Volume 1, Section 2 Snake Lake Reservoir Expansion Project Project Description Overview

Submitted to:

MPE
a division of Englobe
Lethbridge, Alberta

On behalf of:

Eastern Irrigation District
Brooks, Alberta

Submitted by:

AAR Environmental Services
Calgary, Alberta

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AARES Project #: 21-127

Executive Summary

The Eastern Irrigation District (EID) is applying for approval under the Environmental Protection and Enhancement Act (EPEA) to construct the proposed Snake Lake Reservoir (SLR) Expansion Project (the Project). The Project, located between Bassano and Brooks in Alberta, involves the construction of a roughly 8 km long, up to 20 m high dam to increase the storage capacity of the reservoir system from 19.25 million m^3 to 87.4 million m^3. This Environmental Impact Assessment (EIA) section includes an overview of the Project, which contains details on the need and benefits of the Project, water demand, regulatory requirements, Project components and materials, and construction activities.

The purpose for the development of the Project is to increase water storage capacity without requiring additional water diversion from the Bow River and increasing resiliency to drought. Increased storage from the Project means that an additional 50,000 acres (20,000 ha) of irrigated land in the EID will be fully supported by reservoir. This brings the total area supported up from 155,000 acres (62,700 ha) to 205,000 acres (83,000 ha) and reduces the areas that are fully dependent on direct-from-river water to 110,000 acres (44,500 ha). The Project will provide additional water storage using water already allocated under the EID's water license and will not require additional diversion. This will be achieved while also doing their part to ensure the Master Apportionment Agreement, which requires 50% of flow of eastward-flowing streams originating in Alberta to cross into Saskatchewan, will be met (GOA, 2024a).

The Project triggered mandatory activities under the Activities Designation Regulation of the provincial Environmental Protection and Enhancement Act (EPEA), as construction of a dam >15 m high or reservoir capacity >30 million m^3 requires an EIA. The Project also requires several federal, provincial, and municipal approvals, such as the *Species at Risk Act* (SARA), the Alberta *Water Act*, and a road allowance closure bylaw from the County of Newell. The Project is aligned with multiple provincial and municipal programs such as the Alberta Irrigation Modernization (AIM) program which will partially fund the Project.

The Project is estimated to provide secure employment for 2 to 5 years, with an assumed 80% of the construction workforce coming from within the County of Newell, and 20% coming from other parts of Alberta. There will also be spinoff benefits to hotels and service industries.

The stages of construction activities include site preparations, topsoil stripping and storage, clay till excavation and transport, berm surface preparations, berm core and bench construction, armouring and finishing, dust control watering, and reclamation. Expansion of the extant SLR will require material acquisition and shipping, site preparations, clearing and stripping, clay till excavation, berm construction, berm reclamation, and commissioning activities. The extant reservoir will need to be fully drawn down to allow the reservoir basins to be connected with a notch in the east dam.

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Abbreviations

AARES	AAR Environmental Services
AB	Alberta
ac-ft	Acre-feet
AIM	Alberta Irrigation Modernization
Alberta EPA	Alberta Environment and Protected Areas
asl	Above Sea Level
ATEC	Alberta Transportation and Economic Corridors
CCRP	Conceptual Conservation and Reclamation Plan
COP	Code of Practice
CPKC	Canada Pacific Kansas City railway
DDL	Dennis Dirtworx Ltd.
DUC	Ducks Unlimited Canada
EDRAP	Economic Development in Rural Alberta Plan
EI	Environmental inspector
EIA	Environmental Impact Assessment
EID	Eastern Irrigation District
EPEA	*Environmental Protection and Enhancement Act*
ESC	Erosion Sedimentation Control
FTOR	Final Terms of Reference
GOA	Government of Alberta
HRIA	Historical Resources Impact Assessment
IO	Instream objective
MBCA	*Migratory Birds Convention Act*
NRCB	Natural Resources Conservation Board
SARA	*Species at Risk Act*
SIRs	Supplemental information requests
SLR	Snake Lake Reservoir
SMEs	Subject matter experts
SSR	South Saskatchewan River
SSRP	South Saskatchewan Regional Plan
TLSA	Terrestrial Local Study Area
TRSA	Terrestrial Regional Study Area

2.1 PROPONENT AND OTHER LEGAL ENTITIES

The proponent of the Snake Lake Reservoir (SLR) Expansion Project (the Project) is the Eastern Irrigation District (EID). Their main office is in the City of Brooks, AB, located at 550 Industrial Rd W, Brooks, AB, with a mailing address of P.O. Box 128, Brooks, AB, T1R 1B2. The main contact for the Project is Mr. Ryan Gagley, Assistant General Manager, Engineering & Operations.

The EID will manage and operate the Project and hold an operating approval; activities and water uses for the reservoir and irrigation works will be included on their existing Water Licence. The Project is being developed, designed, and constructed by MPE (a division of Englobe), with engineering support from Thurber Engineering Ltd., geophysical support from Shallow Earth Technologies Inc., and environmental support from AAR Environmental Services Ltd. (AARES).

2.2 SNAKE LAKE RESERVOIR

The extant Snake Lake Reservoir (SLR) is located within Townships 19 and 20, Ranges 16 and 17, west of the fourth meridian (W4M), 18 km southeast of Bassano and 23 km northwest of Brooks, Alberta (see Attachment 2, Figure 2A-1). The reservoir is contained by two earth-filled dams: the East Dam in S½ 31-19-16 W4M, and West Dam in S½ 3-20-17 W4M (see Attachment 1, Figure 1A-1). More details on the extant SLR are provided in Volume 1, Section 1.

2.3 PROPOSED EXPANSION PROJECT

2.3.1 Development Overview

The expanded reservoir will require construction of 8 km of earthen berms (dams; Attachment 2A, Figure 2A-2) to an elevation of 784 m asl, resulting in berm height of <5 m on the west side of the expansion area and up to 20 m high on the east side of the expansion area (see Attachment 2A, Figure 2A-3). The berm sides will be sloped (3:1) with a broad bench on each side for stability (see Attachment 2A, Figure 2A-4).

The new dam berms will need to be constructed on the north, east and south sides of the expansion and will tie into higher lands on the west side. The berm design will include an impervious core to protect the dam from seepage. Toe berms will be constructed on both sides to provide the mass needed to maintain the berm integrity. A seepage collection system (see Volume 1, Section 6) will be constructed using fine filter sands on the back side of the impervious core to manage any seepage. At the widest point (east side, 20 m high) the berms plus an outer drainage ditch will be up to 240 m wide.

2.3.2 Project Financing

Program funding by source was based on an original budget estimate of $218,580,000. The Alberta Government grant portion was 30%, Canada infrastructure bank loan was 50%, and the remaining 20% and any cost overruns will be funded by the EID. Current estimates for the Project have an upper limit of $250 million. The Canada infrastructure loan is secured by incremental revenues earned by the EID. Capital asset revenue and increases in irrigation rates will be applied to pay off the loan and its 1% interest rate annually. The loan is due in 2056 and will be repaid through annual installments dependant on outstanding funding at that time. The EID can secure revenue through water conveyance fees on irrigators. Currently EID charges $5.00 per acre, earning about $1.86 million per year. Additional payments may need to come from other operating revenues.

2.4 REGULATORY FRAMEWORK

The construction and operation of the Project will require various regulatory approvals to be obtained at the federal, provincial, and municipal levels. A broad definition of "approval" has been applied, including any legislation that requires a permit, approval, or other form of authorization.

2.4.1 Environmental Impact Assessment Requirements

Given the scope of the Project, the EID approached federal and provincial regulators to determine which legislation was applicable for the Project. The SLR expansion has been exempted from Federal EIA (Environmental Impact Assessment) requirements by the Minister of the Environment (see Attachment 2B; Regulatory Approvals and Communications). However, the Project triggered mandatory activities under the Activities Designation Regulation of the provincial *Environmental Protection and Enhancement Act* (EPEA) (GOA, 2000). As per Schedule 1 – Mandatory Activities of the Environmental Assessment (Mandatory and Exempted Activities) Regulation: construction of a dam >15 m high or reservoir capacity >30 million m^3 requires an EIA (see Attachment 2B; Regulatory Approvals and Communications).

The EIA will be submitted to Alberta Environment and Protected Areas (Alberta EPA) for review by subject matter experts (SMEs) and will be passed to relevant government departments (e.g., Alberta Health) for comments to determine completeness. There will be opportunity for the Alberta EPA to collate and submit supplemental information requests (SIRs) for the EID to provide additional information regarding the requirements in the Final Terms of Reference (FTOR). The EIA will also be submitted for review to the Natural Resources Conservation Board (NRCB), the regulator for the Project.

Following the review, and once deemed complete by the Alberta EPA, the NRCB will initiate the regulatory approval process. The *Natural Resources Conservation Board Act* establishes the NRCB as a quasi-judicial tribunal which conducts public reviews and issues decisions with respect to the public interest of all non-fossil fuel projects that require an environmental impact assessment. The NRCB will receive comments from public groups, assess if a hearing is required, and determine if the Project is in the interest of the province. If the NRCB deems the Project to be in the public interest, then the EID will receive permission to build the Project with approval conditions, in the form of an EPEA approval.

2.4.2 Other Regulatory Requirements

The Project will be subject to other provincial approval or notification requirements under the *Water Act, Historical Resources Act*, etc. Most of the approval requirements are provincial. Appendix 2C, Table 2C-1 lists provincial requirements, approval needs, and Acts or guidelines for which the EID needs to be compliant. Federal requirements also apply, which are presented in Table 2-1 below. Municipal requirements are also discussed in Section 2.4.3.

Table 2-1: Federal legislation applicable to the Project

Legislation	Applicable Section	Activity	Responsible Agency	Status
Fisheries Act	Authorization under Section 35(2) (Serious Harm to Fish)	The *Fisheries Act* includes prohibitions against causing "serious harm" to fish and fish habitat which may support such a fishery. in addition to provisions for flow, fish passage and deleterious substances.	Fisheries and Oceans Canada	Application will be submitted if needed for harm to fish or fish habitat.
Migratory Birds Convention Act (MBCA)	Section 5 (prohibitions) and 6.1 (regulations)	Migratory bird species listed on the *Migratory Birds Convention Act* and their nests are protected from disturbance and destruction.	Environment and Climate Change Canada	No application required unless harm to a nest/nesting migratory bird likely.
Species at Risk Act (SARA)	Section 32, 33 (general prohibitions) and 73,74 (agreements and permits)	Protection under the SARA applies to wildlife and plant species listed in Schedule 1 of the SARA. It is prohibited to kill, harm, harass, capture or take individual species at risk, or damage or destroy their residences.	Environment and Climate Change Canada	No application required unless harm to a protected nest/nesting migratory bird at risk or any aquatic species at risk likely.
Directive on the Application of *Species at Risk Act* Section 33 (Residence) to Aquatic Species at Risk	Section 3. Purpose	Provides guidance on what constitutes a "residence" for an aquatic species and how it will be described, and what is considered damage or destruction of a "residence".	Fisheries and Oceans Canada	No application required unless harm to a protected aquatic species at risk is likely.

2.4.3 Municipal Regulatory Requirements

Municipal approval for project development does not need to be obtained as the Project is under provincial jurisdiction. However, a public road allowance spans the SLR Expansion footprint, and a road allowance closure bylaw administered by County of Newell will be required to remove the portion of the road allowance, as future road construction will not be feasible once the reservoir is filled. Also, as the Project will require shipping, equipment, and commuter traffic on county roads, a development permit will be required.

Steps to begin the transfer of the road allowance have been initiated. County of Newell has written a bylaw to close the road allowances through the extant and new reservoir on December 19, 2024. Council will close the road allowance and will lease the land to the EID. County approval is expected in 2025. However, the actual closure is up to provincial Public Hearing requirements as the road allowance is on Crown Land administered through Alberta Transportation and Economic Corridors (ATEC). Once approved by the County, information will be sent to adjacent landowners as there will be a public hearing. Next, Alberta Transportation will also need to approve the change. Once Alberta Transportation approval is achieved, the County will proceed with second and third reading, followed by leasing of the land.

Commuting and shipping activities will occur (in part) on County roads. A Traffic Impact Assessment for the county is not required; however, a development permit is required. County of Newell also requires a Traffic Accommodation Strategy (or plan), including provisions for traffic detours and public access during shipping and construction activities, when road use may need to be restricted. The County will need to control road dust and noise on some roads, and ongoing maintenance will also be required; the County recommends EID explore a partnership agreement for these activities. County of Newell also recommends EID complete a pavement assessment to determine if the roads are adequate to accommodate shipping and traffic volume. Further details are found in Volume 1, Section 5 (Transportation Infrastructure and Traffic Impact Assessment).

2.5 CONTEXT

2.5.1 Project Need

Water diversion from the Bow River typically starts in mid-April and remains low until seeding is completed and temperatures rise in June. Peak irrigation demands are typically between mid-June and mid-August due to hot temperatures, minimal rainfall, and peak crop demands. This peak demand typically occurs just as the flow in the Bow River is reducing, after snowpack melt is tapering off in late spring. Demand typically reduces in September and diversion stops in early to mid-October. As peak river flow and peak irrigation demand typically do not occur at the same time, storage provides an opportunity to divert water when it is abundant in the river and store it in reservoirs for use when flows in the river are reduced and there is demand for irrigation. Therefore, the case for the development of the Project is to increase water storage capacity without requiring additional water diversion from the Bow River.

Summarized EID data shows that average water extraction at Bassano Dam is about 500 million m^3/year, ranging from 250 to 700 million m^3 over the period 2004 to 2023 (Figure 2-1, below).

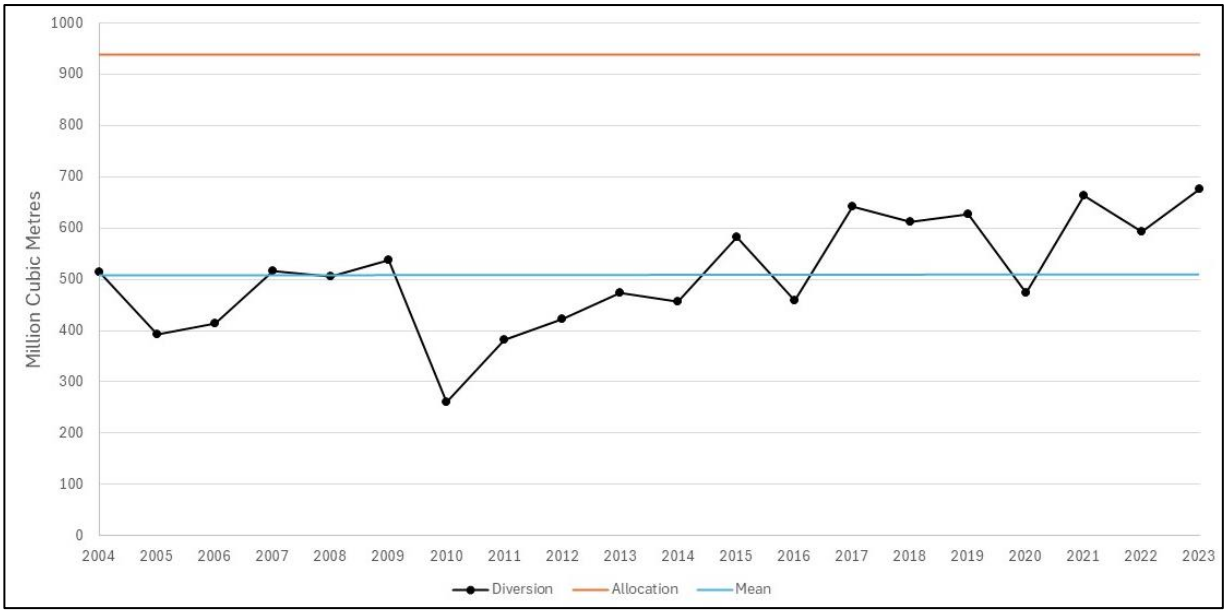

Figure 2-1: Total EID Water Withdrawal at Bassano Dam (2004-2023)

The amount of water obtained daily by the EID varies through the year, but typically extraction ranges from 20 to 50 m^3/s (1.7 million to 4.3 million m^3/d) in mid-spring to mid-summer with lower values of 10 to 20 m^3/s (0.8 to 1.7 million m3/d) in early spring and late summer to fall (Figure 2-2, below). In most years, this water, which is mainly needed to irrigate lands in the EID, can be continuously supplied to the EID canal and pipeline network from the Bow River at Bassano Dam.

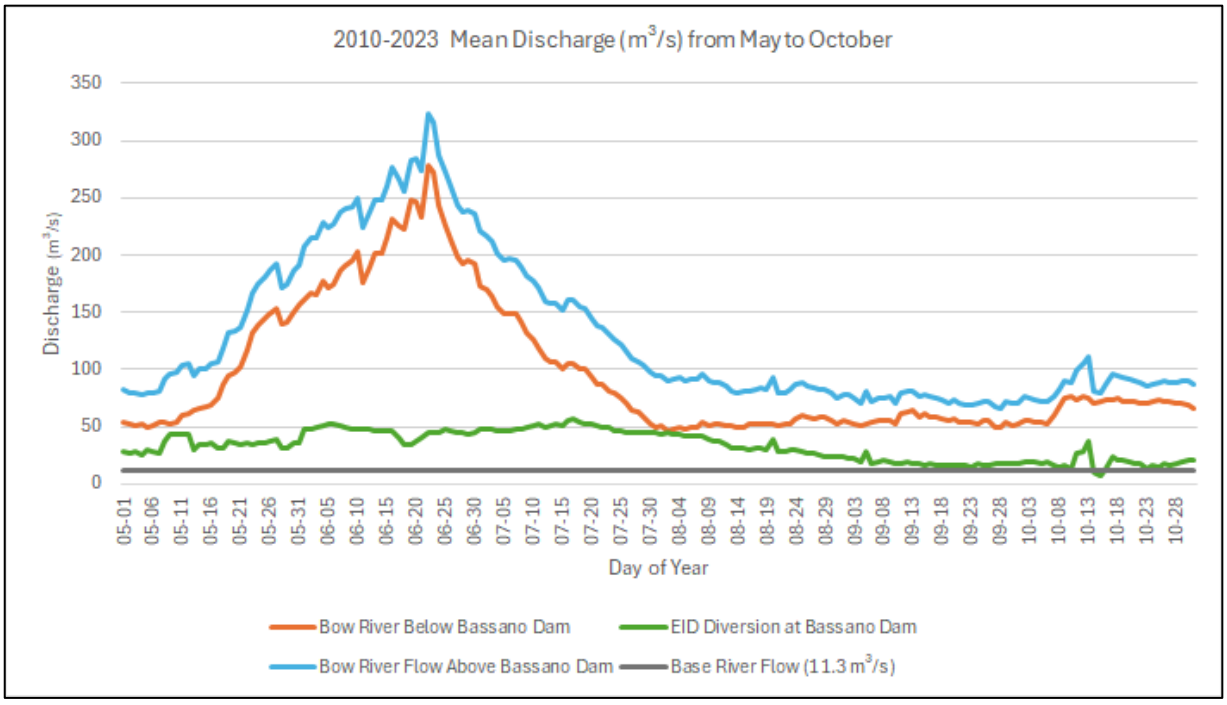

Figure 2-2: Bow River and EID Discharge at Bassano Dam (Mean 2010 to 2023)

However, when water flow in the Bow River is too low to supply these needs, supplemental water from offsite storage reservoirs needs to be added back into the network, as occurred in 2023 (Figure 2-3, below), which showed that after an early spring freshet, water extraction remined low

through much of the summer and fall, with total discharge being maintained at 11.3 m^3/s below the dam. Plus, the EID must ensure a minimum flow target of 11.3 m^3/s remains in the Bow River below Bassano Dam – this is the provincially mandated minimum instream objective (IO) to protect aquatic resources in this reach of the river. Thus, when the Bow River discharge above Bassano Dam is approaching this target flow rate, the maximum extraction is the discharge minus 11.3 m^3/s.

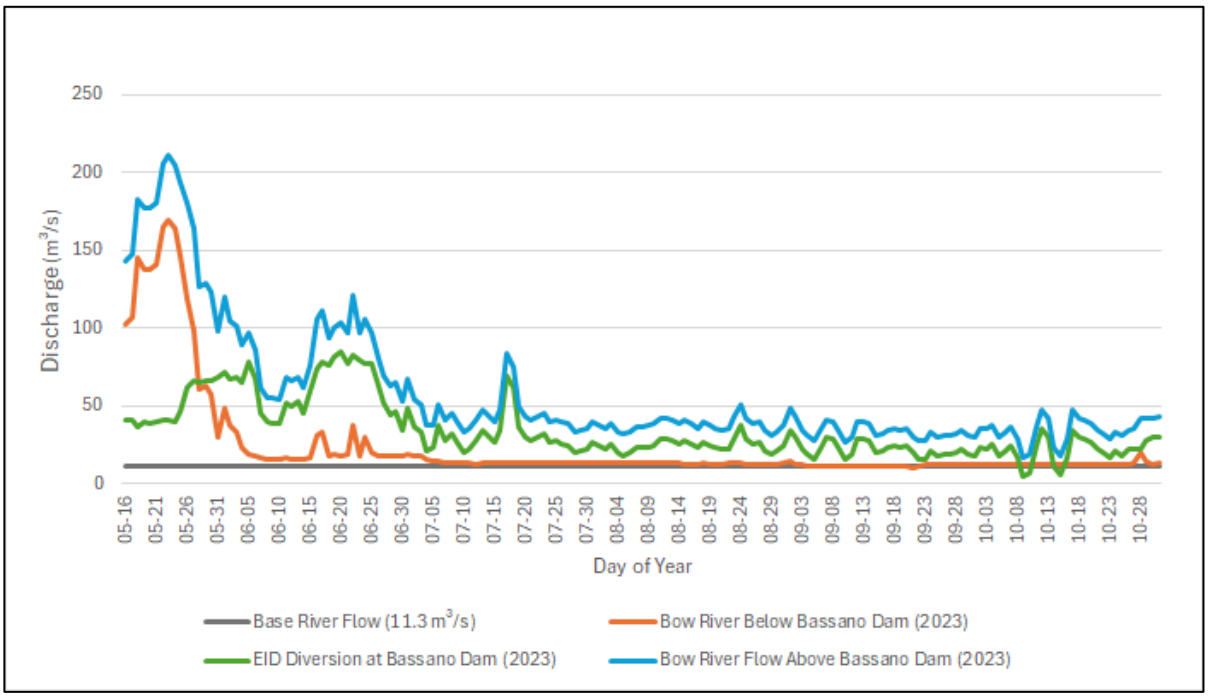

Figure 2-3: Bow River and EID Discharge at Bassano Dam (2023)

There are several off-stream storage reservoirs in the EID that can be used to support canal flows and irrigation demand when flows in the Bow River are reduced. The EID currently irrigates approximately 315,000 acres (127,000 ha). Currently, about half (155,000 acres or 63,000 ha) of all yearly water needs for the EID can be stored in off-stream reservoirs; these allow downstream areas to continue receiving irrigation water when river flows run low. When water is being supplied from reservoirs in one area, certain areas that receive direct-from-river water (160,000 acres or 65,000 ha) will divert water directly from the river. But, when the water flow in the river is near, at, or below the minimum IO, canals transporting direct-from-river water will be limited, requiring water to be rationed among these users not supported by off-stream reservoirs. If the river flows remain very low, no new water may be available for several days to weeks; in an extreme drought, this might last for several months.

The extant SLR holds 19.25 million m^3 when full and can supply less than 20% of the needed water for the 20,000 ha of irrigated land downstream of this reservoir. If a drought were to occur for an extended time, about 16.2 million m^3 could be released from the reservoir (assuming holdback and losses by evaporation of 2.4 million m^3). The average irrigation requirement per year downstream of SLR is 16 inches (41 cm) per unit area (acre or ha), over a 4-month growing season (May to August). The 16.2 million m^3 of water would only supply 8 cm (about 3 inches) per unit area, or about 1/5 of the needed water, and at an extraction rate of 6.25 m^3/s, or 540,000 m^3/day, this would only supply water for 30 days, with none left for the reminder of the year. Thus,

the lands below the extant SLR rely on direct-from-river water for most of their irrigation water and would only receive water from the reservoir during short-term droughts.

To supply the needed water (41 cm) over an entire summer season, the current reservoir would need to be able to supply about 5 times the water stored (i.e. about 90 million m^3, allowing a total of 83 million m^3 of water to be sent downstream over a full growing season (accounting for hold back and various water losses). The proposed SLR expansion, as designed, would store 87.4 million m^3 of water, and would be able to meet most downstream water needs for a full-year without diversion of additional water from the Bow River.

2.6 PROJECT BENEFITS

2.6.1 Support for Water Users

Water uses and losses/returns in the EID for an average year is shown in Figure 2-4, based on detailed water measurements over a 14-year period (2010-2023). Of the approximately 500 million m^3 used per year, irrigation ("Farming Use") accounts for over 300,000 million m^3 or about 62% of the total diversion. Return flows (made up of "Field Runoff" and "Operational Spill") and losses from Evaporation and Seepage account for the next highest amounts of water. After that, water for Ducks Unlimited Canada (DUC) conservation waterbodies is the next highest use, followed by Acreage and Farm users (who can connect to non-potable water for yard irrigation needs), Industrial uses, and Municipal water needs; Other Uses and Net Storage average near zero each year.

