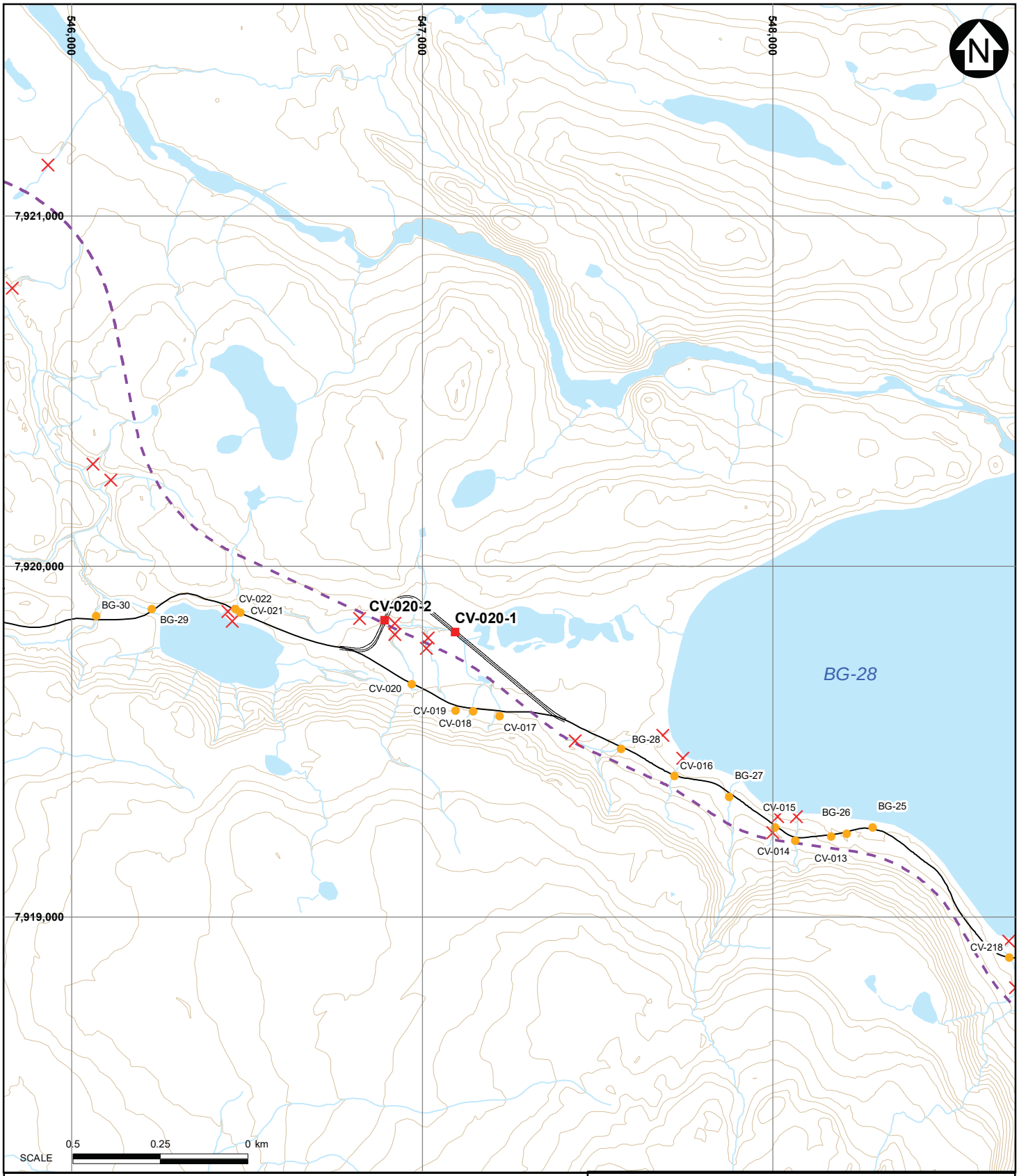


ARCTIC CHAR HABITAT AT REALIGNMENT SITES

- NO
- YES
- EXISTING TOTE ROAD CROSSINGS
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD (EXISTING)
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

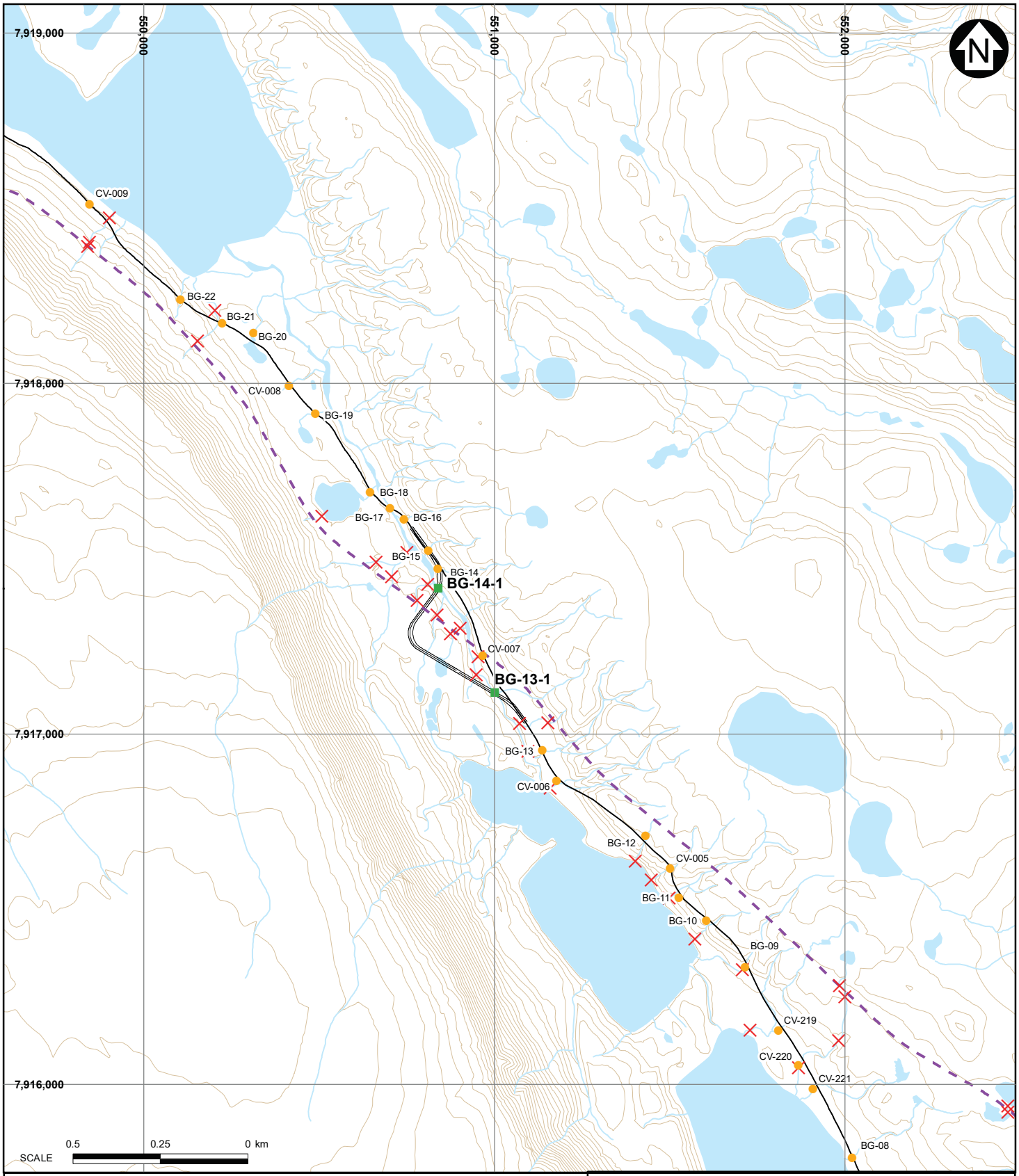
2018 ARCTIC CHAR HABITAT AT TOTE ROAD REALIGNMENT SITES (MAP 6 OF 7)

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-

DATE: 15/11/2018

REV 1



ARCTIC CHAR HABITAT AT REALIGNMENT SITES

- NO
- YES
- EXISTING TOTE ROAD CROSSINGS
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD (EXISTING)
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

2018 ARCTIC CHAR HABITAT AT TOTE ROAD REALIGNMENT SITES (MAP 7 OF 7)

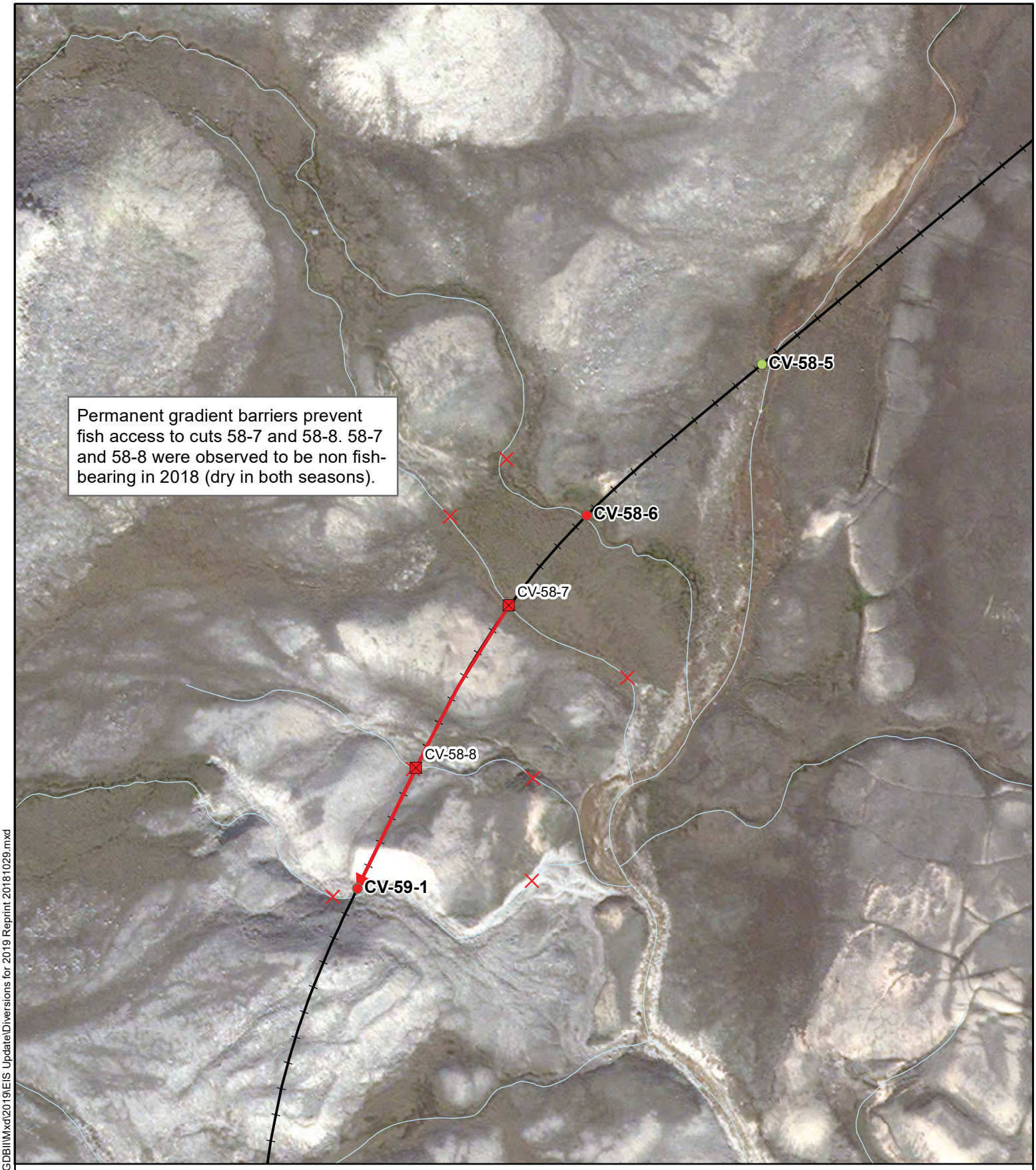
North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-

DATE: 15/11/2018

REV 1

APPENDIX 3. NORTH RAIL DIVERSION SITE MAPS AND RESULTS OF 2018 FIELD PROGRAMS



LEGEND:

