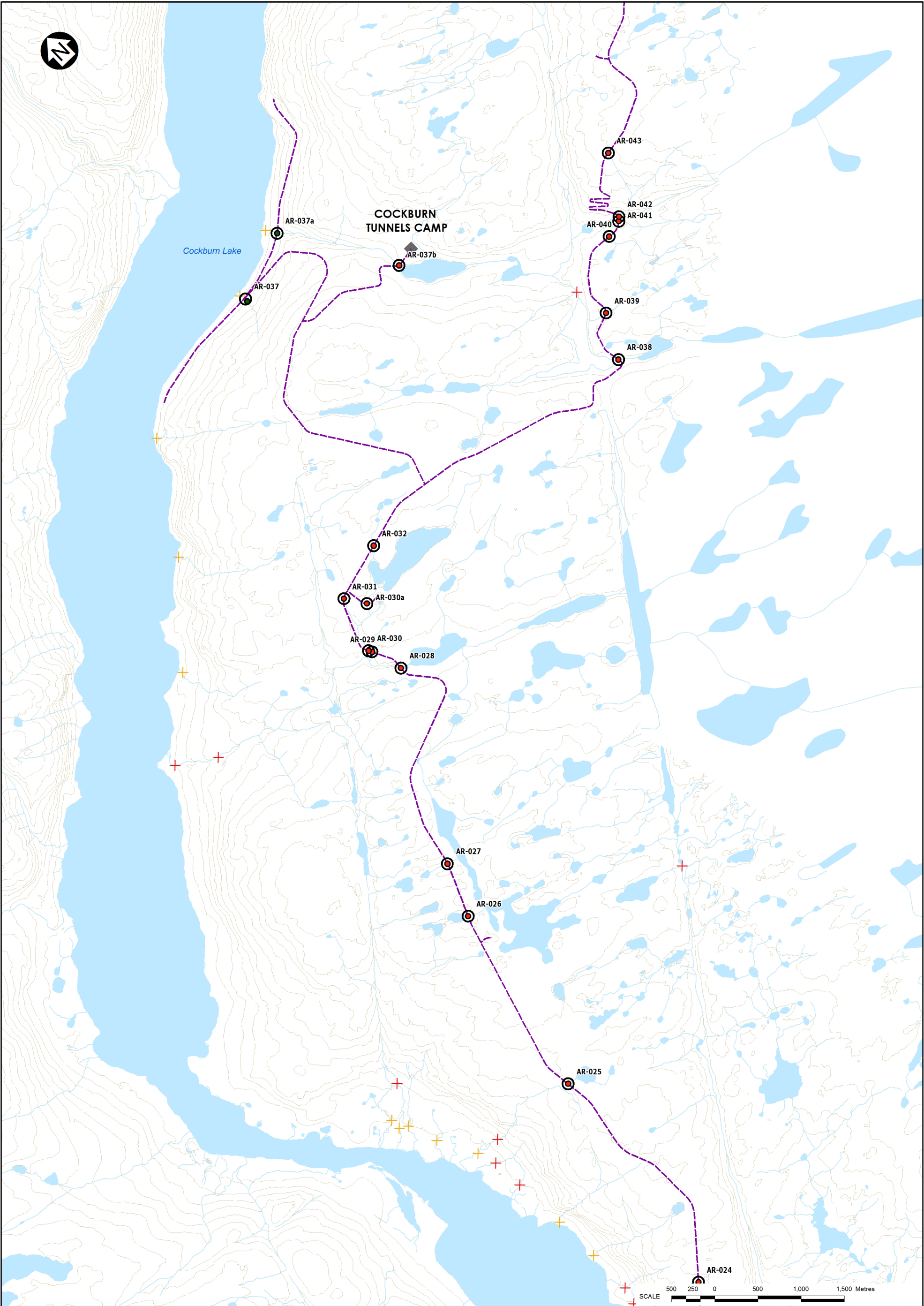


Path: G:\MARYRIV_GDB\IEIS_Figures\MD\Synthesis_RailLine_AccessRoad\Rev2\Apdx\20101119_ApdxAR_sg.mxd



LEGEND:

- ACCESS ROAD CROSSING SURVEY YEAR

●

2007

●

2008

●

2010

○

STREAM CROSSING

✕

FISH BARRIER (CONFIRMED)

✕

FISH BARRIER (AERIAL PHOTO INTERPRETATION)
- CONTOUR

—

MILNE INLET TOTE ROAD (EXISTING)

RAILWAY ALIGNMENT (PROPOSED)

CONSTRUCTION ACCESS ROAD (PROPOSED)

■

WATER

■

INFRASTRUCTURE

NOTES:

1. BASE MAP 1:50,000 © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005).
3. PROPOSED RAILWAY ALIGNMENT PROVIDED BY CANRAIL CONSULTANTS INC.
4. PROPOSED RAILWAY CONSTRUCTION ACCESS ROAD ALIGNMENT PROVIDED BY CANRAIL CONSULTANTS INC. DRAWING NO. RAILWAY ALIGNMENT AND CONST ACCESS RD - MARY RIVER STEENSBY 2010 -12AUG2010.DWG
5. LOCATION OF PROPOSED INFRASTRUCTURE IS APPROXIMATE AND SUBJECT TO FIELD ADJUSTMENTS
6. CONTOUR INTERVAL IS 25 AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

Access Road Stream Crossing Sites (MAP I)



P/A NO.
-
DATE: 19/11/2010

REF NO.
-
REV
2

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-043
UTM Coordinates: 17 W 607564 7831818

Date/Time Surveyed: 27-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | EPH |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Dry, mountain top drain. No headwaters. Channel not well defined.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-043
UTM Coordinates: 17 W 607564 7831818

Date/Time Surveyed: 27-Aug-10

Photographs



A



B

Figure 1. Aerial view looking upstream (A), aerial view looking downstream (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-042
UTM Coordinates: 17 W 607142 7831203

Date/Time Surveyed: 27-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | EPH |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Dry channel. Steep mountain drain which connects to AR-41.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-042
UTM Coordinates: 17 W 607142 7831203

Date/Time Surveyed: 27-Aug-10

Photographs



A



B

Figure 1. Aerial view looking downstream (A), aerial view looking upstream (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-041
UTM Coordinates: 17 W 607103 7831165

Date/Time Surveyed: 27-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | INT |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Steep gradient drainage between two shallow ponds (each < 2 m deep). No connection to overwintering habitat.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-041
UTM Coordinates: 17 W 607103 7831165