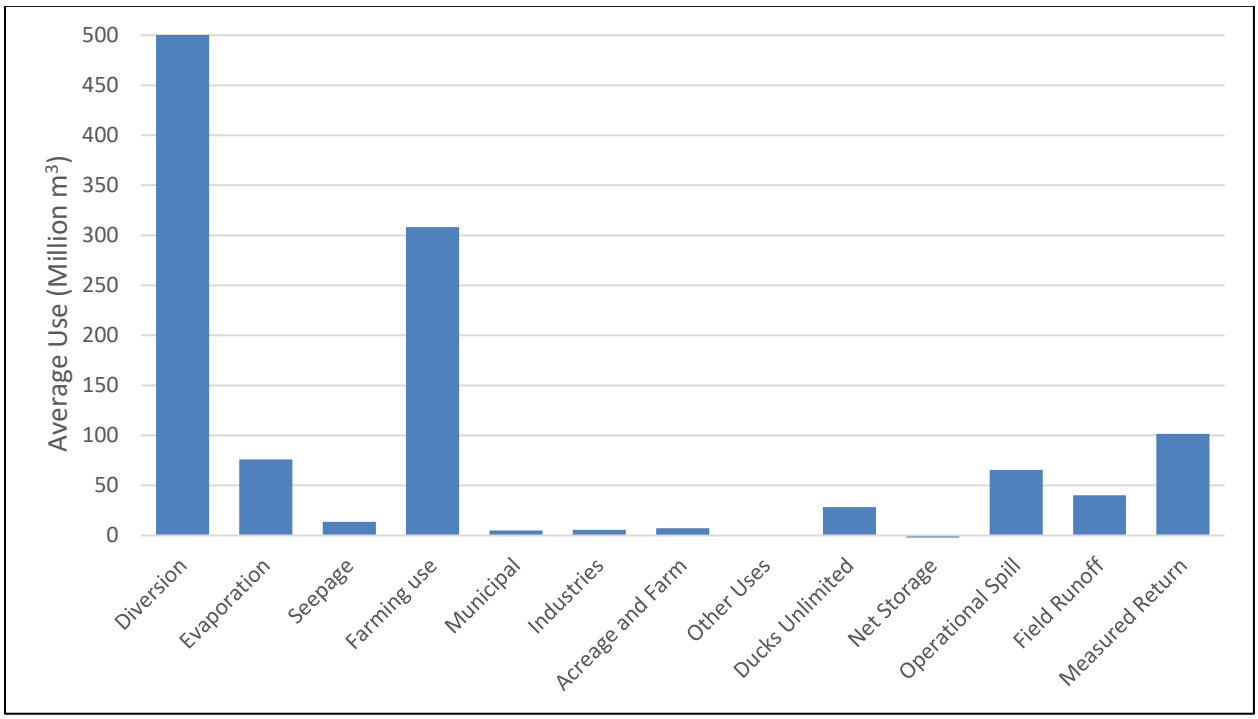

Figure 2-4: Average EID water use by category (2004 – 2023)

Benefits for municipal users occur via the County of Newell Water Project which connects households in the county potable water supplies. Municipalities on this system include City of Brooks, Town of Bassano, Villages of Duchess and Rosemary, and various hamlets in the County of Newell. Industrial users are primarily the food industry and agribusinesses, such as feedlots.

There is additional use of water for recreational purposes that does not get included in the total use. The EID also manages water outflow at Bassano Dam to ensure river discharge meets minimum downstream flow requirements (below Bassano Dam), helps meet apportionment discharge targets, in cooperation with other users on the South Saskatchewan River (SSR) and its tributaries, thus ensuring all downstream communities on the Bow River/SSR continue to benefit from the rivers. While the above benefits are for the EID, similar benefits will accrue for the new Project, with most of the use supporting irrigated agriculture, especially in times of drought.

2.6.2 Climate Resiliency

Based on analysis of precipitation near Brooks, Alberta, the frequency and severity of droughts in this region of Alberta EID Lands appears to be increasing. In the last 10 years, at least five years have been droughts, based on lower-than-average rainfall amounts (See Figure 7-2 in the Water Management Section). If this trend continues, additional severe droughts may be expected over the next 50 to 70 years. If a drought includes both low rainfall, increasing demand on irrigation, and lower river flows in midsummer, such as occurred in 2023, then the shortfall in water needs can only be made up from offsite storage. Currently about half of the water needed in a typical year is stored in offsite reservoirs, meaning 50% of irrigable acres depend on direct from river flows in the EID canals. If the Project is constructed, this will increase the storage to about 62% of total usage, improving resiliency to droughts throughout the EID, which is one of the primary benefits of the Project.

As stated in the previous section, the Project will continue to support all downstream water users throughout the EID, as supply of reservoir-stored water ensures downstream users continue to get needed water even in severe drought, and this allows direct-from-river water to be used elsewhere in the EID. Typically, direct-from-river water will support lands downstream of SLR, and only in periods where demand exceeds supply will reservoir water need to be used.

The increased storage from the Project means that an additional 50,000 acres (20,000 ha) of irrigated land in the EID will be reservoir supported. This brings the total acres that are supported up from 155,000 acres (62,700 ha) to 205,000 acres (83,000 ha) and reduces the acres that are fully dependent on direct-from-river water to 110,000 acres (44,500 ha). This increase will result in 12% more offsite storage within the EID. Note that there will not be an increase in irrigated land directly due to the Project; rather there will be increased security of water supply.

Enhanced climate resiliency means there will be improved water security; possibly incentivizing irrigators to grow higher-value irrigable crops, improving supply of feed for livestock, and improving harvest availability for agrifood processers, even in a drought year. Overall, this security helps maintain the agricultural industry, improving profitability of food processors, with spin-off benefits for service industries, and reliable taxation supporting public institutions.

Climate resiliency also provides more water security for downstream water flow in the Bow River, as less water would need to be withdrawn at Bassano Dam when river discharge is nearing the IO. The Project will increase water security to irrigators and other downstream users, while ensuring water is available to meet the IO (below Bassano Dam), helping ensure apportionment discharge targets are met, and continuing to provide water needed for DUC habitat projects. Apart from the IO, it is unknown if more detailed instream flow needs have been set for this reach of the Bow River.

2.6.3 Irrigation Crop Support

The Project's purpose is to provide additional storage that will better support about 50,000 acres (20,000 ha) of irrigation located downstream from the SLR that currently relies on water directly drawn from the Bow River for 80% of yearly irrigation (Attachment 2A, Figure 2A-5). The Project will help ensure irrigation can continue on these lands, even in severe drought. This increased security could allow farming practices to change, including:

- increased planting of specialty crops which can fail without secure water;
- reduced need to leave fields for summer fallow to reduce water usage; and
- reduced need to cut crops early for feed or silage, instead growing the crop to maturity.

Thus, while there would be no change in the number of irrigated acres due to the Project, changes in the amount or value of agricultural production could occur as more fields are switched to higher value crops. economic output of farms could increase as higher value crops are grown, harvested, and sold. For example, forage crops (hay) can net a higher return with multiple harvests per year under irrigation.

2.6.4 Socioeconomic Benefits (Alberta and Canada)

2.6.4.1 Project Construction

Benefits will occur during Project construction related to the number of goods, services, and money earned through labor or contract work. While the EID is not subject to municipal taxation, its workers or contractors will pay local taxes. Per the Socioeconomic Assessment (Volume 2, Section 17), socioeconomic effects will largely accrue to the local community; it is assumed 60% to 80% of the workforce (75 workers at any one time) will come from the local communities in the County of Newell. The purchase of fuel, maintenance of equipment, hotel stays, and food services industries will also benefit the local economy due to increased workers and construction activities. Most of these benefits will flow to rural residents and businesses in County of Newell or to its municipalities including City of Brooks, Town of Bassano, as well as villages and hamlets.

The size of the construction workforce is substantial but is not high enough to trigger labour shortages that could lead to higher wages. In addition, no short-term population increases are expected; therefore, no negative effects on local services and service suppliers are expected. The Traffic Impact Assessment (Volume 1, Section 5) indicated no significant impacts on local transportation infrastructure; however planned maintenance will ensure roads stay usable for Project activities and public users.

Benefits will flow to a private aggregate supplier south of the Project area, within Lethbridge County, which will earn up to 80 million dollars for manufacture and sale of riprap. Riprap will be quarried from a site about 17 km northeast of Picture Butte, Alberta. Rock will be shipped by truck, 105 km one way, requiring 10 people working two years to process and deliver the materials. Thus, there may be additional benefits for this County via additional workforce needed to manufacture and ship rock as well as servicing/fueling costs for shipping vehicles. Gravel for the Project will come from EID's gravel pit near Eyremore, 12 km northwest of Bow City, Alberta, requiring shipping of 28 km one way, and needing 13 people working to excavate, load, and ship the gravel over two years.

As 20% to 40% of construction workforce will come from the remainder of Alberta, 100% of the workforce is expected to live in Alberta, which will benefit the province and country through taxation of earnings. As stated above, value of crop harvest may also increase with the Project, netting additional tax benefits in County of Newell, as well as benefits to the food industries that may process the higher value crops produced.

Local services will not be affected by the Project. While 20 months of offsite trucking could result in additional demand on protective service providers, the Socioeconomic Assessment did not assess adverse impacts of trucking or demand on protective services.

2.6.5 Operations

Once fully operational, activities by the EID will have minimal benefits beyond those already described for water security. Activities will include daily inspections of the structure and managing water levels in the reservoir, completed by EID staff. The Project will require annual inspections and ongoing minor repairs. The annual operating budget is estimated to be $30,000 (2023). There will also be post-EIA monitoring programs requiring up to $100,000 in the first few years and then decreasing over time. Monitoring programs will be required to support ecological outcomes, such as wetland function assessments to support the *Water Act* approval and wildlife monitoring of offset lost habitat and to test assumptions of the EIA for species occurrence and movements. There will also be monitoring of reclamation and effectiveness of erosion control programs. These will not be long-term monitoring; most programs such as reclamation, water quality, and wetlands monitoring are proposed over the first 3 to 5 years post-construction, and only the monitoring for wildlife, vegetation, and aquatic species may occur over a longer period, but will occur at longer time intervals between measurements. Most of the benefits for these programs will be within the rest of Alberta based on the need for technical work supported out of larger centres in the province.

As there will be no new employment associated with Project operations and with a very small annual operating budget, physical operation of the Project will have no effect on economic conditions in County of Newell. Population and demographic conditions will not be affected, nor will infrastructure and community services.

2.6.5.1 Other Benefits

The reservoir expansion will also result in the following other benefits:

- Increased recreation opportunities including hiking, bird watching, fishing (open water and ice), and boating.
- Increased area of aquatic habitat and potentially increased fish populations in the expanded reservoir; and
- Increased land access for the public and Indigenous community members, as the land for the new reservoir is currently private and largely inaccessible but will be open to the Public once the reservoir is in operation per EID's policy.

2.7 DEVELOPMENT PLAN AND SCHEDULE

A generalized construction schedule, based on a 2025 start to shipping and 2026 start to construction and a 2030+ completion date is shown in Figure 2-5. This schedule is preliminary and will be confirmed once the Project receives regulatory approval and required permit(s) to construct.

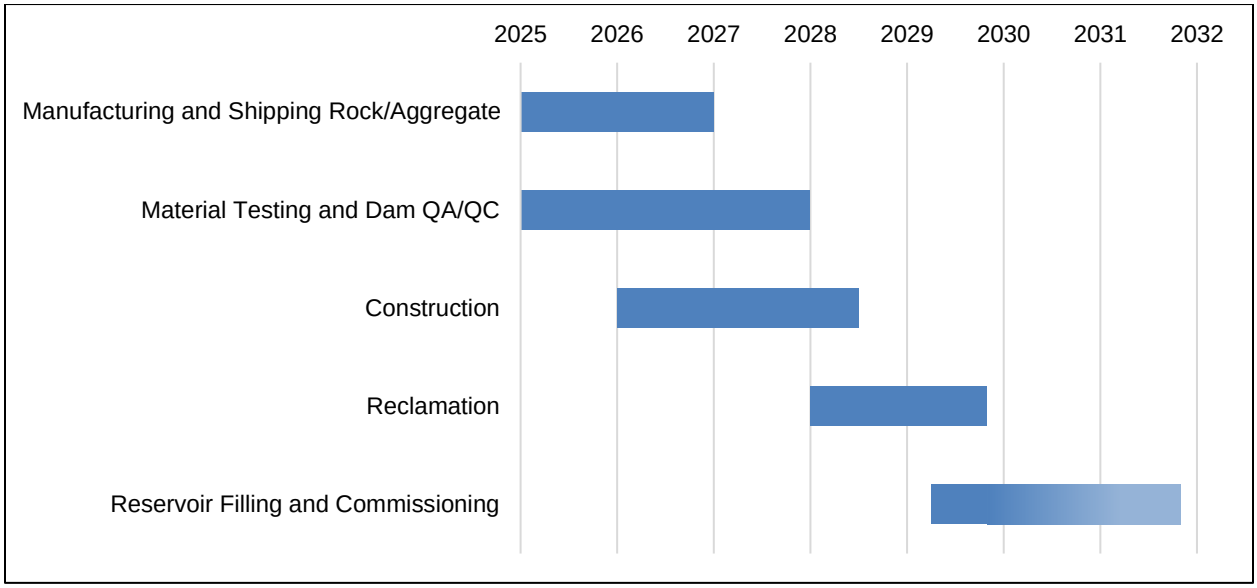

Figure 2-5: Project Schedule by Phase for the Snake Lake Reservoir Expansion

Currently, shipping of rock and aggregates is planned to occur from 2025 to end of 2027, ahead of Project approval. This is justified as the rock will be shipped to private Project lands and will be placed in areas free of environmental constraints (e.g., wetlands), and will be completed with full knowledge of the Project regulators. If approval is received prior to 2026, earthworks may begin while materials are being shipped. Otherwise, construction activities will not occur until after approval. Construction (earthworks) of the reservoir is anticipated to take 3 years. Based on this schedule, regulatory approval is anticipated to occur by the end of 2026, allowing up to 1.5 years for this process.

2.8 ALIGNMENT WITH PROVINCIAL AND MUNICIPAL PROGRAMS

2.8.1 Alberta Irrigation Modernization (AIM) Program

The goal of the AIM program is to modernize the infrastructure of irrigation districts and increase their water storage capacity and efficiency (GOA, 2021). This will be achieved by:

- increasing irrigated acreage and primary crop production;
- improving water use efficiency and storage capacity;
- enhancing water security; and
- providing flood protection to support long-term value-added processing activity.

The EID is completing rehabilitation works under the AIM program, in which the Government of Alberta contributes 30% in funding, irrigation districts contribute 20%, and the Canadian Infrastructure Bank provides a loan (that must be repaid) for the remaining 50% of finance requirements. The SLR Expansion is one of several planned irrigation upgrades under AIM.

Since program inception, the EID has completed 13 projects of the 32 approved under the AIM program. The rehabilitations included 83 km of PVC pipeline installation, 4.8 km of rehabilitated earthen canal, and 12 precast concrete structures.

In recent years AIM completed the following projects, replacing canals with pipelines:

- 01-C Springhill Pipeline
- C-Springhill Pipeline
- 08B-Springhill Pipeline Extension
- 9H-West Bantry Pipeline
- 10H-West Bantry Pipeline
- 16H-West Bantry Pipeline
- 12-Springhill Pipeline
- Scott Pipeline
- 13-H West Bantry Pipeline
- 01-Onetree Pipeline
- Lake Newell South Feeder Canal
- Secondary C North Branch Pipeline
- 02-H West Bantry Pipeline

The EID continues to rehabilitate and improve its infrastructure system under its own capital construction program to the benefit of water users and is conducting soil testing on various parcels of EID owned land to investigate the possibility of irrigation expansion on these lands. The Project aligns with this program as the overall goal is to improve efficiency of water transmission and climate resiliency in the EID.

2.8.2 Economic Development in Rural Alberta Plan (EDRAP)

EDRAP sets out a 5-year commitment to guide rural economic growth. Its focus is on innovation, diversification, and sustainable, long-term economic development (GOA, 2022). Combined with advances in irrigation technology to bolster water efficiency on parcels that are irrigated, the Project aligns with this plan. The SLR expansion will support resilience of agriculture as an economic driver in rural, southern Alberta. The expanded reservoir will improve water supplies for irrigation, crucial for the industry's retention and long-term viability. It specifically aligns with the plan's strategic direction of rural business supports and entrepreneurship.

2.8.3 Alberta's Irrigation – A Strategy for the Future

Alberta's Irrigation – A Strategy for the Future (GOA, 2014) is an initiative to improve Alberta's agricultural industry. The Project is consistent with this strategy, as it aims to enhance water security to meet future needs in the South Saskatchewan Region (GOA, 2014). The expansion is a proactive alternative to safeguard water resources, especially given the challenges posed by likely effects as the climate changes. Specifically, it supports initiatives to explore new opportunities to provide water storage, support reliable and high-quality water supplies for a sustainable economy, to reduce the risk of water shortage to existing users, to protect the aquatic environment, and to mitigate effects due to climate change. This strategy also aligns with the goals of Alberta Agriculture and Rural Development to encourage industry growth by:

- providing access and development of new and existing markets;
- ensuring consumers have confidence and assurance that Alberta is an environmental steward and leader in farm animal health and welfare, plant health, and safe food products;
- supporting Alberta’s agriculture industry development initiatives to maximize value of agricultural output while enabling economic sustainability; and

- ensuring rural Alberta has the development opportunities needed for ongoing economic success.

The strategy states that the Alberta Government "is committed to support these goals through policy development, research, extension programs, and services that reinforce economic competitiveness and build lasting prosperity in Alberta's agriculture industry". Various strategies have been developed to meet these goals though improvements in irrigation and agricultural productivity. These are:

- increase the productivity of the water used by the irrigation industry;
- improve efficiency of water conveyance and on-farm irrigation systems;
- promote effective use and management of water such that only needed water is diverted from rivers; and
- assess options for enhancing water security via existing and potential new reservoirs.

In this strategy, irrigation is considered the major agricultural adaptation to soil water deficits, and the ongoing changes to more modern irrigation systems has dramatically increased on-farm irrigation efficiency.

2.8.4 Eastern Irrigation District Integrated Resource Management Strategy

The Project aligns with the EID Integrated Resource Management Strategy, applies to EID owned lands. It aims to improve management of land and natural resources within the EID, maintain healthy ecosystems, and contribute to the development of a strong, diversified, and sustainable economy (GOA, 1995). The SLR Expansion aims to improve the conservation of water and efficiency of water use for irrigation in the planning area by increasing the water storage capacity for use during drought times while reducing direct reliance on Bow River discharge at these times. This will benefit the Bow River by allowing for the protection of aquatic species when water discharge is low. The plan encourages cooperation between the EID and provincial government to reach mutually advantageous resource management objectives. The Project is consistent with this strategy by managing the irrigation network to meet irrigation demand, creation of new wetlands, and efforts to replace lost wildlife habitat. Additionally, opportunities for public recreation and fishing will support other resource management objectives.

2.8.5 Master Agreement on Apportionment

The EID and the Project are in alignment with and support the Master Agreement on Apportionment. The Master Agreement on Apportionment requires 50% of flow of eastward-flowing streams originating in Alberta to cross into Saskatchewan (GOA, 2024a). For the EID, this requires tracking flow to support sufficient water supplies for irrigation, while also meeting the instream objective (IO) of 11.3 m^3/s to protect aquatic life.

In most years, the EID only needs to capture 20 to 30% of Bow River discharge at Bassano Dam flow. Even in severe drought, the EID reported achievement of its support of the apportionment needs. 2023 is considered one of the hardest droughts on record as total rainfall was low and low upstream flows occurred from July through October, and yet only 42% of the river's water at Bassano Dam was diverted (compare Figures 2-2 and 2-3, in Section 2.5.1).

2.8.6 Alberta Drought Response Plan and Priority Rights

Under the provincial Drought Response Plan (GOA, 2024b), the EID commits to work with other water users to ensure municipal water uses have priority over agricultural use in extremely low river flow years. On June 13, 2023, Stage 3 (Priority Call Management) of the Drought Response Plan was initiated. The EID responded by rationing irrigation among users by setting lower limits of 12 inches (30.5 cm) per unit area above Crawling Valley Reservoir and 16 inches (40.6 cm) per unit area below Crawling Valley Reservoir, while allowing irrigators to transfer unused volumes of water between parcels. Thus, the EID showed it was adaptable to drought conditions ensuring upstream and downstream municipalities along the Bow River had highest priority use of the water while local irrigation users voluntarily reduced their water use. The proposed expansion will allow more water to be stored for drought years, so that the objectives of the Drought Response Plan can continue to be met.

In Alberta, priority rights are managed to ensure that senior licence holders receive their allocated water first during periods of scarcity (GOA, 2024b). The EID holds water licence priority number 1903-09-04-002 (Allocated September 4, 1903) which supersedes more junior licence holders (later priority number) located upstream.

2.8.7 Bow Basin Watershed Management Plan

The Project aligns with the Bow Basin Watershed Management Plan which provides guidance and recommendations to decision-making authorities, municipalities, natural resource managers, users, and residents regarding land and water resources in the watershed (Bow River Basin Council, 2012). The Project meets this plan by allowing the EID to better align water withdrawals from the Bow River during times with lower implications on the ecosystem. The plan addresses the following key areas:

- Groundwater – the importance of groundwater in water supply and any interactions between surface and groundwater.
- Water Quality – the importance of high-water quality to protect human health, provide water for irrigation and livestock, allow for recreational opportunities, and to maintain healthy rivers and streams.
- Water Quantity – the importance of understanding groundwater recharge and discharge areas, alluvial aquifers and ensuring that water resources are used efficiently undemanding that rivers vary in flow due to droughts/hydrological cycles.
- Land use – understanding what lands are most important to protect and to ensure multiuse lands are managed to avoid or minimize effects on ecosystems, including a need to restore damaged vegetation, to conserve hydrologically significant lands and avoid effects on wetlands.

There are no hard targets or limits set; however, the plan includes several best practices or management strategies:

- municipalities are requested to minimize development and ensure guidelines, policies and bylaws are followed;
- projects should use erosion and sediment controls to protect waterbodies;
- projects should limit landscape fragmentation;
- landscapes should be managed using performance management systems;

- predevelopment runoff rates and volume targets should be established for reservoirs; and
- hydrologically significant areas and areas with high biodiversity should be subject to additional management requirements.

Objectives and strategies that may affect the Project include:

- maintaining good water quality to limit eutrophication;
- ensuring water quality parameters are maintained within guidelines; and
- protecting native fish populations while implementing mitigation measures for invasive fish.

The Project supports the plan's 'no further net loss of wetlands' initiative through compliance with the Alberta Wetland Policy (GOA, 2013) and the Wetland Mitigation Directive (GOA, 2018a), which requires the replacement of wetlands to compensate for wetland losses. The Project is being designed with these best practices, objectives, and strategies in mind. Thus, meeting the targets and recommendation in this plan is not a constraint to development.

2.8.7.1 South Saskatchewan Regional Plan

The South Saskatchewan Regional Plan (SSRP) guides sustainable development and manages growth in the South Saskatchewan watershed (GOA, 2018b). The plan provides a set of strategies and objectives, which includes mandatory practices on Crown lands and best management practices on private lands. As the Project occurs entirely on private lands, all requirements under the SSRP are voluntary best management practices. The Plan sets out strategic objectives and policies to issues such as resource development, conservation of natural areas, and infrastructure investment.

The Project supports the SSRP by supporting the region's growing and diversified economy through the provision of a reliable water supply. It aligns with the need for watershed management by providing increased water storage by drawing water from the Bow River at times when it will put the least stress on aquatic ecosystems. The plan requires management at the watershed level, which the EID does through its own plan, the EID's Integrated Resource Management Strategy. The SSRP also promotes opportunities for outdoor recreation and nature-based tourism, while preserving and promoting the region's unique cultural and natural heritage. The Project aligns with this by providing additional recreation opportunities.

The SSRP discourages the loss of native grasslands, although they cannot control the conversion of grasslands to cropland by landowners. While some native grasslands will need to be removed for the Project, the selected Project area has been disturbed by roads, pipelines, canals, and utility corridors and the grasslands may be considered of lower quality in comparison to other areas such has the native grasslands on Crown lands near San Francisco Lake. To offset the loss of native grasslands, the Project intends to restore native prairie grassland on the outer berms of the new reservoir.

Objectives set by the SSRP and interactions with the Project are provided in Attachment 2C-2.

2.8.8 The County of Newell Municipal Development Plan

Alignment with the County of Newell was considered important to the EID to demonstrate a collaborative approach and support of the Project. In alignment with the goals and objectives outlined in The County of Newell Municipal Development Plan (Bylaw No. 2057-23) (County of

Newell, 2023), the development of the reservoir expansion supports the County's vision for sustainable growth and a high quality of life. The Plan underscores the economic significance of agriculture, emphasizing its crucial role in achieving the outlined goals. The Project directly contributes to this by providing additional water storage and ensuring irrigation needs for local agriculture are met during droughts. Furthermore, the Plan promotes recreational and cultural activities, acknowledging that local reservoirs, initially designed for irrigation, can serve as gathering places for activities like fishing, wildlife viewing and camping, thereby enhancing the overall quality of life for residents.

2.9 WATER CONSERVATION PRACTICES

Water conservation practices include methods to reduce water use in the management of reservoirs and conveyance systems (i.e., canals and pipelines), the efficient use of water by irrigators, and the return of unused water to the rivers. See Section 2.12 for detailed discussion on these practices. Efficiency improvements are continually being made by the EID and by irrigators, many of whom are now using the most advanced systems for irrigating.

2.10 EFFECTS ON DOWNSTREAM USERS

Downstream can mean two things for this assessment:

- Downstream of Bassano Dam in the Bow River, and
- Downstream of Snake Lake Reservoir along Springhill Canal

During times of low river levels, the EID uses stored water in its off-stream reservoirs, ensuring that the instream objective (IO) for the Bow River below Bassano Dam of 11.3 m^3/s is maintained. IOs are minimum river discharge rates mandated by Alberta Government (authorizations under the *Water Act)* to ensure there is sufficient downstream flow to meet needs for downstream uses, including junior licence holders, municipal and industrial uses, Indigenous communities, and to protect aquatic ecosystems. These were developed under the provincial Environmental Flows Program (GOA, 2025) which “incorporates ecological requirements for healthy aquatic ecosystems into water allocation decisions and water management planning processes”, under the Surface Water Allocation Directive, which “provides an evaluation method for consistent water allocation decisions … (and) balances both ecological needs and economic considerations” (GOA, 2019). As this objective is not changing, EID will continue to ensure downstream river users have sufficient water supplies.

There will be positive effects on downstream users in the EID. The existing SLR stores enough water to irrigate for about one month without direct-from-river water. The planned expansion will store enough water to irrigate up to an entire year without direct-from river water. Water quality of return water is not expected to change from current conditions, as the amount of water being supplied to farms will not increase. There are also no expected effects on water quality for downstream users. See Volume 2, Section 7 for summarized information recorded on the Irrigation District Water Quality Data Portal (GOA, 2024a) on water quality downstream of SLR.

