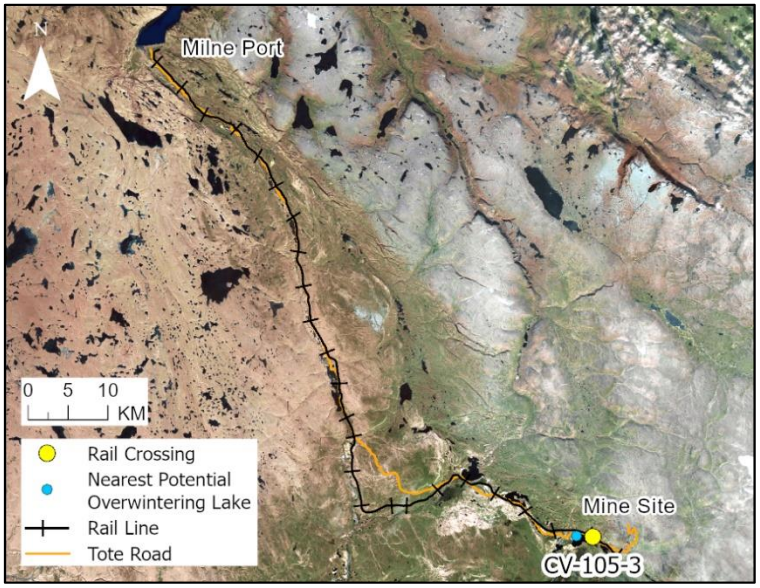
RAIL CV-105-3

LOCATION AND CROSSING DESCRIPTION

Site ID:	CV-105-3	**Dates Surveyed:**	22-Jun-19; 19-Aug-19; 29-Aug-20	**Waterbody Type:**	Pond
Project Interaction:	Rail Pond Encroachment + Culvert	**Centreline UTM Coordinates:**	17W 558854 E 7914617 N	**Culvert Length (m):**	18
Number of Barrels:	1	**Culvert Diameter/Span (mm):**	900	**Slope (%):**	1

GENERAL PHYSICAL CHARACTERISTICS

Surface Area (m^2):	3,774	**Shoreline Length (m):**	344	**Drainage Basin Area (m^2):**	2.273
Maximum Depth (m):	0.6 (estimated)			**Mean Depth (m):**	-



SUMMARY

The rail alignment encroaches upon the northern tip of a shallow pond (~0.6 m maximum depth) in the same stream/pond system as rail crossing CV-105-2 downstream and rail sites CV-105-4, 106-1, 106-1a, 106-2, and 106-3 upstream. The system flows northwest to a larger stream crossed by the rail at CV-104-5 approximately 390 m downstream from the pond's outlet and the Tote Road (BG-01) ~900 m downstream of the rail centreline. The system then flows west and south towards Camp Lake approximately 1.4 km downstream from this pond. There is a small lake (CV-106-3) with sufficient depth to provide overwintering for Ninespine Stickleback and possibly also juvenile char approximately 1.3 km upstream of the site.

This pond provides juvenile rearing habitat for land-locked Arctic Char and rearing and spawning habitat for Ninespine Stickleback. This pond is too shallow (~0.6 m max depth) to support overwintering of either species; substrate is predominantly fines. The encroachment site is shallow (<0.05 m) and provides rearing habitat for both species and probable spawning habitat for stickleback. The stream reach from this pond to site CV-105-4 is to be infilled.

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BARRIERS

Upstream/ Downstream	UTM		Barrier Type			Height (m)	Gradient (°)	Description	Site Label
	Easting	Northing	1	2	3				
Inflowing Stream	NO BARRIERS								
Outflowing Stream	NO BARRIERS								

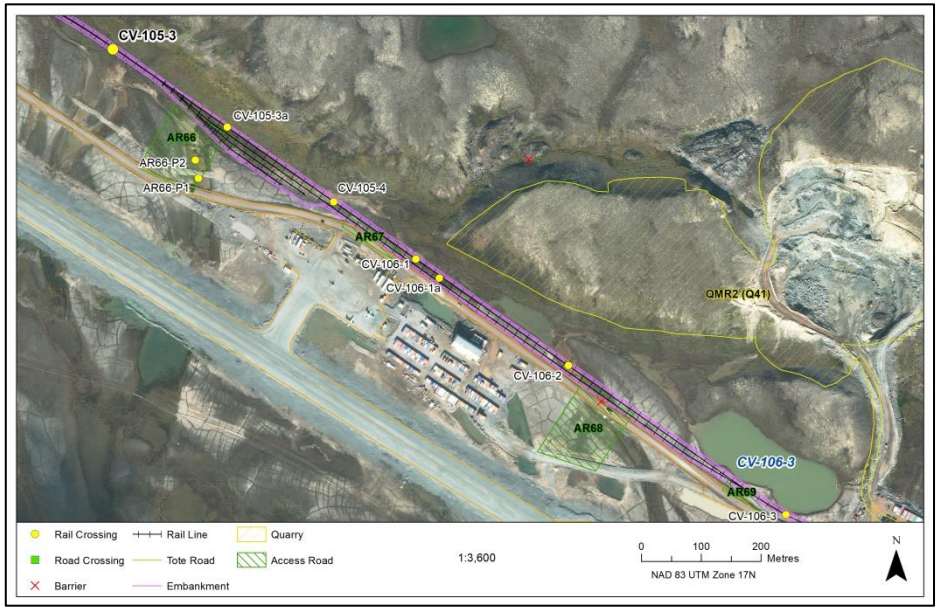
FISH HABITAT POTENTIAL

Nearest Potential Overwintering Habitat - ARCH: Unnamed pond at CV-106-3/Camp Lake **Distance to Nearest Potential Overwintering Habitat - ARCH (km):** 1.3/1.4

