



Inspiring sustainable thinking





ISL Engineering and Land Services Ltd. is an award-winning full-service consulting firm dedicated to working with all levels of government and the private sector to deliver planning and design solutions for transportation, water, and land projects.



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1.0 Background

1.1 Project Overview

The City of Pitt Meadows is proposing to replace a nearly 70 year old Pump Station on the Sturgeon Slough in north eastern Pitt Meadows known as the Pitt Polder Pump Station. The City applied for a 6 million dollar grant to have the station replaced. The grant was approved in late 2017 with the proposed pump station to begin construction in early 2018. The station will be constructed adjacent to the existing station to the north. The site is located east of Rannie Road, roughly 720m inland.

Additionally, as part of the Pitt Polder Pump Station Upgrades project, three (3) existing CSP culverts and one (1) CSP floodbox are to be relined with HDPE pipe due to severe degradation. This portion of the project will be done concurrently with the construction of the new pump station. Please refer to the submitted Preliminary Design Drawings for further information regarding site/project works.

1.2 Investigative Work

Investigative Work		
Activity	Description	Status
Environmental Assessment	ISL conducted an environmental impact assessment for both the Pitt Polder Pump station upgrades as well as the Pitt River Culverts.	Completed
Geotechnical Report	ISL, through Thurber Engineering, conducted a geotechnical investigation at both the Pitt Polder pump station and the Pitt River Culverts. Design considerations have been provided by Thurber	Completed
Archaeological Impact Assessment	ISL, through Antiquus Archaeology and in conjunction with the Katzie First Nations, have begun an archaeological impact assessment for First Nations artifacts. Due to high water levels, the assessment was not completed as water could not be lowered to reach an area of interest. As such, further investigative work is required once construction starts. Antiquus's plan to complete the archaeology assessment during the dewatering stages of construction has been approved by the branch. The report/memo from Antiquus has been attached for review.	In Progress

1.3 First Nations Consultation

The local First Nations (Katzie) are working with the Archeology Consultant (Mike Russo; Antiquus) and are being kept informed with the design aspects of the pump station and culvert work. The contact at the time was Debbie Miller not certain if she is still involved. Mike Russo, of Antiquus, has conducted the Archaeology Impact Assessment can be contacted at 604-467-3497.

2.0 Location

2.1 Description

-The current pump station is situated in the north east section of the City of Pitt Meadows at the east end of the Sturgeon Slough, the area is commonly known as the Pitt Polder area. The pump station is approximately 720m inland from Rannie Road and is accessible via a dike access road. Previously this access road travelled across private land, however, as of February 8th, 2018, a right of way agreement was put in place with the Aquilini Group for official access to the pump station. The pump station is on situated on private land between rural farm land to the north, and Golden Eagle Group facility to the south.

The culverts and floodbox are situated approximately 800m west of Rannie Road on a section of Pitt River dike crossing that crosses Sturgeon Slough where it meets the Pitt River. The same right of way agreement with the Aquilini Group has given office access to the City of Pitt Meadows to access the culverts and floodbox.

2.2 Location Justification

The proposed pump station will be adjacent to the existing station and is required in order to regulate the water levels in the slough and throughout the rest of the drainage area which farmers rely on for watering crops.

Since the existing culverts are to be relined with HDPE pipe, they must remain in their existing location.

2.3 Seasonal Expectations of Use

Seasonal Expectation of Use		
Project Phase	Description of Activity/ Works	Season
Construction	<ul style="list-style-type: none"> The project will require use of the land from the start of construction on ward as the pump station is located on crown/ private land. Parts of the pump station will be constructed in dry conditions as sheet piles and dewatering are required to allow construction to areas that are below the low water level. 	All Seasons
Operations	<ul style="list-style-type: none"> The pump station and culverts will require use of land throughout their design life as the city will require access through all seasons in order to operate and maintain (trimming grass, running pumps, cleaning screens and gates) properly. 	All Seasons



3.0 Infrastructure and Improvements

3.1 Facilities and Infrastructure

The project is provincially and federally funded through the New Building Canada Fund – Small Communities Fund, as such there is a deadline to the funding. Construction at both sites is proposed to begin this year (2018) once all approvals have been received and satisfied.