2.11 WATER DEMAND

2.11.1 Demand in Wet, Dry and Average Years

Per the FTOR, the changing demand for water in wet, average, and dry years was examined.

From 2010 to 2023 (the years where river discharge data were available), based on precipitation data from Brooks, Alberta (see Volume 7, Section 7.2.1) the following years were classified as:

- Wet: 2012
- Dry: 2015, 2018, 2019, 2021, 2023
- Average: 2010, 2011, 2013, 2014, 2016, 2017, 2020, 2022.

In wet years, water use is reduced in early spring to early summer, but peaks at various times of the year. However, as there was only one wet year in the analyzed period, water withdrawals are highly variable, and this analysis should be used with caution. In wet years, the mean water diversion was 423.3 million m^3. In average years, water withdrawal varied between 15 and 35 m^3/s until mid-summer, then increased to between 35 and 50 m^3/s through July and August, then decreased again to between 15 to 35 m^3/s in the fall. In average years, mean water diversion was 467.5 million m^3. In dry years, the water withdrawals ranged from 20 to 40 m^3/s in early spring, and then from mid-May to mid-August were much higher, from 40 to 73 m^3/s. Water use dropped off in late summer to fall, between 10 and 20 m^3/s, possibly reflecting lower demand as crops were harvested earlier in those years. In dry years, total diversion was 632.1 million m^3.

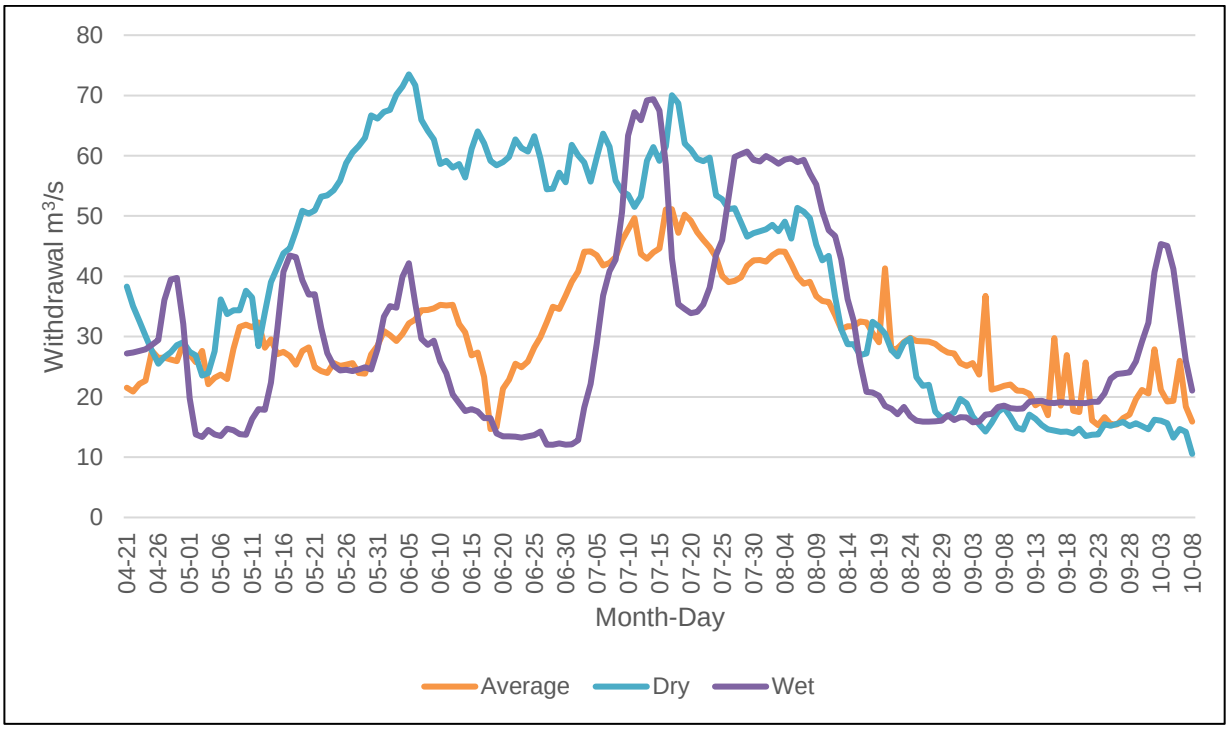

Figure 2-6: Water withdrawal at Bassano Dam (2010-2023) among wet, dry, and average years

2.11.2 Current Use and Estimated Future Needs

The FTOR requires a summary of existing water demand and an estimate of future trends in water demand across the EID as well as downstream of the reservoir. Water demand (diversion) is shown in Figure 2-1 above, in Section 2.5.1. This figure shows that the demand is always accommodated within EID's water allocation. Recent increase in water demand is directly related to drought conditions, which have been especially prevalent in 2021 and 2023. Over the past 30 years, the area of irrigated land in the EID has been slowly increasing. Construction of the Project will not spur additional growth of irrigated area, as the same amount of water will be used and

transferred to landowners. However, there will likely continue to be increases in irrigable land as has been occurring over time, due to increasing efficiencies in water transport (e.g. canal to pipe), delivery (ability to shunt water quickly to where needed), and on-farm uses (improvement in irrigation technology). However, these increases will not be accelerated as a result this Project. Instead, it will continue to be a function of efficiencies in irrigation transport and use. The EID is by its nature very conservative and only issues rights for additional land to be irrigated once it is known that there is enough additional water in the system to support these hectares.

Water demand varies among years as the amount of rainfall, temperature, and crops grown affects water needs. Since 1994, per Water Portal data for EID, the total diversion of water has been trending downward, driven by decreases from 1994 to 2005. On average, water use has changed little since 2006 (Figure 2-7).

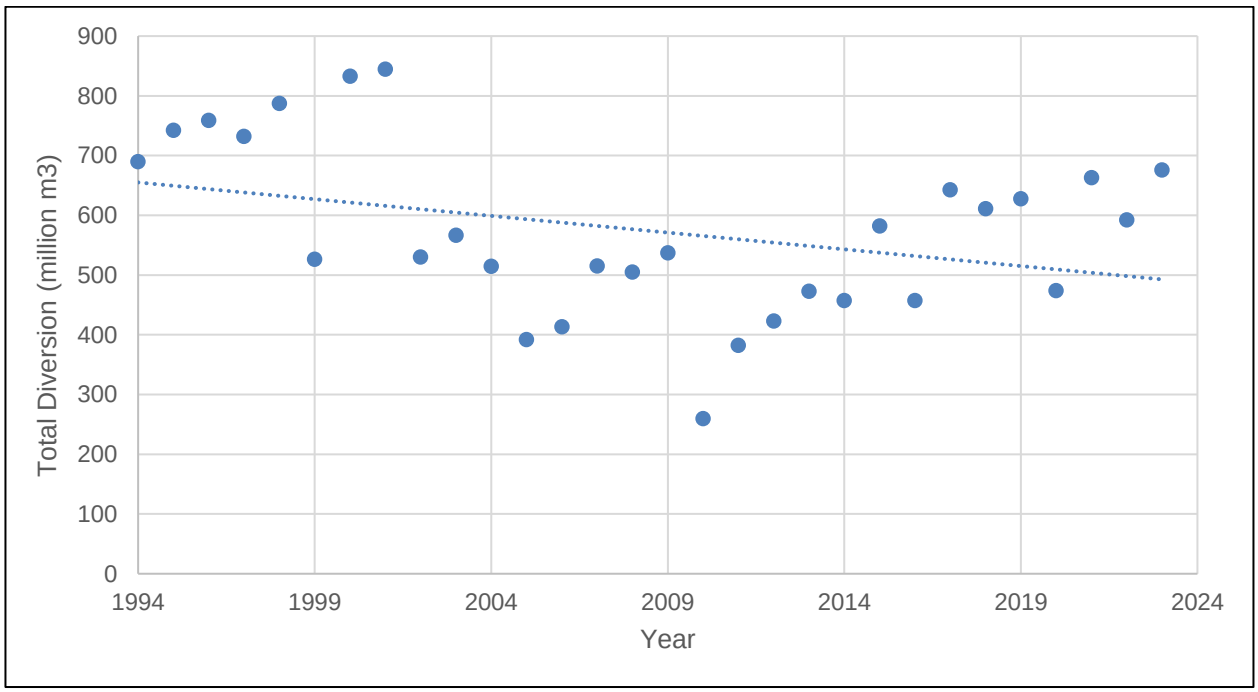

Figure 2-7: Total Water Diversion by year (1994 to 2023)

The reason for the above trend in water use, is likely due to increasing efficiency in water use per hectare. Figure 2-8 (below) shows that the total irrigable lands has been increasing over this period, however, the total water diverted for use has been decreasing.

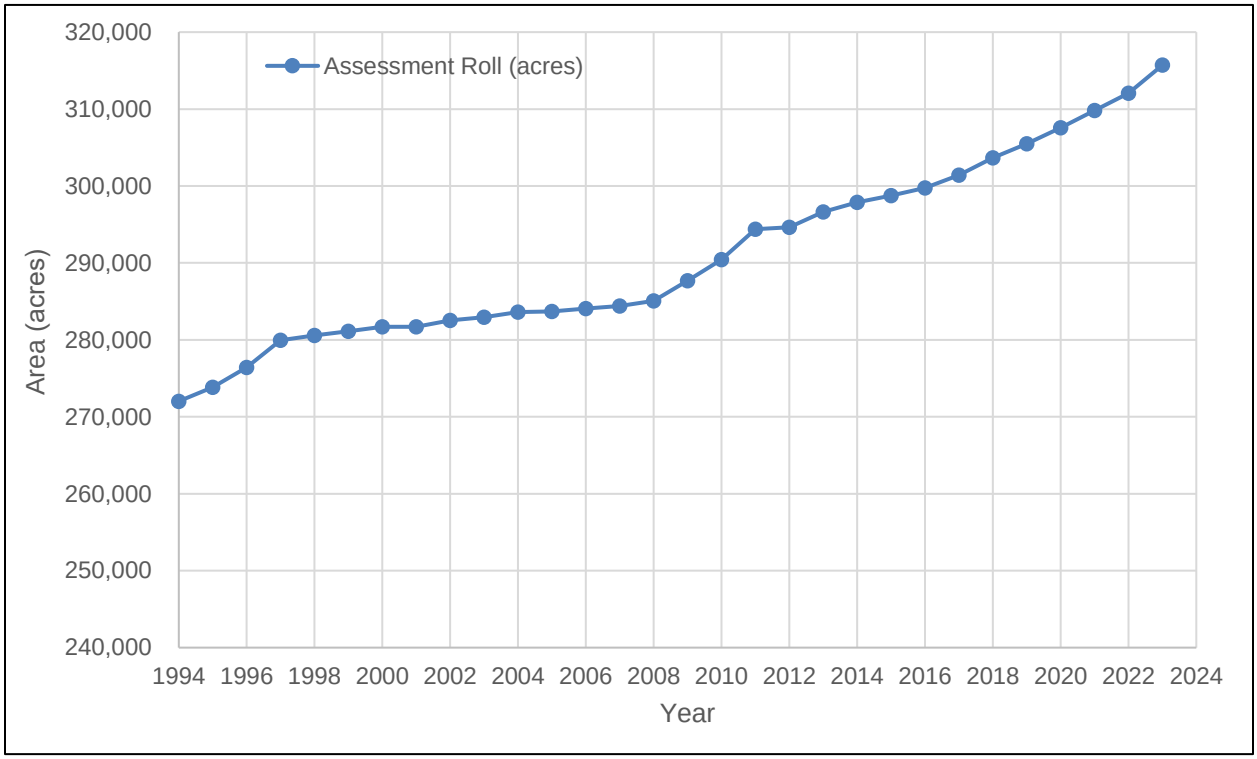

Figure 2-8: Total irrigated land (assessment roll) (1994-2023) (1 acre=0.405 ha)

It is expected that water demand will continue to vary with specific climate among years, but that the total need will remain unchanged, with no increase or decrease over time. The Climate Change Section (Volume 2, Section 12) examines the likelihood of water being available and water needs over time. It included predictions that in most years, water will continue to be available in the Bow River for capture and storage and that annual precipitation in the EID will increase, with more rain and snow in winter, spring, and autumn, but that rainfall will decrease in midsummer. Based on these assessments, it is likely that water demand will not greatly change and that continuing improvements in efficiency of water use will result in this demand remaining stable, despite likely increases in farmed hectares.

2.11.3 Water Sourcing

The EID is licensed under the *Water Act* to use up to 761,000 acre-ft (938 million m^3) of water, while maintaining minimum water flows below Bassano Dam (11.3 m^3/s) and meeting the minimum 50% of discharge requirements into Saskatchewan per the Master Agreement on Apportionment (GOA, 2024a). There will be no changes to the water demand downstream of the SLR related to this project. The Project will not require any changes to EID's withdrawal source, total volume or maximum rate of withdrawal. The existing water licence will not be changed as a result of the Project as there will be no change to the irrigated land base and no change to the total water needed per year. The Project will only draw from the existing water allocation to fill and operate the expanded reservoir, which will supply water to the same number of irrigable hectares as currently exists while providing resilience to increased drought.

2.12 ALTERNATIVES ASSESSMENT

An alternative assessment was completed to determine if there are technically feasible methods to achieve an equivalent increase in water security to the areas downstream of SLR as provided by the proposed Project. The alternatives assessment examined (a) whether improved efficiencies in water use could save an equivalent amount of water as would be stored in the expanded reservoir, and (b), whether an alternative reservoir expansion could store the same amount of water as the Project and if this water could easily be delivered to the needed areas downstream of SLR.

2.12.1 Efficiencies

The Project is needed to supply water downstream along the Springhill Canal (Attachment 2A, Figure 2A-5) and to meet the annual needs for irrigating 50,000 acres in event of a major drought when direct-from-river water may not be available. The requirement is therefore to add a capacity of 55,200 ac-ft (68.1 million m^3) of water, to store a total of 70,900 ac-ft (87.4 million m^3) upstream of these irrigable lands, which could provide up 58,900 ac-ft (72.6 million m^3), allowing irrigation of 14.1 inches (360 mm) per unit of land from drawdown of the reservoir (the difference between full supply level and minimum operating level (see Volume 1, Section 6 for details).

Efficiency considerations discussed below include:

- Efficiency in water transportation and delivery (e.g., by conversion of canals to pipelines to reduce evaporation and seepage);
- Improvements in on-farm water use by encouraging and incentivizing irrigators to use more efficient irrigation equipment; and
- Implementing methods to allow water sharing among users and fields, changing the timing of water delivery to earlier or later seasons to “stockpile” groundwater for the growing season, and supporting advances in crop science towards more water efficient crops.

2.12.1.1 Efficiency in Water Transport and Delivery

A study of irrigation requirements and opportunities was initiated in 1996 by the Alberta Irrigation Projects Association, representing the 13 irrigation districts in Alberta, the Irrigation Branch of Alberta Agriculture, Food and Rural Development, and the Prairie Farm Rehabilitation Administration of Agriculture and Agri-Food Canada (Irrigation Water Management Study Committee, 2002). It showed that additional canal conversion to pipelines at the most feasible sites will potentially save 12.5 million m^3 of water from seepage and evaporation losses in the EID. This would provide the equivalent of 14% of the proposed Project new storage capacity at SLR. However, this increased efficiency would not be able to supply water during drought conditions and would not necessarily provide extra water downstream of SLR. Note that the EID has invested over $320 million since 2000 to improve the efficiency of irrigation transport and delivery.

2.12.1.2 On-Farm Efficiency

On-farm efficiency is the ratio between the amount of irrigation water applied and retained within the active root zone and the total amount of irrigation water delivered into on-farm systems. EID reports this efficiency increased from 60% in 1990 to 71% by 1999. Further efficiencies may result from improved water management, improved irrigation methods on-farm, and improvements in

crops. Currently the EID reports that farm efficiency has reached 86%, due to increasing use of low-pressure spray pivots.

Several methods of water management may be used to further improve water use efficiency:

- Using soil moisture testing to stop watering when the moisture level for each crop is achieved. Further improvements would be achieved if the water needs are adjusted through the stages of crop growth and adjusting for the soil water holding capacity (GOA, 2016).
- Reducing irrigation activity during rainfall events.
- Reducing irrigation during high wind, hot temperatures, or during direct sun exposure to reduce field evaporation.
- Timing irrigation to occur at night or cool days.

Improved water management could increase efficiency of water use by an additional 4%, potentially saving an additional 12.4 million m^3 of water, or about 14% of the needed water. As above this water would not be available during droughts and would not necessarily be transported below SLR.

Improved watering methods may also improve efficiency. The greatest efficiency for pivot systems is realized through low-pressure spray nozzles and/or drop tubes to control water application (McKenzie, 2018). These sprinklers achieve improvements by directing water to the areas needed on the ground, further reducing evaporation and overwatering. The Alberta Irrigation Projects Association concluded that through the 2020s, on-farm efficiency may approach 78% with new technologies, and an additional 3% in efficiency can be achieved by effective water management (Irrigation Water Management Study Committee, 2002). While centre pivot sprinkler systems were initially the most common irrigation method in Alberta (GOA, 2016), EID reported in 2023 that low pressure pivot irrigation is now the most common method, followed by high pressure pivot, wheel move, other sprinkler systems, levelled flood irrigation, and unlevelled flood irrigation (Eastern Irrigation District, 2023). Since most landowners have already switched, there is a smaller potential for continuing improvement. Thus, at most, an improvement of 3% or 9.3 million m^3 of water may be achieved. This amounts to about 13% of the needed water, and as before this water would not be available during droughts and would not necessarily be transported below SLR.

The sum of improvements in delivery (12.5 million m^3), water management (12.4 million m^3) and watering methods (9.3 million m^3) totals 34.2 million m^3, much lower than the 72.6 million m^3 that could be supplied by the expanded reservoir.

2.12.1.3 Crop Improvements to Reduce Water Use

Crop selection and improvements are also important. Crop choice is inherent in determining water needs as each cultivar needs a different amount of water depending on how crops capture and store, and use water, and whether they are efficient in holding water, especially in warm weather. Other factors, such as plant size, fruit/seed productivity, and types of fruits or seeds determined how much water a crop requires. Efficiencies in water use is expected to increase over time via crop improvements, but it cannot be easily quantified how much improvement or how long this will take to achieve.

Thus, it is concluded that efficiency improvements, while able to reduce overall water demand, would not result in a net gain of enough water.

2.12.2 Alternative Reservoirs

There has been extensive analysis to determine the best sites for increasing offsite storage to the greatest benefit of irrigation users. Alberta Irrigation Districts Association completed an analysis in 2019 that concluded, for all irrigation districts in Alberta, that expansion of SLR was tied for 2nd highest rank, out of 13 proposed reservoirs (Alberta Irrigation Districts Association, 2019).

Factors considered included:

- availability of water;
- number of districts that would benefit;
- amount of irrigable land area that would be served;
- current storage available in the reservoir;
- frequency and severity of water shortages;
- location in the basin in the irrigation district;
- cost per volume of water that could be provided; and
- expansions that would provide the most benefits.

Benefits examined in the report included:

- improved water management to ensure the maximum amount of water (50% of total SSR flow) is captured per the apportionment agreement with Saskatchewan such as initially capturing higher amounts and later releasing water to meet the 50% transfer.
- ability to capture and store water during high river flows reducing the need for withdrawals when river flows are low.
- increase in water security during droughts for irrigators, industries, and municipalities to spur on economic development and growth.
- greater ability to maintain healthy aquatic ecosystems within source rivers.
- provision of storage to reduce effects of flood events.
- provide more opportunities for water-based recreation.

For the EIA, potential benefits of expanding other upstream of SLR (on-river) reservoirs and other reservoirs in the EID was also considered. To be a feasible alternative, the reservoir would need to hold the same amount of new water as the expanded SLR and would need to supply water to irrigable acres downstream of SLR. Two different reservoir groups were examined:

- on-stream reservoirs that can provide additional water into the Bow River upstream above or at Bassano Dam, which could then made available for direct-from-river during low flow periods; and
- off-stream reservoirs downstream of Bassano Dam, within the EID and feasibility of getting water from this reservoir to the needed lands.

Onstream options include expansion of reservoirs in the headwaters of the Bow River, including Barrier Reservoir, Bassano Dam Reservoir, Bearspaw Reservoir, Ghost Reservoir, Glenmore Reservoir, Johnson (Carseland) Reservoir, Kananaskis Lakes, Lake Minnewanka, and Spray Lakes. New reservoir options were not considered. The possibility to increase these reservoirs in volume and the associated economic and environmental costs were considered. In addition, competing uses of water for electricity production and flood protection were also considered.

Off-stream reservoirs on EID-owned lands were examined as potential offsite storage enhancement sites including Bantry #1, Bantry #2, Cowoki Lake, Crawling Valley Reservoir, Kitsim Reservoir, Lake Newell, Lathom Lake, One Tree Reservoir, Rock Lake, Rolling Hills Lake, San Francisco Lake, Scots Lake, Tilley 'B', and Twelve Mile Coulee Reservoir.

The newly proposed Eyremore Reservoir was not considered in this assessment as it is not yet an approved reservoir and is 43 kilometres downstream of the Bassano Dam, southwest of Brooks and Lake Newell. It is not planned for use by EID; it is proposed partially to enhance water security for the Bow River Irrigation District and is being managed by the province.

A screening of potential for being an alternative reservoir due to connectivity and reservoir purpose is summarized in Table 2-2. Those reservoirs identified as being potentially suitable included Bassano Dam, Cowoki Lake, Lathom Lake, Rock Lake, Lake Newell, Onetree Reservoir, Kitsim Reservoir, and Tilly B. Reservoir. These were then further examined for environmental, location, and water storage capabilities.

Most of the onstream reservoirs do not provide a good alternative compared to the expansion of the SLR. While water management upstream can be used to provide additional water for downstream irrigation, the need to increase the depth and area of any of the reservoirs upstream of Calgary, in Banff National Park or Peter Lougheed Provincial Park, or other options upstream, would present many environmental challenges and would not specifically supply water for use downstream of SLR. Additionally, other than the Bassano Dam, all the reservoirs are outside of the EID's influence and most of these reservoirs serve multiple purposes including power generation, which requires continuous releases of water, or flood control, which requires reservoirs to be drained ahead of potential flooding conditions.

Other reservoirs in or near the City of Calgary (i.e., Glenmore and Bearspaw) are close to many residences and natural areas and are primarily used for municipal water supply and cannot easily be increased in size without making substantial changes to land uses. Thus, Bassano Dam reservoir is the only potentially suitable upstream and onstream site as an alternative to the Project.