ARCTIC CHAR HABITAT USE

Encroachments and Culvert Installations
- No
- Yes

Bridges
- No
- Yes

Cuts
- No
- Yes

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER
- DIVERSION DIRECTION

SCALE: 1:2,000

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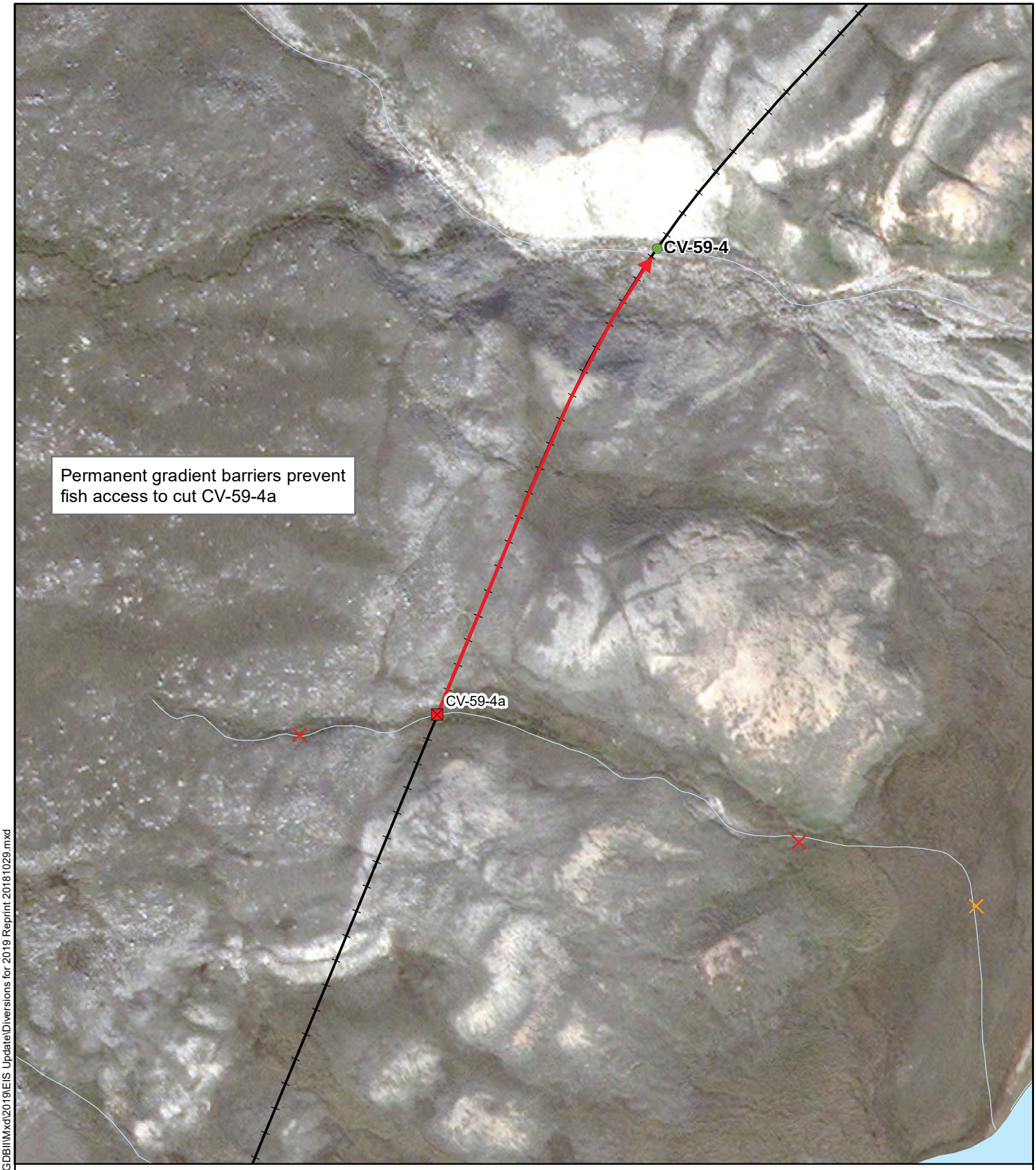

LEGEND:

ARCTIC CHAR HABITAT USE

Encroachments and Culvert Installations
- No
- Yes

Bridges
- No
- Yes

Cuts
- No
- Yes

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER
- DIVERSION DIRECTION

SCALE: 1:1,500

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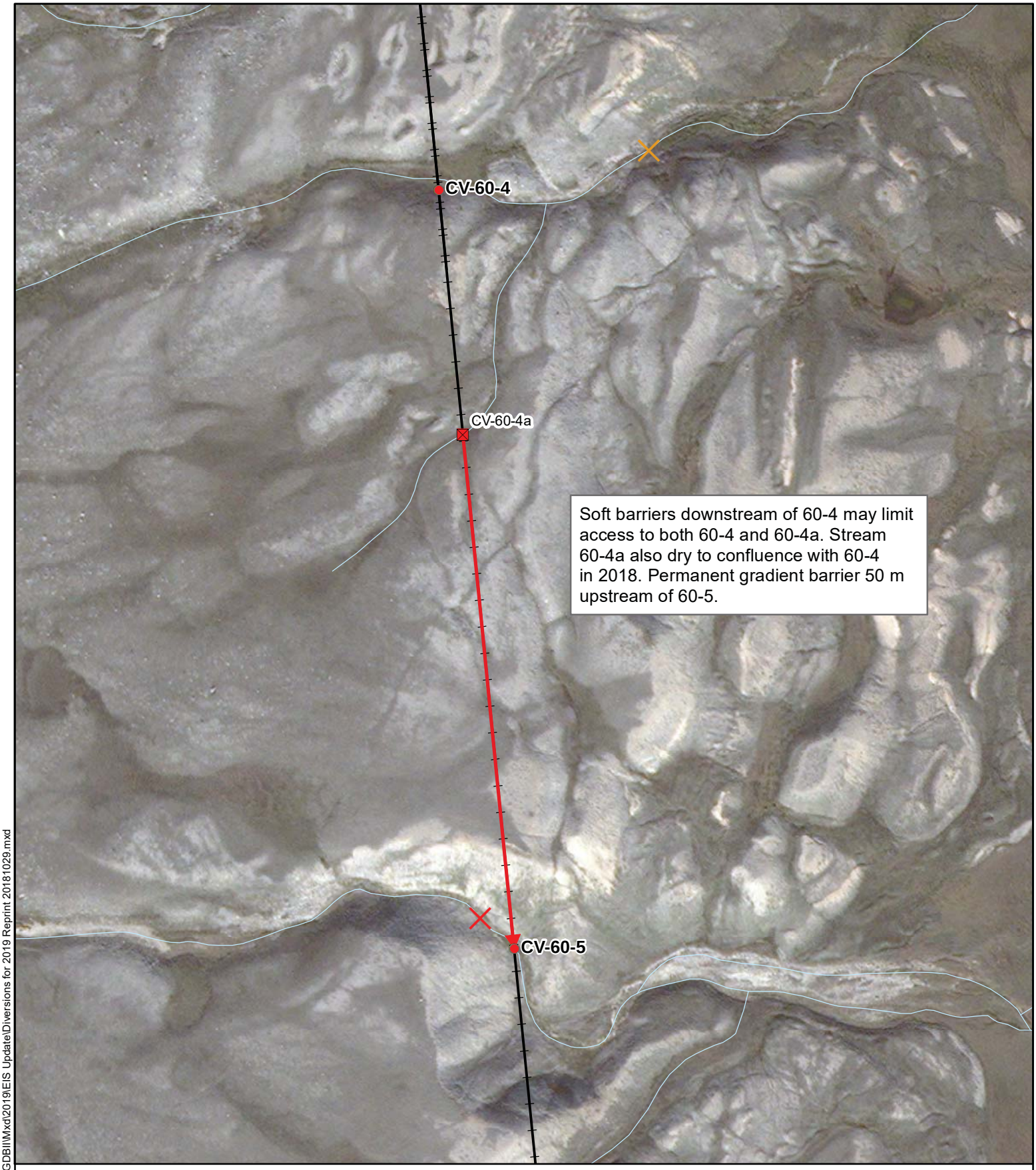

LEGEND:

ARCTIC CHAR HABITAT USE

Encroachments and Culvert Installations
- No
- Yes

Bridges
- No
- Yes

Cuts
- No
- Yes

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER
- DIVERSION DIRECTION

SCALE: 1:2,000

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LEGEND:

ARCTIC CHAR HABITAT USE

Encroachments and Culvert Installations
- No
- Yes

Bridges
- No
- Yes

Cuts
- No
- Yes

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER
- DIVERSION DIRECTION

SCALE: 1:2,000

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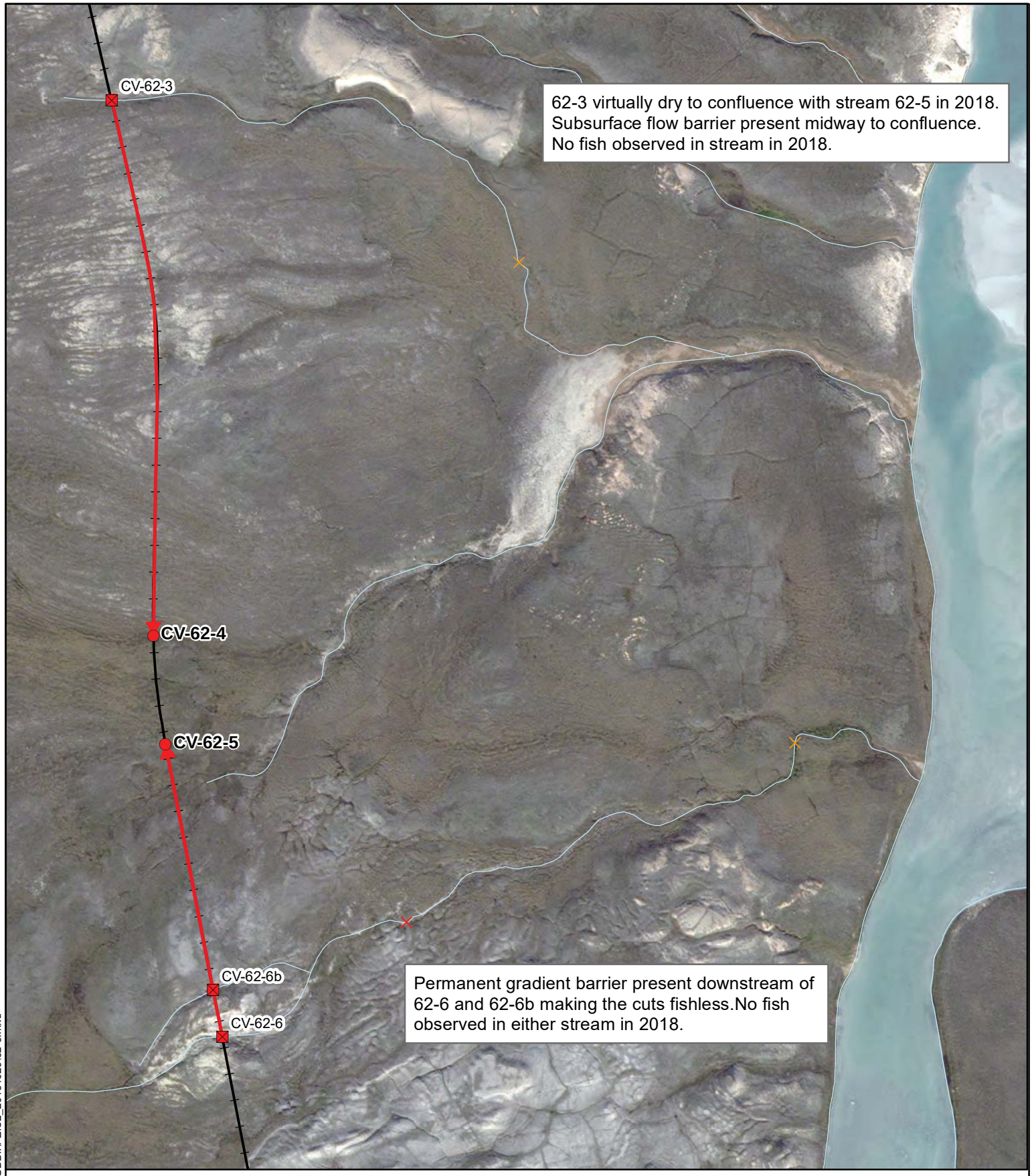

LEGEND:

