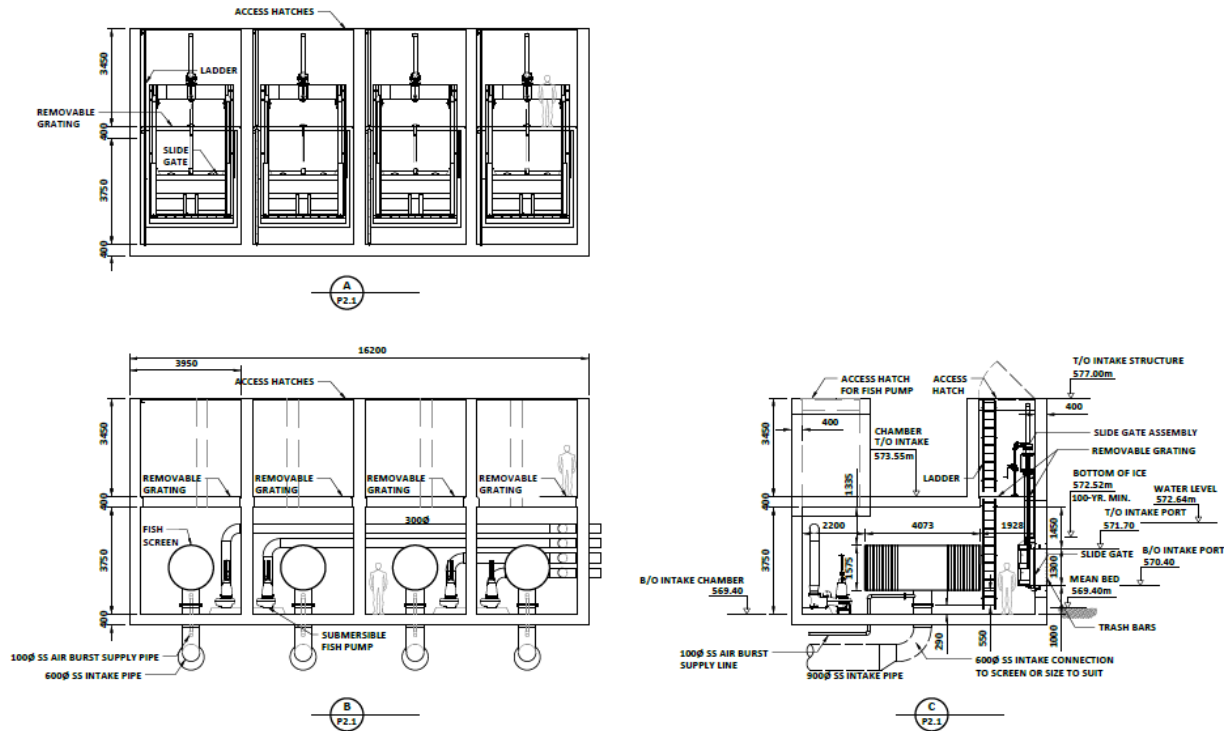
For the full report, refer to Section 10.0 and Appendix F and G of Appendix VII.

To construct the intake, a temporary cofferdam will be required to isolate a portion of the Smoky River. The proposed cofferdam design was informed by the assessments in Section 4.0 and professional judgement and is subject to change as further engineering is completed. Specifically, the current rockfill

design may be replaced by a steel pile design, pending geotechnical analysis and further engineering which is ongoing at the time of application submission. The steel pile design is preferable from a constructability perspective and will have a smaller impact on the Smoky River (discussed below). In this application, details on the rockfill cofferdam design are provided on a conservative basis; any future alterations to the design will result in a lessening of the cofferdam footprint and associated impacts.

Figure 3 shows plan and profile views of the water intake structure, pump station, and rockfill cofferdam. **Error! Reference source not found.** The inside toe of the berm will be offset by 8 m from the eventual intake structure so that scour protection can be placed around the intake. The cofferdam will consist of a homogeneous zone of material, with clay added to the upstream face of the cofferdam after placement of rockfill. The method of placement will allow 2H:1V slopes to be maintained while also reducing the risk of leakage.

