

CASE STUDY: SLIP LINING

4,180 feet of Slip Lining 32-inch HDPE Pipe Completed in One Pull

POWELL RIVER, BC CANADA

Powell River is a city on the northern Sunshine Coast of southwestern British Columbia, Canada. With two intervening long, steep sided fjords inhibiting the construction of a contiguous road connection with Vancouver to the south, geographical surroundings explain Powell River's remoteness as a community, despite a relative proximity to Vancouver and other populous areas of the BC Coast.



- 36-inch water main is Powell River's only water supply, running 4,396 feet from Haslam Lake to the new UV treatment Plant and located in remote area requiring equipment, supplies and workers access only by multiple ferries to project.
- Environmental protection was critical. The 36-inch concrete watermain was initially installed in 1964. The originally large trench excavated to achieve the desired elevation profile remained following the initial watermain installation and subsequently filled with water. A wetland formed in the trench following initial construction. This wetland is over 3,280 feet long and up to 5 feet deep, and supports a number of amphibian and bird species as well as beavers. The wetland is a headwater source for Miller Creek which flows downstream to Cranberry Lake, which are both fish-bearing.
- Requirements of project included a Qualified Environmental Professional (QEP), to produce a Construction Environmental Management Plan (Woodruff and Robert 2017), an Erosion and Sediment Control Plan, and provide Environmental Monitoring (EM).
- The entire length of main was slip lined in one continuous pull of 4,180 feet from entry to exit pit. The original consideration was to drain the entire wet land that had formed since the original construction of the 36-inch water main and split the slip lining into multiple sections. However by slip lining the entire length in one pull allowed the wet land to remain untouched.
- HDPE pipe: Flexibility of the material allowed slip lining of the entire length through the curvilinear alignment. Seismic resistance was critical as the original concrete pipe with tylox (rubber) gaskets was installed on a curvilinear alignment which meant joints on bends are deflected, translating to low seismic performance characteristics. During a seismic event the pipe could separate at the joints and the pipe could act as a conduit for draining Haslam Lake. Hydraulic performance with a C-factor of 150 allowed the selected 32-inch HDPE pipe to meet with required flow to supply water to the City of Powell River. Life expectancy using pppace.com program confirmed 100 plus design life of new HDPE pipe.