ARCTIC CHAR HABITAT USE

Encroachments and Culvert Installations
- No
- Yes

Bridges
- No
- Yes

Cuts
- No
- Yes

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER
- DIVERSION DIRECTION

SCALE: 1:3,000

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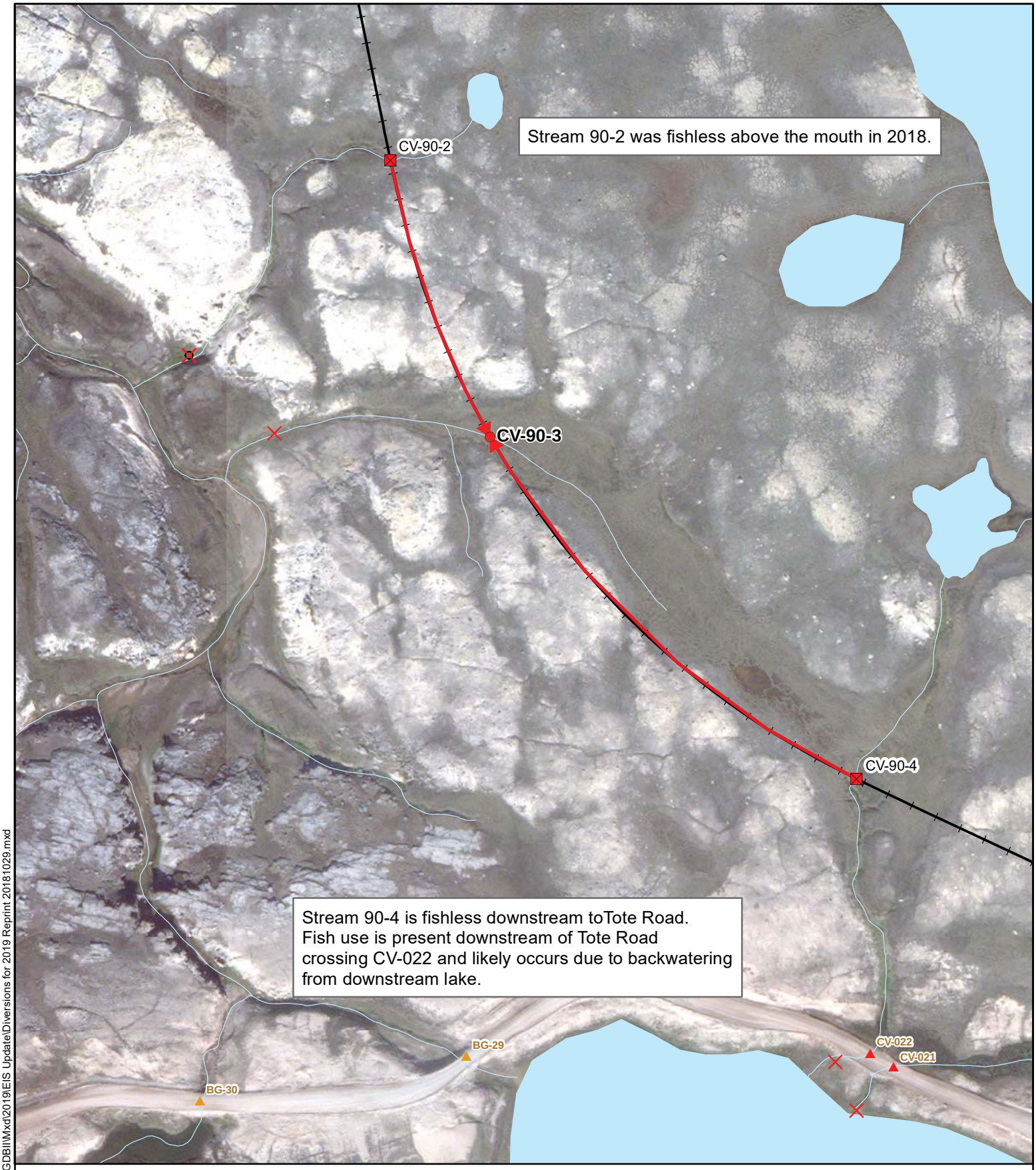

LEGEND:

ARCTIC CHAR HABITAT USE

Encroachments and Culvert Installations
- No
- Yes

Bridges
- No
- Yes

Cuts
- No
- Yes

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER
- DIVERSION DIRECTION

SCALE: 1:3,000

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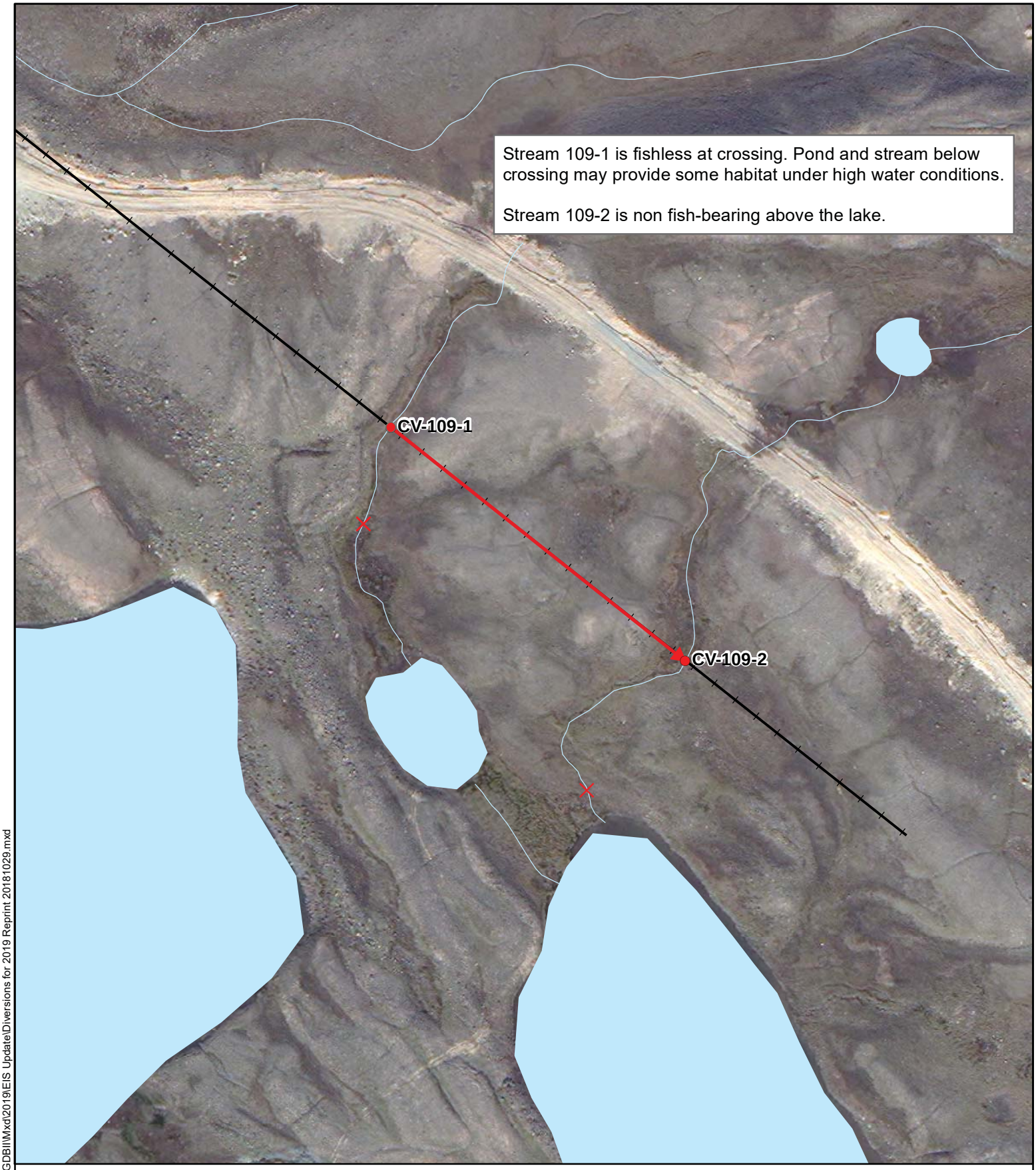

LEGEND:

ARCTIC CHAR HABITAT USE

Encroachments and Culvert Installations
- No
- Yes

Bridges
- No
- Yes

Cuts
- No
- Yes

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER
- DIVERSION DIRECTION

SCALE: 1:2,000

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APPENDIX 4. DETAILED HABITAT ASSESSMENTS AND SUMMARY OF RESULTS FOR RAILWAY AND TOTE ROAD REALIGNMENT STREAM CROSSINGS

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-0-1 & CV-0-2 **Dates Surveyed:** 29 June & 23 August, 2018 **UTM Coordinates:** 17 W 504289 7975593 & 17 W 504234 7975572

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** 5-10° **Flow Regime:** Permanent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

Both sites cross the same stream, which typically has low flows throughout the open-water period (based on observations from baseline studies at Milne Inlet). The two sites are also upstream of a previously identified permanent vertical barrier that is impassable under all flows with no access to overwintering habitat. The sites are never fish bearing.

Photographs

A **B** **C**

Figure 1. Aerial views of CV-0-1 and CV-0-2 in late June near crossings (A) and showing nearby infrastructure (B) and in late August (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-0-3 **Dates Surveyed:** 29 June & 23 August, 2018 **UTM Coordinates:** 17 W 503796 7975280

General Physical Characteristics

Channel Confinement: C **Channel Gradient (range):** N/M **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

Crossing CV-0-3 was dry or nearly so in 2018, which is typical based on observations from Milne Inlet baseline and annual Tote Road studies of the area. The combination of low flows and vertical barriers downstream prevent all fish movements upstream from Phillips Creek.

Photographs

A

B

Figure 1. Aerial views of CV-0-3 during summer (A) and fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-1-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 503801 7975052

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/M **Flow Regime:** None

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a dry spot surrounded by Milne Inlet Port Site infrastructure and equipment during the 2018 survey. There are multiple permanent barriers to fish movement between the site and Phillips Creek downstream. There is never aquatic habitat.

Photographs

A

B

Figure 1. Summer ground (A) and fall aerial (B) views of CV-1-1.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-1-2 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 503830 7974912

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** N/M **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a dry creek bed during the 2018 survey. Based on previous surveys of Milne Inlet and Tote Road waterbodies, there are multiple permanent barriers to fish movement between the site and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A **B**

Figure 1. Summer ground (A) and fall aerial (B) views of CV-1-2.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-1-3 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 503820 7974824

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 10° **Flow Regime:** Open Water

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This crossing is the outflow of a small, shallow, fishless pond. The stream had very low flows in 2018 with a steep downstream gradient. There are multiple permanent barriers to fish movement between the site and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A B C

Figure 1. Views of CV-1-3 looking downstream towards a barrier (A) and across the stream (B) during summer, and a fall aerial (C) view of the upstream pond (arrow is the outlet crossing area).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-1-4 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 503877 7974420

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 10° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

There was no water at this low point in 2018. There are multiple permanent vertical barriers to fish movement between the site and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-1-4 during summer (A) and aerially during fall (B) showing the surrounding terrain.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-1-5 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 503938 7974333

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 10° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This crossing was a nearly dry low point in 2018. There is no connectivity to overwintering habitat and never aquatic habitat at this crossing.

Photographs

A B C

Figure 1. Views of CV-1-5 during summer downstream (A),and at (B) the crossing (A) and aerially during fall (C) showing the surrounding terrain (arrow is the crossing).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-1-6 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 504292 7974064

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 10° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This crossing was nearly dry in 2018. In addition, there are permanent vertical barriers to fish movement between the site and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-1-6 during summer, looking upstream (A) downstream (B) and across (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-1-6 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 504292 7974064

Photographs

A

Figure 2. Aerial view of CV-1-6 during fall (arrow is the crossing area).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-1-7 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 504662 7973667

General Physical Characteristics

Channel Confinement: C **Channel Gradient (range):** > 10° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This crossing was nearly dry in 2018. In addition, there are permanent vertical barriers to fish movement between the site and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-1-7 during summer, looking upstream (A) and downstream (B) from the crossing and a fall aerial view (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-1-8 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 504895 7973426

General Physical Characteristics

Channel Confinement: C **Channel Gradient (range):** > 15° **Flow Regime:** Open Water

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This stream was shallow, but maintained flows during the 2018 open-water period. However, there are several permanent vertical barriers to fish movement between the site and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-1-8 during summer, looking upstream (A) downstream (B) and across (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-1-8 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 504895 7973426

Photographs

A

Figure 2. Aerial views of CV-1-8 and adjacent CV-1-9 during fall.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-1-9 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 504924 7973381

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Open Water

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This stream was shallow, but maintained flows during the 2018 open-water period. However, there are several permanent vertical barriers to fish movement between the site and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A

B

C

Figure 1. Views of CV-1-9 during summer, looking upstream (A) downstream (B) and across (C).

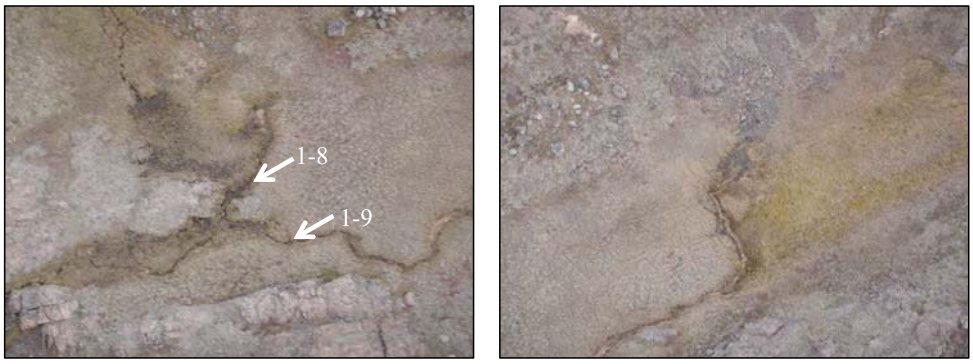
Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-1-9 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 504924 7973381

Photographs



A B

Figure 2. Aerial views of CV-1-9 and adjacent CV-1-8 (A) and the upstream end of CV-1-9 (B) during fall.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING**
			Ninespine Stickleback – NOT FISH-BEARING

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-2-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 505154 7973121

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Open Water

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This stream was shallow, but maintained flows during the 2018 open-water period. However, there are several permanent vertical barriers to fish movement at the crossing and between the site and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A **B**

Figure 1. Views of CV-2-1 during summer (A) and aerially, with nearby CV-2-2, during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-2-2 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 505217 7973067

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Open Water

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This stream was dry during the 2018 open-water period. In addition, there are several permanent vertical barriers to fish movement between the site and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A **B**

Figure 1. Views of CV-2-2 during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-3-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 505388 7972906

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 10° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

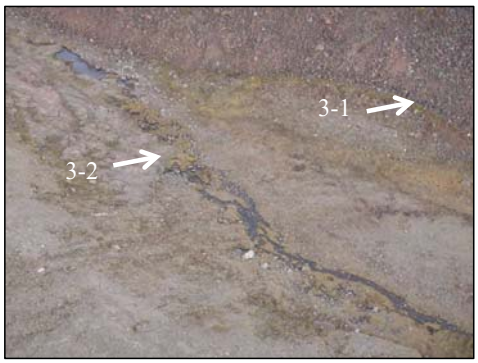
Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This crossing is a low point on a dry hillside. There is never aquatic habitat at this crossing.