Date/Time Surveyed: 27-Aug-10

Photographs

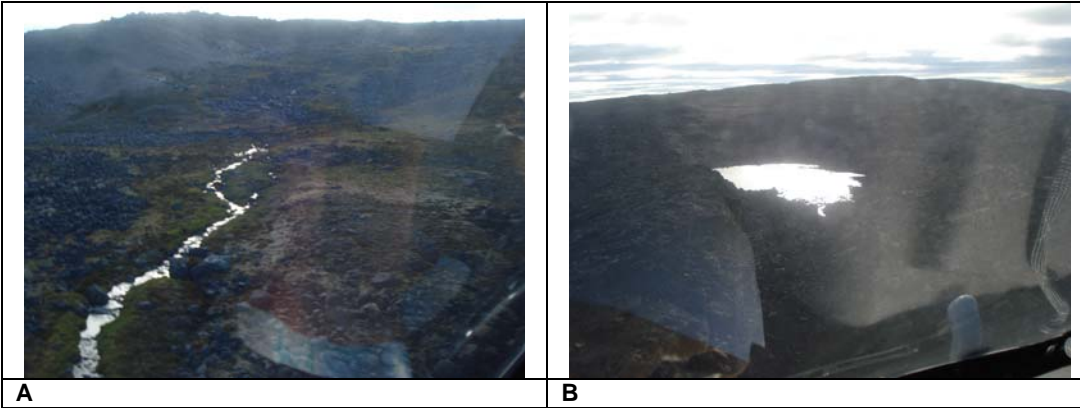


Figure 1. View at crossing looking upstream (A), view of headwater pond (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-040
UTM Coordinates: 17 W 606900 7831117

Date/Time Surveyed: 27-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | INT |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Drainage between two shallow ponds (each < 1 m deep). Poorly defined channel with a ridge between ponds. No connection to overwintering habitat.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-040
UTM Coordinates: 17 W 606900 7831117

Date/Time Surveyed: 27-Aug-10

Photographs



A



B

Figure 1. View downstream from crossing (A), view of upstream pond (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-039
UTM Coordinates: 17 W 606257 7830507

Date/Time Surveyed: 27-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | INT |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Drainage between a small, shallow (< 1 m deep) pond (upstream of crossing) and the same lake as AR-38 (< 4 m deep) (downstream). Was dry at time of survey.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-039
UTM Coordinates: 17 W 606257 7830507

Date/Time Surveyed: 27-Aug-10

Photographs

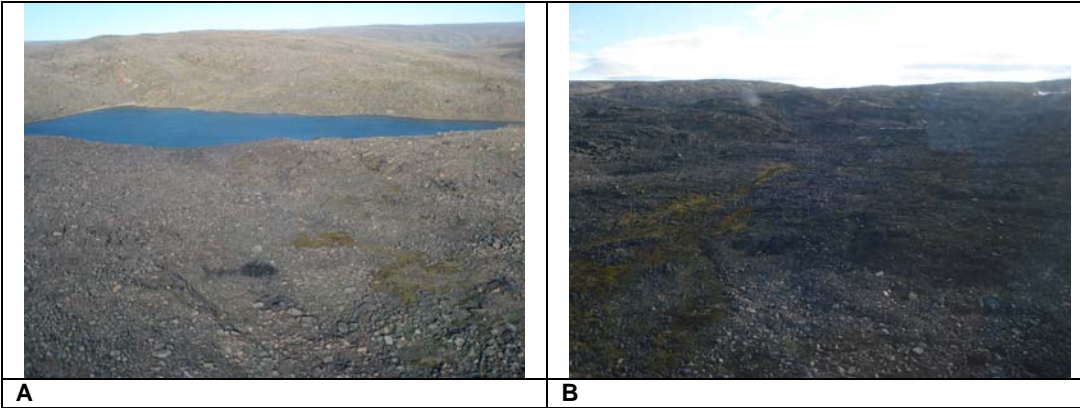


Figure 1. View downstream from crossing (A), view upstream from crossing (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-038
UTM Coordinates: 17 W 605987 7830021

Date/Time Surveyed: 27-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | INT |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Drainage connects two lakes. No defined channel; water percolating through rock. Water depths of upstream and downstream lakes < 4 m; are unlikely to support fish.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-038
UTM Coordinates: 17 W 605987 7830021

Date/Time Surveyed: 27-Aug-10

Photographs



A



B



C

Figure 1. View downstream of crossing (A), view upstream of crossing (B), view from upstream lake looking downstream (C).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-037b
UTM Coordinates: 17 W 604922 7832569

Date/Time Surveyed: 27-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | INT |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Drainage between Cockburn Lk. (downstream of crossing location) and shallow waterbody (upstream; < 4 m deep) that is unlikely to support fish. Steep gradient between crossing location and Cockburn Lk. would prevent fish from Cockburn Lk. reaching crossing area.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-037b
UTM Coordinates: 17 W 604922 7832569

Date/Time Surveyed: 27-Aug-10

Photographs

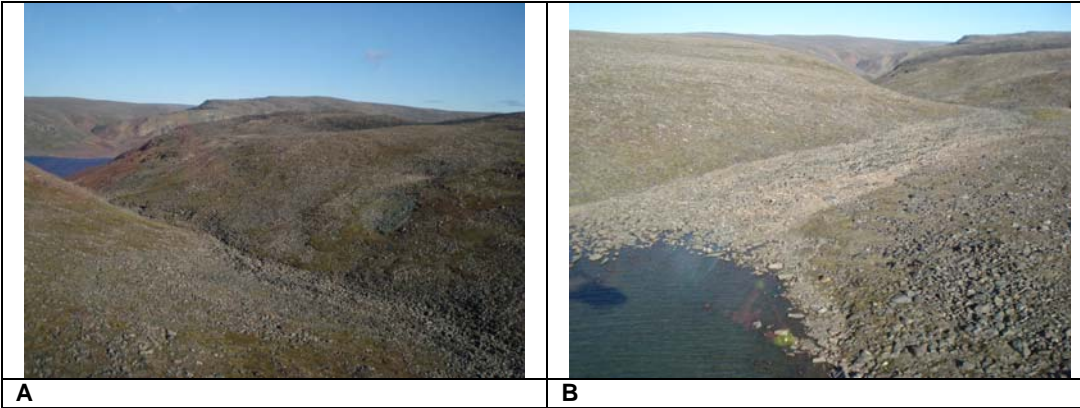


Figure 1. View of crossing area (A), outlet of upstream waterbody (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-032
UTM Coordinates: 17 W 602453 7830448

Date/Time Surveyed: 27-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | EPH |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

No defined channel. No headwaters. No fish habitat. Land ridge prevents waterbody to the East from entering stream.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-032
UTM Coordinates: 17 W 602453 7830448

