APPENDIX 5.2-1.

DETAILED HABITAT ASSESSMENTS AND SUMMARY OF RESULTS FOR LAKE ENCROACHMENT SITES.

Page

Table A5.2-1.1. Summary of results from Railway lake encroachment surveys and assessments.

Site	CANARAIL Site Names (if different)	Surveyed	Survey Year	Survey Date	UTM Coordinates			Habitat Rating	ARCH seen[1]	NNST seen[1]	Comments
					Zone	Easting	Northing				
LE-015-1	-	yes	2008	20-Jul	17W	576946	7903233	None	No	No	-
LE-017-1	-	yes	2008	20-Jul	17W	577999	7902627	Marginal	No	No	-
LE-019-1	-	yes	2008	24-Jul	17W	580628	7901598	None	No	No	-
LE-023-1	-	yes	2008	24-Jul	17W	584445	7900426	Important	Yes	No	-
LE-024-1	-	yes	2008	24-Jul	17W	584840	7900434	None	No	No	-
LE-024-2	-	yes	2008	24-Jul	17W	585107	7900222	None	No	No	-
LE-R36	not identified	yes	2008	3-Sep	17W	595380	7894213	None	No	No	-
LE-R37	not identified	yes	2008	3-Sep	17W	595790	7893228	None	No	No	-
LE-R38	not identified	yes	2008	3-Sep	17W	595911	7892779	None	No	No	-
LE-R39	not identified	yes	2008	11-Aug	17W	596583	7891540	Marginal	No	No	-
LE-R40	not identified	yes	2008	3-Sep	17W	597331	7889379	Marginal	No	No	-
LE-R41	NCV-45-1	yes	2008	3-Sep	17W	597137	7886910	None	No	No	-
LE-R42	not identified	yes	2008	3-Sep	17W	597067	7886846	None	No	No	-
LE-047-1	-	yes	2008	4-Sep	17W	597766	7883332	None	No	No	-
LE-048-1	-	yes	2008	4-Sep	17W	598097	7881675	None	No	No	-
LE-051-1	-	yes	2008	4-Sep	17W	596614	7879326	Important	No	No	-
LE-057-1	-	yes	2008	4-Sep	17W	599442	7874619	Important	No	Yes	-
LE-057-2	-	yes	2008	5-Sep	17W	599389	7874250	Important	yes	Yes	-
LE-062-1	-	yes	2008	5-Sep	17W	598254	7869613	Important	No	Yes	-
LE-068-1	-	yes	2008	4-Aug	17W	601085	7865468	None	No	No	-
LE-074-1	-	yes	2008	26-Jul	17W	603758	7860035	None	No	No	-
LE-082-1	-	yes	2008	4-Aug	17W	606379	7852516	None	No	No	-
LE-095-1	-	yes	2008	4-Aug	17W	608265	7840508	Important	No	No	-
AR-050a	not identified	yes	2010	27-Aug	17W	608027	7840756	Marginal	Yes	Yes	-
AR-050b	not identified	yes	2010	28-Aug	17W	608065	7840787	Marginal	Yes	Yes	-
LE-109-1	-	yes	2008	3-Aug	17W	600834	7832070	Important	No	No	-
LE-117-1	-	yes	2008	3-Aug	17W	597920	7825799	None	No	No	-
LE-121-1	-	yes	2008	2-Aug	17W	598561	7822010	None	No	No	-
LE-127-1	-	yes	2008	3-Aug	17W	598534	7816263	Important	No	Yes	-
LE-127-2	-	yes	2008	3-Aug	17W	598559	7816054	Important	No	Yes	-
LE-127-3	-	yes	2008	3-Aug	17W	598579	7815814	Important	No	Yes	-
LE-128-1	-	yes	2008	3-Aug	17W	598604	7815605	Marginal	No	Yes	-
LE-129-1	-	yes	2008	3-Aug	17W	599356	7814495	Marginal	Yes	Yes	-

Table A5.2-1.1. Continued.

