Volume 1, Section 8 Snake Lake Reservoir Expansion Project
Project Description
Wastewater Management

Submitted to:

MPE
a division of Englobe
Lethbridge, Alberta

On behalf of:

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Brooks, Alberta

Submitted by:

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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.

The following document discusses wastewater management based on requirements in the Final Terms of Reference (FTOR) for the Project, covering topics such as relevant Acts and Regulations, types and characteristics of wastewater generated and management strategies.

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Abbreviations

EID	Eastern Irrigation District
EPEA	*Environmental Protection and Enhancement Act*
GOA	Government of Alberta
FTOR	Final Terms of Reference
SLR	Snake Lake Reservoir

8.1 INTRODUCTION

Wastewater refers to contaminated or unusable water after it has been used for industrial, commercial, and or domestic purposes. Wastewater management involves the collection, storage, transport and disposal, or treatment and reuse of wastewater to lessen negative impacts to the environment and public health. The following subsections discuss wastewater and its management as it relates to the proposed Snake Lake Reservoir (SLR) Expansion Project (the Project).

8.1.1 Regulatory

In Alberta, wastewater management is governed by several Acts, Regulations, and guidelines that outline the legal framework for the proper collection and storage of wastewater. The following may be considered, where appropriate (Table 8-1):

Table 8-1: Wastewater management regulations, guidelines, and codes

Authority	Applicable Acts, Regulations, Guidelines and Codes
Government of Alberta	• *Environmental Protection and Enhancement Act* (EPEA; Government of Alberta [GOA], 2023) • *Wastewater and Storm Drainage Regulation* (GOA, 2012) • *Occupational Health and Safety Act* and *Regulations* (GOA, 2021a) • *Release Reporting Regulation* (GOA, 2021b)

8.2 WASTEWATER GENERATED DURING PROJECT STAGES

8.2.1 Types and Characteristics of Wastewater

There are two main sources of wastewater that may be generated by the Project, including domestic wastewater and construction wastewater. Industrial wastewater is not applicable. See examples and characteristics of each type below.

Domestic wastewater:

- Wastewater generated from domestic uses including use of portable toilets, and water use for personal washing and sanitation. This wastewater may contain biological and chemical contaminants.

Construction wastewater:

- Concrete washout may contain hazardous substances. The concrete outlet structure will be located in the North berm and will discharge water from the reservoir to the Snake Lake Canal downstream. This is the only location concrete pours are anticipated.
- Groundwater produced from borrow pit dewatering may contain salts, sediments and other pollutants.
- Stormwater and irrigation runoff from the construction and reclamation surface may be contaminated with natural salts or silt.
- Runoff water from washing vehicle and equipment may contain silt or substances such as oil, detergent, or chemical residues.
- Excess runoff from watering roads and the stripped footprint for dust control may contain sediments, road salt, spilled hydrocarbons, and other deleterious substances present on roads.

8.2.2 Wastewater Management, Treatment and Disposal

As the Project is still in the process of being finalized, exact wastewater types and management options are not confirmed. Below are wastewater management strategies by type of wastewater that may implemented if applicable to the Project.

Domestic wastewater:

- Sewage and other domestic wastewater will be collected in a self-contained portable toilet and self-contained portable wash basins that will be emptied and serviced regularly, with the wastewater trucked to an approved disposal site.

Construction wastewater:

- Concrete washout, if the cement trucks need to be washed out before returning to Brooks. The cement company will be responsible for managing this wastewater. They will ensure that concrete washout wastewater is collected in an appropriate leak-proof washout container with secondary containment. The containers will be kept within a designated area located at least 100 m from any waterbody. The collected wastewater and solids will then be transported off-site to a recycling or disposal facility.
- Construction related dewatering activities:
    - Volume 1, Section 7.3.1.2: Groundwater dewatering may occur during excavation of borrow pits. This water may be stored in a temporary pond and tested for water quality issues prior to release. If the groundwater is higher in salinity than natural water in the meltwater drainage, this water may need to be diluted with reservoir water prior to release or trucked offsite for disposal.
    - Volume 1, Section 11.8: Work areas within the reservoir may require dewatering of pooled precipitation using power pumps. If pumping, the discharge hose will be aimed at materials such as sandbags or rocks overlaying geotextile fabric to diffuse the flow and prevent scour. The discharge location will be monitored for sediment accumulation; onsite personnel will ensure erosion and sediment control measures are maintained and perform as required. Onsite personnel will also ensure hoses and pumps are of sufficient length and capacity to transfer water to the desired location, and ensure all hoses are in good working condition; hoses with tears or ruptures will be repaired or replaced.
    - If water is turbid, water will be pumped to a location where silt can settle naturally.
- Cleaning vehicles and equipment: If equipment or machinery is washed onsite, it should be washed at a designated cleaning station, where water cannot run into a waterbody. The cleaning station would need to be self-contained such that wastewater can be collected and stored for transport to a treatment facility.
- Stormwater and irrigation run-off:
    - See Volume 1, Section 7 for water management in relation to water run-off.
    - See Volume 1, Section 11 for mitigations, management, and monitoring regarding stormwater and irrigation run-off. Attachment 11-11 outlines the Erosion and Sediment Control Plan.
- Watering roads within the stripped footprint for dust control: Dust control measures will be employed when, and where, conditions warrant. On wet and cool days, less watering will likely be needed. Watering will cease or be completed at a lower rate if water pooling or run-off is observed.

8.2.3 Mitigation and Monitoring Measures to Protect Water Quality

No deleterious substances will be stored within 100 m of water. See Volume 1, Section 11.8 regarding the mitigations, management, and monitoring relating to water quality. Wastewater from dewatering activities will be treated via dilution and/or turbidity filtration. Wastewater will not be treated on site, it will be shipped to appropriate facilities and recycled.

8.2.4 Design of Wastewater Facilities

There will be no onsite facilities for treatment of wastewater. Waste generated from portable toilets and washing stations will be collected and stored in temporary holding tanks. As these fill, this water will be trucked to a treatment centre, offsite. No additional discussion about wastewater facilities is required.

8.3 REFERENCES

Government of Alberta (GOA). (2012). *Wastewater and Storm Drainage Regulation*. Accessed March 2025, from: https://kings-printer.alberta.ca/1266.cfm?page=1993_119.cfm&leg_type=Regs&isbncln=9780779768141

GOA. (2021a). *Occupational Health and Safety Regulation.* Edmonton: King's Printer.

GOA. (2021b). *Release Reporting Regulation*. Accessed March 2025. Available at: https://kings-printer.alberta.ca/570.cfm?frm_isbn=9780779826186&search_by=link

GOA. (2023). *Alberta Environmental Protection and Enhancement Act.* Retrieved from: https://kings-printer.alberta.ca/documents/Acts/E12.pdf.