Overwintering Habitat Upstream of Site - ARCH (Y/N): Unnamed pond at CV-106-3

Species	Spawning	Overwintering	Rearing	Adults Present
ARCH	N	N	Y	N
NNST	P	N	Y	Y

UPSTREAM HABITAT



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FISHERIES DATA

Date: 29-Aug-20 **Temperature (°C):** 11.0 **Gear Used:** Backpack Electrofishing

Species	Reach	Microhabitat Type	Distance Fished (m)	Effort (Seconds)	Fish Captured	CPUE (No. Fish/60 Seconds)	Length Range (mm)
ARCH	1	Sand Flat	20	105	1	0.57	116
NNST	1	Sand Flat	20	105	2	1.14	18 - 27
ARCH	2	Shallow Run	50	213	0	0.00	-
NNST	2	Shallow Run	50	213	2	0.56	23 – 26
ARCH	3	Deep Run	44	237	17	4.30	80 – 160
NNST	3	Deep Run	44	237	1	0.25	30
ARCH	4	Sand Flat	72	249	0	0.00	-
NNST	4	Sand Flat	72	249	7	1.69	19 – 34
ARCH	5	Deep Pool	9	55	1	1.09	140
NNST	5	Deep Pool	9	55	0	0.00	-
ARCH	6	Deep Run	33	258	20	4.65	88 – 175
NNST	6	Deep Run	33	258	3	0.70	18 – 70
ARCH	7	Riffle/Run	46	175	1	0.34	123
NNST	7	Riffle/Run	46	175	3	1.03	20 – 30
ARCH	8	Deep Run	39	380	12	1.89	99 – 214
NNST	8	Deep Run	39	380	0	0.00	-
ARCH	9	Sand Flat	121	616	0	0.00	-
NNST	9	Sand Flat	121	616	47	4.58	18 – 62

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MICROHABITAT SUMMARY STATISTICS

Microhabitat Type	Species	Effort (Seconds)	Fish Captured	CPUE (No. Fish/60 Seconds)	Mean Fork Length (mm)	Length Range (mm)
Deep Pool	**ARCH**	55	1	1.09	140	140
Deep Pool	**NNST**	55	0	0.00	-	-
Deep Run	**ARCH**	875	49	3.36	134	80 – 214
Deep Run	**NNST**	875	4	0.27	36	18 - 70
Riffle/Run	**ARCH**	175	1	0.34	123	123
Riffle/Run	**NNST**	175	3	1.03	23	20 - 30
Shallow Run	**ARCH**	213	0	0.00	-	-
Shallow Run	**NNST**	213	2	0.56	25	23 – 26
Sand Flat	**ARCH**	970	1	0.06	116	116
Sand Flat	**NNST**	970	56	3.46	31	18 - 62

INFILL HABITAT

Habitat Use – ARCH: Juvenile rearing **Habitat Use – NNST:** Rearing; Spawning (probable) **Maximum Water Depth (m):** 0.05

Area	Fines (%)	Gravel (%)	Small Cobble (%)	Large Cobble (%)	Boulders (%)
Nearshore	95	0	5	0	0
Offshore	95	0	5	0	0

OTHER NOTES/OBSERVATIONS

Stickleback were evenly distributed in nearshore pond habitat at CV-105-3 while juvenile char were more common offshore. Similar observations were noted in 2018. Detailed electrofishing data collected by microhabitat from CV-105-3 to CV-105-4 (i.e., the infill area) during summer/fall 2020 identified clear differences in habitat use between the two species in this stream system. The two most common habitat types in the area are sand flats (49% of total habitat) and deep runs (27% of total habitat). Sand flats are characterized by shallow (<0.10), slow-moving water over sand with occasional cobble and these areas were used almost exclusively by stickleback (particularly juveniles). Deep runs are characterized by deeper (>0.20 m), flowing water in shallow channels with vertical to overhanging banks over silt/cobble substrate and these area were used almost exclusively by juvenile char (particularly char >120 mm).

There are no barriers between the pond and the potential downstream or upstream overwintering locations. Stickleback likely overwinter in this stream system (i.e., in the unnamed pond at CV-106-3) rather than Camp Lake (velocities are higher downstream in the larger stream connecting to Camp Lake). Conversely, Camp Lake is expected to be more important for char overwintering (i.e., the unnamed lake at CV-106-3 is relatively small). The upstream lake (CV-106-3) was surveyed for bathymetry and substrate in 2018 (see habitat assessment sheet for site CV-106-3).

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22-JUN-19 & 19-AUG-19

A

B

C

D

Photos 1. Photos taken of: (A) the encroachment area during spring; (B) looking upstream towards inlet during summer/fall; (C) looking downstream towards the outlet during summer/fall; and (D) the encroachment area during summer/fall.