Site	CANARAIL Site Names (if different)	Surveyed	Survey Year	Survey Date	UTM Coordinates			Habitat Rating	ARCH seen[1]	NNST seen[1]	Comments
					Zone	Easting	Northing				
LE-131-1	-	yes	2008	3-Aug	17W	600654	7812572	Marginal	No	Yes	-
LE-132-1	-	yes	2008	3-Aug	17W	600775	7812191	Marginal	Yes	No	-
LE-133-1	-	yes	2008	25-Jul	17W	600853	7810637	None	No	No	-
LE-134-1	-	yes	2008	25-Jul	17W	600381	7810342	None	No	No	-
LE-134-2	-	yes	2008	25-Jul	17W	599985	7810263	None	No	No	-
LE-136-1	-	yes	2008	25-Jul	17W	598899	7809533	Important	Yes	No	-
LE-142-1	-	yes	2008	24-Jul	17W	596885	7803858	Important	no	no	-
LE-142-2	-	yes	2008	24-Jul	17W	597004	7803817	Important	no	no	-
STEP-LE-1-1	-	yes	2008	1-Aug	17W	595035	7802582	Important	No	Yes	-
STEP-LE-2-1	-	yes	2008	1-Aug	17W	594483	7801196	Important	Yes	Yes	-
STEP-LE-6-1	-	yes	2008	1-Aug	17W	594607	7801558	Marginal	Yes	Yes	-
ST28	-	yes	2008	4-Aug	17W	595532	7803279	Marginal	No	Yes	-

[1] - includes all ARCH or NNST that were captured.

MINE INLET TOTE ROAD

MINE SITE

Camp Lake

MAP A

RAVN RIVER CAMP

MAP B

Mid-rail Camp Lake

MID-RAIL CAMP

MAP C

Cockburn Lake

MAP D

Cockburn Lake

COCKBURN TUNNELS CAMP

Cockburn Lake

COCKBURN SOUTH CAMP

MAP E

STEENSBY INLET

STEENSBY PORT

SCALE 3 1.5 0 3 6 9 12 15 km

LEGEND:

LAKE ENCROACHMENT SURVEY YEAR
- 2008
- 2010

STREAM CROSSING

FISH BARRIER (CONFIRMED)

FISH BARRIER (AERIAL PHOTO INTERPRETATION)

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 ADJUSTEMENTS

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

Railway Lake Encroachment Sites

North/South Consultants Inc.
Aquatic Environment Specialists

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

Path: G:\MARYRIV_GDB\EIS_GDB\EIS_Figures_2010EIS_Figures\MXD\Synthesis_RailLine_AccessRoad\Rev2Apdx\20101119_ApdxLE_Overview_.mxd

Camp Lake

CLT-2 Falls

CLT-1 Falls

MILNE INLET TOTE ROAD

Sheardown Lake (N.E.)

SDL-12 Falls

Sheardown Lake (S.W.)

Nuluujaak Mountain

MINE SITE

Mary River Falls

LE-015-1

LE-017-1

LE-019-1

SCALE 1 0.5 0 1 2 3 4 km

LEGEND:

LAKE ENCROACHMENT SURVEY YEAR
- 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 ADJUSTEMENTS
6. CONTOUR INTERVAL IS 25 AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

Railway Lake Encroachment Sites (MAP A)

North/South Consultants Inc.
Aquatic Environment Specialists

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

Path: G:\MARYRIV_GDB\EIS_GDB\EIS_Figures_2010EIS_Figures\MXD\Synthesis_RailLine_AccessRoad\Rev2Apdx\20101119_ApdxLE_sg.mxd

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-015-1
UTM Coordinates: 17 W 576946 7903233
Date/Time Surveyed: 20-Jul-08 / 05:05

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 2:32 **Electrofisher Settings:** 900V, 70Hz, 40%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	No	No
NNST	No	No	No	No

Comments & Summary

The maximum water depth was 0. 05 m. The steam morphology at the crossing was a pool (< 0.2 m) and the substrate composition was 100% small cobble.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-015-1
UTM Coordinates: 17 W 576946 7903233
Date/Time Surveyed: 20-Jul-08 / 05:05