Photographs

A



B

Figure 1. Views of CV-3-1 during summer (A) and aerially, with nearby CV-3-2, during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-3-2 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 505396 7972893

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 10° **Flow Regime:** Open Water

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This crossing was shallow with low flows during 2018. There are both soft (subsurface flow, high gradient) and permanent (vertical drops) barriers to fish movement at and downstream of the crossing. There is never aquatic habitat at this crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-3-2 during summer downstream from (A) and at (B) the crossing, and aerially, with nearby CV-3-1, during fall (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-4-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 505666 7972585

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 10° **Flow Regime:** Open Water

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This crossing was shallow with low flows during 2018. There are both soft (subsurface flow, high gradient) and permanent (vertical drops) barriers to fish movement at and downstream of the crossing. There is never aquatic habitat at this crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-4-1 during summer, looking upstream (A) downstream (B) and across (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-4-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 505666 7972585

Photographs

A

Figure 2. Aerial view of CV-4-1 during fall.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING**
			Ninespine Stickleback – NOT FISH-BEARING

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-4-2 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 505774 7972512

General Physical Characteristics

Channel Confinement: C **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This crossing was nearly dry in 2018 and on a steep rocky hillside. There are permanent (vertical drop) barriers to fish movement at and downstream of the crossing. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-4-2 during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-4-3 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 505836 7972435

General Physical Characteristics

Channel Confinement: C **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This crossing was nearly dry in 2018 and on a steep rocky hillside. There are permanent (vertical drop) barriers to fish movement at and downstream of the crossing. There is never aquatic habitat at this crossing.

Photographs

A **B**

Figure 1. Views of CV-4-3 during summer (A) and aerially, with nearby CV-4-4, during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-4-4 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 505862 7972397

General Physical Characteristics

Channel Confinement: C **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This crossing was dry in 2018 and on a steep rocky hillside. There are permanent (vertical drop) barriers to fish movement at and downstream of the crossing. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-4-4 during summer (A) and aerially, with nearby CV-4-3, during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-4-5 **Dates Surveyed:** 29 June & 23 August, 2018 **UTM Coordinates:** 17 W 506070 7972201

General Physical Characteristics

Channel Confinement: C **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This crossing was nearly dry in 2018 and on a steep rocky hillside. There are permanent (vertical drop) barriers to fish movement downstream of the crossing. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Aerial views of CV-4-5 during summer (A) and fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-5-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 506158 7972031

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This crossing was nearly dry in 2018 and on a steep rocky hillside. There are permanent (vertical drop) barriers to fish movement downstream of the crossing. There is never aquatic habitat at this crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-5-1 during summer looking upstream (A) and downstream (B) from the crossing, and an aerial view during fall (C) with nearby CV-5-2.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-5-2 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 506172 7971999

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

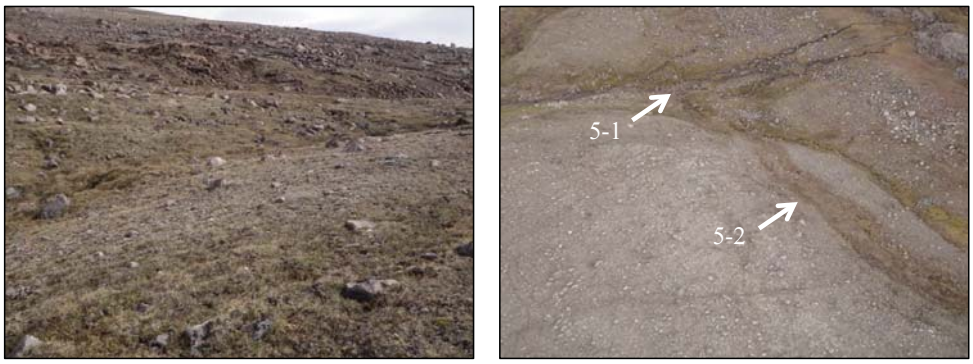
Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This crossing is a dry spot on a hillside. There is never aquatic habitat at this crossing.

Photographs



A **B**

Figure 1. Views of CV-5-2 during summer (A) and an aerial view during fall (B) with nearby CV-5-1.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-5-3 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 506297 7971792

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Open Water

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This stream on a steep hillside had low flows in 2018. In addition there are several permanent vertical barriers to fish movement at the crossing and between the site and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A

B

C

Figure 1. Views of CV-5-3 during summer, looking upstream (A) downstream (B) and across (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-5-3 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 506297 7971792

Photographs

A

Figure 2. Aerial view of CV-5-3 during fall.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING**
			Ninespine Stickleback – NOT FISH-BEARING

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-5-4 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 506540 7971622

General Physical Characteristics

Channel Confinement: C **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This steep stream was nearly dry in 2018. In addition there are several permanent vertical barriers to fish movement at the crossing and between the site and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-5-4 during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-5-5 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 506643 7971540

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 10° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This stream had flows in summer, but was largely dry in fall 2018. There are permanent vertical barriers to fish movement upstream of the crossing and between the Tote Road and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-5-5 during summer looking upstream (A) downstream (B) and across (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-5-5 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 506643 7971540

Photographs

A

Figure 2. Aerial view of CV-5-5 and nearby 5-6 during fall.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING**
			Ninespine Stickleback – NOT FISH-BEARING

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-5-6 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 506661 7971526

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 10° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This stream was nearly dry in 2018. In addition, there are permanent vertical barriers to fish movement upstream of the crossing and between the Tote Road and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A **B**

Figure 1. Views of CV-5-6 during summer (A) and fall with nearby CV-5-5 (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-5-7 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 506781 7971420

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

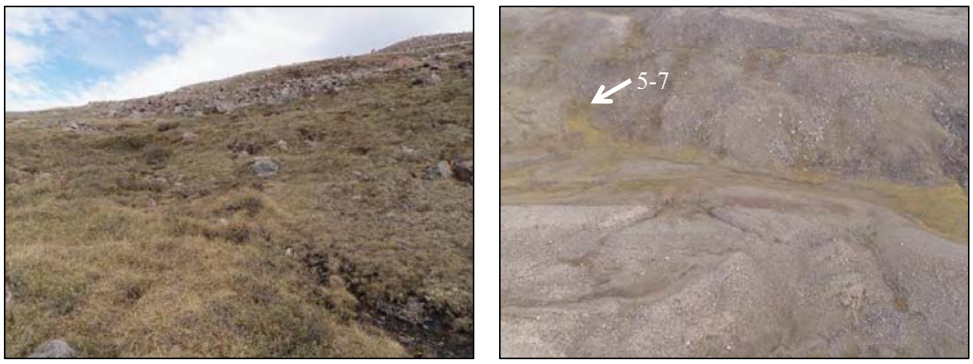
Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site was a dry hillside in 2018. There is never aquatic habitat at this crossing.

Photographs



A **B**

Figure 1. Views of CV-5-7 during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-6-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 506927 7971257

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site was a dry hillside in 2018. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-6-1 during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-6-2 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 507170 7971061

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site was a nearly dry low point on a hillside in 2018. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-6-2 during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-6-3 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 507417 7970910

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Open Water

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This is a steep, shallow stream. In addition, there are permanent vertical barriers to fish movement between the site and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A **B**

Figure 1. Views of CV-6-3 during summer, looking upstream (A) downstream (B) and across (C).

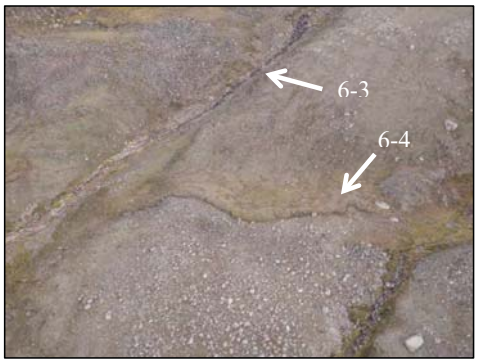
Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-6-3 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 507417 7970910

Photographs



A

Figure 2. Aerial view of CV-6-3 and nearby 6-4 during fall.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-6-4 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 507476 7970841

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Open Water

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This is a steep, shallow stream. In addition, there are permanent vertical barriers to fish movement between the site and Phillips Creek downstream that are impassable under all flows. There is never aquatic habitat at this crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-6-4 during summer, looking upstream (A) downstream (B) and across (C).

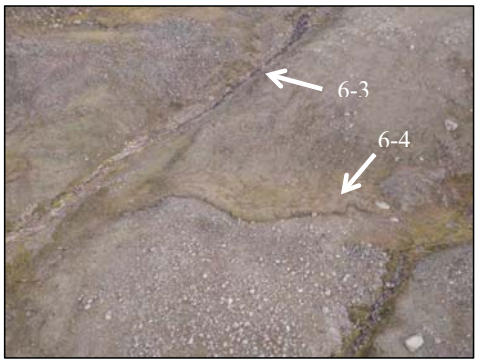
Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-6-4 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 507476 7970841

Photographs



A

Figure 2. Aerial view of CV-6-4 and nearby 6-3 during fall.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-7-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 507732 7970526

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

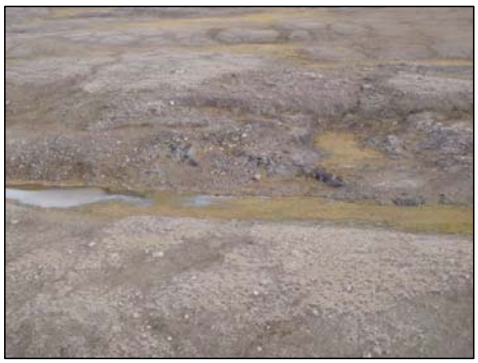
Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a steep, dry low point on a hillside near a flat marshy area. There is never aquatic habitat at this crossing.

Photographs

A



B

Figure 1. Views of CV-7-1 during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-7-2 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 507884 7970336

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a steep, dry low point on a hillside near a flat marshy area. There is never aquatic habitat at this crossing.

Photographs

A **B**

Figure 1. Views of CV-7-2 during summer (A) and aerially with nearby 7-3 during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-7-3 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 507953 7970254

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a steep, dry low point on a hillside near a flat marshy area. There is never aquatic habitat at this crossing.

Photographs

A **B**

Figure 1. Views of CV-7-3 during summer (A) and aerially with nearby 7-2 during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-7-4 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 508038 7970146

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

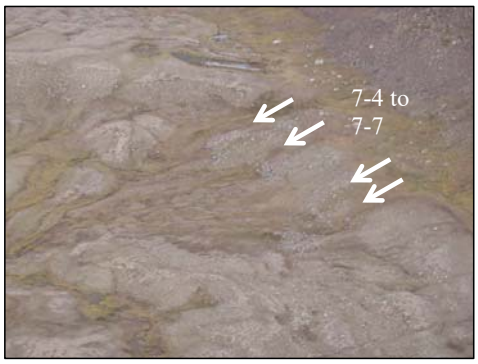
Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a steep, dry low point on a hillside near a flat marshy area. There is never aquatic habitat at this crossing.

Photographs

A



B

Figure 1. Views of CV-7-4 during summer (A) and aerially with several nearby crossings during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-7-5 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 508060 7970116

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

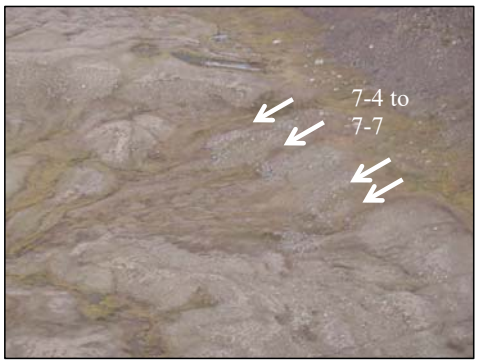
Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a steep, dry low point on a hillside near a flat marshy area. There is never aquatic habitat at this crossing.