Date/Time Surveyed: 27-Aug-10

Photographs

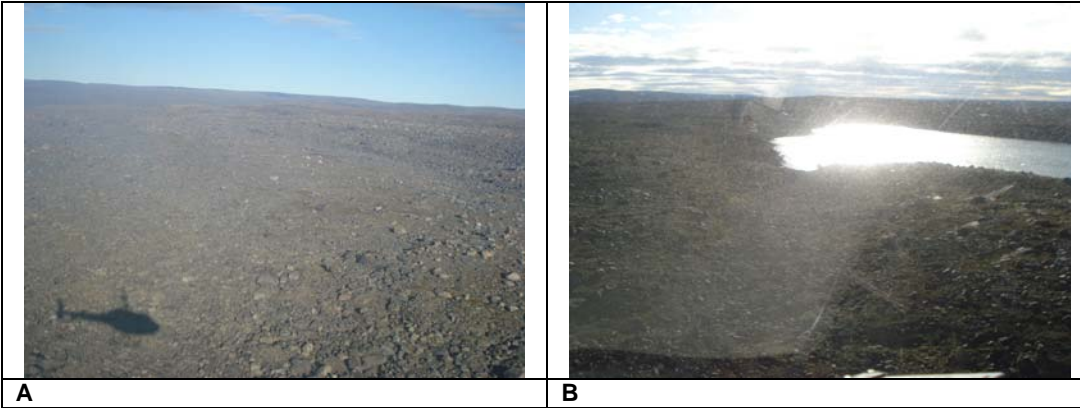


Figure 1. West view of crossing location (A), view of waterbody to the east of crossing (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-031
UTM Coordinates: 17 W 601777 7830247

Date/Time Surveyed: 27-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | UD | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | EPH |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Dry channel at crossing, no defined channel. No headwaters. Tributary to AR-030.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

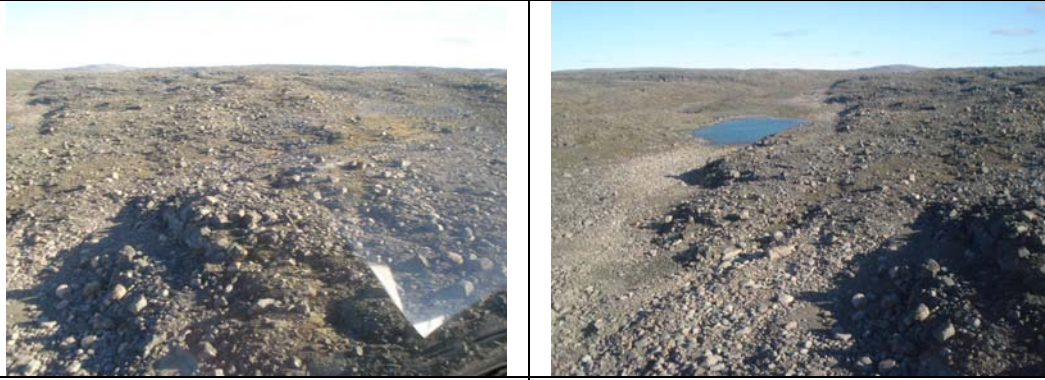
Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-031
UTM Coordinates: 17 W 601777 7830247

Date/Time Surveyed: 27-Aug-10

Photographs



A

B

Figure 1. Aerial view from crossing area looking upstream (A), aerial view of drain's confluence with downstream drain (crossing area is to the right hand side of the photo) (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-030a
UTM Coordinates: 17 W 601932 7830020

Date/Time Surveyed: 27-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | EPH |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Dry channel at crossing. Large waterbody upstream from crossing (< 4 meters deep). Land ridge between waterbody and stream. Flow of water from waterbody to stream would only occur under conditions of high water.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-030a
UTM Coordinates: 17 W 601932 7830020

Date/Time Surveyed: 27-Aug-10

Photographs



A



B

Figure 1. View of dry channel at crossing (A), view upstream from crossing (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-030
UTM Coordinates: 17 W 601566 7829618

Date/Time Surveyed: 27-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | EPH |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Mountain drain with no headwater lake. Was dry at time of survey. Joins with AR-028.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

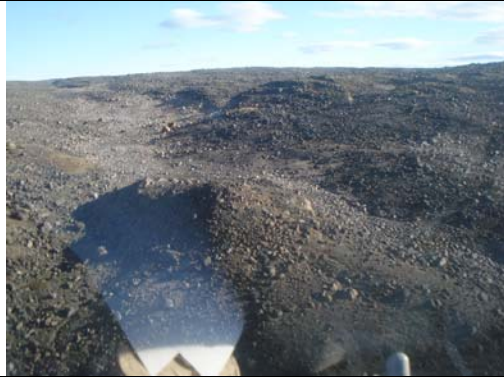
Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-030
UTM Coordinates: 17 W 601566 7829618

Date/Time Surveyed: 27-Aug-10

Photographs



A



B

Figure 1. Aerial view from crossing area looking downstream towards confluence with AR-028 drain (A), crossing location (B)

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-029
UTM Coordinates: 17 W 601585 7829579

Date/Time Surveyed: 27-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | EPH |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Dry drain flowing to AR-028 from shallow pond. High gradient.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-029
UTM Coordinates: 17 W 601585 7829579

Date/Time Surveyed: 27-Aug-10

Photographs



A



B



C

Figure 1. View of dry drain (A), upstream view of crossing (B), view of upstream pond (C).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-028
UTM Coordinates: 17 W 601695 7829211

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | INT |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Drains shallow waterbody to Cockburn Lk. Wetted at crossing area, but dry further downstream. The upstream waterbody is < 4 m deep and is unlikely to support fish. A steep gradient between Cockburn Lk. and the crossing location would prevent fish from Cockburn Lk. reaching crossing area.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-028
UTM Coordinates: 17 W 601695 7829211

Date/Time Surveyed: 26-Aug-10

Photographs



A



B



C

Figure 1. Aerial view from Cockburn Lk. looking upstream at drain's steep gradient (A), aerial view from crossing location looking upstream at headwater lake(B), downstream view of headwater lake and outlet (C).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-027
UTM Coordinates: 17 W 600506 7827212

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | INT |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Drainage with no defined channel between two waterbodies. Dry at the time of the survey. The upstream waterbody is < 2 m deep and is unlikely to support fish. The downstream waterbody is ≥ 4 m deep; however, a steep gradient between this waterbody and the crossing location prevents fish from reaching crossing area.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-027
UTM Coordinates: 17 W 600506 7827212

Date/Time Surveyed: 26-Aug-10

Photographs

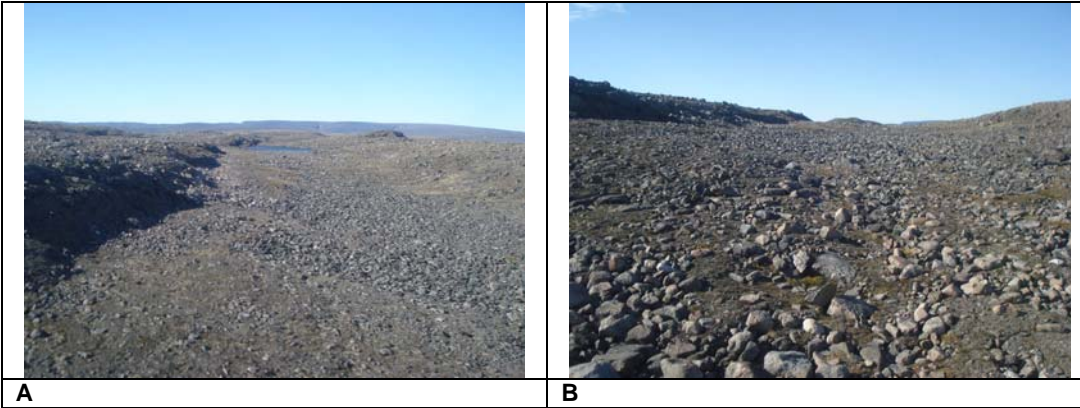


Figure 1. Aerial view from crossing area looking upstream towards smaller waterbody (A), aerial view from larger waterbody looking upstream at steep gradient (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-026
UTM Coordinates: 17 W 600253 7826609