The hydrological and erosional impacts of the cofferdam have been assessed (Appendix F of Appendix VII). Preliminary specifications have been identified for riprap to prevent erosion of the cofferdam as well as of the opposite riverbank. In addition, consideration has been given to fish passage upstream through the constriction which the cofferdam will create in the Smoky River. This constriction will cause higher than normal velocities during the May, July, and August migratory periods, and it is recommended that remedial measures be introduced. For example, Greenview is exploring the placement of boulders to enable fish passage within the constriction zone. The steel pile design will have a smaller footprint, and therefore a smaller impact on flow velocities, which helps to make it the preferable design if it can be safely implemented.



THE EXISTENCE, LOCATION AND ELEVATION OF ALL UTILITIES AS SHOWN ON ANY PLANS MAY BE BASED ON INFORMATION RECEIVED FROM THE RESPECTIVE AUTHORITIES AND ARE NOT GUARANTEED BY THE ENGINEER. NO RESPONSIBILITY IS IMPLIED OR ASSUMED BY THE ENGINEER AS TO THE LOCATION AND ELEVATION OR ANY OMISSIONS. THE CONTRACTOR OR ANY THIRD-PARTY IS RESPONSIBLE FOR DETERMINING THE EXISTENCE, LOCATION AND ELEVATION OF ALL SUCH UTILITIES AND MUST CONTACT THE VARIOUS UTILITY COMPANIES FOR ON SITE INFORMATION PRIOR TO COMMENCEMENT OF ANY OPERATIONS.