Photographs

A



B

Figure 1. Views of CV-7-5 during summer (A) and aerially with several nearby crossings during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-7-6 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 508094 7970073

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

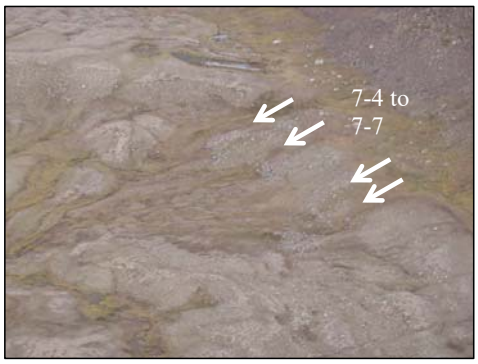
Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a steep, dry low point on a hillside near a flat marshy area. There is never aquatic habitat at this crossing.

Photographs

A



B

Figure 1. Views of CV-7-6 during summer (A) and aerially with several nearby crossings during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-7-7 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 508097 7970069

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

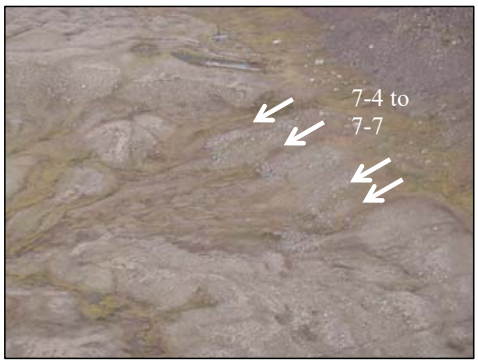
Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a steep, dry low point on a hillside near a flat marshy area. There is never aquatic habitat at this crossing.

Photographs

A



B

Figure 1. Views of CV-7-7 during summer (A) and aerially with several nearby crossings during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-8-0 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 508293 7969747

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Permanent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This small stream maintains flows throughout the open-water period, but there is a very steep gradient and vertical barriers between the rail crossing and Phillips Creek downstream. Fish have never been captured or observed in this stream during annual Tote Road monitoring and there is no fish habitat use in the vicinity of the rail crossing.

Photographs

A **B** **C**

Figure 1. Summer views of CV-8-0 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

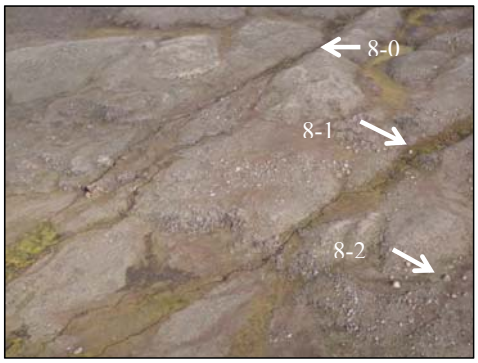
Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-8-0 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 508293 7969747

Photographs



A

Figure 2. Aerial views of CV-8-0 and nearby crossings CV-8-1 and 8-2 during fall (A).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING**
			Ninespine Stickleback – NOT FISH-BEARING

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-8-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 508311 7969712

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Permanent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This small stream maintains flows throughout the open-water period, but there is a very steep gradient and vertical barriers between the rail crossing and Phillips Creek downstream. Fish have never been captured or observed in this stream during annual Tote Road monitoring and there is no fish habitat use in the vicinity of the rail crossing.

Photographs

A B C

Figure 1. Summer views of CV-8-1 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

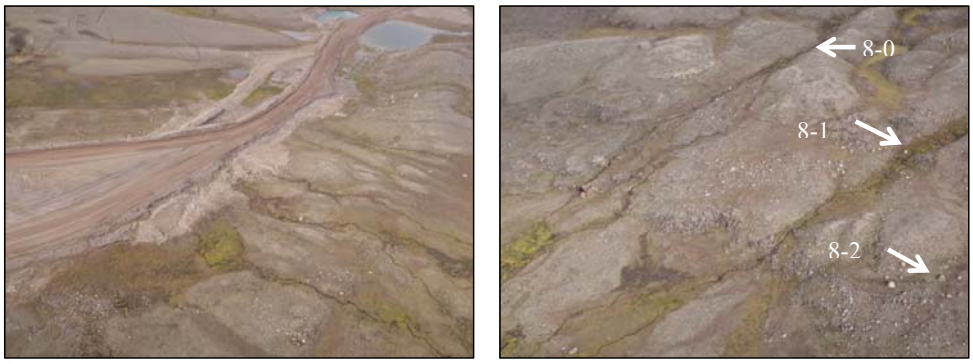
Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-8-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 508311 7969712

Photographs



A B

Figure 2. Aerial views of CV-8-1 and nearby crossings CV-8-0 and 8-2 during fall; (A) and (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-8-2 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 508325 7969683

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Permanent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

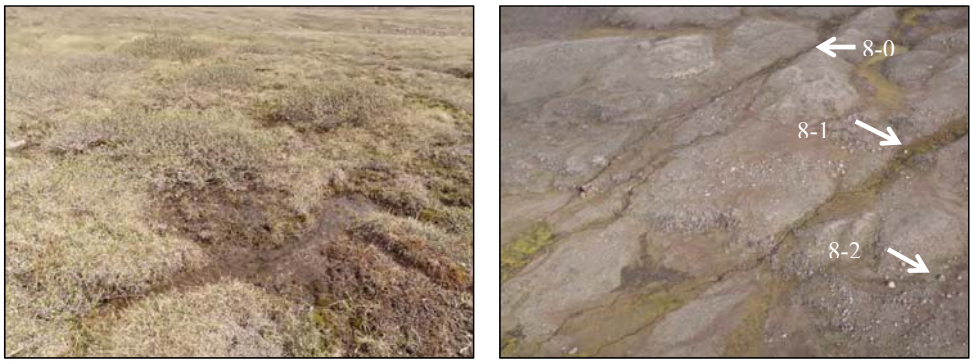
Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site was moist throughout the open-water period in 2018, but there is a very steep gradient and permanent vertical barriers between the rail crossing and Phillips Creek downstream. Fish have never been captured or observed in this stream during annual Tote Road monitoring and there is no fish habitat use in the vicinity of the rail crossing.

Photographs



A B

Figure 1. Views of CV-8-2 at the rail crossing during summer (A) and, aerially with nearby 8-0 and 8-1, during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-8-3 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 508351 7969601

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** > 15° **Flow Regime:** Permanent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

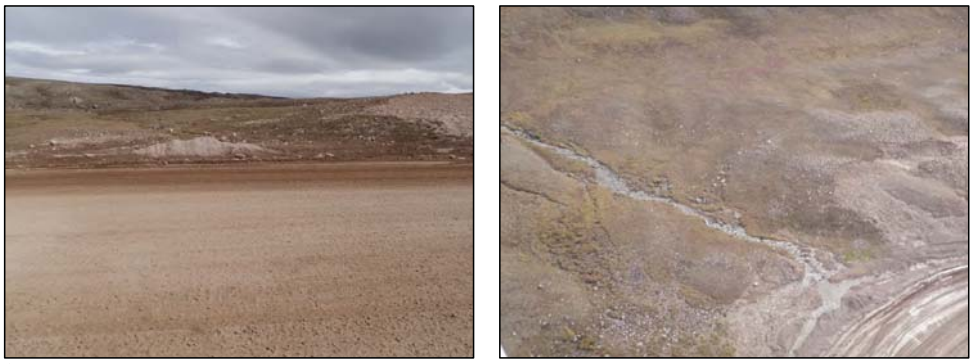
Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This shallow rail crossing is immediately upstream of the Tote Road. There are permanent vertical barriers between the rail crossing and Phillips Creek downstream. Fish have never been captured or observed in this stream during annual Tote Road monitoring and there is no fish habitat use in the vicinity of the rail crossing.

Photographs



A **B**

Figure 1. Views of CV-8-3 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-8-4 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 508412 7969338

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 10° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a roadside ditch. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-8-4 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-9-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 508805 7968873

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 10° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This stream had low flows during both surveys. It flows into a fishless pond downstream of the Tote Road and then into Phillips Creek. In addition to several soft barriers (subsurface flow), there is a permanent vertical barrier between the pond and Phillips Creek preventing fish access to the rail site. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-9-1 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-10-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 509365 7968264

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 10° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This is a dry, low point on a hillside. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-10-1 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-10-2 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 509637 7968011

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/M **Flow Regime:** None

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a dry, low point that may collect some snowmelt in early spring, but never provides aquatic habitat.

Photographs

A

B

Figure 1. Views of the CV-10-2 low point in late June (A) and an aerial image showing surrounding terrain in late August (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-10-3 **Dates Surveyed:** 29 June & 23 August, 2018 **UTM Coordinates:** 17 W 509653 7967999

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This is a dry, low point on a hillside. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-10-3 at the rail crossing during summer (A) and aerially during fall (B). CV-10-2 and 10-3 are both on the same hillside.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-10-4 **Dates Surveyed:** 29 June & 23 August, 2018 **UTM Coordinates:** 17 W 509829 7967867

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

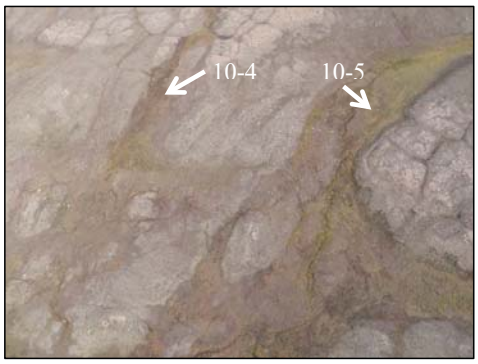
Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This is a dry, low point on a hillside. There is never aquatic habitat at this crossing.

Photographs

A



B

Figure 1. Views of CV-10-4 at the rail crossing during summer (A) and aerially, with 10-5, during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-10-5 **Dates Surveyed:** 29 June & 23 August, 2018 **UTM Coordinates:** 17 W 509872 7967824

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

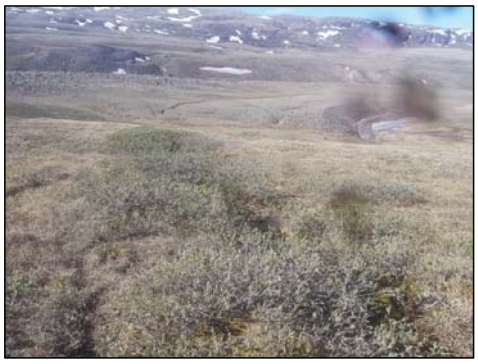
Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site on a steep hillside was nearly dry in 2018. In addition to the soft barrier of the steep gradient, there is a large vertical drop barrier downstream between the crossing and Phillips Creek. There is never aquatic habitat at this crossing.

Photographs

A



B

C

Figure 1. Views of CV-10-5 at the rail crossing during summer, looking upstream (A), downstream (B), and across (C).

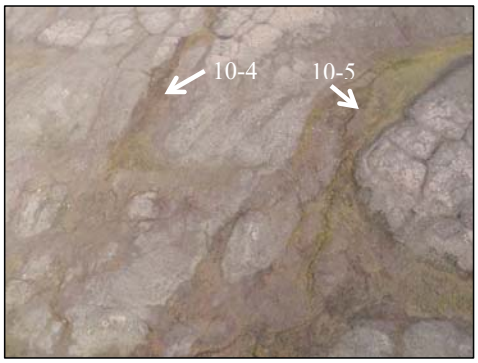
Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-10-5 **Dates Surveyed:** 29 June & 23 August, 2018 **UTM Coordinates:** 17 W 509872 7967824

Photographs



A

Figure 2. Aerial view of CV-10-5, with nearby CV-10-4, during fall.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-11-1 **Dates Surveyed:** 29 June & 23 August, 2018 **UTM Coordinates:** 17 W 509931 7967723

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a nearly dry low point on a steep hillside. In addition to the soft barrier of the steep gradient, there is a large vertical drop barrier downstream between the crossing and Phillips Creek. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-11-1 at the rail crossing during summer (A) and aerially during the fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-11-2 **Dates Surveyed:** 29 June & 23 August, 2018 **UTM Coordinates:** 17 W 510076 7967537

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a dry, low point on a steep hillside. In addition, there is a large vertical barrier downstream between the crossing and Phillips Creek. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-11-2 at the rail crossing during summer (A) and aerially, with nearby 11-3, during the fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-11-3 **Dates Surveyed:** 29 June & 23 August, 2018 **UTM Coordinates:** 17 W 510214 7967455

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a nearly dry stream on a steep hillside. In addition, there is a large vertical barrier downstream between the crossing and Phillips Creek. There is never aquatic habitat at this crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-11-3 at the rail crossing during summer, looking upstream (A) downstream (B) and across (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-11-3 **Dates Surveyed:** 29 June & 23 August, 2018 **UTM Coordinates:** 17 W 510214 7967455

Photographs

A

Figure 2. Aerial view of CV-11-3 and nearby 11-2 during fall.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-11-4 **Dates Surveyed:** 29 June & 23 August, 2018 **UTM Coordinates:** 17 W 510472 7967402

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a dry, low point on a steep hillside. In addition, there is a large vertical barrier downstream between the crossing and Phillips Creek. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-11-4 at the rail crossing during summer (A) and aerially during fall (B). CV-11-5 is in the same dry hillside area.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-11-5 **Dates Surveyed:** 29 June & 23 August, 2018 **UTM Coordinates:** 17 W 510589 7967385

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a dry, low point on a steep hillside. In addition, there is a large vertical barrier downstream between the crossing and Phillips Creek. There is never aquatic habitat at this crossing.