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | INT |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Drainage with no defined channel between two waterbodies. The upstream waterbody is < 3 m deep and is unlikely to support fish. The downstream waterbody is ≥ 4 m deep; however, a steep gradient between the two waterbodies is a barrier to fish moving upstream.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-026
UTM Coordinates: 17 W 600253 7826609

Date/Time Surveyed: 26-Aug-10

Photographs



A

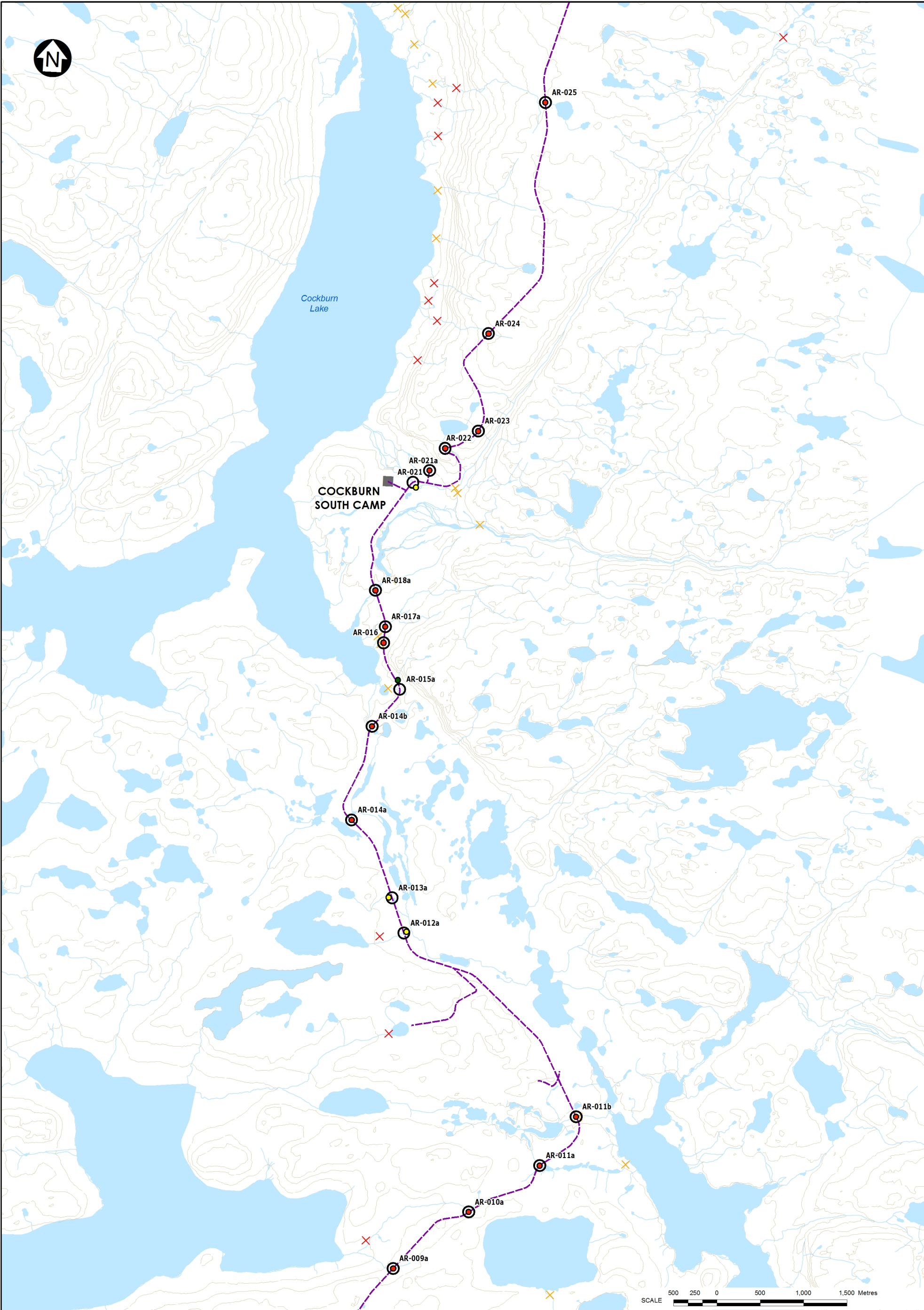


B



C

Figure 1. Aerial view from crossing area looking downstream towards larger waterbody (cobble area is the drainage) (A), aerial view from crossing area looking upstream towards smaller waterbody (B), aerial view from larger waterbody looking upstream at steep gradient (C).



LEGEND:

- ACCESS ROAD CROSSING SURVEY YEAR

 - 2007
 - 2008
 - 2010
- STREAM CROSSING

 - FISH BARRIER (CONFIRMED)
 - FISH BARRIER (AERIAL PHOTO INTERPRETATION)
- CONTOUR

 - MILNE INLET TOTE ROAD (EXISTING)
 - RAILWAY ALIGNMENT (PROPOSED)
 - CONSTRUCTION ACCESS ROAD (PROPOSED)
- WATER

 - INFRASTRUCTURE

NOTES:

- BASE MAP 1:50,000 © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009) ALL RIGHTS RESERVED.
- TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005).
- PROPOSED RAILWAY ALIGNMENT PROVIDED BY CANRAIL CONSULTANTS INC.
- PROPOSED RAILWAY CONSTRUCTION ACCESS ROAD ALIGNMENT PROVIDED BY CANRAIL CONSULTANTS INC. DRAWING NO. RAILWAY ALIGNMENT AND CONST ACCESS RD - MARY RIVER STEENSBY 2010 -12AUG2010.DWG
- LOCATION OF PROPOSED INFRASTRUCTURE IS APPROXIMATE AND SUBJECT TO FIELD ADJUSTMENTS
- CONTOUR INTERVAL IS 25 AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

Access Road Stream Crossing Sites (MAP J)



| | |
|------------------|---------|
| P/A NO. | REF NO. |
| - | - |
| DATE: 19/11/2010 | REV 2 |

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-025
UTM Coordinates: 17 W 599733 7824412

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | EPH |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Mountain drain was dry at time of assessment. Draining mountain top waterbody (< 3 meters deep). No fish passage from Cockburn Lk.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-025
UTM Coordinates: 17 W 599733 7824412