Ultimately, construction methods will be up to the awarded contractor, however, sheet piling and dewatering will be used to reach the bottom of the slough and create a dry workspace to access areas typically below the low water level. Material for the dike and other associated works will be trucked in via the access road and excavators will be on site to place fill. A turn around area will be constructed just west of the proposed pump station location to facilitate construction and meeting dike design guidelines.

Pitt Polder Pump Station

The existing Pitt Polder Pump Station is a concrete structure with a brick building structure over two existing vertical pumps. The new structure will consist of 2 fish friendly submersible vertical pumps in a concrete wet well structure. The two submersible vertical pumps will discharge through the dike (east to west) via two (2) large diameter Weholite pipes. A concrete outlet structure will be constructed complete with grating and stop-logs which will be used to isolate either pump. Electrical motor control centers will be housed in an operations structure adjacent to the north of the pump station. An existing flood box at the Pitt Polder Pump Station is proposed to be upgraded to a 1500mm diameter 'Weholite' pipe with an actuating sluice gate on the downstream side of the existing flood box. At the outlet of the culvert, a motorized combination slide/flap gate will be installed. The gate will act as slide/flap gate. Currently, the existing pumps cannot provide the capacities required for future flood conditions and are not fish friendly.

Pitt River Dike Culverts

There are four exiting corrugated steel pipe culverts located under the Pitt River dike where the Sturgeon Slough meets the Pitt River. Three of the pipes are utilized as culverts while the fourth is a floodbox complete with gate. All four pipes require immediate rehabilitation as they are rusted and disintegrating. As part of this project it is proposed that the pipes be relined with 1015mm diameter HDPE pipe and grouted to renew the life of the culverts without disturbing the dike integrity. Concrete headwalls will be installed on the west side (Pitt River side) of the three culverts complete with two (2) flap gates and (1) combination gate to allow for more flow control. Additionally, concrete headwalls are to be installed at either end of the proposed flood box complete with two (2) combination gates. Timber decks will be built to provide City of Pitt Meadows operations staff access to the gates.

3.2 Access

Access will be along the north side of the Sturgeon Slough on an existing dike access road from Rannie Road, The existing access road is approximately 925m long. The proposed dike road will be raised to an elevation of 5.52 m at the crest of the road only for the portion of the dike that is being upgrade to facilitate the new pump station. At this time, the City of Pitt Meadows does not

have enough budget to upgrade the entire dike, but will need to do so in the future to accommodate future water level and sea level rise. The access road will be 4m wide crowned with a 2% cross fall on either side complete with a gravel shoulder. The dike is within a Statutory Right of Way for the entire length of the road. This road will not be used by the motoring public, as there is a locked access gate at Rannie Road for maintenance and operations purposes only. Pedestrians will be able to use access it if desired.

3.3 Utility Requirements and Sources

The existing pump station has an electrical supply from BC Hydro from the south of the station. The new station will be supplied with power that will run along the dike on the north side of Sturgeon Slough from Rannie Road.

3.4 Water Supply

The new Pump Station will not require any water supply.

3.5 Waste Collection, Treatment, and Disposal

The new pump station will not require waste collection, facilities, or treatment.



4.0 Environmental

4.1 Land Impacts

4.1.1 Vegetation Removal

No timber removal at either site

Vegetation will be stripped where fill is to be placed in order to build up the proposed area. After vegetation is stripped, existing ground will be scored in order to ensure a strong bond between existing and proposed material. Final surface will be hydro seeded and coco matting will be installed where necessary to mitigate erosion.

4.1.2 Soil Disturbance

There will be areas of soil disturbance for the new pump station, and the Pitt River culverts. Clearing, grubbing, excavation and levelling will occur at both project sites.