Photographs

A

Figure 1. Aerial view of CV-11-5 at the rail crossing during fall. CV-11-4 is in the same dry hillside area.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-12-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 510933 7967256

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a dry, low point on a steep hillside. In addition, there is a large vertical barrier downstream between the crossing and Phillips Creek. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-12-1 at the rail crossing during summer (A) and aerially, with 12-2, during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-12-2 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 511019 7967241

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a dry, low point on a steep hillside. In addition, there is a large vertical barrier downstream between the crossing and Phillips Creek. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-12-2 at the rail crossing during summer (A) and aerially, with 12-1, during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-12-3 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 511127 7967223

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a dry, pile of rocks on a steep hillside downstream of the Tote Road in summer and barely wetted during fall 2018. The soft gradient barrier and consistent lack of sufficient water (as noted during previous Tote Road surveys) prevent fish access to the crossing. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-12-3 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-12-4 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 511355 7967185

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 15° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a dry, low point downstream of the Tote Road. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-12-4 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-12-4b | **Dates Surveyed:** 28 June & 23 August, 2018 | **UTM Coordinates:** 17 W 511455 7967168

General Physical Characteristics

Channel Confinement: UC | **Channel Gradient (range):** 5-10° | **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished | **Effort (min):** N/A | **Transect Length (m):** N/A

Fish Habitat Potential

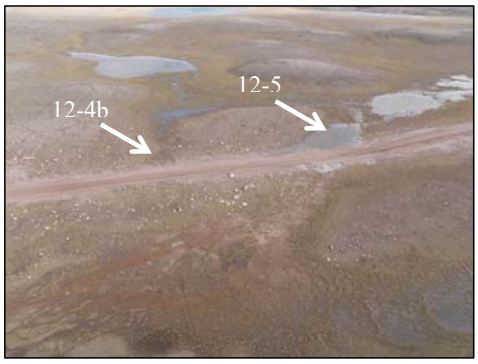
Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site was nearly dry in 2018 and is largely a roadside ditch. None of the upstream ponds are fish-bearing and there are multiple barrier types (subsurface flow, lack of a channel) downstream to Phillips Creek that prevent fish access. There is never aquatic habitat at this crossing.

Photographs

A



B

Figure 1. Views of CV-12-4b at the rail crossing during summer (A) and aerially, with nearby 12-5, during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-12-5 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 511552 7967152

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** 2-5° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a shallow fishless pond that formed on the upstream side of the Tote Road. None of the adjacent ponds are fish-bearing and downstream of the road, flows disperse across the tundra with no channel, insufficient depths for fish use and lack of connectivity to Phillips Creek. There is never aquatic habitat at this crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-12-5 at the rail crossing during summer (A) and (B) and aerially, with nearby 12-4b, during fall (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 511798 7967111

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** 2-5° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

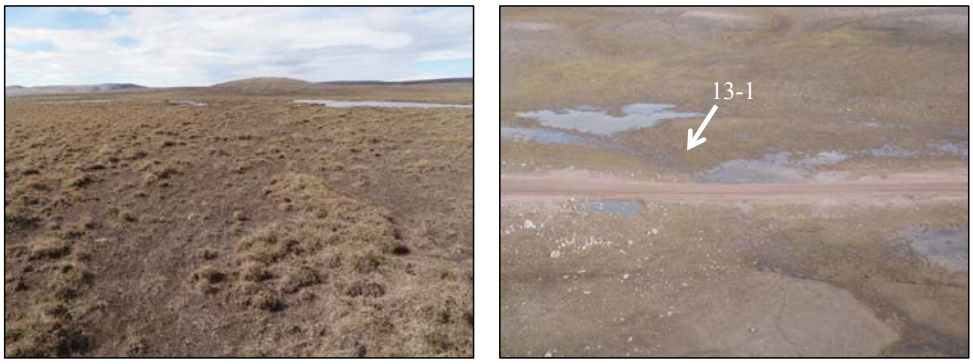
Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site was a dry low point during the summer survey and nearly so during the fall survey in 2018. Nearby ponds are fishless and there is no downstream connectivity to Phillips Creek due to several barriers, including lack of surface flow and water dispersed across the tundra. There is never aquatic habitat at this crossing.

Photographs



A **B**

Figure 1. Views of CV-13-1 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-2 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 512120 7966981

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** 2-5° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

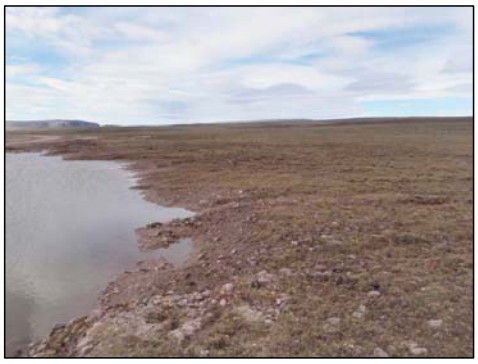
Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a low point where water has ponded alongside the Tote Road. It is shallow, fishless, and not connected to any fish-bearing habitat. There is never aquatic habitat at this crossing.

Photographs



A

B

Figure 1. Views of CV-13-2 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-3 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 512375 7966823

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/M **Flow Regime:** None

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site was a dry low point in 2018. There is never aquatic habitat at this crossing.

Photographs

A

Figure 1. View of CV-13-3 at the rail crossing during summer (A).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-4 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 512415 7966799

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** 2-3° **Flow Regime:** Open Water

Hydrology & Habitat Characteristics

Site	Channel Width (m)		Water Depth (m) (Summer/Fall)				Water Velocity (m/s) (Summer/Fall)			
	Bankfull	Wetted	25%	50%	75%	Max	25%	50%	75%	Max
100D	40.0	- / 34.6	- / 0.06	- / 0.08	- / 0.06	- / 0.08	- / 0.21	- / 0.18	- / 0.17	- / 0.25
80D	38.0	- / 28.8	- / 0.02	- / 0.04	- / 0.04	- / 0.05	- / 0.23	- / 0.24	- / 0.13	- / 0.25
60D	32.5	- / 23.0	- / 0.10	- / 0.10	- / 0.10	- / 0.10	- / 0.52	- / 0.18	- / 0.14	- / 0.52
40D	20.0	- / 8.8	- / 0.08	- / 0.16	- / 0.08	- / 0.18	- / 0.32	- / 0.38	- / 0.16	- / 0.40
20D	35.1	- / 11.4	- / -	- / 0.40	- /-	- / 0.40	- / -	- / 0.14	- / -	- / 0.14
0	13.2	5.7 / 4.9	0.17 / 0.26	0.28 / -	0.21 / 0.30	0.40 / 0.45	0.00 / 0.25	0.12 / -	0.09 / 0.07	0.12 / 0.25
20U	-	- / 4.4	- / 0.20	- / -	- / 0.14	- / 0.20	- / 0.60	- / -	- / 0.41	- / 0.60
40U	-	- / 6.9	- / 0.22	- / 0.08	- / 0.16	- / 0.25	- / 0.58	- / 0.49	- / 0.47	- / 0.60
60U	11.2	4.9 / 7.3	0.14 / 0.24	0.23 / 0.24	0.14 / 0.14	0.25 / 0.28	0.10 / 0.39	0.17 / 0.33	0.16 / 0.12	0.17 / 0.40
80U	11.0	4.6 / 7.3	0.09 / 0.16	0.10 / 0.20	0.16 / 0.08	0.10 / 0.20	0.08 / 0.48	0.10 / 0.67	0.33 / 0.14	0.35 / 0.70
100U	20.7	3.6 / 5.0	0.13 / 0.10	0.18 / 0.12	0.10 / 0.16	0.20 / 0.20	0.48 / 0.77	0.60 / 0.21	0.51 / 0.73	0.60 / 0.80

Site	Stream Morphology Composition (%)						Substrate Composition (%)				
	Riffle	Pool (<0.2 m)	Pool (>0.2 m)	Run	Cascade	Other	Fines	Gravel	Small Cobble	Large Cobble	Boulders
100D	80	20	-	-	-	-	-	-	80	20	-
80D	70	30	-	-	-	-	-	10	80	10	-
60D	70	30	-	-	-	-	70	20	-	10	-
40D	60	20	20	-	-	-	60	30	-	10	-
20D	30	20	50	-	-	-	60	20	20	-	-
0	25	45	25	5	-	-	-	18	75	7	-
20U	70	30	-	-	-	-	-	-	80	20	-
40U	80	15	5	-	-	-	-	20	70	10	-
60U	60	40	-	-	-	-	-	15	55	30	-
80U	75	25	-	-	-	-	-	15	55	30	-
100U	88	12	-	-	-	-	-	10	60	30	-

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-4 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 512415 7966799

Fisheries Data

Gear Used: Backpack Electrofisher **Transect Length (m):** 100

Species	Season	Effort (min)	Total Caught/Observed	CPUE	Length Range (mm)
ARCH	Summer	9.55	7	0.73	56 - 150
	Fall	5.35	5	0.93	60 - 171
NNST	Summer	9.55	0	0	N/A
	Fall	5.35	0	0	N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	H	N
NNST	N	N	N	N

Comments & Summary

A short distance upstream of Tote Road crossing CV-129 with important juvenile Arctic Char habitat throughout the open water season, but particularly during summer. Water temperatures in survey streams during fall sampling averaged approximately 5°C and fish had already begun downstream movements towards overwintering habitat.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char - IMPORTANT** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-4 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 512415 7966799

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A **B** **C**

Figure 1. Summer (top) and fall (bottom) views of CV-13-4 at the 100 m downstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-4 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 512415 7966799

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A **B** **C**

Figure 2. Summer (top) and fall (bottom) views of CV-13-4 at the 80 m downstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-4 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 512415 7966799

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A **B** **C**

Figure 3. Summer (top) and fall (bottom) views of CV-13-4 at the 60 m downstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-4 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 512415 7966799

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A **B** **C**

Figure 4. Summer (top) and fall (bottom) views of CV-13-4 at the 40 m downstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-4 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 512415 7966799

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A **B** **C**

Figure 5. Summer (top) and fall (bottom) views of CV-13-4 at the 20 m downstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-4 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 512415 7966799

Photographs

A B C

Figure 6. Summer (top) and fall (bottom) views of CV-13-4 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-4 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 512415 7966799

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A **B** **C**

Figure 7. Summer (top) and fall (bottom) views of CV-13-4 at the 20 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-4 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 512415 7966799

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A

B

C

Figure 8. Summer (top) and fall (bottom) views of CV-13-4 at the 40 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-4 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 512415 7966799

Photographs

A **B** **C**

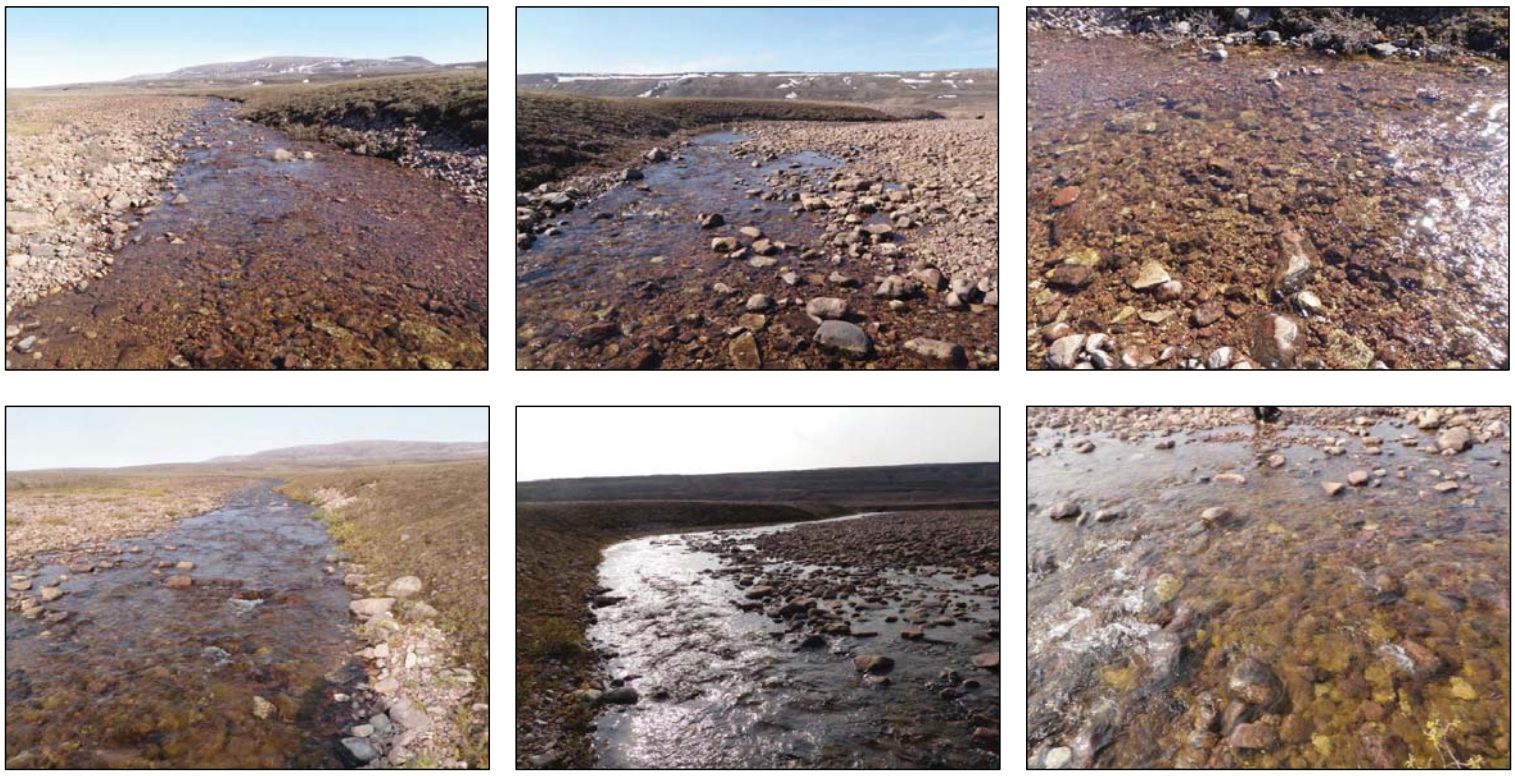
Figure 9. Summer (top) and fall (bottom) views of CV-13-4 at the 60 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-4 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 512415 7966799