1 24-12-18 FOR PRELIMINARY DESIGN REPORT

ISSUE YY-MM-DD REVISION

MON DD, YYYY



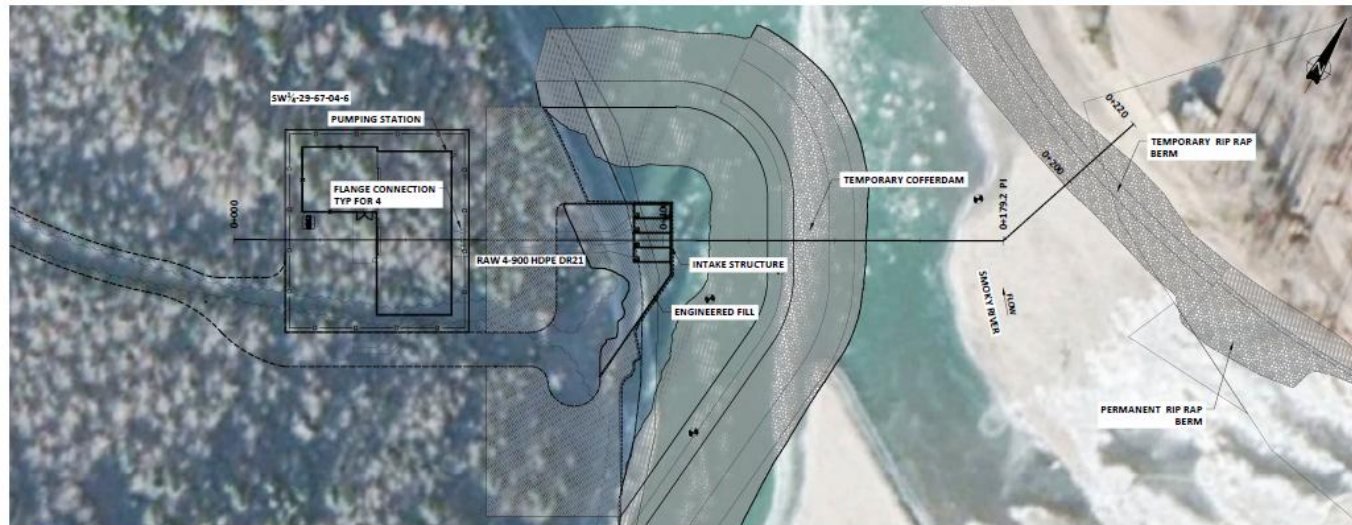
WATERSMART A HAZEN COMPANY

**GREENVIEW INDUSTRIAL GATEWAY
WATER INTAKE AND RAW WATER TRANSFER
STATION
PROCESS
SECTION VIEW**

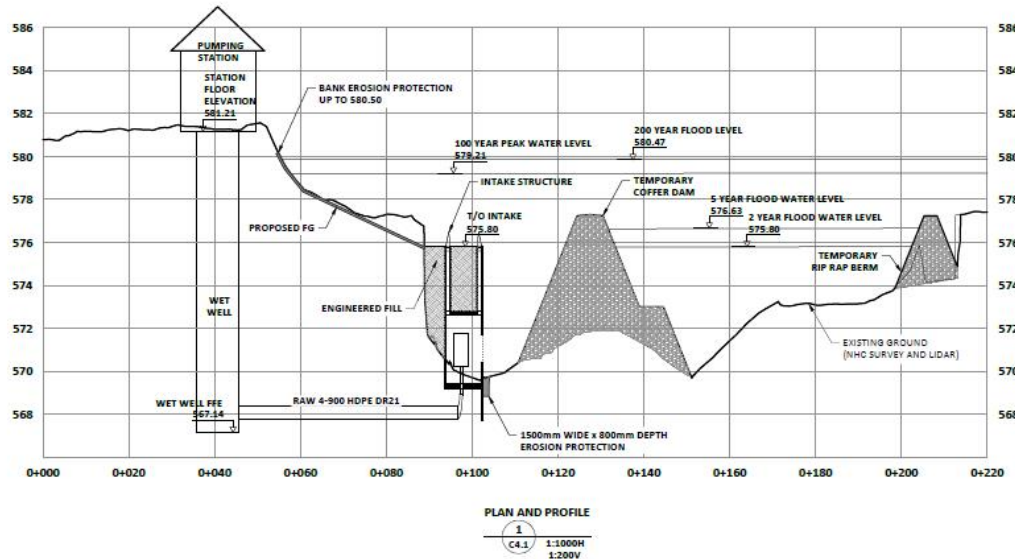
DESIGNED I.A.K.	JOB 5946-001-00
DRAWN D.F.F., J.M.M.	SCALE 1:150
DATE NOVEMBER 2023	DRAWING P2.2

Figure 2: Section views of the water intake structure design, illustrating the four-chamber approach and providing a sense of scale.

DIGITAL DRAWINGS BEST VIEWED IN CADORE ADOBE READER



- NOTES:
1. FOR INFORMATION REGARDING GENERAL NOTES, UTILITIES, SYMBOLS AND ABBREVIATIONS REFER TO THE LEGEND AND ABBREVIATIONS DRAWINGS.
 2. ALL ELEVATIONS, STATIONS, PIPE LENGTHS AND DIMENSIONS IN METRES AND PIPE SIZES IN MILLIMETRES UNLESS NOTED OTHERWISE.
 3. ALL BOLD ITEMS INDICATE WORK TO BE DONE AND ALL LIGHT ITEMS INDICATE EXISTING CONDITIONS.
 4. THE CONTRACTOR SHALL CALL ALBERTA ONE-CALL AT 1-800-242-3447 AT LEAST THREE (3) WORKING DAYS PRIOR TO BEGINNING ANY EXCAVATION OR REMOVALS.
 5. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING UTILITY LINE CROSSING WITH UTILITY COMPANIES.
 6. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATE BARRICADES, CONSTRUCTION SIGNAGE, TRAFFIC CONTROL, AND FLAG PERSONS.
 7. THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING RESIDENTS AND BUSINESSES AFFECTED BY CONSTRUCTION PROCEDURES AT LEAST SEVEN (7) DAYS PRIOR TO COMMENCING CONSTRUCTION.
 8. THE CONTRACTOR IS RESPONSIBLE FOR MEETING OCCUPATIONAL HEALTH AND SAFETY REGULATIONS.



1	24-12-18	FOR PRELIMINARY DESIGN REPORT
ISSUE	YY-MM-DD	REVISION

MON DD, YYYY



a division of Englobe

WATERSMART A HAZEN COMPANY

**GREENVIEW INDUSTRIAL GATEWAY
WATER INTAKE AND RAW WATER TRANSFER
STATION
CIVIL
INTAKE AND PIPELINES**

DESIGNED	I.A.K., C.C.	JOB	5945-001-00
DRAWN	T.N.Q., C.C.	SCALE	1:1000
DATE	NOVEMBER 2023	DRAWING	C4.1

Figure 3: Plan and profile views for the water intake structure, pump station, and temporary cofferdam for isolation during construction.