Photographs

A

B

Figure 1. View of habitat (A-B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-017-1
UTM Coordinates: 17 W 577999 7902627
Date/Time Surveyed: 20-Jul-08 / 03:05

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 3:45 **Electrofisher Settings:** 700V, 70Hz, 40%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	No	Yes
NNST	No	No	No	No

Comments & Summary

ARCH must migrate from large D/S river during high water into CV-017-1. The maximum water depth at the crossing was 0.45 m and the substrate was 100% fines. The water temperature was 4.0 °C.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-017-1
UTM Coordinates: 17 W 577999 7902627
Date/Time Surveyed: 20-Jul-08 / 03:05

Photographs

A

B

C

Figure 1. View of habitat (A-C).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-019-1
UTM Coordinates: 17 W 580628 7901598
Date/Time Surveyed: 24-Jul-08 / 04:35

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 4:30 **Electrofisher Settings:** 600V, 40Hz, 30%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	No	No
NNST	No	No	No	No

Comments & Summary

No connections with overwintering habitat. The substrate composition at the crossing was 70% small cobble and 30% large cobble.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-019-1
UTM Coordinates: 17 W 580628 7901598
Date/Time Surveyed: 24-Jul-08 / 04:35

Photographs

A

B

C

Figure 1. View of habitat (A-C).

LE-023-1
LE-024-1
LE-024-2
RAVN RIVER CAMP
LE-R36
LE-R37
LE-R38
LE-R39
Pingimajuq Ridge
LE-R40
LE-R42
LE-R41
LE-047-1
LE-048-1
LE-051-1
MID-RAIL CAMP
Mid-rail Camp Lake
SCALE 1 0.5 0 1 2 3 4 km

LEGEND:

LAKE ENCROACHMENT SURVEY YEAR
- 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 ADJUSTEMENTS
6. CONTOUR INTERVAL IS 25 AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

Railway Lake Encroachment Sites (MAP B)

North/South Consultants Inc.
Aquatic Environment Specialists

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

Path: G:\MARYRIV_GDB\EIS_GDB\EIS_Figures_2010EIS_Figures\MXD\Synthesis_RailLine_AccessRoad\Rev2Apdx\20101119_ApdxLE_sg.mxd

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-23-1
UTM Coordinates: 17 W 584445 7900426
Date/Time Surveyed: 24-Jul-08 / 03:55

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 5:00 **Electrofisher Settings:** 600V, 40Hz, 30%DC

Species	Total Caught/Observed	CPUE	Length Range (mm)	Weight Range (g)
ARCH	9	1.8	75-95	6-8
NNST	0	-	-	-

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	No	No	High	No
NNST	No	No	No	No

Comments & Summary

The water body was 10 X 200 m and the maximum water depth ranged from 1.0 – 1.5 m. The substrate composition at the crossing was 50% small cobble, 30% large cobble and 20% boulders. The flow regime was permanent and the water temperature was 1ºC.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-23-1
UTM Coordinates: 17 W 584445 7900426
Date/Time Surveyed: 24-Jul-08 / 03:55

Photographs

A

B

C

Figure 1. View of habitat (A-C).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-024-1
UTM Coordinates: 17 W 584840 7900434
Date/Time Surveyed: 24-Jul-08 / 04:00

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 4:30 **Electrofisher Settings:** 600V, 40Hz, 30%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	No	No
NNST	No	No	No	No

Comments & Summary

No fish habitat. Not connected to any river or deep lake. The substrate composition at the crossing was 45% small cobble, 45% large cobble and 10% boulders.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-024-1
UTM Coordinates: 17 W 584840 7900434
Date/Time Surveyed: 24-Jul-08 / 04:00

Photographs

A

B

Figure 1. View of habitat (A-B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-024-2
UTM Coordinates: 17 W 585107 7900222
Date/Time Surveyed: 24-Jul-08 / 04:20