Table 2-2: Screening of potential alternative reservoirs by connectivity

Waterbody Name	Irrigation District or Basin	Primary Purposes	Connectivity	Suitable
Onstream Options				
Barrier Reservoir	Upper Bow River (Kananaskis Basin)	• Hydroelectricity, flood protection, flow regulation	• Connected to a tributary of Bow River upstream of Bassano Dam	No
Bassano Dam	Headwaters of Eastern Irrigation District	• Irrigation (EID), flood protection, flow regulation	• Connected to Bow River upstream of Bassano Dam	Yes
Bearspaw Reservoir	Middle Bow River	• Hydroelectricity, municipal water source, flow regulation	• Connected to Bow River upstream of Bassano Dam	No
Ghost Reservoir	Upper Bow River	• Hydroelectricity, flood protection, flow regulation	• Connected to Bow River upstream of Bassano Dam	No
Glenmore Reservoir	Middle Bow River	• Municipal water source, flow regulation	• Connected to a tributary of Bow River upstream of Bassano Dam	No
Johnson Reservoir	Headwaters of Bow River Irrigation District	• Irrigation (BRID[1]); Hydroelectricity, flood protection, flow regulation	• Connected to Bow River upstream of Bassano Dam	No
Lake Minnewanka	Upper Bow River	• Recreation, Hydroelectricity, flow regulation	• Connected to a tributary of Bow River upstream of Bassano Dam	No
Lower Kananaskis Lake	Upper Bow River (Kananaskis Basin)	• Hydroelectricity, flood protection, flow regulation	• Connected to a tributary of Bow River upstream of Bassano Dam	No
Spray Lakes	Upper Bow River	• Hydroelectricity, flow regulation	• Connected to a tributary of Bow River upstream of Bassano Dam	No
Upper Kananaskis Lake	Upper Bow River (Kananaskis Basin)	• Hydroelectricity, flood protection, flow regulation	• Connected to a tributary of Bow River upstream of Bassano Dam	No
Off-stream Options				
Bantry #1	Eastern Irrigation District	• Irrigation	• Poor connectivity to irrigable lands downstream of SLR	No
Bantry #2	Eastern Irrigation District	• Irrigation	• Poor connectivity to irrigable lands downstream of SLR	No
Cowoki Lake	Eastern Irrigation District	• Irrigation	• Potential connectivity via One Tree Canal and Reservoir	Yes
Crawling Valley Reservoir	Eastern Irrigation District	• Irrigation	• No connectivity to irrigable lands downstream of SLR	No
Kitsim	Eastern Irrigation District	• Irrigation	• Potential connectivity via One Tree Canal and Reservoir	Yes
Lake Newell	Eastern Irrigation District	• Irrigation	• Potential connectivity via One Tree Canal and Reservoir	Yes
Lathom Lake	Eastern Irrigation District	• Local Uses	• Directly connected to lands downstream of SLR	Yes
One Tree Reservoir	Eastern Irrigation District	• Irrigation	• Connected back to the lands below SLR	Yes
Rock Lake	Eastern Irrigation District	• Irrigation	• Downstream of SLR on Springhill Canal	Yes
Rolling Hills Lake	Eastern Irrigation District	• Irrigation	• Poor connectivity to irrigable lands downstream of SLR	No
San Francisco Lake	Eastern Irrigation District	• Habitat Protection	• No connectivity to irrigable lands downstream of SL	No
Scots Lake	Eastern Irrigation District	• Irrigation	• Poor connectivity to irrigable lands downstream of SLR	No
Tilley ‘B’	Eastern Irrigation District	• Irrigation	• Potential connectivity via One Tree Canal and Reservoir	Yes
Twelve-mile Coulee Reservoir	Eastern Irrigation District	• Irrigation	• Poor connectivity to irrigable lands downstream of SLR	No

1. Bow River Irrigation District

Table 2-3: Detailed screening of potential reservoir options

Waterbody Name	Current and Potential Storage	Constraints and Issues	Assessment
Bassano Dam	• 600,000 ac-ft (740 million m^3) • Adding 10 m of dam and bank height would allow storage of 56 million m3.	• To increase storage capacity, new berms would have to be built along the banks upstream of the dam. • This would have the effect of flooding riparian habitat several more kilometers upstream, within Siksika lands. • This reservoir is used as a take-off point for EID and as a flood protection structure. It would not be appropriate to build here, as it would require a major, very costly change to the dam height	Not a feasible option
Cowoki Lake	• 6,780 ac-ft (8.36 million m^3) • 6.51 km^2 • could store 50-60 million m^3 in an adjoining reservoir.	• Suitable area of non-irrigated land surrounds this reservoir for construction of a similar sized reservoir expansion. • Some irrigated farmlands south and west of the reservoir; expansion would be most suitable for the non-irrigated lands to the northeast. • May require pumping to move water to the needed areas upstream within the EID because Cowoki Lake is somewhat downstream.	Potentially feasible but not as good as SLR Site
Lathom Lake	• 1 km^2 • approximately 50,000 m^3 if 5 m depth • not enough room to expand a reservoir of sufficient size	• Not an official EID reservoir • Pumping would be required to get water into Latham Lake • Surrounded by irrigated and commercial farmland, wetlands, and native grasslands. • Trans Canada Highway 1 bordering east side of lake. • Little room for expansion due to existing infrastructure (Town of Lathom). • Small reservoir would need a massive expansion to store similar volume.	Not a feasible option
Rock Lake	• 3,240 ac-ft (4 million m^3) • 3.03 km^2 • could store 50-60 million m3 in an adjoining reservoir.	• Suitable undeveloped land available for reservoir development • Would require same effort level of altering the surrounding landscape; • Would require pumping to move water to some of the areas upstream within the EID.	Potentially feasible but not as good as SLR Site
Lake Newell	• 255,610 ac-ft (315.3 million m^3) • 66.22 km^2 • Unlikely to store additional water as would need to flood more areas (low flat area)	• Previously expanded to near maximum size, creating wetlands and habitat areas • Existing infrastructure on north side of the reservoir (Lake Newell Resort and cottages). • Suitable area of non-irrigated land primarily to the east of the reservoir, with some opportunities for expansion to the south and west. • Waterbody supporting Endangered birds (i.e., Piping Plover) – may be a barrier to development • Kinbrook Island Provincial Park on northeast portion of reservoir. • Would require pumping to move water to the needed areas upstream within the EID because Lake Newell is too far downstream.	Not a feasible option
One Tree Reservoir	• 4,590 ac-ft (5.66 million m^3) • 0.78 km^2 • could store 50-60 million m3 in an adjoining reservoir.	• Existing infrastructure (grain storage site and farmland) located directly on the reservoir. • Would be feasible to expand to the west of the reservoir, though it would require alteration of irrigated farmland. • Surrounding wetlands in southern and western portion of reservoir. • Very small reservoir would require a significant expansion to store similar volume. • Too far downstream to provide value to upstream sites	Potentially feasible but not as good as SLR Site
Kitsim Reservoir	• 15,790 ac-ft (19.48 million m^3) • 1.2 km^2 • could store 50-60 million m3 in an adjoining reservoir.	• Sections of irrigated farmlands surrounding the reservoir with a railway running along the north/north-east portion of the reservoir. • Non-irrigated land northwest of the reservoir but would be a narrow space for expansion. • Would require pumping to move water to the needed areas upstream within the EID because Kitsim Reservoir is too far downstream.	Not a feasible option
Tilly B. Reservoir	• 17,080 ac-ft (21.07 million m^3) • 13.2 km^2 • could store 50-60 million m3 in an adjoining reservoir.	• Suitable area of non-irrigated grazing land surrounds this reservoir for construction of a similar sized reservoir expansion. • Ideally expansion to the east would be preferred as to not impede the adjacent road directly west of the reservoir. • Sensitive Snake and Hibernacula areas on the eastern sections of the reservoir. • Would require pumping to move water to the needed areas upstream within the EID because Tilly B. Reservoir is too far downstream.	Not a feasible option

Among off-stream reservoir options, the assessment considered whether water was stored as far upstream in the EID as possible since water flow is primarily gravity fed, and water from a reservoir near the headwaters will be moved to a greater number of areas. Since the SLR supplies off-stream stored water into Spring Hill Canal at an upstream location of the EID, it can affect water availability for irrigators in and around Rock Lake, Duchess, Rosemary, and Millicent. The results of the assessment were that none of the reservoirs examined would be as suitable as the SLR expansion site (Table 2-3).

2.13 PROJECT COMPONENTS AND MATERIALS

2.13.1 Development Area

Based on Project design plans, a schematic drawing of the reservoir expansion has been completed showing the planned inundation areas, berms, notch within the existing east dam to connect the reservoir basins, temporary workspace, and the topsoil storage area. This drawing also shows the planned design limits for the berms and a contingency design to which the berms may be widened in case of stability issues that could arise during construction. All activities will be contained within sections 29, 30, 31, and 32 Township 19, Range 16, W4M. The location of the future berm road is shown as well as the inside berms where riprap will be laid. All outer berms below the road and the temporary workspace area will be reclaimed and restored to native grassland. The soil storage area will maintain intact (i.e., no soil stripping planned) and will also be restored to grassland. (Attachment 2A, Figure 2A-6).

2.13.2 Proposed Dam Structure

The expanded reservoir will include 8 km of earthen berms (dams; Attachment 2A, Figure 2A-2) to an elevation of 784 m asl, resulting in berm height of <5 m on the west side of the expansion area and up to 20 m on the east side (see Attachment 2A, Figure 2A-4). The berm sides will be strongly sloped (3:1) with a broad bench of overburden material on each side for stability (see Attachment 2A, Figure 2A-3).

The dam berms will be constructed on the north, east, and south sides of the expansion and will tie into higher elevation lands on the west side. The berms will include a central core of clay-enriched materials to protect the dam from seepage effects. A passive seepage water collection feature, composed of sands and gravel, will be built into the berms to gather and direct seepage water away from the dam. Any rainfall infiltration will also be captured in this system. Any water gathered in this system will empty into a ditch along the outer edge of the berms, which will direct water to an outlet channel on the east side of the reservoir. This water will flow into a natural meltwater channel that will transfer this water toward San Francisco Lake, southeast of the Project.

New berms (8 km) will be on the north, east, and south sides and higher lands to the west will make up the remainder of the new reservoir perimeter, which will total 11.9 km (Attachment 2A, Figure 2A-7). At the widest point (east side, where berm is 20 m high) the berms plus the outer drainage ditch will be up to 240 m wide, while the narrowest points (<5 m high) will be less than 69 m wide, as per Table 2-4.

Table 2-4: Example widths of the Project berms for 20 m high and 5 m high locations

Berm Feature	20 m High Berm	5 m High berm
Berm Apex (perimeter road)	8 m (4 m on the inside and 4 m on the outside)	8 m (4 m on the inside and 4 m on the outside)
Outer drainage channel and surrounding land	4 m (4 m wide on the outside)	4 m wide on the outside
Upper slope of dam	54 m (9 m upper slope height, at a 3:1 slope resulting in 27 m width, on the inside and outside slopes)	13.5 m (2.25 m upper slope height, at a 3:1 slope resulting in 6.75 m width (inside and outside)
Bench	120 m (2 m height bench at 30:1 slope, resulting in a 60 m bench width on inside and outside)	30 m (0.5 m height bench at 30:1 slope, resulting in a 15 m bench width on inside and outside)
Lower slope of dam	54 m (9 m lower slope height, at a 3:1 slope resulting in 27 m width, on the inside and outside slopes)	13.5 m (2.25 m lower slope height, at a 3:1 slope resulting in 6.75 m width (inside and outside)
Total width	**240 m**	**69 m**

2.13.3 Proposed Facilities, Buildings, and Infrastructure

The Project proposes the following features:

- Dam (berms), meant for holding back water, also used for a perimeter road on the top.
- Connecting road hooking onto the county road system on a location to be determined.
- Notch in the extant SLR East Dam, joining the extant reservoir to the expansion.
- Low level outlet structure to the Snake Lake Canal with 22.6 m^3/s capacity, with electronically controlled, mechanical control gates, tying into the Snake Lake Canal.
- Control building adjacent to the outlet structure, that will house electronic equipment to gather and send real time information on water depth and flow to EID, and to allow control of the dam outlet structure.
- Drainage ditch, for collecting seepage from the reservoir and runoff water from the outside berms, directing the flow away from the reservoir.

2.13.4 Aggregate Resources

Construction materials will include up to 7 million m^3 of clay till excavated from within the proposed reservoir to minimize haul distance and maximize storage while aggregates will be imported from source pits south of the Project within southern Alberta (Table 2-5).

The Project will require approximately 1,000,000 tonnes of sand, gravel, and riprap to be delivered to site. The EID is currently working with a contractor to manufacture and deliver riprap to the Project starting in 2025. The EID is working with a local contractor to manufacture filter sands and gravels from EID's Eyremore Pit.

MPE and Thurber Engineering Ltd. have conducted tests of berm construction using *in-situ* materials. These have included compaction trials for the weathered shale material and deep overburden, as these materials are not useful for constructing an impervious layer. They can, however, be used to provide weight for benches that will protect the berm stability.

Several test pits have been excavated allowing MPE to understand volume of aggregate, clay and other materials needed for berm construction. Tests of the use of weathered clay shale have shown it can be packed down with equipment to create a soil-like material that can be used in construction. The weathered shale can maintain a low moisture content, with higher bulk density than expected, and once compacted, there is little evidence of cracking or layering. Thus, the shale can be used during construction.

Table 2-5: Material sources for the Snake Lake Reservoir Expansion Project

Material	Source
Riprap	A private regional quarry 105 km south of the Project has been identified. This quarry will manufacture boulders of stable rock needed protect the dam from wave action and storms. These materials will require shipping by large haul trucks.
Clay	Clay-till will be sourced from within the reservoir expansion footprint. Two main borrow areas have been identified following exploratory drilling programs.
Gravel	Gravel will be trucked from the EID's Eyremore Quarry, about 28 km south of the site.
Sand	Sand will also be trucked from the EID's Eyremore Quarry.
Concrete	Concrete, needed for the new outlet structure, will be sourced from commercial suppliers in Brooks, AB.
Topsoil	Reclamation soils will be sourced within the footprint.
Native Grass and Cover Crop Seeds	Native grass and cover crop seeds will be sourced from seed suppliers within Alberta.
Irrigation Water for Reclamation Watering	Irrigation water and water for dust control will be obtained from the extant reservoir or other nearby sites under EID's existing water licence.
Erosion and Sediment Control (ESC) Supplies	ESC supplies such as silt fences, silt logs, crimping straw, tackifier, hydromulch, coconut matting, etc., will be ordered from a commercial supplier in Alberta.
Miscellaneous Supplies	These may include fences, office trailers, porta-potties, cleaning facilities, vehicle washing bay, wiring and electronic control mechanisms, and fuel tanks, etc., obtained form commercial suppliers.

2.13.5 Stockpile Locations

Topsoil and subsoil will be stored in stockpiles within the Topsoil Storage area (Attachment 2A, Figure 2A-6. This triangular site is northeast of the planned expansion areas, covering 41 ha of EID owned land, and is bounded by the CPKC mainline to the northeast, Township Road 200 to the south, and Snake Lake Canal to the northwest.

2.13.6 Containment Structures

Containment structures include the dam (berms) that are described in section 2.15. There will be no liners required for this reservoir.

2.13.7 Waste and Debris Storage Area and Disposal Sites

Waste storage sites are described in Volume 1, Section 8 (Wastewater) and Section 9 (Waste).

2.13.8 Borrow Pits

Planned borrow pit locations are shown in Attachment 2A, Figure 2A-2. Final plans for depth of extraction, number of pits and size of pits will be determined during construction, as pits will be excavated until enough material is available for dam construction. Borrow pit slopes will have a maximum steepness of 3:1.

2.13.9 Water Supply System

The water supply system is shown in Volume 1, Section 1, Attachment 1A, Figure 1A-1, including the source of water from the East Branch Canal and the outgoing water into the Snake Lake Canal and then into Springhill Canal.

For a detailed view of the canals and reservoirs for the EID, refer to the EID's Irrigation Recording and Management Application or IRMA (https://www.eid.ca/irma_app.html).

2.13.10 Water Conveyance Structures

The Reservoir will continue to receive water via the East Branch Canal and the outgoing water will flow into the Snake Lake Canal. The flow rate into Snake Lake Canal will be increased from 8.5 m^3/s to 22.6 m^3/s in the new outlet structure.

2.13.11 Reservoirs

The extant reservoir is also shown in Volume 1, Section 1, Attachment 1A, Figure 1A-1. The planned reservoir expansion is shown in Attachment 2A, Figure 2A-7.

2.14 USE OF ROADS

2.14.1 Road Access

EID has a long history of working with the County of Newell and has been in discussion with County of Newell regarding use of roads to access the project site. Offsite road upgrades may be needed to ensure the roads will be suitable for transportation of rock and equipment, but this is out of the Project scope as roads are constructed and maintained by the County or Province. The EID is willing to work with the County and Province as needed to facilitate road upgrades. These may include installing signage at intersections, temporary crossing guards or lights at train crossings of the Canada Pacific Kansas City (CPKC) Main Line, or cost-sharing road maintenance needs or upgrades such as widening or increasing road strength to facilitate heavy truck traffic. As per discussion regarding County regulations (Section 2.4.3), the County of Newell requires a Traffic Accommodation Plan, and will want to discuss dust and noise control as well as ongoing maintenance and a pavement assessment for travelled roads. A development permit will also be required (see also Volume 1, Section 5: Transportation Infrastructure and Traffic Impact Assessment).

2.14.1.1 Commuting

The primary route for workers and specialized equipment will be from Brooks, AB, to the Project site, via the TransCanada Highway to Range Road 162 to the south to Township Road 200 to the west, which accesses the north end (Attachment 2A, Figure 2A-8). An alternative access route is from the TransCanada highway to Range Road 164 to the south to access the east side of the project site or further travel along a private road to the west to access the west and south sides of the Project. Alternatively, smaller vehicles coming from Bassano can access from the

TransCanada Highway onto Range Road 172 to the south, then Township Road 202 to the west, Range Road 173 to the south, and EID East Branch Canal Road to the east.

2.14.2 Material Shipping

Riprap, gravel, and sand requirements will be quarried offsite trucked to the Project. Riprap will be sourced from Dennis Dirtworx Ltd. (DDL), located 105 km south of the Project site. DDL's quarry is located off Highway 845 near Turin, AB (Attachment 2A, Figure 2A-8). Riprap will be manufactured and then loaded onto trucks at the quarry. Trucks will travel north on Highway 845, turning on to Highway 539 to the east, then crossing the Bow River on Highway 539, which turns into Range Rd 171 to the north. Range Rd 171 will be followed to Township Rd 184 to the east and across an existing bridge over East Branch Canal. The East Branch Canal Road leads to Snake Lake Reservoir. Rock shipment will start in 2025 and will occur over 2 years using 30 to 40 ton dump trucks. The shipment of 490,000 tons of riprap from DDL's quarry to the Project will require up to nine trucks at four runs per day on a 12-hour day. There will be 7,560 km travelled per day at 400 days for 3.024 million km total.

Gravel for the Project will come from EID's Eyremore gravel pit requiring shipping 28 km one way. The aggregate shipping will start at the Eyremore Pit then tie into the same route described above. (Attachment 2A, Figure 2A-8). It is estimated that 670,000 tons of sand and gravel will be shipped from Eyremore Pit to the Project, requiring six trucks at eight runs per day and 28 km one way while working 12-hour days. There will be 400 days of shipping, with 19,200 truck trips at an average of 35 tons per load. At 2,688 km per day, total distance travelled totals 1.075 million km.

2.15 CONSTRUCTION ACTIVITIES

Expansion of the extant SLR will require material acquisition and shipping, site preparations, clearing and stripping, clay till excavation, berm construction, berm reclamation, and commissioning activities. Work will be contracted to one or more companies who will supply labour and equipment. Work will be managed by the contracting company specifications developed for the construction, with environmental and construction oversight provided by EID or its agents.

2.15.1 Labour and Equipment

Requirements for onsite labour (contractors and/or employees), shipping needs, and use of construction equipment were estimated based on the construction plan to provide a Project case for assessment of air emissions, noise, human health, land use and socioeconomic effects. These needs were parsed out over the planned activity timelines (see Section 2.7), to represent a realistic case for assessment of project effects. When possible, estimates at the upper end of needs were used so that these assessed effects represent a worst-case scenario.

2.15.1.1 Labour Needs

Estimated labour requirements to construct the Project will total 300 to 350 person-years and will include a mix of general labour, equipment operators and truck drivers and mechanics, skilled tradespeople, as well as project managers and designers/planners. It is assumed that 80% of the construction workforce will come from within the County of Newell with the other 20% coming from other parts of Alberta. However, at the time of construction, these percentages may change if there are not enough available contractors in the county. Most workers will live at their own homes, driving about 25 to 50 km one way to the project site, plus a return trip each day. Out of

county workers will rent rooms in local hotels, rent apartments, or stay in local campgrounds. This project will provide secure employment for 2 to 5 years, plus spinoff benefits to hotels and service industries. The socioeconomic assessment (Volume 2, Section 17) determined construction of the project will not trigger labour shortages that could lead to higher wages. EID routinely uses local contractors to build its projects and have several experienced contractors to chose from.

2.15.1.2 Construction Equipment Needs

Equipment needs for construction are identified by stages of construction activities from site preparations to reclamation and armouring. Estimated equipment needs are then summarized as equipment days (i.e., days of use for each type of equipment). Detailed description of construction activities are provided in the next section. Equipment needs for each activity include:

- **Site Preparations:** Mowing, stockpiling, and removing wood, thatch, boulders, and other unsuitable materials.
- **Topsoil Stripping and Storage:** Stripping topsoil and subsoil, stockpiling soils, collecting and piling cobbles and boulders for future use, and hauling soils to the storage area.
- **Clay Till Excavation and Transport:** Excavating clay and hauling this to berm locations for immediate use or to temporary storage sites.
- **Berm Surface Preparations:** Dumping and spreading surface materials (clay till), followed by levelling and compacting.
- **Berm Core and Bench Construction:** Including surface preparation and drain construction, clay and aggregate mixing, piling, testing, compacting, and slope grading.
- **Armouring and Finishing:** This includes laying riprap on inside berms, spreading additional materials for stability, building and testing the new outlet structure, and preparing the future wetland surface within the reservoir.
- **Dust Control Watering:** It is estimated that 4 trucks will work 12-hour shifts over 540 days (estimated 6 months/year for 3 years) for reservoir surface dust control, plus two trucks working 150 nights in the hottest time of the year (estimated 2.5 months/year over two years) for road surface dust control; this includes filling trucks with a portable pump.
- **Reclamation:** Grading and contouring slopes, trucking topsoil to the slopes, followed by soil spreading, compacting, and tracking to limit runoff; ESC measures installed as needed, followed by seeding and watering of reclaimed slopes.

As shown in Table 2-6, this totals to 27,360 equipment days, or approximately 76 equipment years. These detailed plans were provided in monthly increments to the air and noise assessment teams for emission and dust/PM2.5 modelling, and for noise and vibration assessments.

Table 2-6: Equipment requirements for construction

Equipment	Construction Activity (Equipment Days)								
	Site Preparation	Topsoil Stripping and Storage	Clay Till Excavation/ Transport	Berm Surface Preparation	Berm Construction	Armoring and Finishing	Dust Control Watering	Reclamation	Equipment Totals
Mower/Cutter	120								120
Rock Picker	60								60
Loader	120	160	1,600	120	3,240	240		80	5,560
Dump Truck	240	640	4,800	720	4,880	480		160	11,920
Scraper/Ripper		960							960
Bulldozer		320			40			80	440
Comp actor				240	2,040	20		120	2,420
Water Truck							2,460		2,460
Excavator			1,600		80	60			1,740
Portable Pump							540		540
Material Mixer					800				800
Grader					80			80	160
Seeder								40	40
Tractor								40	40
Cement Trucks						20			20
Portable Crane						80			80
Activity Totals	540	2,080	8,000	1,080	11,160	900	3,000	600	27,360

2.15.2 Site Preparations

2.15.2.1 Removal of Existing Infrastructure

See the Land Use and Management Section (Volume 2, Section 13) for information on existing infrastructure and leases in the Project area. As part of a separate Project for this development, Torxen Energy decommissioned 29 gas wells and abandoned all pipelines within the Project footprint.

2.15.2.2 Surface Preparations

Once all needed permits are in place, site preparations will begin. Preparations will include staking the boundary of the reservoir surface, berm limits, and temporary activity boundaries, including topsoil storage sites, equipment laydown areas, and parking areas. Soil boundaries will be marked by soil classes as mapped.

Laydown areas and temporary control yards will be established including buildings or trailers for site permitting, entrance control booth, gated entrance, meeting/training room, lunch trailer, washrooms/porta-potties, vehicle and large equipment/trailer parking, waste storage site, etc. For further details on waste management see Volume 1, Section 9.

Onsite parking will be needed during construction. Up to 100 private vehicles may be on site per day plus large trucks and 50 or more pieces of construction equipment. While there is no plan for construction of a temporary hard surface parking lot, ample space for parking is available. Parking will likely occur in the northeast corner of the Project site, as this is the closet location to Brooks, where most vehicles will be from. Other parking areas may occur on the existing East Dam Road, between the existing reservoir and the Project, and within the new footprint area; there are no plans for an offsite shuttle service.

2.15.3 Site Clearing and Stripping

Site clearing includes cutting trees and shrubs and mowing tall herbaceous vegetation. This should be done outside of the bird breeding season as this will reduce the chance for wildlife nesting during construction; if not, a wildlife sweep will be completed before activities, with buffers established to protect any nesting or denning species (as per the Project Wildlife Management Plan; Volume 2, Section 11, Appendix I4). Once cut, woody materials will be stockpiled and removed from site or burned (if so, under permit), including the root boles. Smaller roots will be excavated and removed along with topsoil. If needed, cleared timber may also be used for other purposes such as crossing swampy ground, berm slope stabilization, or fish habitat enhancement. To reuse this material as above, these features will need to be moved to a temporary storage site and stockpiled.

Soil stripping will occur with ripper and blades that can be set to various depths. Where topsoil measures less than 10 cm depth, a minimum stripping depth of 10 cm will be used, capturing the transition layers with the topsoil. Suitable subsoil will also be stripped and stored for use in surface berm reclamation. Topsoil and subsoil will be stored in separate stockpiles.

Only suitable topsoil and subsoil, as determined in the Soil and Terrain section of the EIA (Volume 2, Section 9), will be saved for reclamation. Once a sufficient volume of subsoil is available for reclamation, the remainder of the subsoil will be saved on site for berm construction or other uses. The Conceptual Conservation and Reclamation Plan (CCRP) provides details on locations to be

stripped, total soil volumes to be stripped and replaced for berm reclamation (Volume 1, Section 10). The CCRP also provides the current stripping depths for subsoil and topsoil. Any remaining suitable subsoils can then be stockpiled for use in dam construction. If there is excess topsoil the reclamation depths can be increased, or the excess can be shipped offsite for other uses within the EID. Materials below the stripped soil will be left in place until the start of excavation of in-situ construction materials.

To protect the integrity of topsoil for reclamation use, soil stripping will only occur when the soil surface is sufficiently dry. EID will retain an Environmental Inspector (EI) as needed who will address all environmental issues including imposing shut-down procedures to protect the soil when required. To protect the stripped soil, construction traffic will only include equipment with low-ground pressure tires or wide pad tracks to prevent soil compaction. Admixing of topsoil and subsoil materials will be prevented so that the soils will remain suitable for reclamation.

2.15.4 Clay Till Excavation

After soil stripping, remaining unconsolidated materials occurring above the geological shale layer (i.e., the overburden) will be extracted within borrow pits. Planned borrow pit areas are shown in Attachment 2A, Figure 2A-2, based on the locations where the greatest depths of suitable clay till were observed during exploration drilling programs. If these areas do not provide enough borrow materials for berm construction and reservoir surface preparation, addition areas within the footprint will be assessed and excavated. Due to the variable depths of clay till materials, the excavation areas, depths, and starting excavation locations cannot be planned prior to commencement of construction activities. The final locations, surface area, and depth of excavation will depend on the quantity and quality of materials excavated from these sites. Thus, it will be required to have approval to excavate all materials to top of bedrock, if needed, throughout the Project footprint.

During extraction, groundwater seepage may occur into the pits at rates and depth described in Volume 2, Section 6 (Hydrogeology). If necessary, this groundwater will be pumped out of the pits and disposed elsewhere within the footprint into a location where the water can infiltrate into the soil.

As per the *Historical Resources Act* Approval with Conditions (see Attachment 2B; Regulatory Approvals and Communications), this overburden has potential for containing fossil materials and must be monitored for paleontological resources prior to excavating.

The overburden will be excavated and stored in piles separated by uses. Overburden composed of suitable clay will be stored for berm core development; sand or gravel dominated soils will be stored to provide the mass needed for the outer berms and benches.

Currently, the amount of clay-till overburden is believed to be sufficient for berm construction, so marine shale bedrock should not need to be excavated. If there is a shortfall on suitable clay till in the overburden layer for berm construction, marine shale bedrock can be excavated; however, prior to excavation, the shale layer would need to be examined by the paleontology monitoring team to assess if there are historical resources of interest. Once cleared for use, these materials would be excavated with bucket loaders and hauled to storage sites or used immediately in berm construction; however, if there are any additional discoveries of historical human use, or of major fossils, skeletons, or other signs of past life, the paleontologists or archaeologists will be informed and must reassess the site before work continues.

2.15.5 Temporary Access, Workspace, Infrastructure, and Drainage

Temporary roads will be constructed to access the footprint from the East Branch Canal and Snake Lake East Dam roads. Temporary haul roads will be constructed within the footprint for the shipping of aggregate and rock materials to avoid rutting or damaging the surface layer. For activities that occur prior to *Water Act* approval for wetland disturbance, wetlands will be avoided with a suitable buffer for travel and stockpiling activities. As the dam is being constructed, temporary access roads to the top of berm will be updated as needed.