5.3 Intake and cofferdam construction

It is understood that the restricted activity period (RAP) for the Smoky River is August 1 to July 15 of the following year. This RAP provides a two-week period for instream work, from July 15 to July 31, each year. It is expected that construction of the rockfill cofferdam will take longer than two weeks, meaning that work within the RAP would be required. From a constructability and worker safety perspective, it would be preferable to construct the cofferdam during the low flow periods in fall or winter (ideally, September). Given that work within the RAP will be required regardless, Greenview is exploring the regulatory approval pathway to enable construction of the rockfill cofferdam in September. This effort is ongoing in parallel to the submission of this application.

It is estimated that construction of the intake structure will take 12 – 18 months, during which time the cofferdam will be required on an ongoing basis. There are also considerations for managing peak flow periods in June and early July; once the intake structure is built, it would be preferable to remove the cofferdam before peak flows, although this would also require instream work within the RAP. Greenview is considering this decommissioning aspect in parallel to the installation of the cofferdam.

6.0 Supporting Infrastructure Conceptual Design

As noted in Section 3.1, the GIG will require additional infrastructure supporting the water intake, including a raw water pump station, water transmission pipeline, water storage pond, and ancillary infrastructure (e.g., storage pond supply lines, booster stations, water distribution lines, and stormwater collection ditches). The corresponding regulatory approvals for this infrastructure will be managed separately from this application. Conceptual level information regarding this infrastructure is included in this document to offer a comprehensive overview of the water system which will serve the GIG. See Section 7.0 for a summary of how the infrastructure will be constructed using a phased approach.

6.1 Pump station

For the full report, refer to Appendix C of Appendix VII.

The conceptual pump station (also referred to as a raw water transfer station) design involves civil site works such as tree clearing, access road construction, stockpiling of materials, and backfilling. The design team assumed a sloped excavation (minimum 2H:1 V slope) as the suitable soil support method. For concept plan view schematics, as well as building and site layout of the Station, refer to Appendix C of Appendix VII.

Consistent with the design approach noted in Section 4.2, the pumping system design criteria used for this exercise are:

- 0.355 m³/s flow rate per pump.
- 194 m (276 psi) of design head.
- 352 m (500 psi) of potential surge pressure.

The pump station is configured with four vertical turbine pumps. At 1,250 HP each and with at least one pump having a variable frequency-drive, this design allows for capacity redundancy.

Piping has a targeted flow velocity of less than 3 m/s, with 600 mm pipe diameter for connections to the raw water transmission pipeline, 400 mm for pump outlets, and 900 mm for all headers that may carry

the ultimate pump station design flow. Each of the pump outlets includes anti-cavitation pump control valves, silent checks, and isolation valves for mitigation of surges in the downstream raw water transmission pipeline. The conceptual design also incorporates equipment for hydraulic and air backflush to remove sediments by flushing them through the raw water conveyance between the inlet structure and the intake bay. The rectangular wet well was designed with minimal raw water retention time to reduce sedimentation and maintenance.

Although the final power supply plan has not been completed, the proposed pump station can be supplied by a single 25 kV high voltage utility feed into an outdoor switch yard. The switch yard would contain the 25 kV service entrance switchgear, two pad mounted 25 kV:5 kV power distribution transformers (1 duty and 1 redundant), and a 25 kV:600 V step down transformer. An exterior 300 kW outdoor standby generator could be located within the fenced compound, but outside of the switch yard.

The conceptual design conforms to all applicable codes, standards, and references, including but not limited to:

- EPA, Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems, 2012
- National Building Code, 2019
- National Energy Code, 2017
- IES, Illuminating Engineers Society Standards
- CSA, Canadian Standards Association
- CEC, Canadian Electrical Code C22.1
- IEEE, Institute of Electrical and Electronic Engineers
- EEMAC, Electrical and Electronic Equipment Manufacturers Association of Canada
- NEMA, Standards of National Electronic Manufacturers Association
- ANSI, American National Standards Institute
- *Public Lands Act*
- *Historical Resources Act*

6.2 Water transmission pipeline

For the full report, refer to Appendix VIII.

