



Erosion and Riverbed integrity at the Low-Level Outlet for the Springbank Off-Stream Reservoir Project

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In this report, we raise concerns over the effects the “low level outlet” flow will have on the unprotected banks and channel of the unnamed stream and the Elbow River downstream from the confluence of the outlet flow with the Elbow River.



Detail of Low Level Outlet works from drawing 73396A-111, Stantec General Reservoir Overview, Springbank Off-Stream Storage Project Preliminary Design Report, December 2020

11.2.4 Low-Level Outlet Works

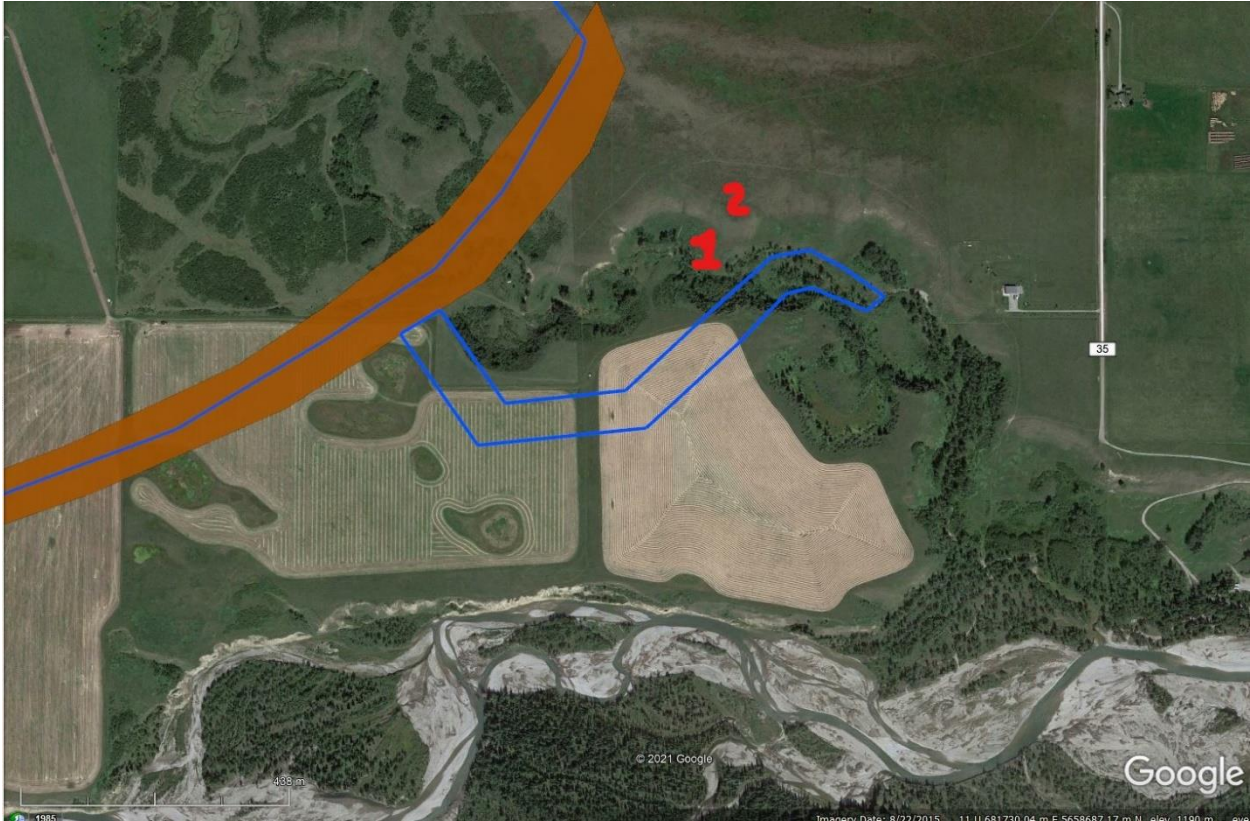
During Reservoir drawdown, discharge from the Reservoir could reach flows up to 27 m³/s. This increase in discharge can pose a risk to persons near the Unnamed Creek and to those on the Elbow River near the confluence.