Date/Time Surveyed: 26-Aug-10

Photographs



Figure 1. Aerial view upstream of crossing area at headwaters (A), aerial view of crossing area (B), aerial view looking downstream of crossing location (C).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-024
UTM Coordinates: 17 W 599218 7821715

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | EPH |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Mountain top drain. No fish habitat. Not connected to upstream waterbody.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-024
UTM Coordinates: 17 W 599218 7821715

Date/Time Surveyed: 26-Aug-10

Photographs

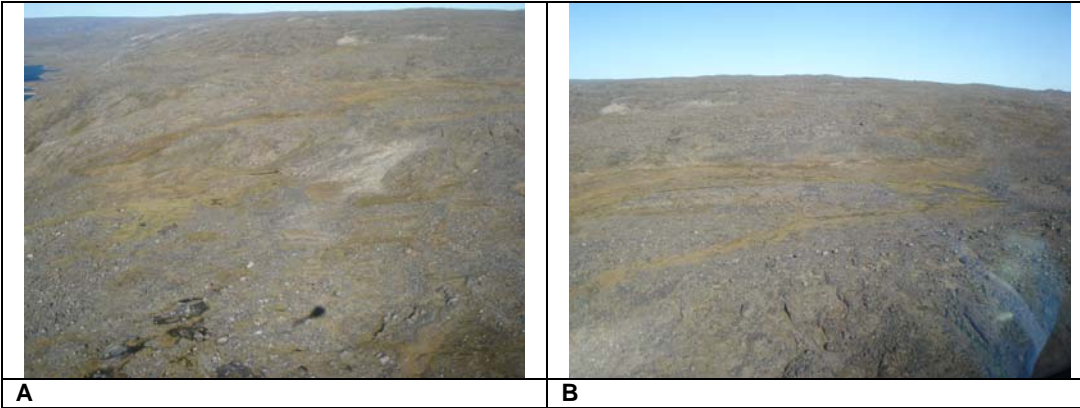


Figure 1. Aerial view of crossing location (A), aerial view upstream of crossing location (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-023
UTM Coordinates: 17 W 599162 7820588

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | EPH |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Mountain drain; steep gradient impassable to upstream moving fish. Channel was dry at the crossing location.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-023
UTM Coordinates: 17 W 599162 7820588

Date/Time Surveyed: 26-Aug-10

Photographs

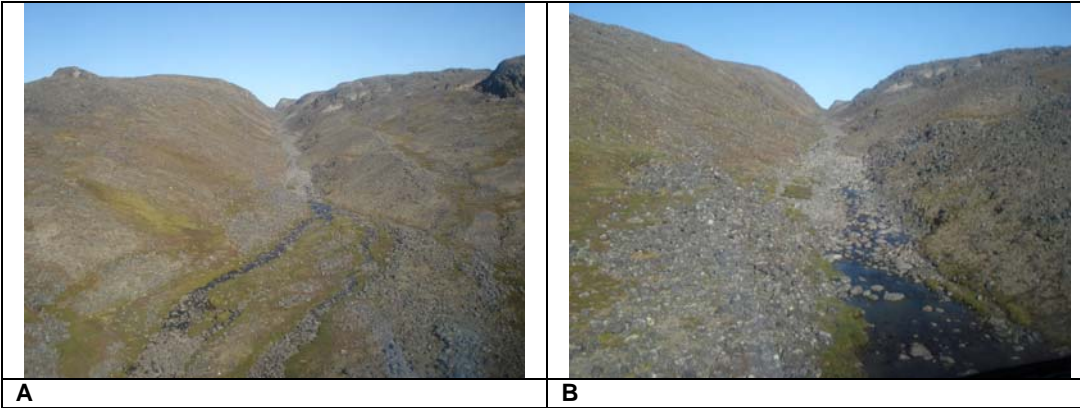


Figure 1. Aerial view from downstream of the crossing location looking upstream (A) and (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-022
UTM Coordinates: 17 W 598788 7820368

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | EPH |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Dry drain from small deep lake on top of mountain.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

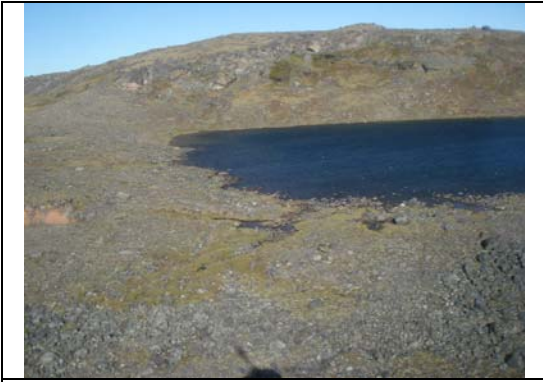
Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-022
UTM Coordinates: 17 W 598788 7820368

Date/Time Surveyed: 26-Aug-10

Photographs



A

Figure 1. Aerial view of dry drain from small deep lake on top of mountain (A)

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-021a
UTM Coordinates: 17 W 598623 7820102

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | EPH |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Dry drain which goes to stream entering Cockburn Lk.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-021a
UTM Coordinates: 17 W 598623 7820102

Date/Time Surveyed: 26-Aug-10

Photographs



A



B



C

Figure 1. Aerial view looking upstream towards crossing location (A), aerial view at crossing location (B), aerial view looking downstream of crossing (C)

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-018a
UTM Coordinates: 17 W 598072 7918689

Date/Time Surveyed: 26-Aug-10 / N/M

General Physical Characteristics

Floodplain Width (m): N/M **Channel Pattern:** Sinuous **Stage:** Moderate
Channel Confinement: PC **Channel Gradient (range):** 4-14° **Flow Regime:** PER
Bank Height (range in m): 0.75 **Bank Shape:** S **T_w (°C):** 8.5

Hydrology & Habitat Characteristics

| Distance and Direction from Crossing (m) | Channel Width (m) | | Water Depth (m) | | | | Water Velocity (m/s) | | | |
|--|-------------------|------------|-----------------|------|------|------|----------------------|------|------|------|
| | Wetted | High Water | 25% | 50% | 75% | Max | 25% | 50% | 75% | Max |
| 60D | 20.0 | 30.0 | 0.11 | 0.08 | 0.25 | 0.26 | 0.16 | 0.38 | 0.16 | 0.78 |
| 40D | 25.0 | 27.0 | 0.20 | 0.14 | 0.15 | 0.25 | 0.25 | 0.12 | 0.76 | 0.76 |
| 20D | 20.0 | 21.5 | 0.10 | 0.19 | 0.17 | 0.38 | 0.00 | 0.00 | 0.12 | 0.28 |
| 0 | 21.0 | 23.0 | 0.10 | 0.18 | 0.20 | 0.39 | 0.00 | 0.09 | 0.23 | 0.68 |
| 20U | 31.0 | 39.0 | 0.05 | 0.18 | 0.14 | 0.21 | 0.01 | 0.43 | 0.25 | 0.88 |
| 40U | 25.0 | 50.0 | 0.14 | 0.20 | 0.17 | 0.36 | 0.40 | 0.19 | 0.13 | 0.83 |
| 60U | 15.5 | 46.0 | 0.28 | 0.26 | 0.12 | 0.39 | 0.21 | 0.29 | 0.12 | 0.88 |