Once on the footprint, most light vehicles can travel throughout the site without temporary roads, but vehicles will need to avoid wetlands and drainages until approval is received. Once the *Water Act* approval is received, wetland areas will be removed, and access will be available throughout the footprint. Existing temporary access roads around the outside of the berm construction area which were supported by a Code of Practice (COP) for Watercourse Crossings will continue to be used, with amendments to the COP as needed, until wetlands are approved for removal. Historical Resources Approval has been received for the berms and reservoir surface area but is still in progress for the temporary workspaces and storage areas. Thus, only existing roads across these areas should be used until this approval is in place. Wildlife setbacks will also continue to be in place as per the Wildlife Management Plan (Volume 2, Section 11) including the active Ferruginous Hawk (*Buteo regalis*) nest buffer, which will remain in place until approval to remove and compensate (replace) for this feature has been granted.

Temporary runoff controls will require ditching across the footprint. Once the *Water Act* approval is obtained, wetland areas can be removed, and temporary ditches will be established to direct water to drain offsite. If needed, silt controls will be in place to capture water for silt settling before release offsite. Initially this water can be directed through the existing low areas. As the new berms are constructed, a temporary outlet for runoff water may be required; if so, this drainage ditch would tie into the existing meltwater channel. Alternatively, excess runoff water may need to be collected in a temporary pond and could be pumped offsite.

Temporary control yards will be established during construction to facilitate tracking and permitting needs for onsite work. Temporary buildings or trailers may be brought in to serve various construction-related functions, including gated entrance, entrance control booth, construction offices for meetings, orientations, and training, lunch trailer, washrooms/porta-potties, temporary laydown areas, vehicle and large equipment/trailer parking, and waste storage site, etc. Portable lighting may be installed to allow work after dark in the shoulder seasons and winter, if required by the construction contractor. A medic and ambulance will be on site when the number of workers triggers this need. Fuel storage tanks and filling station, or portable fuel trucks may also be kept on site.

2.15.6 Berm Construction

Berms will be built as per the engineering design plans (Volume 1, Section 6). Berms will be built with a central clay till core and surrounding benches of unconsolidated berm materials for weight (Attachment 2A, Figure 2A-4).

Foundation preparations will include:

- Removal of unsuitable soils areas, such as soft, loose, sandy or gravelly, or excessively wet soils which may be unstable or allow water seepage.

- Grading and contouring the land surface below the planned berms to create a flat area suitable for development. If any water collects in these areas, the surface will be gently contoured to drain or the surface will be pumped dry.
- A layer of clay till 20 to 30 cm depth will be placed and compacted on the reservoir surface, except where sufficient clay is already present. The goal is to develop a stable base layer that is impervious to water seepage.
- Deep channels of gravel and sand may need to be excavated and infilled with clay-till to prevent drains from forming.
- Bentonite seams will be capped with clay to prevent interaction with this substance. As the bentonite layers are deep, they cannot be removed. Instead, the dam structure has been designed to account for bentonite presence.

2.15.7 Slope Stabilization

During construction, slope stabilization (of berms and borrow pits) will be required anywhere that potential slumping could occur. Based on existing terrain and slopes, no areas have been identified where steep slopes will be encountered that would require slope stabilization. The greatest slopes encountered as reported in Soil and Terrain (Volume 2, Section 9) were strong slopes (15-40%). Maximum slopes for all new construction (berms and borrow pits) is 3:1 (33.3%). As a general rule, slopes steeper than 50% (2:1 slopes) may be subject to potential slumping, however, gentler slopes may also slump if soils become saturated. Thus, standard methods such as installation of shoring timbers and netting to stabilize steep soils and prevent slumping should not be required.

2.15.8 Appurtenant Structures and Linings

Appurtenant (supporting) structures include the new low level canal outlet and control gates with instrumentation for recording flow depth and volume. The outlet will require concrete construction and features to dissipate flow in the outlet canal. A control building will also be installed at the outlet. Fencing will be installed where needed to prevent access of the public or wildlife onto the construction site.

The dam construction will not use impervious linings; instead, an impervious core will be constructed, and seepage collection system will be developed to collect and remove water from the back side of the dam. A seepage collection ditch will surround the outer berms and will capture seepage water that flows through the berms as well as any surface runoff and precipitation infiltration. The ditches will direct flow into an existing channel area that flows to the east.

2.15.9 Change Management

To avoid needing approval amendments, the application will encompass foreseeable contingencies for construction size and activity areas. Small changes in design would likely only require regulator notification.

2.15.10 Quality Control

Quality control of dam construction will require inspection and monitoring throughout the construction process to ensure the dam meets standards for stability and EIA approval conditions. Compaction testing will be completed throughout the placement of material. Onsite inspectors will monitor fill placement and compaction as needed. Slope stability monitoring instruments and pore

pressure monitoring instruments will be installed at locations that may develop these issues. This monitoring would occur throughout the construction phase.

Dam stability and integrity testing will be needed. Automated detectors for surface movement will be installed to ensure any subsurface movements, even a few centimetres, are recorded. Additionally, sample cores and/or geophysical (sonar or LiDAR based) observations will be used to identify the strength, stability, bulk density, and moisture content within the berms to assess if weak layers are developing. Mass movement and stability will also be monitored through drone sampling of surface elevations during the build. If issues are identified, remedial actions will be taken to address these; however, if the needed changes are major, work will stop in the affected area until the issues can be solved, new designs can be drawn, and updated construction processes can be implemented. Standards will follow the Alberta Dam and Canal Safety Guidelines (GOA, 2018c; GOA, 2014).

Upon completion of dam construction, a comprehensive inspection will be completed to ensure dam stability and integrity. Inspection reporting will determine if additional monitoring needs to occur during initial reservoir filling and operations stages. Additional information on quality control for dam construction is addressed in Dam Safety (Volume 1, Section 6).

2.15.11 Environmental Controls

Environmental standards, as included in the Mitigation Measures, Management Practices, and Monitoring Plans (Volume 1, Section 11) will be self-enforced through environmental inspection processes to ensure environmental resources are protected and approval conditions are met. An EI will be on site when needed and will have the authority to stop work until corrective action is taken. The EI will also be employed during reclamation to ensure soil replacement standards and revegetation is being achieved. Some required monitoring may be automated if needed under the approval, such air emission, particulates, or noise monitoring, to ensure the workplace remains safe. Where this monitoring shows exceedances of standards, a modified work plan will be developed and additional mitigation measures, design changes, or management controls will be established.

An Erosion Sedimentation Control (ESC) plan will be developed and implemented during all stages of construction to protect surrounding waterbodies and drainages from rainfall and runoff. During initial site clearing, ESC measures such as silt fencing will be used when necessary to prevent silt movement and deposition. Clean runoff water will be held in a settling pond and tested before release; it will then be directed into ditches that convey the water offsite.

If conditions occur resulting in wind or water erosion, mitigations will include options such as grading, installing protective structures, surface watering, or covering erodible features with netting or fabrics. Water erosion on berm slopes may be mitigated using temporary berms of subsoil, logs, timber, sandbags, or bales or by excavating temporary cross ditches to collect and drain water. To prevent wind erosion, wind fences can be installed in problem areas. Once topsoil is salvaged, wind erosion of the new surface can be minimized by tackifying or watering the surface, especially if there is a delay between topsoil stripping and overburden excavation.

Temporary ESC measures will also be established during construction to protect the berms as they are being constructed. Construction will occur in stages and as each stage is completed, additional ESC measures will be installed if needed. This will depend on the time of year of

construction, but in spring during snowmelt and in spring to fall whenever heavy rainfalls can occur, additional measures may include tarping or installing netting on new construction areas.

Erosion measures will also be needed for the topsoil piles as they will be stored for months to years before use in reclamation. These measures are needed to contain and manage runoff and silt. Silt fences will be erected when necessary around the piles in the event the soil on the pile becomes saturated and starts to slump or run-off. These piles will be sloped at an angle that is not conducive to runoff and if they will be in place for greater than one year, a cover crop will be seeded to establish a rooted grass cover that will not persist into the future. If needed, the pile will also be covered with geofabric or netting to stabilize soils and discourage weeds.

Soil erosion control measures will be inspected regularly and replaced before nearby activities start. During reclamation, after soils are spread across the site, a tracked packer will be driven up and down the slopes to create a surface with track marks perpendicular to the slope. This assists in holding runoff water rather than forming runoff rills that would facilitate downward flow. This capture of rainfall or irrigation water more easily infiltrates into the topsoil for support of planted species.

2.15.12 Mechanical and Electrical Instrumentation

Wired conduits will be installed connecting the control building to the automated monitoring equipment. There will be electrical power and communication lines in these conduits with redundancy to allow for future expansions. These will be installed with a trencher and will be contained in protective coating. These will be installed below the frost line (>1 m).

The mechanical and monitoring equipment will include gates to open and close flows and water level/flow monitoring transducers. Backup power systems will be included in the control building. Gates will also have manual controls in case of power failure. A control building will have memory storage and equipment to wirelessly transfer water level and volume data to the EID in Brooks.

2.15.13 Testing and Commissioning

As previously stated, stability monitoring will be completed throughout the construction process and following completion of construction. Part of the inspection process includes testing and commissioning the outlet structure for proper flow and the dam's ability to hold water. The integrity of the outlet will be tested to assess flow control and allow for control instruments to be calibrated. A wet test may be completed by partially filling the reservoir and releasing water through the new low-level outlet.

Testing the dam's integrity may involve various measurements and observation of the dam walls during the filling process such as obtaining photographs and elevations with a drone to inspect dam stability. Subsurface monitoring will also be in place to determine if water is seeping into the earthen dam. Once the inspections are complete and show the dam and outlet are functioning as planned, the reservoir can be filled.

2.16 RESERVOIR FILLING

2.16.1 Filling Preparations

The extant SLR will need to be fully drawn down to allow the reservoir basins to be connected. Once reconnected and fully tested for integrity, the full reservoir will be filled with 94.4 million m^3 of water in the first year or more of operations (the additional volume wil be needed to fill borrow

pits that will remove 7,000,000 m^3 of materials. In future years it will be refilled following drawdown. During the initial years of operation of the expanded Snake Lake Reservoir, a reservoir filling plan will be implemented.

94.4 million m^3 represents about 10% of the EID's licensed allocation and remains lower than the unused allocation each year; even in 2023 there were over 230 million m^3 of unused water on EID's licence. Therefore, filling the reservoir from empty will not require new water allocation. As the reservoir is filled for the first time, there will be visual monitoring to look for any potential problems that arise, with any needed environmental issues addressed. It is likely that initially the filling will occur slower than the maximum rate, to avoid a surge of water that could scour the base of the new reservoir.

Filling will likely occur in springtime during the Bow River freshet, so that excess water is used to fill the reservoir. Alternatively, the reservoir may be filled partially during fall if the canal is able to keep flowing after crops have been harvested. If there is a drought year like 2023, there may not be enough water early in the year to fill the reservoir and still meet the IO for the Bow River; this would necessitate waiting to fill the reservoir at a different time. If needed, filling can be extended into the fall or over multiple years to match filling with periods with ample water flow.

2.16.1.1 Filling Controls

In the first year of filling, water will need to fill the reservoir and supply irrigation water to irrigators downstream of SLR. This additional water required for the first filling will not result in exceedances of water use beyond the licensed volume and water will be extracted slowly so the reservoir fills only when excess water is available. Ultimately all water diverted into the reservoir will be used downstream, but some will be stored longer, including into future years. In future years following a year of drawdown, water extracted will both refill the reservoir and supply irrigation water downstream. Also, when water is taken during the freshet, suspended silts composed of various particles and chemicals may be present at higher proportions than normal for water entering the reservoir. However, there has never been an issue with siltation in the East Branch Canal; any suspended silts will be very minor and are expected to settle out in the slow-moving Main Canal, Little Dam Reservoir, and East Branch Canal. Any remaining suspended sediment that enters the expanded SLR will be very minor and will settle out. In this case, water can be held in the reservoir for a few days to allow settling, as usually the freshet also corresponds with rainy (or immediately post rainy) periods when less water needs to be transferred downstream.

The reservoir shoreline will be fully protected with rock armoring (riprap) prior to filling to prevent erosion during filling and operations; a management plan will be written to address collection and disposal of surface debris which may be dislodged from the reservoir surface and float within the reservoir. This plan will include regular shoreline sweeps to collect and remove debris.

The extant reservoir will need to be fully drawn down to allow the reservoir basins to be connected. Once the new basin is constructed and passes all tests for safety and integrity, the extant SLR East Dam will be progressively notched downwards while allowing the water to drain into the new reservoir area. The notch will be approximately 300 m wide at the top and will slope to the base at a 3:1 ratio. Excess water may be directed to exit the new low-level outlet, but much will be allowed to accumulate in the reservoir expansion, providing new habitat for fish and other aquatic species. Draining the SLR also provides an opportunity to check for issues on the reservoir

surface and remove debris. However, the reservoir was drawn down in 2023 and no problems were identified.

Water gauges are already in place at the inlet site to collect hydrologic data and make observations while filling the reservoir. The filling plan will include predictions for water volumes and depths based on the area and morphology of the reservoir water as water is transferred into the reservoir. Monitoring equipment will also be in place to measure depth throughout the process. To restrict public access to the site during the filling process, fencing and signage in appropriate locations will be installed; in addition, remote cameras will be used to monitor the site.

If the reservoir is filled at the maximum inlet rate of 11.3 m^3/s, (976,000 m^3/day), it would take a minimum of 90 days to fill the reservoir (to FSL). The maximum rate of reservoir filling is limited by the capacity of the existing inlet structure into SLR. However; the initial fill rate has not yet been determined. The maximum rate of filling will be 8.5 m^3/s until a depth of 2 m is achieved at the inlet site; this will ensure the base of the new reservoir will not be scoured when initially filled. Initially water will flow from the extant SLR into the expanded reservoir, where it will fill on the deeper east side first. The expanded reservoir will be filled until the water volume reaches the FSL.

2.16.1.2 Dam Safety and Shoreline Stability

Before filling the reservoir, the shoreline will be fully protected with rock armoring (riprap) to prevent erosion during filling and operations. Prior to filling the newly constructed reservoir, a filling plan will be written and implemented, including a safety and emergency management plan. These will include processes for when the new dam is fully or partially breached. After the first fully-filled year, the integrity of the reservoir may need to be inspected again, which may require a partial drawdown.

2.16.1.3 Environmental Controls

Prior to completing the notch between the extant SLR (in the East Dam) and the expansion reservoir area, the reservoir water may be isolated from the working area to help contain sediment mobilized within the workspace and ensure no harm comes to fish.

If construction or reservoir filling requires fish salvage (if there will be any interaction with open water and fish), an Alberta EPA fish handling licence will be obtained. Under the fish licence, biologists would safely capture and move fishes to safe pools; where possible, they will be allowed to travel to the east side of the new reservoir area via the Snake Lake Canal.

A management plan will be written to address collection and disposal of surface debris which may be dislodged from the reservoir surface and float within the reservoir. This plan will include regular shoreline sweeps to collect and remove debris.

Biologists will work with construction personnel to monitor water chemistry at the outlet during filling. If the water becomes turbid due to mixing of sediments into the water, a decision will be made to stop outflow from the reservoir. During filling, sediments will be expected to settle.

2.16.2 SLR East Dam Decommissioning

Once the extant East Dam is not needed, it will be closed, materials shipped off site, and the substrate will be checked for contamination or other issues. If contaminated, these materials will

be excavated and removed. The land surface will then be contoured to an appropriate slope that integrates into the landscape. The site will be inspected to ensure stability.

2.17 RESERVOIR OPERATIONS AND MAINTENANCE

Maintenance activities during Project operations will be informed by regular maintenance and inspections; an inspection checklist will be developed, and a record of maintenance activities will be maintained.

Typical reservoir maintenance activities include:

- Removing silt and unwanted vegetation growth within the reservoir, its inlet and outlet structures and canals;
- Remove debris from the shoreline;
- Fixing any cracking or settling of the berms;
- Addressing areas where water is collecting on the outside berms, such as at the toe;
- Ensuring stability of berm slopes;
- ESC measures will be installed to reduce erosion issues on the berms; once ESC measures are not needed, they will be removed and stored for reuse or disposed;
- Clearing unwanted vegetation such as trees or shrubs on the berms; and
- Ensuring and signs and fencing is maintained.

2.18 RESERVOIR MODIFICATION POTENTIAL

There is little potential for future modification and expansion of the SLR. To be economically viable, most of the aggregate and clay needs to be sourced locally, so further addition to height of the reservoir would not be economically feasible. In addition, if the height were to be increased, the existing SLR would also need to be built up higher, further increasing the expense. The outlet into the Snake Lake Canal will also stay the same. It would not be feasible to shunt water back to the East Branch Canal as the canal is higher in elevation than the reservoir outlet; if this were to be done, pumps would be required.

2.19 PROJECT RISKS

2.19.1 Project Delay

A delay to the Project could leave the EID and the farms it supplies without sufficient water for crop irrigation during future low-flow periods in the Bow River, or in drought conditions, adversely affecting local agriculture. There will also be potential increased costs for construction the longer the Project is delayed both due to inflation and the ending of the Alberta Irrigation Modernization (AIM) program which will partially fund this Project; work done under the AIM program needs to be competed by 2028 to be eligible. The potential for another drought year and the significant effects to irrigators without access to irrigation water is high.

2.19.2 Potential Flooding in Extreme Scenarios

The FTOR requires an examination of potential flooding in extreme events (see Volume 1, Section 6). As required for a high consequence dam, this inflow was based on a potential flood event one third between the 1:1,000 year flood event and the Probable Maximum Flood; this resulted in an event with an inflow of 3.192 million m^3. The designed dam will hold and will not flood any additional areas in a flood event up to this assessed value. Following a review of the hydrology for the expanded Snake Lake Reservoir, it was recommended that the dam classification be

increased from Significant to High. Additionally, in an extreme flood the intake of water by EID can be shut down or restricted to ensure the system reservoirs do not flood. Water can also be run through the canal system and drained back to the river at downstream sites. EID's offsite reservoirs are not designed as flood control structures. Flood control is managed at the Bassano Dam. Additional information on the consequence classification of the dam and flooding is available in Dam Safety (Volume 1, Section 6).

2.20 ADAPTIVE MANAGEMENT APPROACH

The Project will implement an adaptive management approach throughout its operations. Adaptive management is a process designed to improve resource management practices and mitigations by learning from the outcomes of operational programs. The practices are implemented and monitored to understand the effects of the management actions. The results are integrated to adjust the next step in management.

The six steps of adaptive management are:

1. Assess the problem;
2. Design the plan;
3. Implement the plan;
4. Monitor the results;
5. Evaluate the outcomes; and
6. Adjust the plan.

Adaptive management provides flexibility in addressing complexity and uncertainty associated with environmental management and provides a structured and rigorous process to follow. Research, planning and input is needed to provide a robust management framework. The management practices, mitigation measures and monitoring that will be used to support the Project are identified in Volume 1, Section 11. Where not otherwise specified, the timing, milestones and process for implementing adaptive mitigations will be identified by subject matter experts.

The baseline assessments and issue scoping have been completed to assess the problems that may be encountered during the construction, filling, and operations of the Project. Different Project activities require different mitigation and monitoring practices and they may change depending on the stage of the Project. For example, many of the mitigations are construction specific. In comparison, when the reservoir is built and operating, the emphasis will shift to monitoring. When the management plans are implemented during construction, filling, and operation, monitoring will be used to acquire information on any issues regarding integrity of the berm, reclaimed vegetation, water storage capability, and integrity of the dam. If issues are discovered, they will be triaged to see if they need to be addressed immediately or if they are something to monitor over time.

2.21 LAND CLEARING

Clearings, including all anthropogenic disturbance in the local study area are shown in Attachment 2A, Figure 2A-9. Clearing activities have been ongoing in and surrounding the Project site for many years. An FTOR requirement requires the proponent to describe and map land clearing activities, showing the timing of the activities. This is provided in Attachment 2A, Figure 2A-10.

2.22 EID COMMITMENTS

The EID commits to the best management practices, mitigation measures and monitoring programs described in this EIA. The EID will also participate in meetings or other forms of communication to listen, respond, and address as need arises with public interest groups, the County of Newell, Provincial or Federal Regulators, Indigenous Groups or anyone else with concerns or inquiries regarding the Project.

2.23 REFERENCES

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Attachment 2

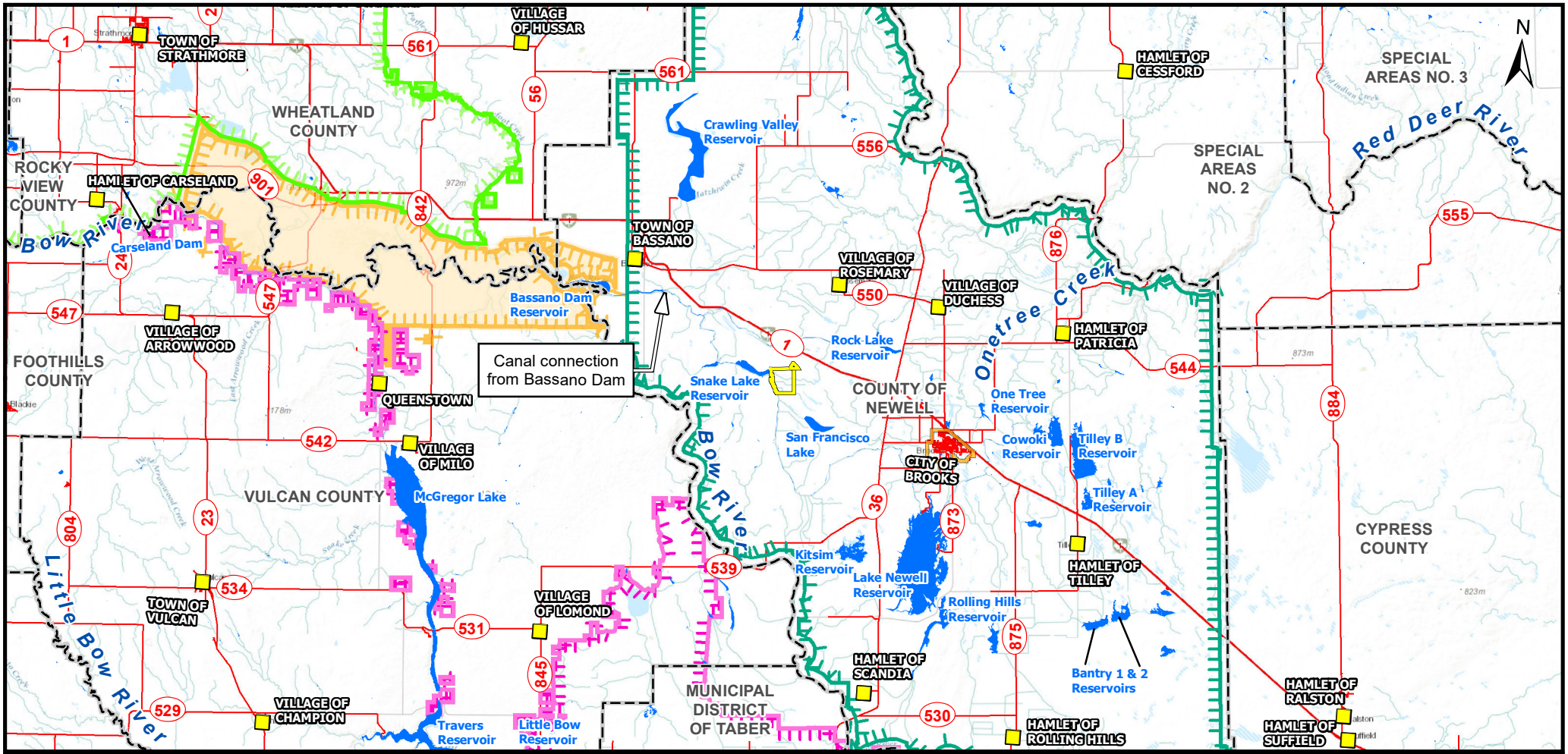
Attachments

Figures

Regulatory Approvals and Communications

Tables

Attachment 2A: Figures



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Approved:	LC	Revision:	0
Route Source:		Date: Oct 8, 2024	
KML		Revision:	0

Data Sources:
ESRI World Topographic Map
ATS Grid: AltaLIS 2007

AAR Environmental Services

Please contact AARES for all other sources.

Please note that the topographic map is from 2010 (NRCAN) and although we have no reason to doubt the accuracy and completeness of it, users should be aware discrepancies may be present.