It is proposed to install a siren with warning signs located near the LLOW CSU Basin as well as signs along trails leading to the tributary to warn of rapid water level rise during drawdown.

A secondary siren, with signs, located near the confluence is proposed to warn members of the public located on the Elbow River near the confluence that flows from the tributary may fluctuate and impact the Elbow River accordingly.

11.2.5 Dam Structures

Description of operation of Low Level Outlet from Stantec December 2020 Preliminary Design Report. 27m³/s is more than 3 times the average annual flow rate for the Elbow River in this stem of the river which is 8m³/s.



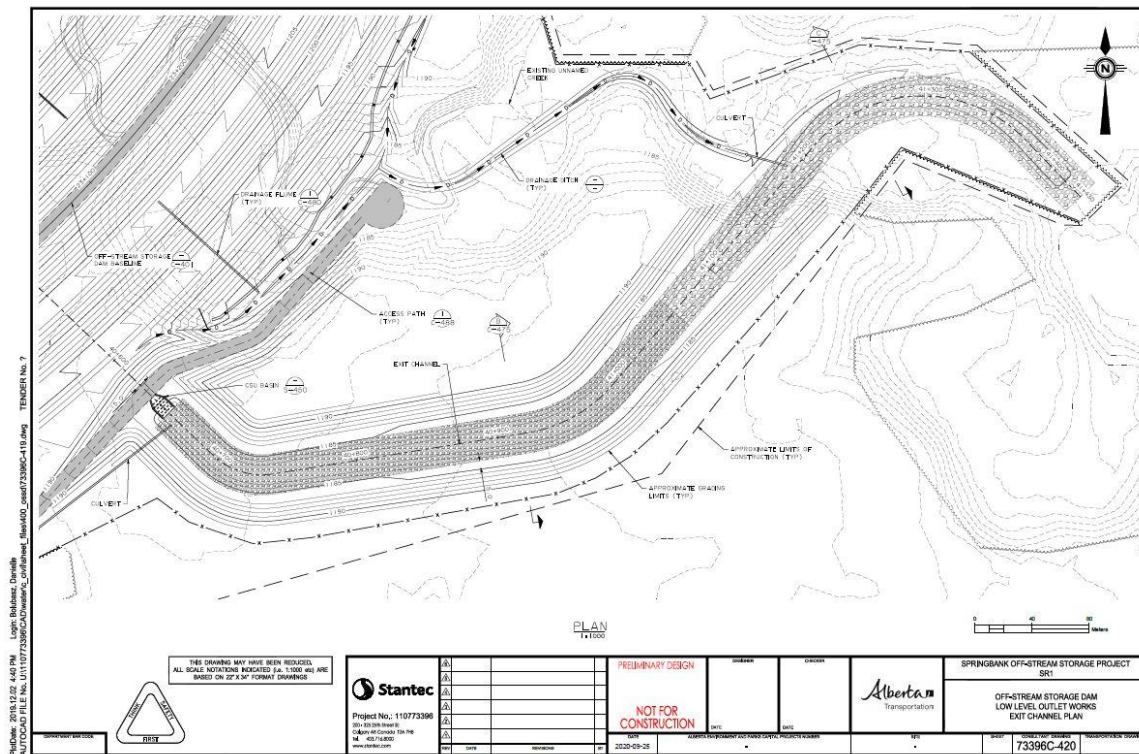
Google Earth image of area of Low Level Outlet Works showing locations of Photograph 1 and 2 shown below.