| Distance and Direction from Crossing (m) | Stream Morphology Composition (%) | | | | | | Substrate Composition (%) | | | | |
|--|-----------------------------------|---------------|---------------|-----|---------|------|---------------------------|--------|--------------|--------------|----------|
| | Riffle | Pool (<0.2 m) | Pool (>0.2 m) | Run | Cascade | Flat | Fines | Gravel | Small Cobble | Large Cobble | Boulders |
| 60D | 100 | | | | | | | | 5 | 15 | 80 |
| 40D | 100 | | | | | | | | 10 | 20 | 70 |
| 20D | 100 | | | | | | | | 20 | 30 | 50 |
| 0 | 100 | | | | | | | 10 | 35 | 35 | 20 |
| 20U | 90 | | 10 | | | | | 10 | 40 | 35 | 15 |
| 40U | 100 | | | | | | | | 30 | 30 | 40 |
| 60U | 100 | | | | | | | | 50 | 20 | 30 |

**Baffinland Iron Mines
Mary River Project**



Fish Habitat Quality – IMPORTANT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-018a
UTM Coordinates: 17 W 598072 7918689

Date/Time Surveyed: 26-Aug-10 / N/M

Fisheries Information

Electrofishing Conducted: N **Effort (min):** N/A **Electrofisher Settings:** N/A

| Species | Total Caught/Observed | CPUE | Length Range (mm) | Weight Range (g) |
|---------|-----------------------|------|-------------------|------------------|
| ARCH | 0 | - | - | - |
| NNST | 0 | - | - | - |

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|----------|--------------------|
| ARCH | No | No | High | Moderate |
| NNST | No | No | Moderate | Low |

Comments & Summary

Although electrofishing was not conducted, habitat near the crossing is suitable for rearing of both species. Connected to Cockburn Lake downstream of crossing; no downstream barriers observed.

**Baffinland Iron Mines
Mary River Project**



Fish Habitat Quality – IMPORTANT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-018a
UTM Coordinates: 17 W 598072 7918689

Date/Time Surveyed: 26-Aug-10 / N/M

Photographs



A



B



C

Figure 1. Aerial view of crossing area (A), view upstream of crossing (B), and downstream of crossing (C).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-017a
UTM Coordinates: 17 W 598208 7818277

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | EPH |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Crossing was dry during survey. Drains small shallow ponds (each < 1 m deep) into AR-016.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

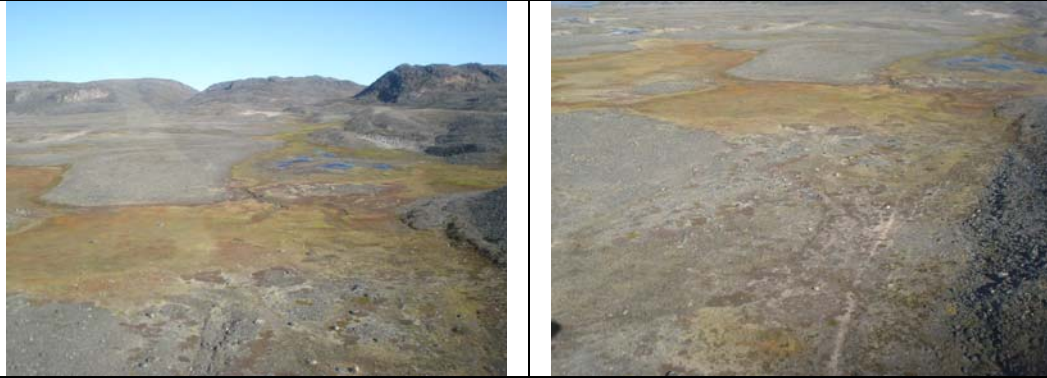
Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-017a
UTM Coordinates: 17 W 598208 7818277

Date/Time Surveyed: 26-Aug-10

Photographs



A

B

Figure 1. Aerial view of drainage (A), aerial view of crossing location (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-016
UTM Coordinates: 17 W 598198 7818092

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | EPH |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Ephemeral drain into deep waterbody. Steep gradient downstream of the crossing likely prevents fish passage.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

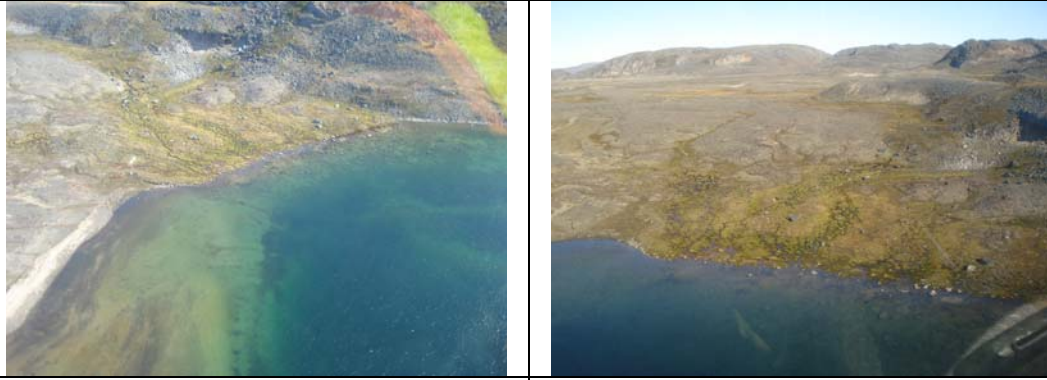
Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-016
UTM Coordinates: 17 W 598198 7818092

Date/Time Surveyed: 26-Aug-10

Photographs



A

B

Figure 1. Aerial view of drain entering waterbody downstream of crossing location (A), aerial view of drain; crossing location above sloped area (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-014b
UTM Coordinates: 17 W 598116 7917121

Date/Time Surveyed: 26-Aug-10 / N/M

General Physical Characteristics

| | | | | | |
|----------------------------------|-------------|----------------------------------|------------|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | Meandering | Stage: | Low |
| Channel Confinement: | C | Channel Gradient (range): | 2-8° | Flow Regime: | INT |
| Bank Height (range in m): | 0.28 – 0.35 | Bank Shape: | V | T_w (°C): | 4.5 |