Photographs



A B C

Figure 10. Summer (top) and fall (bottom) views of CV-13-4 at the 80 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-4 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 512415 7966799

Photographs

A B C

Figure 11. Summer (top) and fall (bottom) views of CV-13-4 at the 100 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-13-5 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 512556 7966712

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** 2-5° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site was a dry low point in summer and slightly wetted marshy terrain during fall. There is no connectivity to overwintering habitat. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. View of CV-13-5 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-14-1 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 513252 7966428

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** 1-5° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

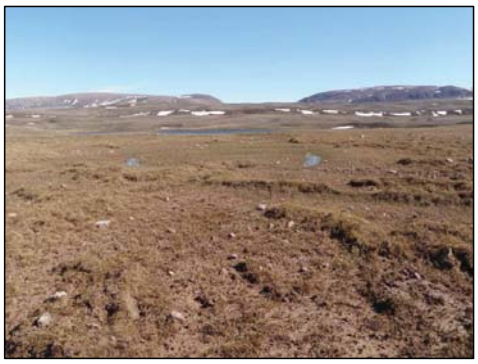
Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site was a nearly dry low point in summer and a wetter low point during fall. There is no connectivity to overwintering habitat. There is never aquatic habitat at this crossing.

Photographs



A

B

Figure 1. View of CV-14-1 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-14-2 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 513436 7966375

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **Flow Regime:** Open Water

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a small shallow pond connected to a similar pond at CV-14-3, but with no other connections. There is no connectivity to overwintering habitat and never aquatic habitat at this crossing.

Photographs

A **B** **C**

Figure 1. View of CV-14-2 at the rail crossing during summer (A) and (B), and aerially, with nearby 14-3, during fall (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-14-3 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 513532 7966333

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **Flow Regime:** Open Water

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a small shallow pond connected to a similar pond at CV-14-2, but with no other connections. There is no connectivity to overwintering habitat and never aquatic habitat at this crossing.

Photographs

A B C

Figure 1. View of CV-14-3 at the rail crossing during summer (A) and (B), and aerially, with nearby 14-2, during fall (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-1 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 513624 7966294

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **Flow Regime:** None

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site was a dry low point in 2018. There is never aquatic habitat at this crossing.

Photographs

A

B

Figure 1. View of CV-15-1 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-2 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 513781 7966188

General Physical Characteristics

Channel Confinement: N/A **Channel Gradient (range):** N/A **Flow Regime:** Open Water

Hydrology & Habitat Characteristics

Site	Channel Width (m)		Water Depth (m) (Summer/Fall)				Water Velocity (m/s) (Summer/Fall)			
	Bankfull	Wetted	25%	50%	75%	Max	25%	50%	75%	Max
0	N/A	N/A	N/A	N/A	N/A	0.70 / 0.75	N/A	N/A	N/A	0.00 / 0.00

Site	Stream Morphology Composition (%)						Substrate Composition (%)				
	Riffle	Pool (<0.2 m)	Pool (>0.2 m)	Run	Cascade	Other	Fines	Gravel	Small Cobble	Large Cobble	Boulders
Nearshore	-	80	20	-	-	-	80	-	20	-	-
Offshore	-	-	100	-	-	-	90	-	10	-	-

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char - MARGINAL** **Ninespine Stickleback – IMPORTANT**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-2 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 513781 7966188

Fisheries Data

Gear Used: Backpack Electrofisher **Transect Length (m):** 50

Species	Season	Effort (min)	Total Caught/Observed	CPUE	Length Range (mm)
ARCH	Summer	4.50	0	0	N/A
	Fall	2.83	0	0	N/A
NNST	Summer	4.50	33	7.28	40 - 68
	Fall	2.83	0	0	N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	M	N
NNST	H	N	H	H

Comments & Summary

This pond and nearby CV-15-3 provide abundant important NNST habitat during summer, but ARCH are uncommon. Most char in this area likely use a deeper upstream lake. Water temperatures in survey streams during fall sampling averaged approximately 5°C, so the absence of NNST in the fall catch may indicate that fish had already moved to the deep upstream lake for overwintering.

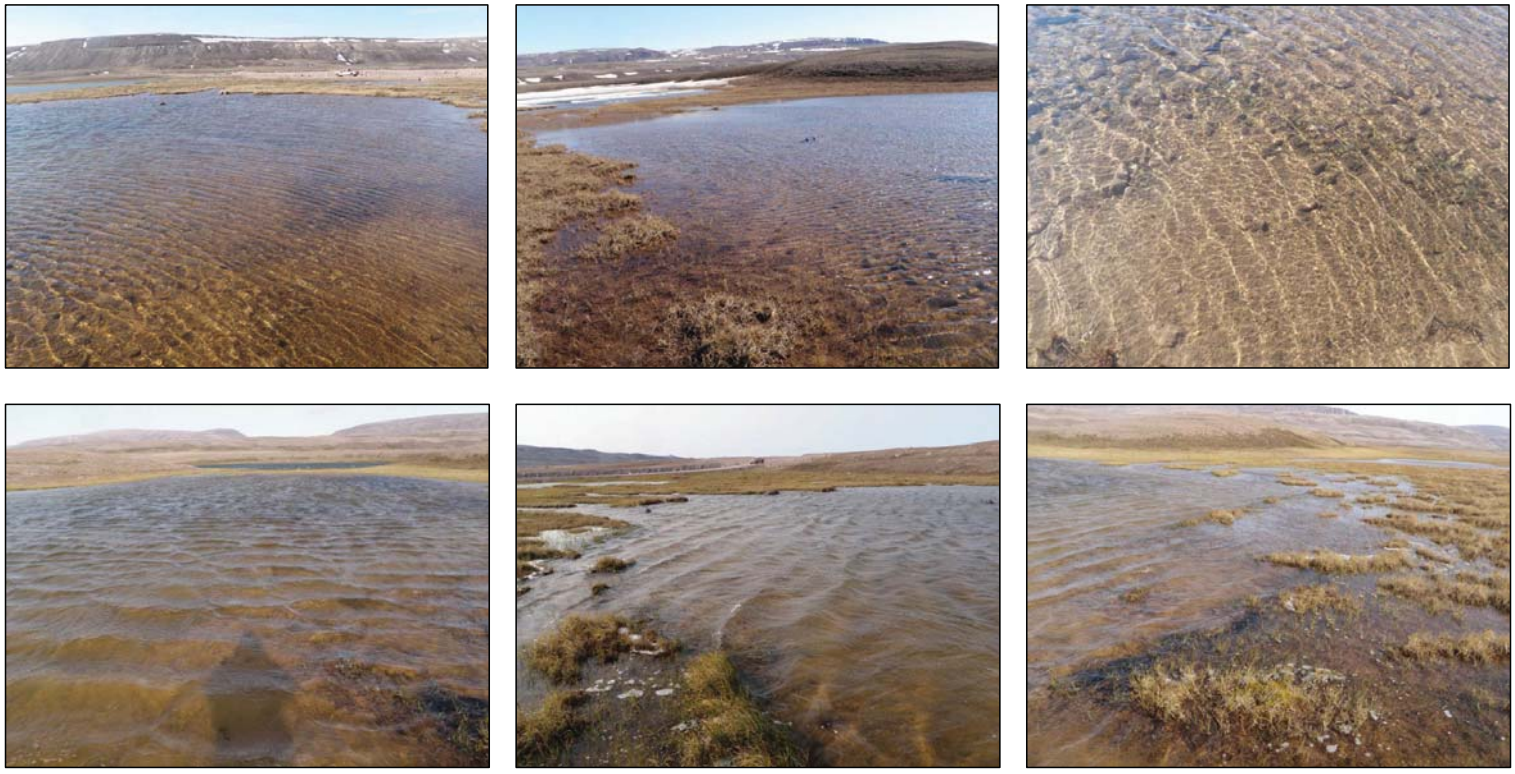
Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char - MARGINAL** **Ninespine Stickleback – IMPORTANT**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-2 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 513781 7966188

Photographs



A B C

Figure 1. Summer (top) and fall (bottom) views of CV-15-2 at the encroachment site (all images).

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-3 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 513892 7966034

General Physical Characteristics

Channel Confinement: N/A **Channel Gradient (range):** N/A **Flow Regime:** Open Water

Hydrology & Habitat Characteristics

Site	Channel Width (m)		Water Depth (m) (Summer/Fall)				Water Velocity (m/s) (Summer/Fall)			
	Wetted	High Water	25%	50%	75%	Max	25%	50%	75%	Max
0	N/A	N/A	N/A	N/A	N/A	1.00 / 1.05	N/A	N/A	N/A	0.00 / 0.00

Site	Stream Morphology Composition (%)						Substrate Composition (%)				
	Riffle	Pool (<0.2 m)	Pool (>0.2 m)	Run	Cascade	Other	Fines	Gravel	Small Cobble	Large Cobble	Boulders
Nearshore	-	80	20	-	-	-	75	-	20	5	-
Offshore	-	-	100	-	-	-	75	-	20	5	-

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char - MARGINAL** **Ninespine Stickleback – IMPORTANT**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-3 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 513892 7966034

Fisheries Data

Gear Used: Backpack Electrofisher **Transect Length (m):** 50

Species	Season	Effort (min)	Total Caught/Observed	CPUE	Length Range (mm)
ARCH	Summer	4.50	1	0.48	-
	Fall	3.20	0	0.00	N/A
NNST	Summer	4.50	2	0.96	-
	Fall	3.20	0	0.00	N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	M	N
NNST	H	N	H	H

Comments & Summary

This pond and nearby CV-15-2 provide abundant important NNST habitat, but ARCH are uncommon. Most char in this area likely use a deeper upstream lake. Water temperatures in survey streams during fall sampling averaged approximately 5°C, so the absence of NNST in the fall catch may indicate that fish had already moved to the deep upstream lake for overwintering.

Baffinland Iron Mines
Mary River Project

North/South Consultants Inc.
Aquatic Environment Specialists

Fish Habitat Quality – MARGINAL (ARCH) to IMPORTANT (NNST)

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-3 **Dates Surveyed:** 30 June & 24 August, 2018 **UTM Coordinates:** 17 W 513892 7966034

Photographs

A **B** **C**

Figure 1. Summer (top) and fall (bottom) views of CV-15-3 at the encroachment site (all images).

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-4 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 514123 7965711

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **Flow Regime:** None

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

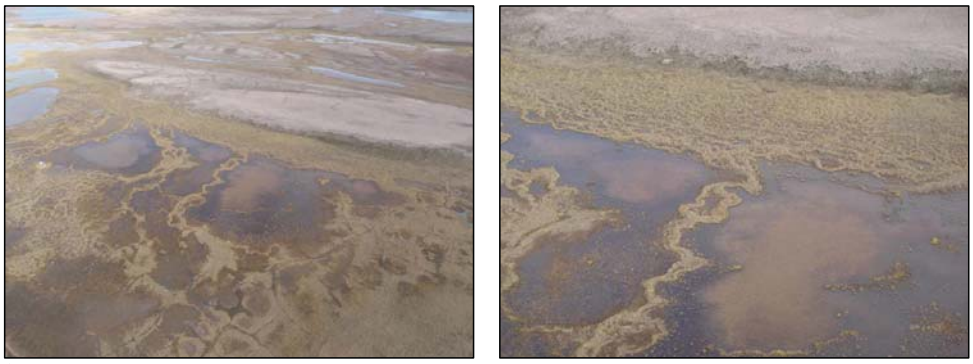
Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a shallow, fishless pond/marshy area that is unconnected to nearby fish habitat at 15-2, 15-3, or 15-5 even under high flows. There is never aquatic habitat at this crossing.