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 4:00 **Electrofisher Settings:** 600V, 40Hz, 30%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	No	No
NNST	No	No	No	No

Comments & Summary

No fish habitat. The substrate composition at the crossing was 80% fines, 10% small cobble and 10% large cobble.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-024-2
UTM Coordinates: 17 W 585107 7900222
Date/Time Surveyed: 24-Jul-08 / 04:20

Photographs

A

B

Figure 1. View of habitat (A) and substrate (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-R36
UTM Coordinates: 17 W 595380 7894213
Date/Time Surveyed: 3-Sept-2008

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 2:32 **Electrofisher Settings:** 300V, 30Hz, 30%

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	No	No
NNST	No	No	No	No

Comments & Summary

The channel gradient was 1.25° and the water temperature was 6.0 °C. The maximum water depth at the crossing was 0.75 m and the substrate was 95% algae, 2% large cobble and 3% boulders.

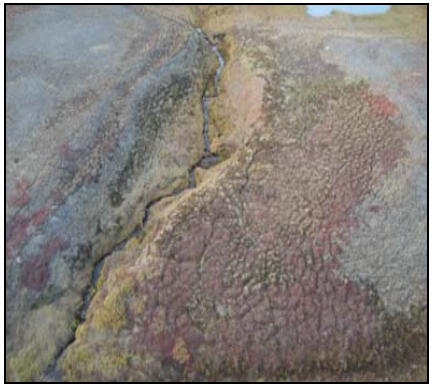
This is the shallow pond downstream of CV-R19 and R20. It is separated by a stretch of dry land that has a small amount of water running down over the grass in one spot. Approximately 50m downstream there is nice fish habitat, but even at high water it is very unlikely fish could reach the pond.

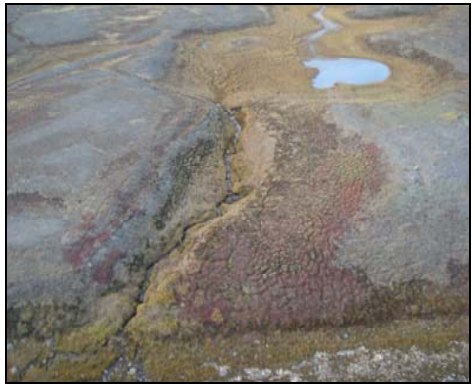
Rail Alignment Watercourse Crossing Assessment

Location

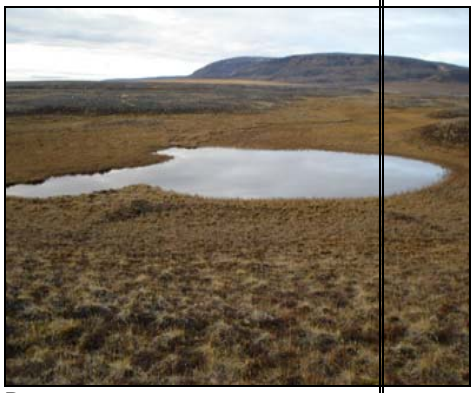
Crossing ID: LE-R36
UTM Coordinates: 17 W 595380 7894213
Date/Time Surveyed: 3-Sept-2008

Photographs


A


B


C


D


E


F


G

Figure 1. Aerial view of downstream stream (A), barrier between lake and downstream (B), lake (C), lake (D), disconnected stream downstream of lake (E), barrier downstream of lake (F), and lake substrate (G).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-R37
UTM Coordinates: 17 W 595790 7893228
Date/Time Surveyed: 3-Sept-2008

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 2:52 **Electrofisher Settings:** 300V, 30Hz, 30%

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	No	No
NNST	No	No	No	No

Comments & Summary

The maximum water depth at the crossing ranged from 1.0-1.5 m and the substrate was 90% fines, 8% gravel and 2% boulders.