Legend

- Snake Lake Reservoir Expansion Project Area
- Municipality
- Paved Road
- Siksika Indian Reserve #146
- Rural Boundary
- Western Irrigation District No. 12
- Eastern Irrigation District No. 13
- Bow River Irrigation District No. 11
- City Boundary
- Waterbody

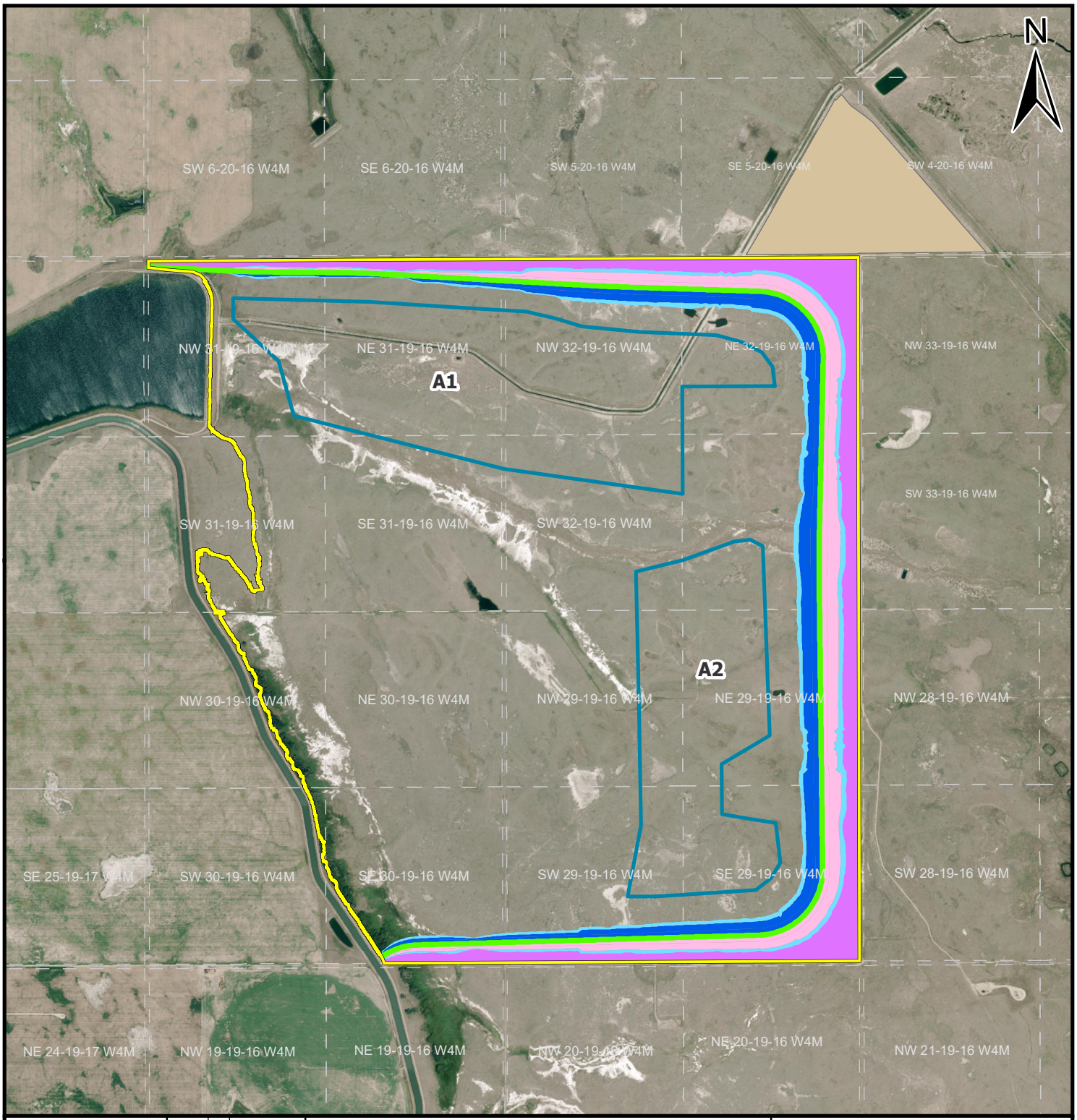
EID

Project Location in Southern Alberta

January 2025

REF.: AARES 21-127
(ProjectDescription)

Figure 2A-1



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Drafted:	MM	Date:	Mar 14, 2025
Approved:	WB	Revision:	0
Route Source:		Date:	Feb 18, 2022
CAD Survey		Revision:	0

Data Sources:
Imagery Reference: ESRI 2021/07/10
ATS Grid: AltaLIS 2007

AAR Environmental Services

Please contact AARES for all other sources.

Please note that the imagery is from 2021 and although we have no reason to doubt the accuracy and completeness of it, users should be aware that discrepancies may be present

Legend

Routing:

- Snake Lake Reservoir Expansion Project Area
- Topsoil Storage Area

Berm Extent:

- Backslope
- Dam Toe (Contingency)
- Top of Dam
- Inside Slope
- Temporary Workspace
- Planned Borrow Areas A1 & A2

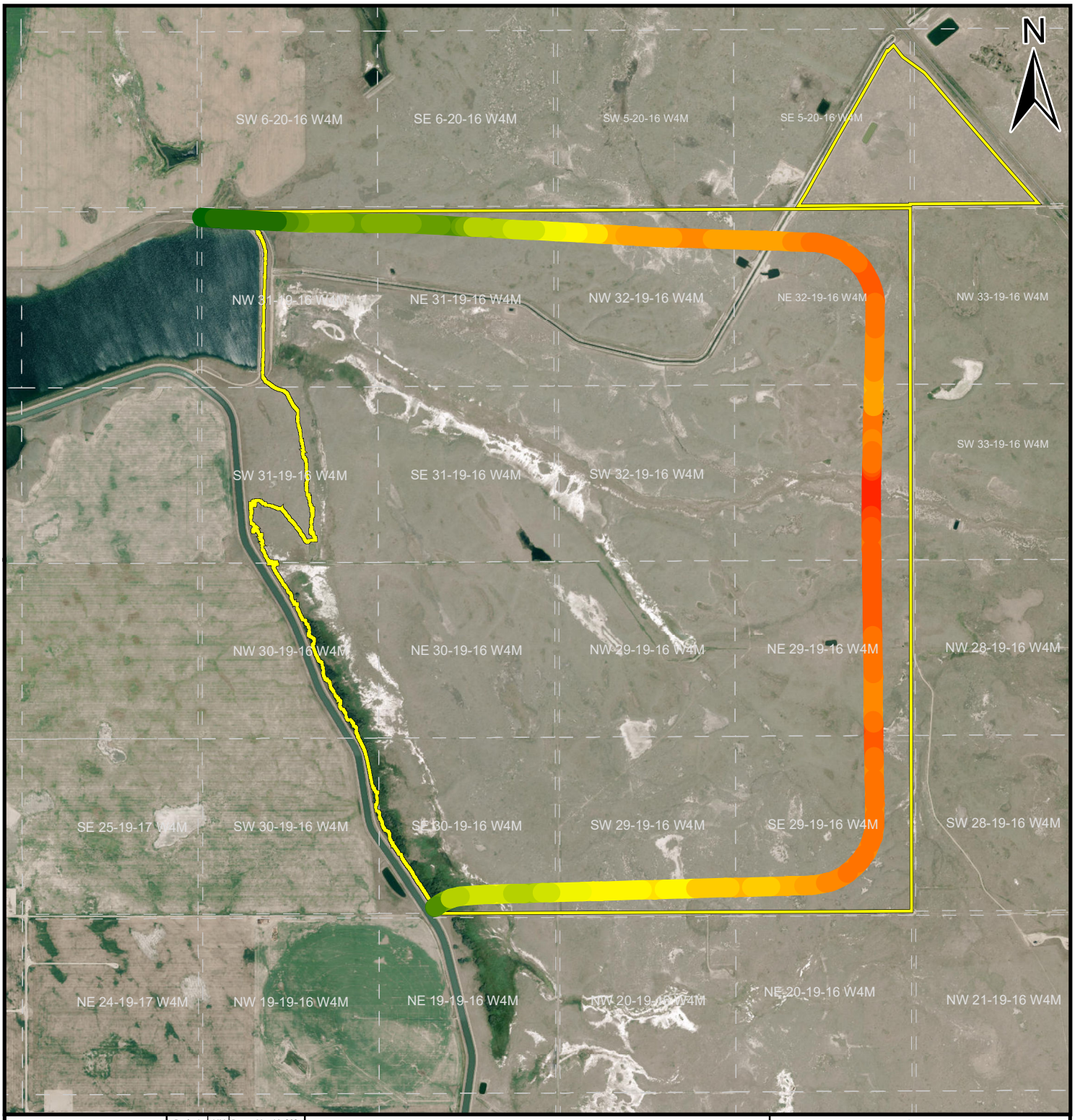
EID

Dam Location and Project Layout

March 2025

REF.: AARES21-127
(ProjectDescription)

Figure 2A-2



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Drafted:	MM	Date:	Mar 14, 2025
Approved:	WB	Revision:	0
Route Source:		Date:	Feb 18, 2022
CAD Survey		Revision:	0

Data Sources:
Imagery Reference: ESRI 2021/07/10
ATS Grid: AltaLIS 2007

AAR Environmental Services

Please contact AARES for all other sources.

Please note that the imagery is from 2021 and although we have no reason to doubt the accuracy and completeness of it, users should be aware that discrepancies may be present

Legend

Routing:

Snake Lake Reservoir Expansion Project Area

Berm Height (M):

0 5 10 15 20

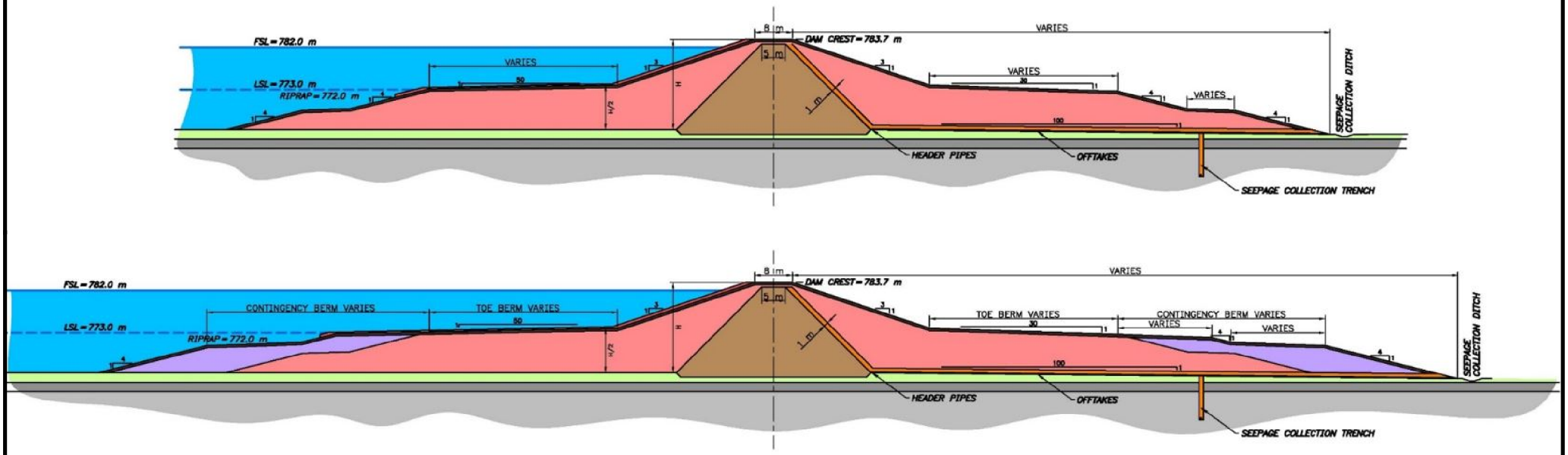
EID

Dam Location and Berm Heights

March 2025

REF.: AARES21-127
(ProjectDescription)

Figure 2A-3



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Approved:	LC	*Revision:*	0
Route Source:		*Date:* Oct 8, 2024	
KML		*Revision:*	0

Data Sources:
Thurber Engineering,
provided to MPE Engineering
(a division of Englobe) on
behalf of Eastern Irrigation District

AAR Environmental Services

THURBER

Legend

- CORE
- SHELL
- RIPRAP
- FILTER
- COVER
- CONTINGENCY BERM
- RESERVOIR
- CLAY (TILL)
- WEATHERED CLAY SHALE
- CLAY SHALE

DRAFT

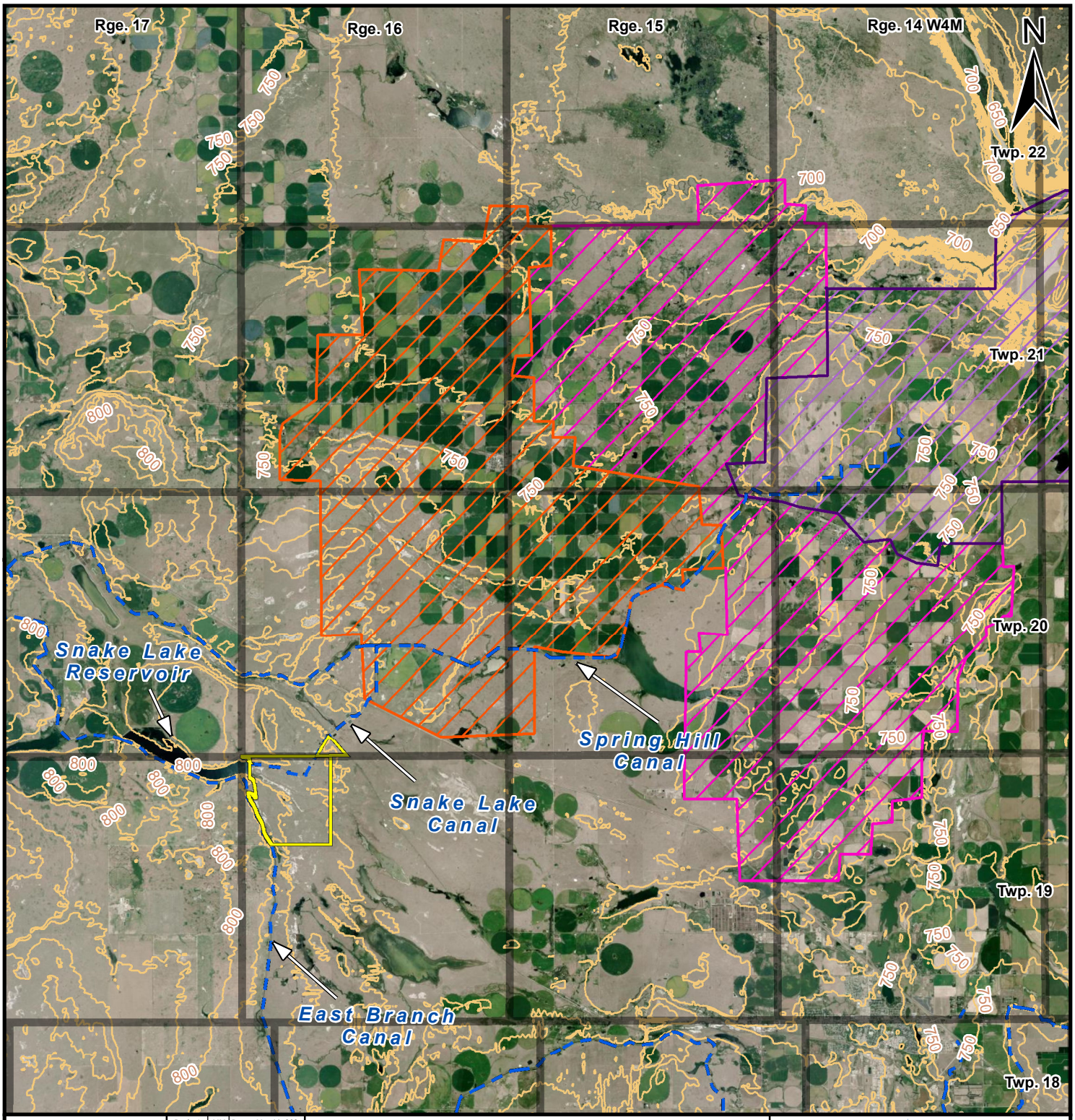
EID

Snake Lake Reservoir Expansion - Conceptual Dam Design

March 2025

REF.: AARES 21-127
(ProjectDescription)

Figure 2A-4



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Approved:	WB	Revision:	0
Route Source:		Date:	Feb 18, 2022
CAD Survey		Revision:	0

Data Sources:
Imagery Reference: ESRI 2021/07/10
ATS Grid: AltaLIS 2007

AAR Environmental Services

Please contact AARES for all other sources.

Please note that the imagery is from 2021 and although we have no reason to doubt the accuracy and completeness of it, users should be aware that discrepancies may be present

Legend

- Snake Lake Reservoir Expansion Project Area
- Water Operator Area 04 Rosemary
- Water Operator Area 06 Duchess
- Water Operator Area 04 North Duchess/Steveville
- Canal
- 10m Contour

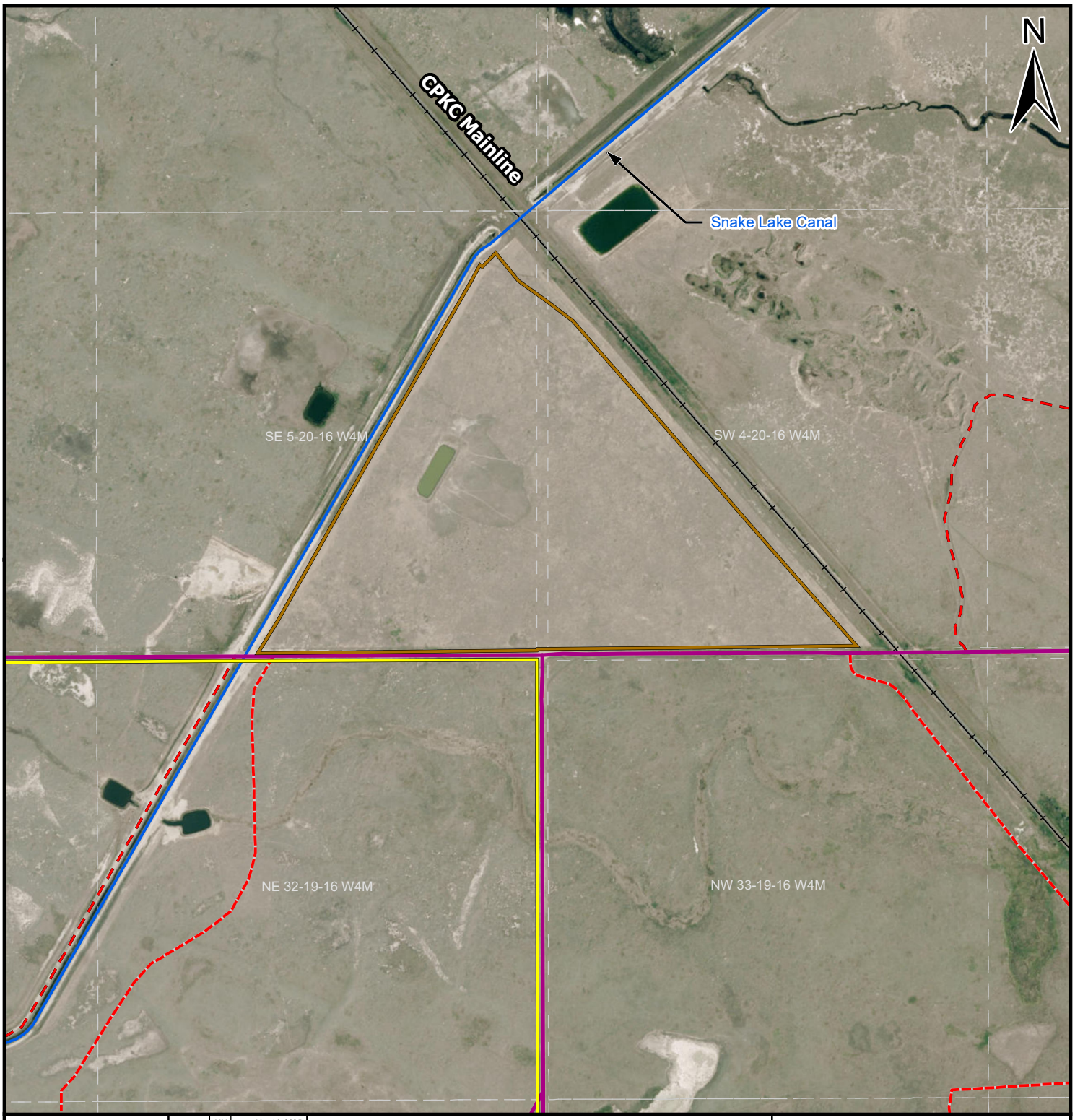
EID

Estimated Irrigation Servicing Area Downstream of Snake Lake Reservoir

March 2025

REF.: AARES21-127 (ProjectDescription)

Figure 2A-5



SCALE: 1:10,000

80 0 80 160 M

Drafted:	MM	Date: Mar 14, 2025	
Approved:	WB	Revision:	0
Route Source:		Date: Feb 18, 2022	
CAD Survey		Revision:	0

Data Sources:
Imagery Reference: ESRI 2021/07/10
ATS Grid: AltaLIS 2007

AAR Environmental Services

Please contact AARES for all other sources.

Please note that the imagery is from 2021 and although we have no reason to doubt the accuracy and completeness of it, users should be aware that discrepancies may be present

Legend

- Topsoil Storage Area
- Proposed Snake Lake Reservoir Expansion Area
- County Gravel Road
- Trail
- Railway
- Canal

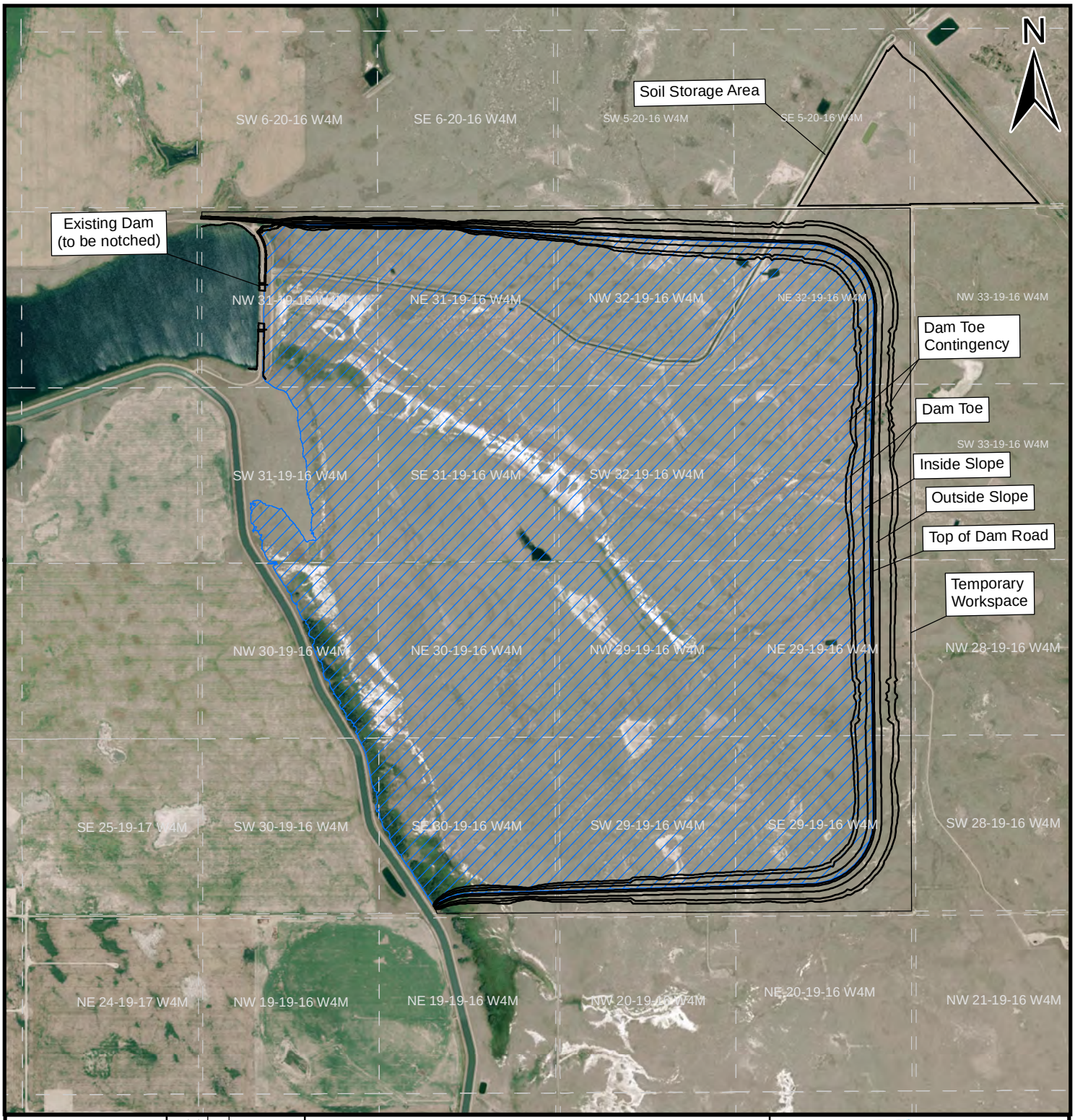
EID

Temporary Topsoil Storage Area

March 2025

REF.: AARES21-127
(ProjectDescription)

Figure 2A-6



SCALE: 1:25,000

150 0 150 300 M

Drafted:	JNB	Date:	Mar 14, 2025
Approved:	WB	Revision:	0
Route Source:		Date:	Feb 18, 2022
CAD Survey		Revision:	0

Data Sources:
Imagery Reference: ESRI 2021/07/10
ATS Grid: AltaLIS 2007

AAR Environmental Services

Please contact AARES for all other sources.