Hydrology & Habitat Characteristics

| Distance and Direction from Crossing (m) | Channel Width (m) | | Water Depth (m) | | | | Water Velocity (m/s) | | | |
|--|-------------------|------------|-----------------|------|------|------|----------------------|------|------|------|
| | Wetted | High Water | 25% | 50% | 75% | Max | 25% | 50% | 75% | Max |
| 60D | 1.3 | 2.0 | 0.09 | 0.06 | 0.13 | 0.13 | TRACE | | | 0.01 |
| 40D | 1.8 | 2.1 | 0.01 | 0.06 | 0.02 | 0.06 | TRACE | | | 0.01 |
| 20D | 1.5 | 2.1 | 0.04 | 0.01 | 0.01 | 0.06 | TRACE | | | 0.01 |
| 0 | 0.80 | 2.1 | 0.08 | 0.07 | 0.01 | 0.08 | TRACE | | | 0.01 |
| 20U | DRY | 8.1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 40U | IP (0.3) | 3.4 | 0.02 | 0.04 | 0.03 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 |
| 60U | DRY | 2.4 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| Distance and Direction from Crossing (m) | Stream Morphology Composition (%) | | | | | | Substrate Composition (%) | | | | |
|--|-----------------------------------|---------------|---------------|-----|---------|------|---------------------------|--------|--------------|--------------|----------|
| | Riffle | Pool (<0.2 m) | Pool (>0.2 m) | Run | Cascade | Flat | Fines | Gravel | Small Cobble | Large Cobble | Boulders |
| 60D | | 100 | | | | | | | 40 | 20 | 40 |
| 40D | 5 | 95 | | | | | | 10 | 20 | 30 | 40 |
| 20D | 5 | 95 | | | | | | 15 | 20 | 25 | 40 |
| 0 | 10 | | | | | 90 | | 5 | 60 | 30 | 10 |
| 20U | DRY | | | | | | | | 60 | 35 | 10 |
| 40U | | 100 | | | | | | 5 | 60 | 25 | 10 |
| 60U | DRY | | | | | | | 5 | 60 | 25 | 10 |

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – MARGINAL

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-014b
UTM Coordinates: 17 W 598116 7917121

Date/Time Surveyed: 26-Aug-10 / N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 2:31 **Electrofisher Settings:** 710V, 30Hz, 12%DC

| Species | Total Caught/Observed | CPUE | Length Range (mm) | Weight Range (g) |
|---------|-----------------------|------|-------------------|------------------|
| ARCH | 0 | - | - | - |
| NNST | 0 | - | - | - |

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | Low | No |
| NNST | Low | No | Low | No |

Comments & Summary

Fish habitat near the crossing is marginal for rearing of both species due to low water level; however, further downstream, close to where the watercourse enters a waterbody, fish habitat improves (i.e., water depth increases). No fish were captured at the crossing area and fish utilization is likely limited to periods when water levels are higher (e.g., during higher spring water levels; after rainfall).

**Baffinland Iron Mines
Mary River Project**



Fish Habitat Quality – MARGINAL

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-014b
UTM Coordinates: 17 W 598116 7917121

Date/Time Surveyed: 26-Aug-10 / N/M

Photographs



A



B



C



D

Figure 1. Aerial view of crossing area (A), view upstream of crossing (B), downstream of crossing (C), and view upstream from 60 m upstream of the crossing (D).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-014a
UTM Coordinates: 17 W 597938 7816029

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|-----|----------------------------|-----|
| Floodplain Width (m): | N/M | Channel Pattern: | N/M | Stage: | N/A |
| Channel Confinement: | N/M | Channel Gradient (range): | N/M | Flow Regime: | INT |
| Bank Height (range in m): | N/M | Bank Shape: | N/M | T_w (°C): | N/M |

Hydrology & Habitat Characteristics

N/M

Fisheries Information

| | | | | | |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|
| Electrofishing Conducted: | N | Effort (min): | N/A | Electrofisher Settings: | N/A |
|----------------------------------|---|----------------------|-----|--------------------------------|-----|

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | No | No |

Comments & Summary

Saturated wetted connection between two shallow waterbodies (each < 3 m deep) that are unlikely to support fish.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-014a
UTM Coordinates: 17 W 597938 7816029

Date/Time Surveyed: 26-Aug-10

Photographs

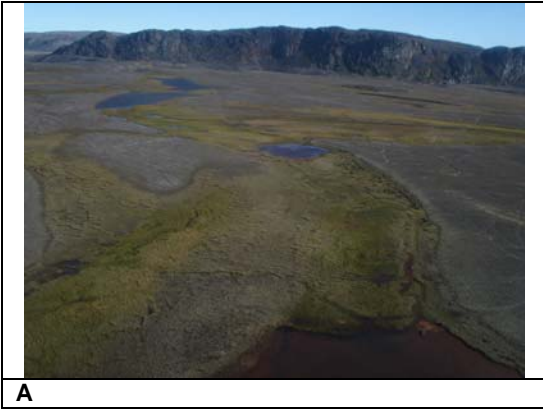


Figure 1. Aerial view of crossing area (A).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-013a
UTM Coordinates: 17 W 598413 7815163

Date/Time Surveyed: 6-Sept-2008/11:45

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: N **Effort (min):** N/A **Electrofisher Settings:** N/A

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|----------|--------------------|
| ARCH | No | No | No | No |
| NNST | No | No | Moderate | No |

Comments & Summary

The maximum water depth at the crossing was 0.1 m and the substrate composition was 100% silt.

This is more marshy area; the substrate is entirely flooded terrestrial/silt. In the spring and maybe in the summer NNST might use this habitat for spawning. At that point this habitat is also probably very indirectly connected to overwintering habitat. No fish would be here currently. There are several small ponds nearby that look like better open water habitat. No obvious ponds upstream. (All the ponds in this area had NNST in the summer and were shallow (~0.3 m) and had FT/silt as the substrate.)

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – MARGINAL

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-013a
UTM Coordinates: 17 W 598413 7815163

Date/Time Surveyed: 6-Sept-2008/11:45

Photographs



A



B



C

Figure 1. View of habitat at crossing (A), downstream of crossing (B) and upstream of crossing (C).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-012a
UTM Coordinates: 17 W 598639 7814776

Date/Time Surveyed: 7-Sept-08 / 10:45

General Physical Characteristics

| | | | | | |
|----------------------------------|---------|----------------------------------|------------------------|----------------------------|--------------|
| Floodplain Width (m): | 200 | Channel Pattern: | Straight | Stage: | Normal -high |
| Channel Confinement: | NC | Channel Gradient (range): | 0.0-0.25° | Flow Regime: | PER |
| Bank Height (range in m): | 0.0-0.2 | Bank Shape: | 30% UC, 70% UD-Flooded | T_w (°C): | 3.0 |