Several concepts were considered for the pipeline to transmit water from the pump station to the water storage ponds. These concepts were developed and evaluated using criteria such as capital and operating costs, construction risks, and environmental impacts. Four different pipeline alignments were compared, with the recommended alignment selected because it:

- Will be located almost entirely within the GIG boundary.
- Has a short length, minimizing the land area dedicated for right-of-way which reduces tree clearing requirements and pumping needs.
- Avoids the construction of the pipeline adjacent and parallel to other surface and underground infrastructure.
- Minimizes the risk of locating the pipeline through future developable land.
- Has the lowest cost of evaluated options.

The recommended alignment, shown in Appendix VIII and Figure 1, follows a relatively direct alignment from the raw water intake to the GIG raw water storage ponds, while staying entirely within the GIG boundary. While this alignment will have a larger impact on virgin forests than the other options, it avoids most other pipelines, roads, and railways (except for crossings) which reduces potential conflicts with other infrastructure. The final alignment will be confirmed through detailed design efforts and based on the placement of the raw water storage ponds.

6.3 Raw water storage ponds

For the full reports, refer to Appendix IX and Appendix X. These two files explore different options for raw water storage pond locations which Greenview is evaluating. Although the storage location has not been finalized, these files are provided as part of this application package for information and to validate that Greenview has a plan to store and utilize the water which will be diverted from the intake structure once it is constructed.

Two alternative water storage pond locations were evaluated for the build out of the GIG, with a total capacity of either 7,560,000 m³ or 8,285,000 m³. In both cases, this storage would be accommodated across multiple ponds which would be constructed in phases as the GIG develops. Depending on final siting, the conceptual design includes a total of 6 to 9 ponds constructed within the GIG Area Structure Plan (ASP) area, accounting for the natural slopes in that area. Given their size, it is possible that the storage ponds will be classified as dams per the Alberta Water (Ministerial) Regulation and will need to be designed and operated in accordance with these requirements. Greenview will evaluate and address this possibility in the future as part of ongoing design work.

6.4 Water management within the GIG boundary

For preliminary reference information, see Sections 6 to 8 of Appendix IX. Note that this is subject to change and provided for information to demonstrate that Greenview is taking steps to appropriately design water management infrastructure within the GIG boundary.

In addition to the infrastructure described above, Greenview will require on-site water infrastructure to service the industrial facilities in the GIG. Greenview is continuing to develop a master site plan for the GIG, within which water management infrastructure will be managed. On a preliminary basis, this planning is expected to consider the following water distribution and management infrastructure:

- Pond supply line to connect the storage ponds to a common collection head.
- Booster station and water distribution lines to move water from the storage location to the boundary of each lot or facility within the GIG.
- Water metering, which will be required at the intake on the Smoky River and within the distribution network to measure the water use by each tenant of the GIG.
- Stormwater collection ditches associated with shared infrastructure within the GIG and each individual lot.
- Treatment and pumping infrastructure to achieve the agreed upon quality, quantity, and rate of water to be delivered to the boundary of each lot and/or facility.

Further details will be generated as part of ongoing planning and engineering by Greenview and its industrial partners.

7.0 Construction and Operation Plan

7.1 Construction phasing

Recognizing that the full build out of the GIG's water infrastructure will require significant investment of capital and time, Greenview is exploring opportunities to phase this build out over time, such that major water infrastructure can be made available on an as-needed basis as the GIG grows. For example, the raw water storage ponds and the water transmission pipelines both offer opportunities for phased development. See Section 5.3 of Appendix IX for an example of preliminary thinking on how this infrastructure could be phased. Importantly, the water intake structure itself will **not** be phased; that is, Greenview is planning to enter the river one time to construct the intake structure which will have capacity to service the entire GIG build-out. This approach will help reduce cumulative environmental effects over time.