Please note that the imagery is from 2021 and although we have no reason to doubt the accuracy and completeness of it, users should be aware that discrepancies may be present

Legend

- Design Feature
- Inundated Area

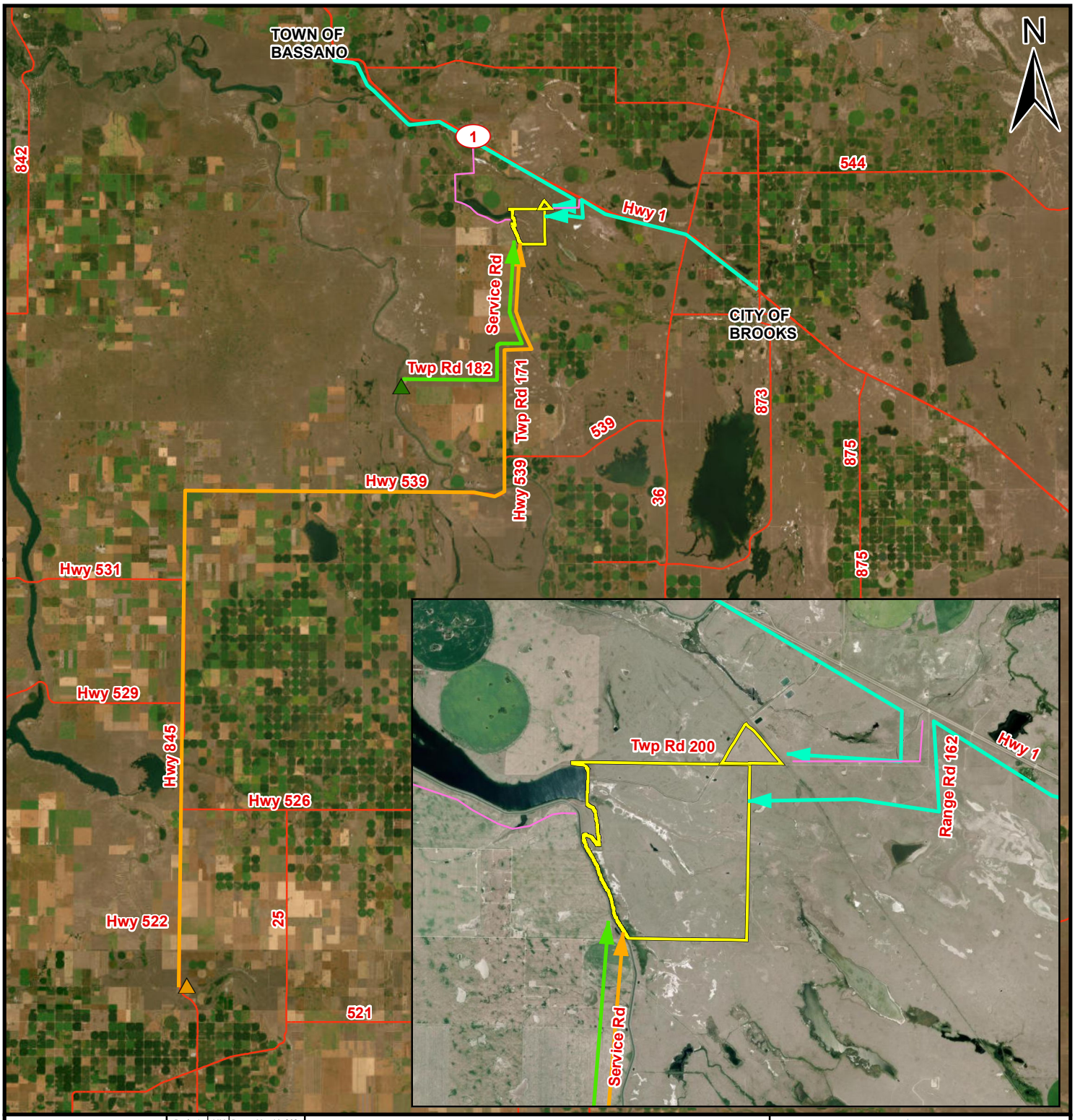
EID

Conceptual Construction Plan

March 2025

REF.: AARES21-127
(ProjectDescription)

Figure 2A-7



SCALE: 1:500,000

4 0 4 8 Km

Drafted:	MM	Date:	Mar 14, 2025
Approved:	WB	Revision:	0
Route Source:		Date:	Feb 18, 2022
CAD Survey		Revision:	0

Data Sources:
Imagery Reference: ESRI 2021/07/10
ATS Grid: AltaLIS 2007

AAR Environmental Services

Please contact AARES for all other sources.

Please note that the imagery is from 2021 and although we have no reason to doubt the accuracy and completeness of it, users should be aware that discrepancies may be present

Legend

- Snake Lake Reservoir Expansion Project Area
- Eyremore Pit Location
- Dennis Dirtworx Pit Location
- Roadway Network
- Truck Traffic from EID Eyremore Pit (28 Km)
- Staff Traffic from Brooks and Bassano (28-30 Km)
- Truck Traffic from Dennis Dirtworx Pit (105 Km)
- Primary Route

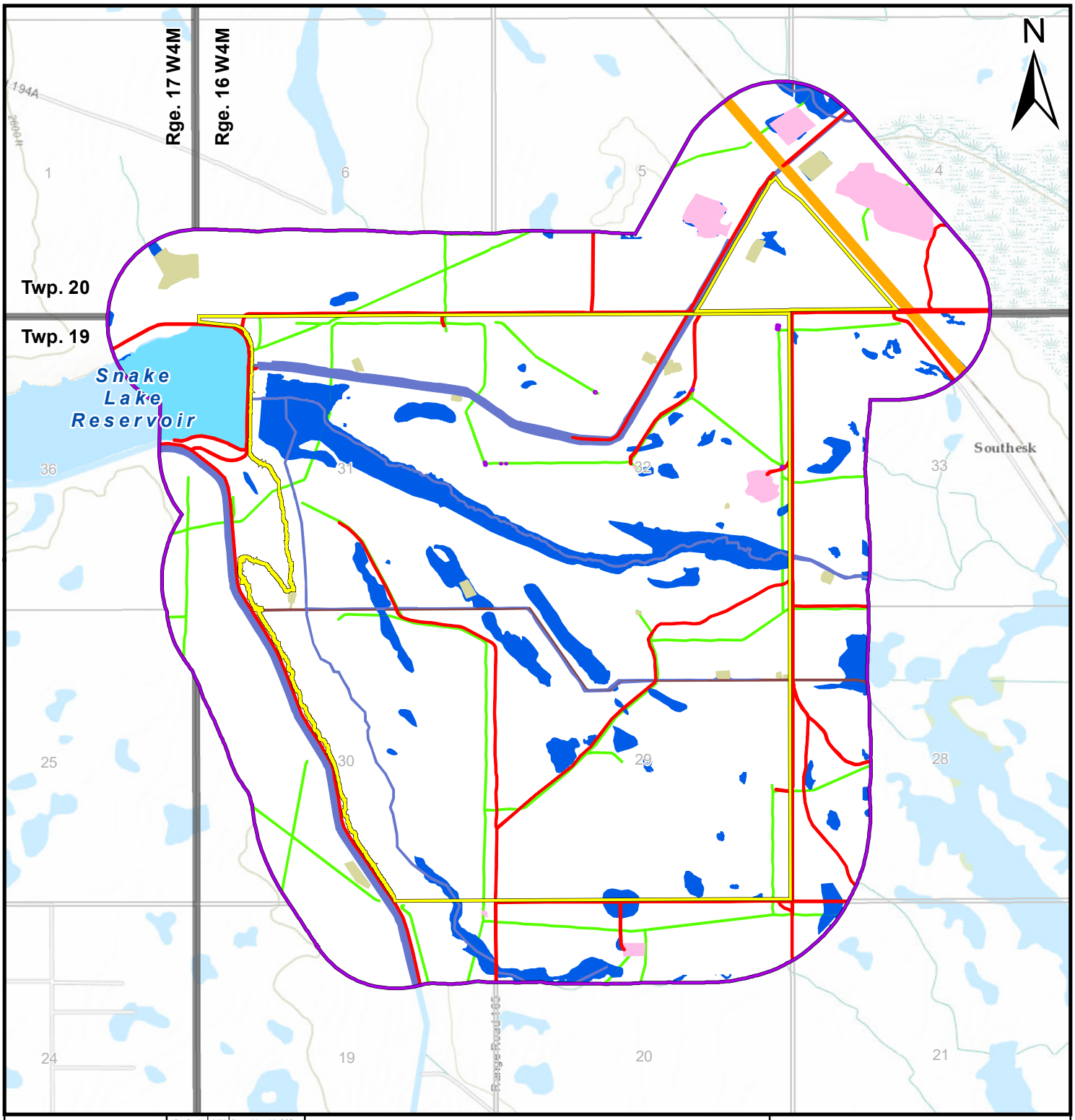
EID

Shipping and Commuting Travel Routes to the Snake Lake Expansion Project

March 2025

REF.: AARES21-127
(ProjectDescription)

Figure 2A-8



SCALE: 1:30,000

200 0 200 400 M

Drafted:	MM	Date:	Mar 14, 2025
Approved:	WB	Revision:	0
Route Source:		Date:	Feb 18, 2022
CAD Survey		Revision:	0

Data Sources:
ESRI World Topographic Map
ATS Grid: AltaLIS 2007.

AAR Environmental Services

Please contact AARES for all other sources.

Please note that the topographic map is from 2010 (NRCAN) and although we have no reason to doubt the accuracy and completeness of it, users should be aware discrepancies may be present.

Legend

Routing:

- Proposed Reservoir Expansion Project Area
- Terrestrial Local Study Area
- Background Water
- Waterbody

Disturbance Type:

- Canal
- Railway
- Ditch
- Reservoir
- Dugout
- Trail, Road
- Industrial, Gravel Pit, Reclaimed Wellsite
- Wellsite
- Pipeline

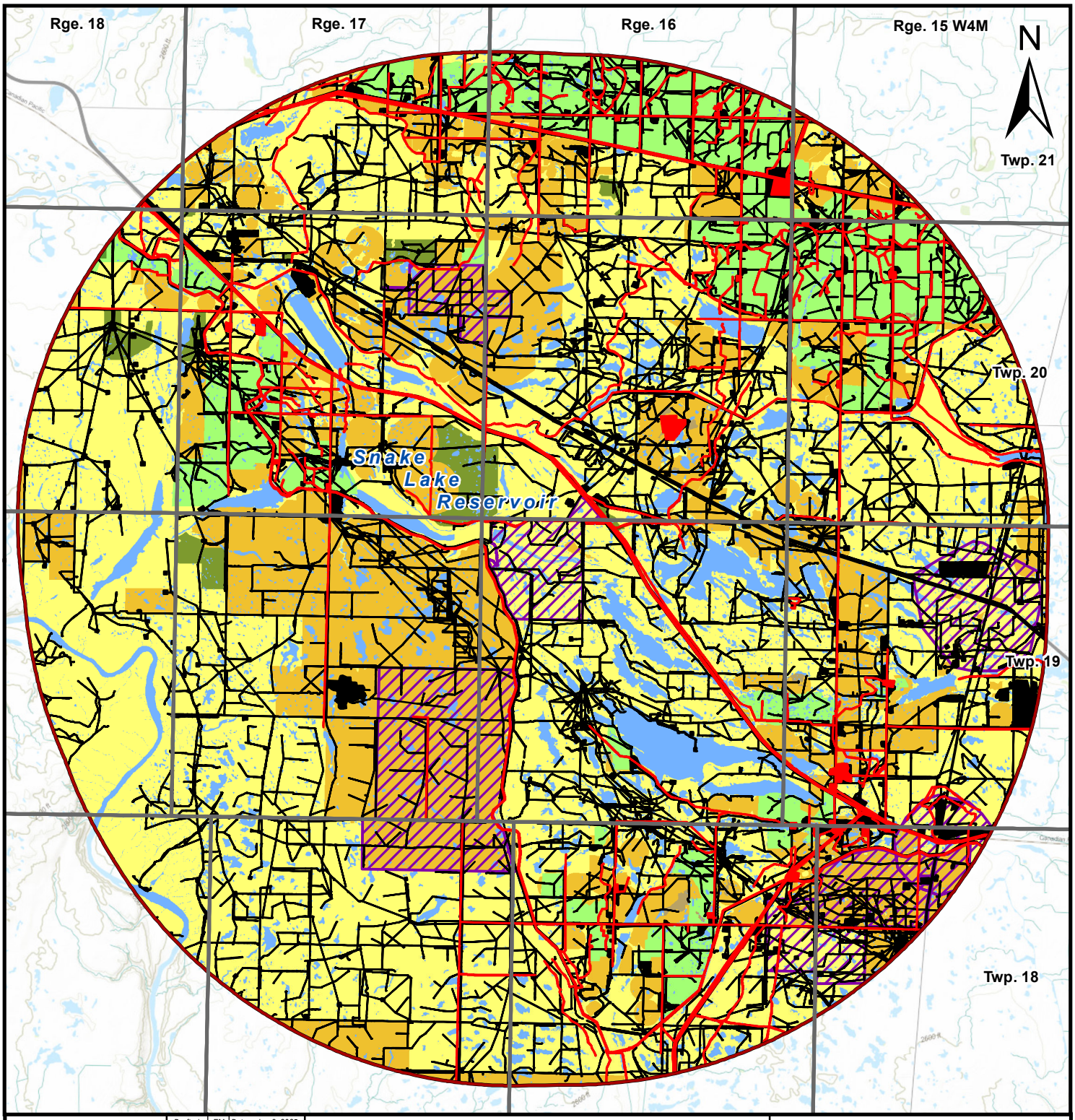
EID

Terrestrial Local Study Area Baseline Disturbance

March 2025

REF.: AARES21-127
(Project Description)

Figure 2A-9



SCALE: 1:175,000
Km
1 0 1 2

Drafted:	EM	Date:	Jan 8, 2025
Approved:	SJ	Revision:	00
Route Source:		Date:	Feb 18, 2022
CAD Survey		Revision:	0

Data Sources:
ESRI World Topographic Map
ATS Grid: AltaLIS 2007.

AAR Environmental Services

Please contact AARES for all other sources.

Please note that the topographic map is from 2010 (NRCAN) and although we have no reason to doubt the accuracy and completeness of it, users should be aware discrepancies may be present.

Legend

- Terrestrial Regional Study Area
- Grassland/Pasture in 1950
- Water as of 1950
- Linear Disturbance as of 1950
- Land for Agriculture as of 1950
- Linear Disturbance Added as of 2012
- Cleared Land for Agriculture as of 2012
- Cleared Land for Agriculture as of 2021
- Future Disturbance (CEA)

EID

Land Clearing Over Time in the Terrestrial Regional Study Area

March 2025

REF.: AARES21-127
(ProjectDescription)

Figure 2A-10

Attachment 2B: Regulatory Approvals and Communications

Attachment 2B-1: Environmental Impact Assessment Requirement Letter – Alberta EPA

Environment and Parks

Regulatory Assurance Division
Approvals Unit
2nd Floor, Petroleum Plaza, South Tower
9915 – 108 Street
Edmonton, Alberta T5K 2G8
Canada
Telephone: 780-427-5828
http://www.ea.alberta.ca

May 18, 2022

Ryan Gagley, P.L.Eng.
Engineering Manager
Eastern Irrigation District
550 Industrial Road West
P.O. Box 128
Brooks, AB T1R 1B2

Dear Mr. Gagley:

Further to your e-mail of April 29, 2022, I wish to advise you that the proposed Snake Lake Reservoir Expansion Project is a mandatory activity pursuant to Schedule 1(c) and 1(e) of the *Environmental Assessment (Mandatory and Exempted Activities) Regulation*. Eastern Irrigation District is required, pursuant to Section 44(1)(a) of the *Environmental Protection and Enhancement Act* (EPEA), to prepare and submit an Environmental Impact Assessment (EIA) report for this project. The EIA report is to be prepared in accordance with the provisions of Division 1 of Part 2 of EPEA.

If you have any questions or require further direction about the Environmental Assessment process, please contact Meghan Jurijew at 780-643-6853.

At this time I would recommend you contact the Impact Assessment Agency of Canada (IAAC) (pnr-rpn@iaac-aeic.gc.ca) to discuss the potential submission of a federal project description and any federal environmental assessment requirements under the *Impact Assessment Act.* I would also encourage you to contact Laura Friend (laura.friend@nrcb.ca or 403-297-8269) of the Natural Resources Conservation Board (NRCB) to discuss any potential application requirements they may have.

Eastern Irrigation District should also note that The Government of Alberta's Proponent Guide to First Nations and Metis Settlements consultation procedures may apply to this project and accordingly, Eastern Irrigation District may be required to submit a Consultation Plan to the Aboriginal Consultation Office of Indigenous Relations. For more information about the First Nations or Metis Settlement consultation process please contact Amanda Tangedal (amanda.tangedal@gov.ab.ca).

Sincerely,

Corinne Kristensen
Director, Regulatory Assurance Section
Environment and Parks
(Designated Director, *Environmental Protection and Enhancement Act*)

cc: L. Friend (NRCB)
pnr-rpn@iaac-aeic.gc.ca (IAAC)
D. Lok (AEP)
Historica.LUP@gov.ab.ca (CMSW)
A. Tangedal (IR)
M. Daneluk (AEP)

Attachment 2B-2: Decision Letter from Impact Assessment Agency of Canada

Impact Assessment Agency of Canada | Agence d'évaluation d'impact du Canada

Prairie and Northern Region
Canada Place
Suite 1145, 9700 Jasper Avenue
Edmonton, Alberta T5J 4C3

Région des Prairies et du Nord
Place Canada
Pièce 1145, 9700 rue Jasper
Edmonton (Alberta) T5J 4C3

September 21, 2022

ELECTRONIC MAIL

Ivan Friesen
Eastern Irrigation District
550 Industrial Road West,
Brooks, AB T1R 1B2
403-362-1400
eid@eid.ca; ivan.friesen@eid.ca

Dear Ivan Friesen,

On April 12, 2022, the Minister of Environment and Climate Change (the Minister) received a request to designate the proposed Snake Lake Reservoir Expansion Project (the Project) under subsection 9(1) of the *Impact Assessment Act*.

On September 21, 2022, the Minister decided that the Project does not warrant designation. In making the decision, the Minister took into consideration the information provided by Eastern Irrigation District, advice from federal authorities, input from Alberta Environment and Parks, concerns expressed in the requester's letter, and the concerns from Indigenous groups and the public that are known to the Impact Assessment Agency of Canada (the Agency).

The Minister's response to the request, with reasons, and the Agency's Analysis Report, are available on the Canadian Impact Assessment Registry Internet site (Reference number 83566): https://iaac-aeic.gc.ca/050/evaluations/proj/83566 .

Further questions can be directed to Andrew Clarke at 587-341-3290 or by email at Andrew.Clarke@iaac-aeic.gc.ca.

Sincerely,

<transmitted electronically>

Sean Carriere
Regional Director, Prairie and Northern Region

Attachment 2B-3: File Number for Consultation Decision Letter – Alberta EPA

Approvals Unit
Regulatory Assurance
Regulatory Programs
2nd Floor, South Petroleum Plaza
9915 108 Street NW
Edmonton, Alberta T5K 2G8
Canada
Telephone: 780-427-5828
www.alberta.ca

September 26, 2022 File Number for Consultation: FNC202251256

Ryan Gagley, P.L. Eng.
Engineering Manager
Eastern Irrigation District
Via e-mail: ryan.gagley@eid.ca

Dear: Mr. Gagley

Re: Pre-Consultation Assessment Decision – Eastern Irrigation District – Snake Lake Reservoir Expansion

In accordance with the Government of Alberta's *Policy on Consultation with First Nations on Land and Natural Resource Management* (2013) and the Government of Alberta's *Guidelines on Consultation with First Nations on Land and Natural Resource Management* (2014), Alberta Environment and Parks (AEP) has reviewed this file and the Pre-Consultation Assessment request provided by Eastern Irrigation District regarding their proposed project.

Based on the information provided, AEP has determined no consultation is required for the Water Act approval as applied for under FNC202251256, or the environmental impact assessment report.

If new information becomes available regarding the approval required under the *Water Act* and there are changes to scope, scale, duration and intensity a new Pre-Consultation Assessment may be required.

This decision pertains only to the approvals under the *Water Act*. If additional approvals are required another Pre-Consultation Assessment may need to be completed.

Should you have any questions, please contact me at 780-644-4983 or via email at Lori.Havanka@gov.ab.ca.

Sincerely,

Lori Havanka
Approvals Program Manager
Approvals Unit, Regulator Assurance Section
Alberta Environment and Parks

cc: Tanner Philipps, MPE Engineering Ltd., tphilipps@mpe.ca
Wayne Bessie, Senior Terrestrial Ecologist, Wetland Authenticator, AAR Environmental Services, wbessie@aares.ca
Kathleen Perchaluk, Consultation Advisor, Aboriginal Consultation Office, Kathleen.Perchaluk@gov.ab.ca

Attachment 2B-4: Signed *Historical Resources Act* Approval with Conditions

Alberta

HRA Number: 4825-21-0010-003
January 24, 2025

Historical Resources Act Approval with Conditions

Proponent: Eastern Irrigation District
550 Industrial Road W, Brooks, AB T1R 1B2
Contact: Ryan Gagley

Agent: AAR Environmental Services
Contact: Devin Hill

Project Name: **Snake Lake Reservoir Expansion Project**

Project Components: Reservoir
Dam
Other - Outfall structure

Application Purpose: Requesting HRA Approval / Requirements

Historical Resources Act approval is granted for the activities described in this application and its attached plan(s)/sketch(es) subject to the following conditions.

David Link
Assistant Deputy Minister
Heritage Division
Alberta Arts, Culture and Status of Women

SCHEDULE OF CONDITIONS

ARCHAEOLOGICAL RESOURCES

There are no *Historical Resources Act* requirements associated with archaeological resources; however, the proponent must comply with Standard Requirements under the *Historical Resources Act*: Reporting the Discovery of Historic Resources, which are applicable to all land surface disturbance activities in the Province.

1. *Historical Resources Act* approval is granted for this project relative to archaeological resources based on the results of Historic Resources Impact Assessment studies carried out by AAR Environmental Services under Archaeological Research Permit no. 22-065.

2. This *Historical Resources Act* Approval applies only to development areas evaluated under Archaeological Research Permits 21-73 and 22-065, as illustrated in the attached map entitled "MPE Engineering Ltd., Eastern Irrigation District, Snake Lake Reservoir, Reservoir Expansion, Site Plan" (Figure 3, project 1560-176-00) dated April 2018.

SCHEDULE OF CONDITIONS (continued)

3. This correspondence acknowledges that with the exception of archaeological sites EdPb-28 and EdPb-39, *Historical Resources Act* Approval was granted to all other portions of the development footprint under correspondence HRA #4825-21-0010-002 (May 13, 2022).

   As the result of the *Historical Resources Act* Approval with Conditions issued under HRA #4825-21-0010-002, no further investigation was required for sites EdPb-20, EdPb-24, EdPb-25, EdPb-26, EdPb-27, EdPb-29, EdPb-30, EdPb-31, EdPb-32, EdPb-33, EdPb-34, EdPb-35, EdPb-36, EdPb-37, EdPb-38, EdPb-40, EdPb-41, EdPb-42, EdPb-43, EdPb-44 and EdPb-45.

4. Based on the result of the investigation that was conducted for the project under Permit 22-065, the remaining requirements for sites EdPb-28 and EdPb-39 have been addressed. *Historical Resources Act* Approval is now granted to this project, and development may proceed as planned without further concern for archaeological resources.

5. Site-specific conditions and approvals for the remaining sites in the project area are as follows:

SITE	HRV	SITE DESCRIPTION	CONDITIONS/APPROVAL
EdPb-28	0	scatter <10, stone feature	There are no further *Historical Resources Act* requirements for this site relative to current and future projects. Development may proceed in the area of this site.
EdPb-39	0	campsite, stone feature	There are no further *Historical Resources Act* requirements for this site relative to current and future projects. Development may proceed in the area of this site.

PALAEONTOLOGICAL RESOURCES

Conditional *Historical Resources Act* approval is granted on the understanding that a Historic Resources Impact Assessment for palaeontological resources in the form of a monitoring program will be conducted, as outlined below.

1. The following *Historical Resources Act* conditions are based on the results of Historic Resources Impact Assessment studies carried out by Aeon Paleontological Consulting Ltd. under Palaeontological Research Permit No. 21-066.

2. The monitoring program is required for the following locations:

   a. Excavation activities and grade cuts along the eastern and northeastern areas of the proposed dam footprint. Both Quaternary and bedrock deposits have a high potential to yield significant palaeontological resources in this area.

   b. Excavation activities impacting Bearpaw Formation shale in Area 2.

3. No excavation activities, as described above, are to take place on the project until a professional consulting palaeontologist is on site to monitor construction activities. Should significant palaeontological resources be encountered during the conduct of the monitoring program, the Royal Tyrrell Museum of Palaeontology must be contacted. It may then be necessary for Alberta Arts, Culture and Status of Women to issue further instructions regarding these resources.

SCHEDULE OF CONDITIONS (continued)

4. The Historic Resources Impact Assessment for palaeontological resources is to be conducted on behalf of the proponent by a palaeontologist qualified to hold a palaeontological research permit within the Province of Alberta. A permit must be issued by Alberta Arts, Culture and Status of Women prior to the initiation of any palaeontological field investigations. Please allow ten working days for the permit application to be processed. To obtain contact information for consultants qualified to undertake this work, please consult the list of Alberta Historic Resource Consultants.

INDIGENOUS TRADITIONAL USE SITES

There are no *Historical Resources Act* requirements associated with Indigenous traditional use sites of a historic resource nature; however, the proponent must comply with Standard Requirements under the Historical Resources Act: Reporting the Discovery of Historic Resources, which are applicable to all land surface disturbance activities in the Province.

HISTORIC STRUCTURES

There are no *Historical Resources Act* requirements associated with historic structures; however, the proponent must comply with Standard Requirements under the *Historical Resources Act*: Reporting the Discovery of Historic Resources, which are applicable to all land surface disturbance activities in the Province.

PROVINCIALLY DESIGNATED HISTORIC RESOURCES

There are no *Historical Resources Act* requirements associated with Provincially Designated Historic Resources; however, the proponent must comply with Standard Requirements under the *Historical Resources Act*: Reporting the Discovery of Historic Resources, which are applicable to all land surface disturbance activities in the Province.

ADDITIONAL COMMENTS

1. In addition to any specific conditions detailed above, the proponent must abide by all Standard Conditions under the *Historical Resources Act*.