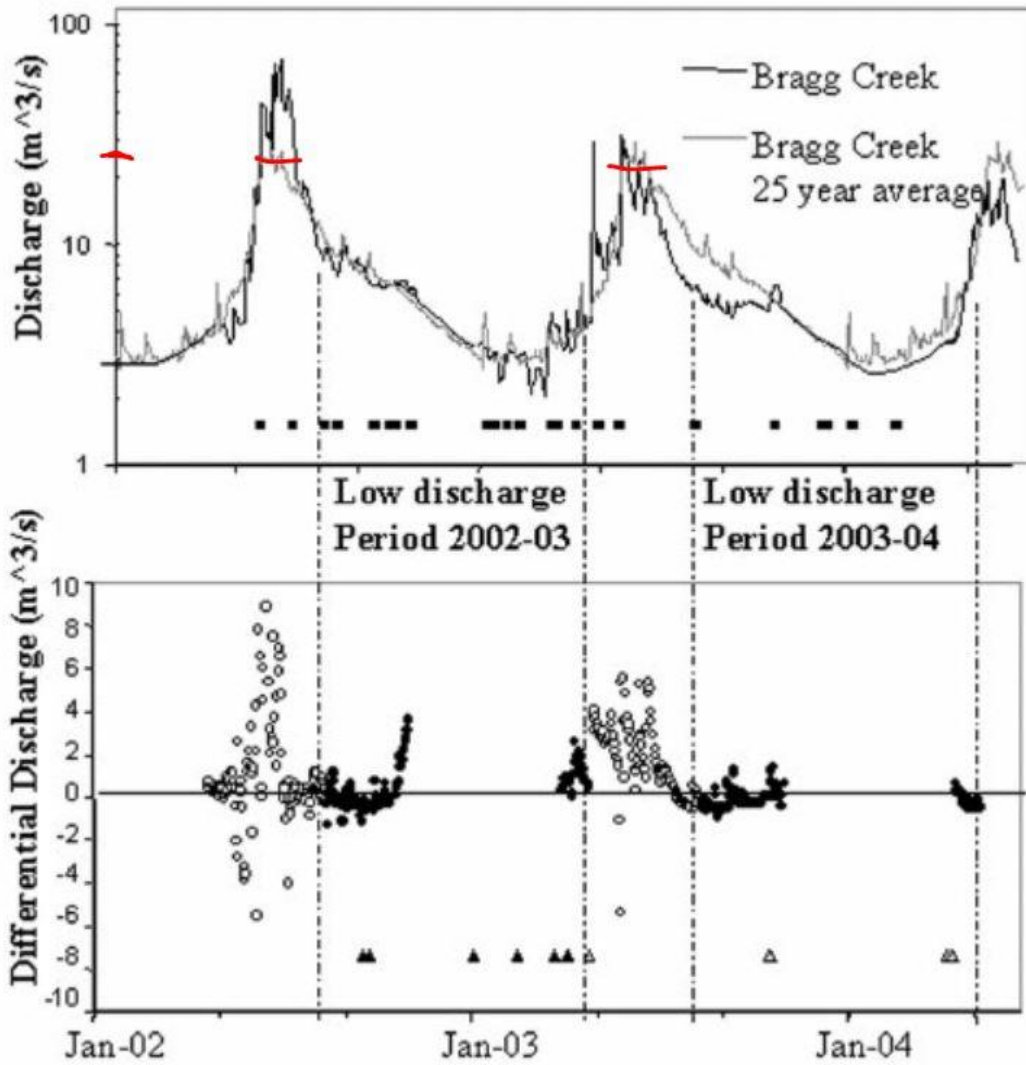
Photograph 1 View southeast along unnamed creek showing wooded area along creek bottom