The excavation will be in an area where no contaminated soils were detected;

A preliminary archaeological assessment was completed by Antiquus. No archaeological or historical artifacts were found, and none are expected. Archaeological assessment was not completed due to the inability to lower the water level in the slough. Antiquus will finish the assessment during the dewatering and construction stage of the project. Excavation is to be monitored by First Nations and archeologist when excavation begins. Please refer to Archaeological memo/letter, attached to the Land Tenure application, for further information.

4.1.3 Riparian Encroachment

Some work will be done adjacent to a riparian zone.

4.1.4 Pesticides and Herbicides

There will be no use of any pesticides or herbicides for this project.

4.1.5 Visual Impacts

There will be no adverse effects from the construction of the proposed pump station as there will be no superstructure with the pump station being mostly underground. Additionally, the pump station and culverts are located in rural Pitt Meadows adjacent to farm land.

4.1.6 Archaeological Sites

Antiquus Archaeological Consultants has done an (AIA) relating to the proposed impact zones associated the Sturgeon Slough pump house replacement project. Please refer to their assessment memo/letter attached to the Land Tenure application.

4.1.7 Construction Methods and Materials

Ultimately, the construction methods will be up to the contractor.

The proposed replacement pump station will be constructed with reinforced concrete material. The excavation for the pump station will be kept dry with use of steel sheet piles which will be removed once construction is complete.

The culvert rehabilitation on the Pitt River dike will use High Density Polyethylene liner placed in the existing corrugated steel pipes.

All materials will not have any impacts to the surrounding areas with regards to contamination. Dewatering will be required at both sites in order to construct.

4.2 Atmospheric Impacts

4.2.1 Sound, Odor, Gas, or Fuel Emissions

There will be some loud continuous noise once the sheet piling is driven into place, there will not be much noise once the concrete structure is under construction or when it is completed. Once the pump station is commissioned the stations electric pumps will be unnoticeable; Please refer to the Preliminary Design Report attached to the land tenure application for further information on the sound attenuation.

No anticipated odors will be generated from the pump station;

No gas will be used in the operation of the pump station, and emergency stand-by generator will be on site and will run in the event there is a power failure;

No anticipated fuel emissions are expected. As per the previous note, an emergency standby diesel generator will run in the event of power loss.

4.3 Water or Land Covered by Water Impacts

4.3.1 Drainage Effects

The proposed pump station will have a positive effect on drainage in the area as the pumps will be more efficient than the existing station thereby minimizing the effects of localized flooding. The proposed pump station and culvert upgrades will provide the City of Pitt Meadows better control over the drainage of Area 4.

4.3.2 Public Access

The proposed project will not result in changes to public access once the project is complete, access may be denied during the construction period.

4.3.3 Flood Potential

The pump station and culvert upgrades are being done so in order to provide greater control and protection over future water levels and sea level rise. As a result, they will not result in the



potential for flooding but will enhance pumping requirements in the event of potential flood risks. Furthermore, the existing pump station will remain operational throughout construction of the proposed pump station in order to mitigate any flood potential.

4.4 Fish and Wildlife Habitat Impacts

4.4.1 Disturbance to Wildlife and Wildlife Habitat

- The proposed pump station will not have any adverse effects on wildlife or wildlife habitat;
- The construction and operations phase of both the pump house and culvert rehabilitation will occur in and around water bodies (the Pitt River and Sturgeon Slough);
- There will be no increase in erosion or sedimentation during and after the construction phase at both the sites;
- No water will be diverted during the construction or operation to the pump station or culvert work, the existing pump station will remain in operation until the newly constructed station is commissioned;
- No species will be at risk during the construction phase as the site will be cordoned off and the excavation will use steel sheet piles to allow excavation below water level.
- The proposed pump station has been designed with fish-friendly pumps. The existing pump station were typical grinder pumps that was not safe for fish passage.