BF 77469 Lily Creek Culvert on Hwy 88 near Slave Lake
Hydrotechnical Summary

Channel Capacity:

S = 0.021 (based on LiDAR)
B = 4.6 m, h = 1.5 m, T_h = 10.7 m (Based on file review)
Use n = 0.055

At Bank Height: Y = 1.5 m, V = 2.6 m/s, Q = 31 cms
At Channel Capacity: Y = 2.25 m, V = 3.8 m/s, Q = 75 cms

Historical Highwater Data:

July 5-6, 1988 inspection photos noted HWM 0.6 m above top of culvert, which is equivalent to approx. 3.5 m water depth.

WSC Gauge 07BG004 (DA = 23.7 km^2, flow records 1987 – now, water level records 2012 - now) is located approx. 1 km downstream of the culvert site.

On July 6, 1988, peak mean daily flow = 22.7 cms, peak instantaneous flow = 41 cms, water level unknown, drift and debris were found downstream of culvert outlet.

On July 25, 2019, peak flow approx. 32 cms, water level approx. 3.5 m.

The recent rainfall event in July 23-26, 2019 resulted in total of 170 to 180 mm of rain in the Slave Lake region.

Basin Runoff Potential:

d = 100 mm, T_p = 20 hrs, q = 1.4 cms/km^2 (considering the basin slope and location in proximity to a hydrologic region where higher runoff value could occur, a higher value was used for this site.)
Gross DA = 23 km^2 (delineate using LiDAR)
Q_p = 33 cms

Conclusion:

Historical data are in line with the basin runoff potential estimates. Basin runoff potential governs for design.

Recommended parameters: Y = 1.6 m, V = 2.7 m/s, Q = 33 cms.