Hydrology & Habitat Characteristics

| Distance and Direction from Crossing (m) | Channel Width (m) | | Water Depth (m) | | | | Water Velocity (m/s) | | | |
|--|-------------------|------------|-----------------|------|------|------|----------------------|------|------|------|
| | Wetted | High Water | 25% | 50% | 75% | Max | 25% | 50% | 75% | Max |
| 20D | ~70 | flooded | 0.07 | 0.06 | 0.03 | 0.07 | 0.44 | 0.00 | 0.00 | 0.44 |
| 0 | 52 | ~62 | 0.06 | 0.14 | 0.06 | 0.14 | 0.15 | 0.08 | 0.00 | 0.15 |
| 20U | 29 | ~82 | 0.07 | 0.06 | 0.04 | 0.23 | 0.05 | 0.00 | 0.00 | 0.05 |
| 40U | 11.7 | flooded | 0.07 | 0.1 | 0.05 | 0.18 | 0.00 | 0.1 | 0.00 | - |
| 60U | 16.1 | flooded | 0.24 | 0.06 | 0.09 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 |

| Distance and Direction from Crossing (m) | Stream Morphology Composition (%) | | | | | | Substrate Composition (%) | | | | |
|--|-----------------------------------|---------------|---------------|-----|---------|-------|---------------------------|--------|--------------|--------------|----------|
| | Riffle | Pool (<0.2 m) | Pool (>0.2 m) | Run | Cascade | Other | Fines | Gravel | Small Cobble | Large Cobble | Boulders |
| 20D | 25 | | 75 | | | | 40FT | | 20 | 30 | 10 |
| 0 | 10 | | 90 | | | | 35 sand,35FT | | 20 | 15 | 5 |
| 20U | 20 | | 80 | | | | 40 sand,40FT | | 5 | 10 | 5 |
| 40U | | | 100 | | | | 75sand,10Ft | 3 | 5 | 5 | 2 |
| 60U | | | 100 | | | | 10FT,78sand | | 5 | 5 | 2 |

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – IMPORTANT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-012a
UTM Coordinates: 17 W 598639 7814776

Date/Time Surveyed: 7-Sept-08 / 10:45

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 9:40 **Electrofisher Settings:** 800V, 50HZ, 30%

| Species | Total Caught/Observed | CPUE | Length Range (mm) | Weight Range (g) |
|---------|-----------------------|------|-------------------|------------------|
| ARCH | 3 | 0.31 | 53-87 | 1-6 |
| NNST | 2 | 0.20 | 35-65 | <1-2 |

Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | High | Moderate |
| NNST | Moderate | No | High | Moderate |

Comments & Summary

Pond downstream is connected to many other ponds indirectly and eventually overwintering habitat, although water levels may prevent passage. Upstream barrier at UTM 17 W 598335 7814707.

**Baffinland Iron Mines
Mary River Project**



Fish Habitat Quality – IMPORTANT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-012a
UTM Coordinates: 17 W 598639 7814776

Date/Time Surveyed: 7-Sept-08 / 10:45

Photographs



A



B



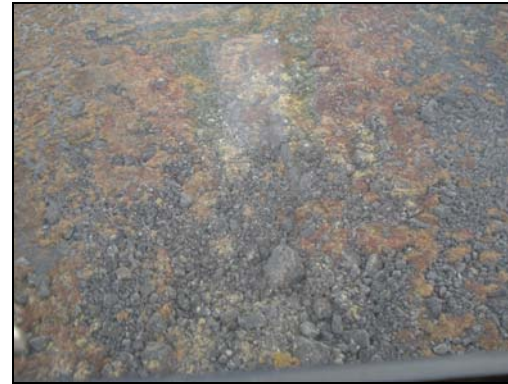
C



D



E



F

Figure 1. View of habitat, (A) 40m downstream across, (B) 20m downstream, (C) 20m upstream, (D) 40m upstream across, (E) at crossing across, and (F) upstream barrier.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-011b
UTM Coordinates: 17 W 600706 7812749

Date/Time Surveyed: 26-Aug-10 / N/M

General Physical Characteristics

| | | | | | |
|----------------------------------|-----|----------------------------------|----------|----------------------------|------|
| Floodplain Width (m): | N/M | Channel Pattern: | Sinuuous | Stage: | High |
| Channel Confinement: | NC | Channel Gradient (range): | < 2° | Flow Regime: | PER |
| Bank Height (range in m): | FL | Bank Shape: | S | T_w (°C): | 6.0 |

Hydrology & Habitat Characteristics

| Distance and Direction from Crossing (m) | Channel Width (m) | | Water Depth (m) | | | | Water Velocity (m/s) | | | |
|--|-------------------|------------|-----------------|------|------|------|----------------------|------|------|------|
| | Wetted | High Water | 25% | 50% | 75% | Max | 25% | 50% | 75% | Max |
| 60D | 10.3 | 10.3 | 0.08 | 0.10 | 0.09 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 |
| 40D | 5.2 | 5.2 | 0.05 | 0.13 | 0.07 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20D | 4.5 | 4.5 | 0.03 | 0.14 | 0.05 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0 | 4.5 | 4.5 | 0.03 | 0.24 | 0.03 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20U | FT | FT | | | | | | | | |

| Distance and Direction from Crossing (m) | 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 | | 100 | | | | | 100 | | | | |
| 40D | | 100 | | | | | 100 | | | | |
| 20D | | 100 | | | | | 100 | | | | |
| 0 | | 50 | 50 | | | | 100 | | | | |
| 20U | | FT | | | | | 100 | | | | |

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 5:57 **Electrofisher Settings:** 380V, 30Hz, 12%DC

| Species | Total Caught/Observed | CPUE | Length Range (mm) | Weight Range (g) |
|---------|-----------------------|------|-------------------|------------------|
| ARCH | 0 | - | - | - |
| NNST | 16 | 2.69 | N/M | N/M |

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – MARGINAL

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-011b
UTM Coordinates: 17 W 600706 7812749

Date/Time Surveyed: 26-Aug-10 / N/M

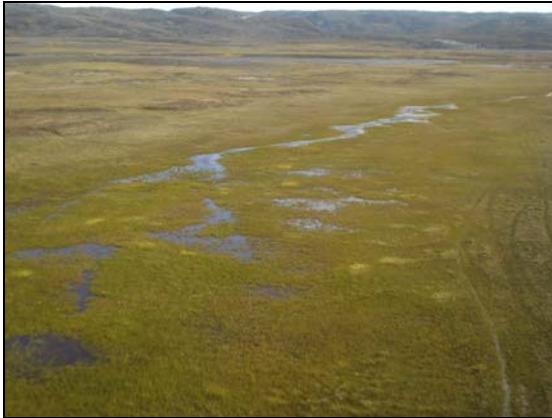
Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---------|----------|---------------|---------|--------------------|
| ARCH | No | No | No | No |
| NNST | Moderate | No | High | No |

Comments & Summary

Approximately 20 m upstream of the crossing location, the watercourse channel disappears and the habitat becomes fen-like (i.e., saturated grass). NNST habitat would be rated Marginal in this fen-like habitat as water depth is diminished. Habitat at and downstream of the crossing may be used by NNST for spawning. Further downstream, there is a connection to an overwintering waterbody.

Photographs



A



B



C

Figure 1. Aerial view of crossing area (A), view upstream of crossing (B), and view downstream of crossing (C).