Table 1 provides a high-level overview of Greenview's current design and construction plan for the major water infrastructure associated with the GIG. Note that these dates are preliminary and subject to change. Additionally, note that the End date reflects the expected completion of the first phase of construction (where applicable). For example, construction of raw water storage ponds is expected to extend beyond the End date below as additional phases are completed. This schedule is updated on an ongoing basis as Greenview progresses planning for the GIG, and further information can be provided by request. It has been provided in this form for the application to give EPA a sense of how the water intake structure is expected to integrate with the larger development plan for the GIG.

Table 1: Preliminary design and construction schedule for the GIG's water-related infrastructure. These dates are preliminary and subject to change.

Component		Start (actual or planned)	End (actual or planned)
Intake structure, Pump station, and Cofferdam	Design	May 2022	September 2025
	Regulatory authorization	April 2023	September 2025
	Construction	September 2025	June 2027
Water transmission pipeline	Design	May 2022	December 2025
	Regulatory authorization	November 2025	April 2026
	Construction	May 2026	September 2026
Raw water storage ponds	Design	May 2022	October 2025
	Regulatory authorization	September 2025	February 2026
	Construction	January 2026	July 2026
On-site water management infrastructure	Design	April 2025	December 2025
	Regulatory authorization	Requirements and timing TBC	
	Construction	Requirements and timing TBC	

7.2 Operation plan

Greenview has drafted an internal water infrastructure policy which outlines how water will be distributed within the GIG and how the operation of this system will be managed, including the responsibilities of

Greenview and the GIG tenants. This policy is undergoing review and amendment on an ongoing basis as Greenview works with its development partners to progress the vision for the GIG, including master site planning. It is anticipated that the final operational plan/policy will incorporate components such as water metering, maintenance, and water shortage response planning, as required under the conditions of Greenview's Preliminary Certificate (PC) No. 00476030-00-00. Greenview will provide information from this plan in fulfillment of these conditions as available.

8.0 Engagement and Consultation Plan

Greenview recognizes the importance and necessity of early engagement and formal First Nations Consultation (FNC) related to both the diversion of water for the GIG and the construction of the water intake structure. Working together with the GIG's development partners and other regional collaborators, Greenview has already performed extensive public engagement, as well as pre-Consultation engagement with local First Nations communities. This has included a combination of media communications (e.g., newspaper, LinkedIn), open house events, and individual, in-person meetings. In addition, Greenview participated in Level 3 consultation under the *Public Lands Act*, which was led by the Government of Alberta for the GIG ASP boundary.

Greenview recognizes their statutory obligation to complete FNC per the requirements of the Aboriginal Consultation Office (ACO). Per the ACO determinations, Greenview will complete Level 2 Consultation with the following groups:

- Gift Lake Métis Settlement.
- Horse Lake First Nation.
- Sturgeon Lake Cree Nation.
- Sucker Creek First Nation.

At the time of application submission, the Consultation has not been completed. In the future, the Record of Engagement will be completed and submitted to the regulator as required by the Level 2 consultation guidelines. Table 2 summarizes the FNC requirements associated with the GIG's water supply, including from federal regulators.

Table 2: Summary of all the pre-consultation assessment request details associated with this intake (ATS location SW-29-067-04-W6M)

Activity Number	Act	Regulatory Body
FNC202352119	<i>Water Act</i>	Alberta Environment and Protected Areas (EPA)
FNC202300678	<i>Public Lands Act</i> (Disposition Licence of Occupation [DLO])	EPA
File No.23-HCAA-00679	<i>Fisheries Act</i>	Fisheries and Oceans Canada
Registry No. 7633	<i>Canadian Navigable Waters Act</i>	Transport Canada

9.0 Monitoring, Reporting, and Performance Management

As noted in Section 7.2, Greenview's operational planning efforts will incorporate components such as water use monitoring and other forms of monitoring pertinent to the PC conditions. In addition, Greenview will prepare plans for reporting and performance management which fulfill other requirements of the PC. This will include reporting on water diversions from the Smoky River and ongoing updates as the tenants of the GIG are confirmed and change over time. Greenview is committed to performance improvement over time and will seek opportunities to optimize its operations, including timing of water diversions, as the GIG is developed.