Photographs



A **B**

Figure 1. Aerial views of CV-15-4 at the rail crossing during fall (A) and (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-5 **Dates Surveyed:** 30 June & 30 August, 2018 **UTM Coordinates:** 17 W 514239 7965626

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** 1-3° **Flow Regime:** Open Water

Hydrology & Habitat Characteristics

Site	Channel Width (m)		Water Depth (m) (Summer/Fall)				Water Velocity (m/s) (Summer/Fall)			
	Bankfull	Wetted	25%	50%	75%	Max	25%	50%	75%	Max
60D	90.0	85.0 / 80.5	0.81 / 0.20	0.82 / 0.18	0.82 / -	0.90 / 0.90	0.47 / 0.34	0.65 / 0.43	0.50 / -	1.00 / 1.00
40D	90.0	85.0 / 80.5	0.24 / 0.22	0.50 / -	0.56 / -	1.00 / 1.00	0.25 / 0.18	0.40 / -	0.02 / -	1.00 / 1.00
20D	90.0	85.0 / 77.7	0.75 / 0.38	0.75 / -	0.68 / -	0.90 / 0.90	0.24 / 0.25	0.37 / -	0.22 / -	1.00 / 1.00
0	90.0	85.0 / 77.7	0.63 / 0.22	0.81 / -	1.07 / -	1.20 / 1.20	0.10 / 0.11	0.37 / -	0.57 / -	1.00 / 1.00
20U	90.0	85.0 / 81.4	0.48 / 0.70	0.69 / -	0.88 / -	1.00 / 1.00	0.23 / 0.09	0.14 / -	0.28 / -	1.00 / 1.00
40U	90.0	85.0 / 82.3	0.71 / 0.40	0.95 / -	1.20 / -	1.20 / 1.20	0.38 / 0.17	0.71 / -	0.41 / -	1.00 / 1.00
60U	90.0	85.0 / 72.2	0.80 / 0.42	1.12 / -	1.11 / -	1.25 / 1.25	0.54 / 0.20	0.40 / -	0.62 / -	1.00 / 1.00

Site	Stream Morphology Composition (%)						Substrate Composition (%)				
	Riffle	Pool (<0.2 m)	Pool (>0.2 m)	Run	Cascade	Other	Fines	Gravel	Small Cobble	Large Cobble	Boulders
60D	25	15	15	45	-	-	5	5	40	45	5
40D	25	15	15	45	-	-	5	5	40	45	5
20D	25	15	15	45	-	-	5	5	40	45	5
0	35	15	15	35	-	-	5	5	40	45	5
20U	30	20	20	30	-	-	5	5	35	45	10
40U	35	10	10	45	-	-	10	5	35	45	5
60U	35	10	10	45	-	-	10	5	35	45	5

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-5 **Dates Surveyed:** 30 June & 30 August, 2018 **UTM Coordinates:** 17 W 514239 7965626

Fisheries Data

Gear Used: Observation Only **Transect length (m):** N/A

Species	Season	Effort (min)	Total Caught/Observed	CPUE	Length Range (mm)
ARCH	Summer	N/A	2	-	~ 100-150
	Fall	N/A	0	-	N/A
NNST	Summer	N/A	0	-	N/A
	Fall	N/A	0	-	N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	H	H
NNST	N	N	L	L

Comments & Summary

Large river with abundant high-quality habitat. Too broad and deep to effectively electrofish, but large numbers of char are known to use this river throughout the open-water season.

Baffinland Iron Mines
Mary River Project

North/South Consultants Inc.
Aquatic Environment Specialists

Fish Habitat Quality – IMPORTANT

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-5 **Dates Surveyed:** 30 June & 30 August, 2018 **UTM Coordinates:** 17 W 514239 7965626

Photographs

A **B** **C**

Figure 1. Summer (top) and fall (bottom) views of CV-15-5 at the 60 m downstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-5 **Dates Surveyed:** 30 June & 30 August, 2018 **UTM Coordinates:** 17 W 514239 7965626

Photographs

A **B** **C**

Figure 2. Summer (top) and fall (bottom) views of CV-15-5 at the 40 m downstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-5 **Dates Surveyed:** 30 June & 30 August, 2018 **UTM Coordinates:** 17 W 514239 7965626

Photographs

A **B** **C**

Figure 3. Summer (top) and fall (bottom) views of CV-15-5 at the 20 m downstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-5 **Dates Surveyed:** 30 June & 30 August, 2018 **UTM Coordinates:** 17 W 514239 7965626

Photographs

A **B** **C**

Figure 4. Summer (top) and fall (bottom) views of CV-15-5 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-5 **Dates Surveyed:** 30 June & 30 August, 2018 **UTM Coordinates:** 17 W 514239 7965626

Photographs

A **B** **C**

Figure 5. Summer (top) and fall (bottom) views of CV-15-5 at the 20 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-5 **Dates Surveyed:** 30 June & 30 August, 2018 **UTM Coordinates:** 17 W 514239 7965626

Photographs

A B C

Figure 6. Summer (top) and fall (bottom) views of CV-15-5 at the 40 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-15-5 **Dates Surveyed:** 30 June & 30 August, 2018 **UTM Coordinates:** 17 W 514239 7965626

Photographs

A **B** **C**

Figure 7. Summer (top) and fall (bottom) views of CV-15-5 at the 60 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-16-1 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 514325 7965565

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **Flow Regime:** None

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

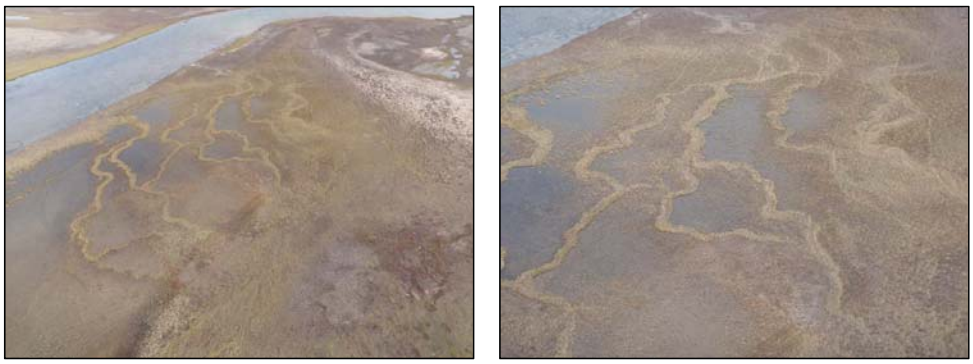
Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is a shallow, fishless low point/marshy area that is unconnected to nearby fish habitat at 15-5 unless that large river were to exceed its bank-full width.

Photographs



A **B**

Figure 1. Aerial views of CV-16-1 at the rail crossing during fall (A) and (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-16-2 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 514768 7965089

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **Flow Regime:** None

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This pond was fished in 2017 and no fish were captured or observed. It is too shallow for overwintering and is unconnected to CV-15-5 upstream due to a permanent vertical barrier at the confluence. There is no fish habitat at this crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-16-2 at the rail crossing during summer (A) and (B), and aerially during fall (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-16-3 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 514811 7964916

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** 1-3° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

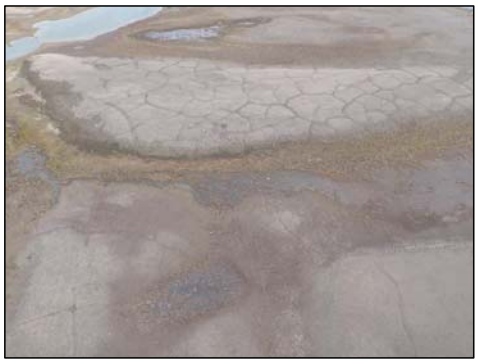
Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a dry creek bed in summer and nearly dry in fall. It is unconnected to fish-bearing habitat due to several soft and permanent barriers between the crossing and both upstream and downstream habitat. There is no fish habitat at this crossing.

Photographs

A



B

Figure 1. Views of CV-16-3 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-17-1 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 515261 7964025

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **Flow Regime:** Open Water

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This is a small, shallow, isolated pond beside the Tote Road. Fish were not observed and overwintering is not possible. There is no fish habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-17-1 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-18-1 **Date Surveyed:** 30 June, 2018 **UTM Coordinates:** 17 W 515331 7963846

General Physical Characteristics

Channel Confinement: N/A **Channel Gradient (range):** N/A **Flow Regime:** Open Water

Hydrology & Habitat Characteristics

Site	Channel Width (m)		Water Depth (m)				Water Velocity (m/s)				
	Wetted	High Water	25%	50%	75%	Max	25%	50%	75%	Max	Min
0	N/A	N/A	N/A	N/A	N/A	> 2.00	N/A	N/A	N/A	0.00	0.00

Site	Stream Morphology Composition (%)						Substrate Composition (%)				
	Riffle	Pool (<0.2 m)	Pool (>0.2 m)	Run	Cascade	Other	Fines	Gravel	Small Cobble	Large Cobble	Boulders
Nearshore - East	-	80	20	-	-	-	90	-	10	-	-
Nearshore - West	-	80	20	-	-	-	90	-	10	-	-
Nearshore - North	-	80	20	-	-	-	10	-	80	10	-
Nearshore - South	-	80	20	-	-	-	10	-	80	10	-
Offshore	-	-	100	-	-	-	-	-	-	-	-

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char - NOT FISH-BEARING** **Ninespine Stickleback – IMPORTANT**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-18-1 **Date Surveyed:** 30 June, 2018 **UTM Coordinates:** 17 W 515331 7963846

Fisheries Data

Gear Used: Backpack Electrofisher **Transect Length (m):** 100

Species	Season	Effort (min)	Total Caught/Observed	CPUE	Length Range (mm)
ARCH	Summer	4.35	0	-	-
	Fall	-	N.A	N.A	N.A
NNST	Summer	4.35	9	2.07	33 - 66
	Fall	-	N.A	N.A	N.A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	H	H	H	H

Comments & Summary

This is an isolated pond that provides habitat for all life history stages of Ninespine Stickleback. There are no char in this pond. A detailed depth and substrate survey was conducted on 31 August, 2018.

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char - NOT FISH-BEARING** **Ninespine Stickleback – IMPORTANT**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-18-1 **Date Surveyed:** 30 June, 2018 **UTM Coordinates:** 17 W 515331 7963846

Photographs

A **B** **C**

Figure 1. Summer (top) and fall (bottom) views of CV-18-1 shoreline habitat (A and B) and substrate (C).

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-18-2 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 515405 7963693

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** 1-3° **Flow Regime:** Open Water

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This site is an area of shallow ponding on the upstream side of the Tote Road. There is a steep gradient and no channel downstream of the road, creating a barrier under all flow conditions. There is no fish habitat at this crossing.

Photographs

A

B

C

Figure 1. Views of CV-18-2 at the rail crossing during summer (A) and (B), and aerially during fall (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-18-3 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 515607 7963389

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

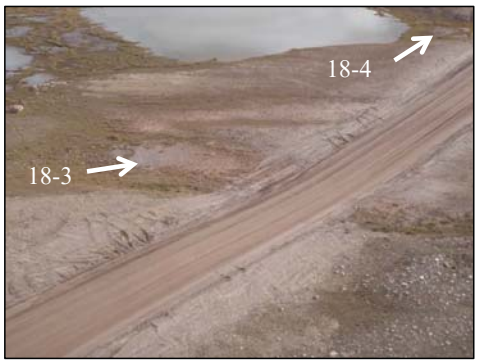
Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a dry low point during summer and nearly dry during fall. There are no connections to other habitat. There is no fish habitat at this crossing.

Photographs

A



B

Figure 1. Views of CV-18-3 at the rail crossing during summer (A) and (B), and aerially, with nearby 18-4 during fall (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-18-4 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 515682 7963328

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a nearly dry low point during summer and fall 2018. There are no connections to other fish-bearing habitat. There is no fish habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-18-4 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-19-1 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 515927 7963175

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This is an area of shallow ponding upstream of the Tote Road. There are no connections to other fish-bearing habitat due to downstream subsurface flow barriers. There is no fish habitat at this crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-19-1 at the rail crossing (A) and downstream of the Tote Road (B) during summer, and aerially during fall (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-19-2 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 516161 7963031

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This is a shallow, isolated pond upstream of the Tote Road. Fish were not observed. It does not provide overwintering habitat and there are no connections to other fish-bearing waterbodies. There is no fish habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-19-2 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-19-3 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 516613 7962587

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a dry low point in 2018. There is no fish habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-19-3 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-20-1 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 517040 7962255

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **Flow Regime:** None

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

This was a dry low point in 2018. There is no fish habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-20-1 at the rail crossing during summer (A) and aerially during fall (B).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-20-2 **Dates Surveyed:** 30 June & 23 August, 2018 **UTM Coordinates:** 17 W 517267 7962029

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** > 5° **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

Water levels were very low at this site during both surveys. In addition, there are multiple soft barriers to fish movement (subsurface flow, high gradient), and impassable vertical drops between the crossing and Phillips Creek downstream. There is no fish habitat at this crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-20-2 at the rail crossing during summer, looking upstream (A) downstream (B) and across (C).

Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char – NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**