Proposed Development Location:

MER	RGE	TWP	SEC	LSD List
4	16	19	30	1-2,6-11,13-16
4	16	19	29,31-32	1-16

Documents Attached:

Document Name	Document Type
Preliminary Sketch Plan	Illustrative Material

Attachment 2C: Tables

Table 2C-1: Key Provincial Regulations affecting the Snake Lake Reservoir Expansion

Policy or Regulation	Applicable Section (s)	Applicable Activities	Responsible Agency	Status	Project Components
Alberta Wetland Policy	Vegetation and Wetlands	The Alberta Wetland Policy was developed to protect wetlands and their benefits as part of the planning and regulatory approval process. The policy requires that impacts to wetlands be approved after considering avoidance, minimization, and replacement options. Wetland Policy is enforced through the *Water Act.*	Alberta EPA	Approval will be sought as part of a *Water Act* application for Wetland Disturbance.	Construction and Operations
Dangerous Goods Transportation and Handling Act	Dam Safety, Health and Safety	This Act addresses safe transportation and handling of products, substances, and organisms. The Minister of Transportation is granted the authority to issue permits, stop orders, designate inspectors, and address incidents related to health, public safety, property and environmental damage.	Ministry of Transportation	Permit applications will be completed as needed for transport or use of dangerous goods.	Construction
Environmental Code of Practice for Pesticides (under EPEA)	Vegetation and Wetlands; Wildlife	Provides requirements for the safe handling, use, and application of pesticides for industrial vegetation management, pest control, and use of pesticides near open water.	Alberta EPA	No approvals required. EID will ensure pesticide use follows the code.	Construction, Reclamation Operations
Pesticide (Ministerial) Regulation (Under EPEA)	Vegetation and Wetlands; Wildlife	Outlines regulatory requirements for pesticide applicators and classifies pesticides into Schedules. See "Environmental Code of Practice for Pesticides".	Alberta EPA	EID will ensure pesticide use is overseen by a certified applicator and records maintained on all pesticides used on site.	Construction, Reclamation Operations
Environmental Assessment Regulation (Under EPEA)	All Sections	Outlines the notification requirements and stipulations between the Director, proponent, and the public. Provides rules, provisions, and stipulations for formal Project examination to determine the potential environmental and socio-economic implications of a proposed Project.	Alberta EPA & Natural Resources Conservation Board	The EIA is in progress.	Planning, Construction and Operations
Conservation and Reclamation Regulation (Under EPEA)	Conservation and Reclamation	Provides guidance for conserving and reclaiming disturbed land and returning to equivalent land capability. Addresses requirements for reclamation certification and registered pits.	Alberta EPA	Reclamation activities will be incorporated into the construction plan for the reservoir. The regulation will not be applicable beyond construction.	Construction
Activities Designation Regulation (Under EPEA)	Wildlife, wetlands, aquatic ecology	Identifies activities affecting the environment which require approval, registration, or notifications.	Alberta EPA	Activity triggered EIA.	Construction, operation, filling
Environmental Protection and Enhancement Act (EPEA)	All Sections	Manages regulatory requirements for air, water, land, and biodiversity. The Act supports and promotes the environmental protection, enhancement, and wise use by designating proposed activities requiring approval or registration.	Alberta EPA	Provides requirements and direction for the EIA through the Guide to Preparing Environmental Assessment Reports in Alberta.	All Project components
Fisheries Act	Aquatic Ecology	Provincial Fish Research Licence Application is required to conduct fish rescue activities before and during instream work.	Alberta EPA	Has been active as part of baseline studies and will again be needed prior to fish salvage during reservoir filing.	Planning, Reservoir Filling
Forest and Prairie Protection Act	Health and Safety	Enables the protection of prairies from wildfire. Establishes the fire season, enables cost recovery and fire control orders, and identifies firefighting responsibilities.	Forestry and Parks	A wildfire plan is required in the EIA Safety section.	Construction, Operations
Forest and Prairie Protection	Health and Safety	Outlines precautions and fire hazard reduction pertaining to debris disposal and conducting firefighting operations.	Forestry and Parks	A wildfire plan is required in the EIA Safety section.	Construction,

Policy or Regulation	Applicable Section (s)	Applicable Activities	Responsible Agency	Status	Project Components
(Ministerial) Regulation					operation, filling
General Fisheries (Alberta) Regulation	Aquatic Ecology	Outlines the licenses available (section 2), including research licenses and salvage fishing licenses, and who the licenses are to be used by.	Alberta EPA	included in the fish rescue plan during filling operations.	Planning, Reservoir Filling
Historical Resources Act	Historical Resources	Addresses the use, designation and protection of palaeontological, archaeological, historic/natural sites, and structures/objects). The Act governs research permits and collection use/transport of historic resources. An application for Historical Resources Act Clearance is required prior to land clearing and topsoil stripping. Historical Resources Impact Assessment and may be required. Notification rules for discoveries are in effect.	ACSW	Clearance application has been submitted, along with the Historical Resources Impact Assessment, Historical Resources Impact Mitigation, and of the Paleontological Historical Resources Impact Assessment.	Construction (Stripping and Excavation)
Hunting, Fishing and Trapping Heritage Act	Wildlife, Aquatics Land and Resource Use	Provides persons with the right to hunt, fish, and trap within provisions of the law and includes the Wildlife Act, the Fisheries Act (Canada), the Migratory Birds Convention Act, 1994 (Canada) and the regulations made under those Acts.	Alberta EPA	Will be addressed in the examination of recreation and land use.	Construction and operation
Irrigation Districts Act	Project Description, Socio-economic Assessment, Land and Resource Use Water Management	Enables the establishment of irrigation districts in Alberta. Irrigation districts construct, operate and maintain irrigation works under the Water Act and promote the economic viability of the district.	Agriculture and Irrigation	Several sections are being written to address needs.	All components
Land Stewardship Act	All sections	Development of regional plans providing land-use objectives, including economic, environmental, and social objectives, while respecting private property rights.	Alberta EPA	Has been referenced, no direct involvement in Project.	All components
Alberta Fisheries Regulations	Aquatic ecology, Land Use	Regulates all fishing activities in Alberta. Lists species of game fish, describes fish management zones and restricted activity periods.	Alberta EPA	Referenced in the Aquatics and Land Use reports.	All project components
Aquatic invasive Species Regulations	Aquatic ecology, socio-economic assessment	Designates species as “invasive,” prohibits the importation, possession, transportation, release of invasives and introduction of non-indigenous species.	Fisheries and Oceans Canada	Proper techniques will be written into the mitigation plan for interaction with water.	Filling, Operations
Natural Resources Conservation Board Act	Section 5 Approval of the Project to construct and operate a water management project	The Act establishes the Natural Resources Conservation Board, which conducts public reviews and provides decisions regarding public interest of all non-fossil fuel projects that require an environmental impact assessment. Approval under the Act is required prior to the start of water management projects (Section 5).	NRCB	The NRCB will coordinate with Alberta Environment and Parks, EID, and its consultants to establish the joint terms of reference for the EIA for the Project.	All Project Components
Oil and Gas Conservation Act	Land Use and management, socio-economic assessment	Establishes a regulatory regime administered by the Alberta Energy Regulator for oil and gas development with the goal of maximizing yield, minimizing environmental impact, and involving the public.	Energy and Minerals	Site preparations require removal of all oil and gas infrastructure prior to stripping, clearing and excavation. EID is working with Oil and Gas companies to fund removal of this infrastructure.	Site Preparation and Planning
Agricultural Pests Act	Wildlife and wildlife habitat, soils, vegetation, conservation, and reclamation	Enables the Minister to declare an animal, bird, insect, plant, or disease as a pest/nuisance if it is destroying, harming, or is likely to destroy or harm any land, livestock, or property. Describes the duties of individuals and local authorities to the prevention of and destruction of pests.	Agriculture and Irrigation	Mitigations will be written to ensure equipment does not pose a threat by spreading weeds or invasive species and any invasive species will be captured and removed from the system.	All
Pest and Nuisance Control Regulation	Wildlife and wildlife habitat, soils, vegetation, conservation, and reclamation	Provides a list of declared pests and nuisances in Alberta. Describes the permit process for some pests including rats, and control of nuisances including coyotes and skunks.	Agriculture and Irrigation	Mitigations will be written to ensure equipment does not pose a threat by spreading weeds or invasive species and any invasive species will be captured and removed from the system.	All project components

Policy or Regulation	Applicable Section (s)	Applicable Activities	Responsible Agency	Status	Project Components
	Includes clubroot				
Public Lands Act	Land and Resource Use	Management and access to Crown Land Resources (Disposition, temporary field authorizations) including deep natural waterbodies and all watercourses. This Act, however, does not have jurisdiction over certain types of Crown lands, like Road Allowances, as these have been provided to the Transportation Department or Municipalities and are equivalent to private lands. While the Project occurs on private lands, including a road allowance, there is Crown land in the regional study area, including grazing leases and large water bodies and watercourses. A Wetland Permanence Review submitted to Alberta EPA's Water Boundaries Unit was assessed and no wetlands were found to meet the criteria to be claimed by the Crown as public lands.	Alberta EPA	Not applicable to this application as there are no lands administered by the *Public Lands Act.*	N/A
Soil Conservation Act	Soils and Terrain; Reclamation	Requires measures to prevent soil loss or deterioration or to mitigate these effects.	Alberta EPA	Losses and reclamation are addressed in the Reclamation Plan.	All project components
Traffic Safety Act	Public health and safety, socio-economic impact, transportation infrastructure and traffic impact	Safe design and operations of Alberta highways, including any street, road, sidewalk or bridge that the public is generally entitled or permitted to use, including administration; Transportation Safety Board hearings, reviews and appeals; motor vehicle administration general operation of vehicles, off-highway vehicles; transportation network companies; commercial motor transport; enforcement, rights, remedies and obligations.	Alberta Transportation	Traffic Impact Assessment underway.	Construction and operations
Transportation Act and Municipal Government Act	Control of Roads	Defines road allowances and their governance. Municipalities in Alberta control and manage all municipal roads within their lands and they have authority to open or close a road allowance, as per a Memorandum of Understanding with the Minister of Transportation.	Alberta Transportation	EID is applying for closure of Road Allowances.	N/A
Water Act	Vegetation and Wetlands, Aquatics, Waterbodies, Hydrogeology, Land Use	Activity with the potential to cause an effect to the aquatic environment requires a *Water Act* Approval, with the exception of activities exempted from requiring an Approval in the Water (Ministerial) Regulation. Also includes Wetland disturbance & compensation permitting. Licence to take "small" volumes of water from a surface water body (i.e. water for dust control).	Alberta EPA	*Water Act* Application will not be submitted until the final survey plans are ready.	All Project Components
Water Ministerial Regulation	Dam safety, accidents, and malfunctions	Promotes the safety of dams and canals to prevent loss of life. Pertains to the administration of the *Water Act*, including definitions of relevant terms and activities that can be performed under the *Water Act*.	Alberta EPA	included in the EIA.	Construction, operation, filling
Weed Control Act	Vegetation and Wetlands	Requires landowners or occupants to destroy occurrences of plants listed as prohibited noxious upon discovery and control them to prevent their spread.	Alberta EPA	Mitigations within the EIA for weed control.	All project components
Wildlife Act	Wildlife and wildlife habitat, Land Use	Wildlife species (and their residences) listed on the *Wildlife Act* as endangered or threatened are protected from disturbance and destruction.	Alberta EPA	Wildlife Management plan has been written and will be included in the EIA.	All project components
Wildlife Regulation	Wildlife and wildlife habitat, conservation, and reclamation	The regulation supports the *Wildlife Act* in managing Alberta's wildlife and adds protection for endangered animals. The regulation discusses the identification and categorization of wildlife species, controlled animals, endangered species, and subject animals. Many species of wildlife require permits, including research purposes.	Alberta EPA	Wildlife Management plan has been written and will be included in the EIA.	All project components

Table 2C-2: South Saskatchewan Regional Plan objectives and strategies affected by the Project

Primary Objective	Desired Outcome	Resource or Topic Addressed	Objective	Strategies	Project Relationship
Economy	The region's economy is growing and diversified.	Agriculture	The region's agricultural industry is maintained and diversified.	1.1. Maintain an agricultural land base by reducing the fragmentation and conversion of agricultural land.	• The Project occurs on grazing land and therefore does not affect higher value croplands or irrigated cropland areas. • Grazing agricultural land will be converted to an irrigation reservoir that will support the agricultural economy downstream, maintaining the earnings on these lands and incentivizing protection of these lands • Grazing lands will be further fragmented but access for grazing will be maintained along the county road network and updated dam road system.
				1.2. Support a diverse and innovative irrigated agriculture and agri-food sector.	• The Project supports continued irrigation on 50,000 acres of land downstream. The Project aims implement of Alberta's Irrigation Strategy as discussed in the SSRP. By providing enhanced security, the agri-food sector is also more secure.
		Energy - Petroleum and Natural Gas, Coal and Minerals	Opportunities for the responsible exploration, development and extraction of energy resources are maintained.	1.7 Ensure rules regarding access to energy and processing and transportation of energy resources are clear and ensure economic development opportunities are appropriately considered against other land uses and values.	• Existing energy facilities (wellsites) and transportation pipelines and powerlines are being removed to support development of the Project. This was required as energy facilities in the Project development area were not compatible with the development of a new reservoir.
		Energy- Renewable Energy	Opportunities for the responsible development of the region's renewable energy industry are maintained (support of Alberta's commitment to greener energy) Value-added opportunities that enhance Alberta's industries and communities.	None apply	• Future development of solar energy may be considered on reservoir lands.
		Corridors for the Co-location of Linear Infrastructure	N/A	1.12 Ensure that opportunities for future routes and siting for pipeline gateways, transportation corridors and utility and electrical transmission corridors are maintained in the region.	• The Project will not affect routing of existing transportation corridors. These corridors would also be logical choices for locating energy transmission facilities.
		Forestry	The region's forest industry is maintained and diversified.	None apply	• N/A – Not a forest region
		Surface Materials (aggregates)	Opportunities for the responsible development of surface materials resources are maintained on public lands.	None apply	• N/A – No public lands where aggregate sources would be developed near the Project
		Tourism	The region is positioned as a world-class, year-round- tourism destination	1.20 Work with municipalities, private investors and landowners to identify areas of high value for recreation and tourism and to encourage tourism investment and infrastructure development opportunities.	• The expanded SLR will be available for recreational land and water uses. Although there are no current plans to expand the recreation facilities at this site, future development may be considered in consultation with Newell County and private investors
Air	Air quality is managed to support healthy ecosystems and human needs through shared stewardship	Air Quality	Releases from various point and non-point sources are managed so they do not collectively result in unacceptable air quality	2.1 Implement the South Saskatchewan Region Air Quality Management Framework	• The assessment of air emissions associated with Project construction will align with the South Saskatchewan Region Air Quality Management Framework, including examination of triggers and limits
				2.3 Encourage municipalities, industry and the public to be proactive in addressing air quality issues through voluntary programs and initiatives to address emissions sources such as transportation	• Development of the Project will consider several initiatives to reduce emissions including ensuring vehicles are fully maintained, consider use of low emission fuels and biofuels, reducing idling time of equipment by shutting-off equipment when not in use for longer than 30 minutes, and maintaining fuel on site so equipment need not be sent to the nearest town for refuelling.
Biodiversity and Ecosystems	Biodiversity and ecosystem function are sustained with shared	Integrated Management of Crown Land: Management Intent for Green Area and White Area Public Land;	No objectives set	No strategies set	• As this Project will occur on private land there is no direct interaction with management of public lands, but EID would be willing to participate and support any initiatives such as the intended Biodiversity Management Framework, addressing connectivity of landscape areas, landscape conservation, addressing cumulative effects, and effects of invasive species.

Primary Objective	Desired Outcome	Resource or Topic Addressed	Objective	Strategies	Project Relationship
	stewardship – Conserving and Maintaining the Benefits of Biodiversity	Management Approaches on Green Area and White Area Public Land	No objectives set	No strategies set	• As this Project will occur on private land there is no direct interaction with management of public lands, but EID would be willing to participate and support enhanced management of land disturbance and focussing on areas of sensitive terrestrial and aquatic habitat and areas promoting connectivity. This Project has incorporated a plan to restore native grassland habitat and to use this to develop and learn the process of restoration that could be applied in future project areas. In addition, the Project is being designed to address interactions with species at risk.
		Conservation Areas;	No objectives set	No strategies set	• Not applicable
		Management Intent and Land Uses in Conservation Areas;	No objectives set	No strategies set	• Not applicable
		Partnerships	No objectives set	No strategies set	• EID will continue to be a partner with the Government of Alberta in managing public and crown land, including for conservation
		Stewardship and Conservation on Private Lands	No objectives set	No strategies set	• The Project will include management of environmental effects on wildlife, vegetation, soils and aquatic resources to meet conservation objectives.
		Biodiversity and Ecosystems - Integrated management of Crown land and private lands	Regional Objectives -terrestrial and aquatic biodiversity are maintained. -long-term ecosystem health and resiliency are maintained. -species at risk are recovered and no new species at risk are designated. -intact grasslands habitat is sustained. -biodiversity and healthy, functioning ecosystems provide benefits to Albertans Crown Land Objectives - additional conservation areas. are established -Private Land Objectives: -landowner stewardship and conservation efforts are recognized. -opportunities to support ecosystem services are identified the ecosystem services value of private lands is identified -the value of ecosystem services on private lands and supplied by economic sectors reliant on private lands is recognized.	3.1 Complete the South Saskatchewan Region Biodiversity Management Framework by the end of 2015	• Although referenced in the SSRP as planned for release in 2015, this document has not been published on the Alberta Government Website. The EID would work with the Government of Alberta to implement this framework of the mutual benefit of both parties.
				3.2.1 Develop landscape management plans to address footprint management on public land.	• Although the Project occurs on private land, this strategy acts as a Best Management Practice (BMP) for footprint management and will be implemented by: - Identify shared values and objectives; - Providing access to resources, while protecting environmental values; - Identifying areas for restoration; - Support regional objectives in the biodiversity management framework (if implemented); - Build on the innovative and collaborative work by regional industries; - Work with Indigenous communities, municipalities, industry stakeholders, non-government organizations and the public to achieve objectives.
				3.4 Review Integrated Resource Plans in the region for their relevance and incorporate as appropriate under this regional plan by the end of 2015.	• The activities of the EID for this Project are guided by the Eastern Irrigation District Integrated Resource Management Strategy
				3.7 Implement guidelines to avoid conversion and maintain intact native grasslands on public land using different guidelines for: -species at risk habitat -Intact native grasslands -Non-intact native grasslands	• Although the Project occurs on private land, this strategy acts as a BMP for native grassland management to be implemented by the Project by restoring disturbed habitat areas on the outside berms and temporary use areas to native grassland Information acquired through the monitoring and assessment of this restoration may be used for implementation on other project areas within the SSRP
				3.10 Continue to work with other governmental agencies, other levels of government, landholders, non-governmental organizations, industry, the research community and other partners within and outside the province to manage risk associated with invasive species.	• Monitoring and mitigation of noxious weeds will be implemented by the Project. EID will continue to monitor and control invasive aquatic plants such as Flowering Rush
			Stewardship and Conservation on Private Land	3.15 Encourage and support the continued stewardship of Alberta's private lands through the development and piloting of regionally appropriate conservation tools; including: voluntary actions of landowners, pilot studies, local authorities and organizations, development of funding mechanisms, and support of sustainable grazing and management practices for sensitive areas	• Regionally appropriate tools for conservation of private lands have been implemented through use of the Native Grassland Restoration Framework, Sensitive Species Inventory Guidelines, and Wetland Directives and other guidance documents in support of the Alberta Wetland Policy. The EID will continue to work with the Government of Alberta on a future iteration of the Southeast Alberta Conservation Offset for native grassland losses

Primary Objective	Desired Outcome	Resource or Topic Addressed	Objective	Strategies	Project Relationship
Water	Watersheds are managed to support healthy ecosystems and human needs through shared stewardship	Surface Water Quality	Surface water quality in the Bow, Oldman, South Saskatchewan and Milk Rivers is managed so current and future water uses are protected	4.1 Implement the South Saskatchewan Region Surface Water Quality Management Framework.	• The assessment of water quality associated with project construction and operations will align with the South Saskatchewan Region Surface Water Quality Management Framework., including examination indicators, triggers, and limits
		Enhanced Integrated Watershed Management	Regional approaches and tools support integrated management of water and aquatic ecosystems	4.2 Develop a comprehensive approach to groundwater management	• Information collected by the Project on groundwater wells and upland interactions will be shared with the province as needed.
				4.3 Continue to support the work of the watershed assessment and planning under the Water for Life strategy, in alignment with regional planning.	• The EID is a major partner in the management of water of the SSRP area. The Project will not require new water sources there will be no change to the management of water in this region of Alberta.
				4.4 Continue to increase knowledge and improve management of wetland areas within the region	• A full wetland assessment as per the Alberta Wetland Policy has been completed and will be used to support a *Water Act* application for the removal of wetlands and the replacement of wetlands under the Permittee Responsible Replacement Program. Information learned through the development and replacement of wetlands within the reservoir will provide knowledge that will be shared with the province and can be broadly implemented throughout the EID
				4.6 Encourage the use of best management practices for land disturbances to minimize sedimentation of water bodies	• Erosion and sediment control plans will be implemented during project construction to prevent effects on offsite wetlands and other waterbodies
				4.9 Encourage decision-makers and land managers to use available planning information, riparian and wetland mapping, environmentally significant areas mapping and groundwater vulnerability mapping.	• Planning information including government databases and aerial photography assessment were used in the initial examination of Project Effects
		Efficient and Resilient Water Supply	Water is used as efficiently as possible to meet the current and future human and ecosystem needs and develop resiliency in the water management system to adapt to change	4.10 Continue to develop an optimized water management system in the region, supported by water supply studies, adaptation projects, and assessment of storage options to improve protection of the aquatic environment, guide development of water storage projects and mitigate the effects of climate change.	• Water management in the EID is described in this assessment. The Project does not require the use of new water resources. Improvements in water storage for climate resiliency is the focus of this Project.

				4.11 Continue to work towards the targets set within the Water for Life strategy with all sectors demonstrating best management practices to reach overall water efficiency and productivity improvements.	• A review of water transportation and on-farm use efficiency is included as part of the Project assessment
					• The water for life strategy contains the following outcomes:
					  • Safe, secure drinking water supply
					  • Healthy aquatic ecosystems
					  • Reliable, quality water supplies for a sustainable economy

				4.12 Continue to develop approaches to address the climate variability including: -Support flood management (mapping and mitigations) -Support drought management and preparedness -Further develop climate adaptation tools and initiatives	• This Project intends to provide additional drought resiliency within the EID
		Headwaters	Headwaters in the region are managed to maintain recharge capabilities and support critical water quality, quantity and aquatic ecosystem requirements	4.15 Review existing water conservation objectives for headwaters tributaries in support of the Approved Water Management Plan for the South Saskatchewan River Basin	• Targets for waterflow (Instream Objectives) have been established as 11.3 m^3/s. This target is maintained by the EID and will not be affected by the Project. Headwaters tributaries are not affected by the Project.

Primary Objective	Desired Outcome	Resource or Topic Addressed	Objective	Strategies	Project Relationship
Efficient Use of Land	Lands are efficiently used to minimize the amount of area taken up by the built environment	Use Land Efficiently	The amount of land that is required for development of the built environment is minimized over time	5.1 Land-use planners and decision-makers are encouraged to consider the efficient use of land, including: -Reduced rate of land conversion -Use the minimum land required -Preferential development of disturbed lands -Develop to best use existing infrastructure -Reclaiming previously developed lands that are no longer required	• The Project will require land use conversion, resulting in negative effects on the total available natural land. However, in keeping with the objective and strategy for the efficient use of land, the Project has been designed to use the minimum land required and to avoid disturbance of land areas used as temporary topsoil storage areas. Much of the temporary land area and substantial portions of the Project area were subject to past disturbance and fragmentation effects including canal infrastructure, pipelines, wellsites, and other infrastructure. Additionally. All lands that will remain as uplands will be repurposed as usable roadways or reclaimed to native grasslands.
Outdoor Recreation and Historic Resources	Enhanced quality of life through outdoor recreation and preservation of the region's natural heritage	Public Lands	Management Intent and Land Uses in Provincial Parks and Provincial Recreation Areas	No strategies – but the intent is to follow these strategic directions	• Lands developed for the Project will have public access as per EID's public land use policy.
			Recreation on Green Area Public Land	No strategies – but the intent is to follow these strategic directions	• The Project will improve safety for recreational users; and will require ongoing maintenance to reduce environmental damages in the developed reservoir area.
		Outdoor Recreation and Historic Resources	-Several recreation and tourism opportunities will meet the needs of residents and tourists -Artifacts, fossils, historic places and aboriginal heritage sites are identified and managed	6.4 Maintain and enhance public access to recreational; water bodies	• The Project will provide increased areas for Public recreation for regional residents.
				6.8 Ensure that development activities identify and protect historic resources	• Historic resources have been inventoried through studies of archaeology and paleontology as part of the Historical Resource Impact Assessment Process
				6.14 Manage recreation and parks areas to provide outdoor recreation and nature-based tourism opportunities	• Recreation opportunities in the Project area will be managed as per EID recreation and public use policies
Aboriginal Peoples	Aboriginal peoples are included in land-use planning	Inclusion of Aboriginal Peoples in Land-use Planning	Encourage aboriginal participation in land-use planning and decision making, recognizing aboriginal communities constitutionally protected rights. To help address land-use conflicts, while supporting traditional uses, and the exercise of treaty rights	7.1 In accordance with applicable government policy as it may be from time to time, the Government of Alberta will continue to consult with aboriginal peoples in a meaningful way when decisions may adversely affect the continued exercise of their constitutionally protected rights and the input from such consultations continues to be considered prior to the decision	• A request was submitted to the Alberta Aboriginal Consultation Office (ACO) for a determination whether indigenous consultation would be required for the *Water Act* and EPEA (EIA) Assessment. The ACO responded that consultation is not required for either the *Water Act* or the EIA. However, attempts to engage with the nearby Siksika (Blackfoot) Nation have been initiated via email, however no response has been received. Additionally, through the required draft Terms of Reference notification process, an advertisement for comments was placed in the province-wide Windspeaker Media Internet site; however, no Indigenous groups responded. Therefore, the no Indigenous engagement is being completed.
Community Development	Community development needs are anticipated and accommodated	Planning Cooperation and Integration –	Fostering cooperation and knowledge sharing among communities in land-use planning and decision-making	8.1 Work together to achieve the shared environmental, economic and social outcomes in the South Saskatchewan Regional Plan and minimize negative environmental cumulative effects	• Regional and cooperative initiatives to be undertaken by the EID to address adverse cumulative effects are discussed in the EIA.
				8.2 Address common planning issues, especially where valued natural features and historic resources are of interest to more than one stakeholder and where the possible effect of development transcends jurisdictional boundaries.	• The EIA and other approval processes will require all planning issues, natural features and historical resources to be addressed in a transparent and public process and will provide opportunities to work with common stakeholders as part of the approval process.
				8.3 Coordinate and work with each other in their respective planning activities (such as in the development of plans and policies) and development approval processes to address issues of mutual interest.	• The EIA and other approval processes process will require all planning issues, natural features and historical resources to be addressed in a transparent and public process and will provide opportunities to work with common stakeholders as part of the approval process.
				8.8 Coordinate land-use planning activities with First Nations, irrigation districts, school boards, health authorities and other agencies on areas of mutual interest.	• The EIA and other approval processes will require all planning issues, natural features and historical resources to be addressed in a transparent and public process and will provide opportunities to work with common stakeholders as part of the approval process.

Primary Objective	Desired Outcome	Resource or Topic Addressed	Objective	Strategies	Project Relationship
		Building sustainable communities	Provide information needed to support municipalities to: -promote healthy and sustainable communities -support beneficial and sustainable development - maintain and enhance a healthy natural environment - foster preservation of historic resources - contribute to a safe, efficient and cost-effective transportation network; - minimize risks to health, safety, property	Several strategies for municipalities are provided.	• N/A – these only refer to Municipal requirements