10.0 Additional Regulatory Considerations

In addition to this application, approvals for the intake structure are being sought under the *Fisheries Act*, *Canadian Navigable Waters Act*, *Historical Resources Act*, and *Public Lands Act* (for the disposition and temporary field authorization). Table 3 summarizes the status of these regulatory considerations as of March 1, 2025.

Table 3: Summary of regulatory applications and related efforts for the water intake structure and overall GIG water supply.

Act	Permit Type	Application Status	Next Steps
<i>Fisheries Act</i>	Project Request for Review	Submitted April 4, 2023. Regulatory review in progress. Meetings have been held with Fisheries and Oceans Canada with ongoing supplemental information requests in progress.	Confirmation on project footprint and fish return system to be provided once available. Provide updated information regarding river velocity in consideration for cofferdam design. Contact provincial biologist to consider the potential for work in the RAP.
<i>Canadian Navigable Waters Act</i>	Approval	Draft application was reviewed with Transport Canada and is in progress. A copy of the PC was provided to the regulator for the application file.	Application to be submitted once design details are finalized. Approval will be dependent on the results of the FNC process. 30-day posting on public registry will be required once submitted.
<i>Historical Resources Act</i>	Approval HRA No. 4970-22-0064-002	Completed in August 2023. Approval with conditions for monitoring received December 15, 2023.	Monitoring is required during construction for excavation activities greater than 1 m below surface at LSD 3-4 Sec 29-067-4-W6M and LSD 1, 8-11 Sec 30-067-4-W6M
<i>Public Lands Act</i>	Disposition Licence of Occupation File No. DLO240013	Review in progress. Amendment and FNC details confirmed on March 3, 2024.	Footprint was revised to remove bank armoring which will be covered by a Temporary Field Authorization. EPA to work directly with Greenview on plans for site access.
<i>Public Lands Act</i>	Temporary Field Authorization	Application to progress when further information is available.	Temporary Field Authorization will be required for temporary access during instream construction, including the armoring of the opposing bank.
<i>Water Act</i>	Approval	Issuance of this approval is dependent on results of the FNC process.	Complete the FNC requirements. Provide Qualified Aquatic Environment Specialist Recommendations for submission once instream works plan is confirmed. Draft is in progress.
<i>Water Act</i>	Water Diversion License	PC has been received. Issuance of the associated licence is dependent on results of the FNC process.	Greenview to submit certificate of completion for PC once terms and conditions are fulfilled.

References

- Government of Alberta. (2022). *Environmental Siste Assessment Repository*. Retrieved from Alberta Environment and Protected Areas: <https://www.esar.alberta.ca/esarmain.aspx>
- Prior, G. J., Hathaway, B., Glombick, P. M., Pana, D. I., Banks, C. J., Hay, D. C., . . . Weiss, J. A. (2013). *Bedrock Geology of Alberta. Map 600*. Alberta Geological Survey.

Appendices

The following appendices have been submitted as separate files within the Digital Regulatory Assurance System.

- Appendix I: Associated Engineering, September 2022. Greenview Industrial Gateway Intake Environmental Overview.
- Appendix II: Associated Environmental Consultants, July 2024. Environmental Overview.
- Appendix III: Northwest Hydraulic Consultants, February 2023. Greenview Industrial Gateway Raw Water Intake – Preliminary Hydrotechnical Design Final Report.
- Appendix IV: Intake Preliminary Selection Overview.
- Appendix V: Englobe, June 2023. Geotechnical Investigation Greenview Industrial Gateway.
- Appendix VI: Circle CRM Group, September 2023. Historical Resources Impact Assessment – 2022-3376 Greenview Industrial Gateway Intake: Final report.
- Appendix VII: MPE, a division of Englobe, December 2024. Preliminary Design Report – Water Intake and Raw Water Transfer Station.
- Appendix VIII: Associated Engineering, January 2023. Greenview Industrial Gateway Raw Water Pipeline Alignment Options.
- Appendix IX: Associated Engineering, August 2023. Greenview Industrial Gateway Raw Water Storage Ponds Concept.
- Appendix X: Associated Engineering, January 2025. Greenview Industrial Gateway Estimated Land Requirements for Raw Water Storage Ponds.