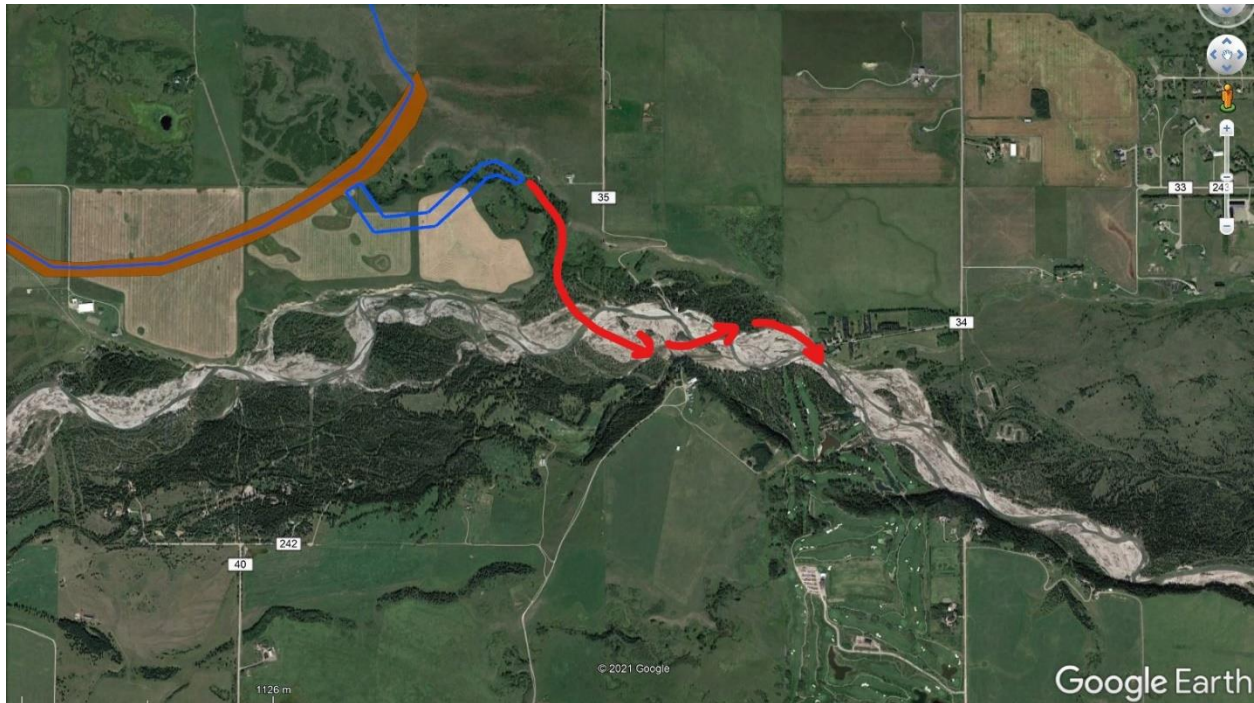
Photograph 2 from benchland east of unnamed creek looking south along the stretch of the creek below the outlet of the low level diversion. This area will be turned into a “new” Elbow River at the flow rates for drainage of the reservoir. No rip-rap is scheduled for the creek bed at the outlet.



Drawing 73396C-420 showing outlet detail and lack of scour protection at eastern outlet into creek bottom.



Hydrographs for the Elbow River at Bragg Creek and downstream for the years 2002 to 2004 from Manwell (2006). 27m³/s is marked on the vertical (log scale) upper graph. Note that for these years that value is about a third of the flood maximum (about 75m³/s).



Google Earth image of the confluence of the unnamed creek receiving up to 27m³/s and the Elbow River here likely flowing at it's summer flow rate of 3-5m³/s. At 27 m³/s we would expect some scour and redeposition of bedload. This rate might significantly alter the channel configuration and cutbanks downstream from the outlet, as well as eliminate much of the riparian environment for wildlife during the summer period.

The Springbank SR1 Concerned Landowners Group seeks mitigation from erosion within the unnamed stream and Elbow River floodplain at the high flow rates for draining the reservoir after a flood event which fills the reservoir. We anticipate that this will require additional rip-rap within the unnamed stream bed on both west and east banks, and along the south side of the Elbow River floodplain opposite the confluence with the unnamed creek.

Stantec, Springbank Off-Stream Storage Project Preliminary Design Report, December 2020

Manwell, B. and M. C. Ryan, 2006, Chloride as an Indicator of Nonpoint Source Contaminant Migration in a Shallow Alluvial Aquifer. Water Quality Research Journal of Canada, V4 No.4
DOI:[10.2166/wqj.2006.042](https://doi.org/10.2166/wqj.2006.042)