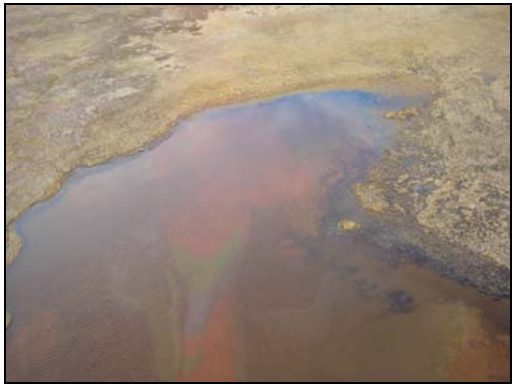
Isolated pool on top of a rise, with no significant connectivity to other waterbodies. Fish cannot likely reach this pond.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-R37
UTM Coordinates: 17 W 595790 7893228
Date/Time Surveyed: 3-Sept-2008

Photographs



A

B

C

Figure 1. Aerial view of lake (A), lake (B), and substrate of lake (C).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-R38
UTM Coordinates: 17 W 595911 7892779
Date/Time Surveyed: 3-Sept-2008

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 3:10 **Electrofisher Settings:** 300V, 30Hz, 30%

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	No	No
NNST	No	No	No	No

Comments & Summary

The maximum water depth at the crossing was 0.5 m and the substrate was 98% fines, 1% gravel and 1% boulders.

Isolated pool on a rise. Not connected to any other water body.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-R38
UTM Coordinates: 17 W 595911 7892779
Date/Time Surveyed: 3-Sept-2008

Photographs

A

B

C

Figure 1. Aerial view of lake (A), lake (B), and substrate (C).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-R39
UTM Coordinates: 17 W 596583 7891540
Date/Time Surveyed: 11-Aug-08 / 11:50

General Physical Characteristics

N/M

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
0	~183X366		~1	-	~1	>2				

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
0							30		25	40	5

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	Moderate	No
NNST	Moderate	No	Moderate	No

Comments & Summary

Same water body as CV-R24 previously assessed.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-R39
UTM Coordinates: 17 W 596583 7891540
Date/Time Surveyed: 11-Aug-08 / 11:50

Photographs

A

B

Figure 1. View of habitat at encroachment (A-B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-R40
UTM Coordinates: 17 W 597331 7889379
Date/Time Surveyed: 3-Sept-2008

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 2:42 **Electrofisher Settings:** 200V, 30Hz, 30%

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	No	No	Low	No

Comments & Summary

The maximum water depth at the crossing ranged was 0.75 m and the substrate was 30% fines, 20% algae, 20% gravel, 20% large cobble and 10% boulders.

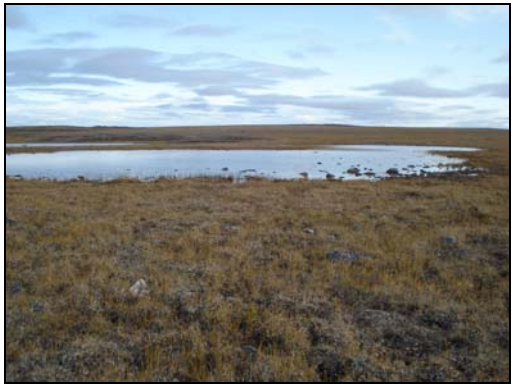
Not currently connected to any other water body except via flooded terrestrial. The lake is not deep enough to overwinter fish, but in the spring this lake may be connected indirectly (through 3 or 4 ponds) to CV-029, which has fish.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-R40
UTM Coordinates: 17 W 597331 7889379
Date/Time Surveyed: 3-Sept-2008

Photographs



A

B

C

Figure 1. View of nearby lake (A), nearby lake substrate (B), and substrate at the crossing (C).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-R41
UTM Coordinates: 17 W 597137 7886910
Date/Time Surveyed: 3-Sept-2008

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 2:33 **Electrofisher Settings:** 200V, 25Hz, 30%

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	No	No
NNST	No	No	No	No

Comments & Summary

The maximum water depth at the crossing was 0.5 m and the substrate was 30% fines, 20% gravel, 40% large cobble and 10% boulders.

Not deep enough for fish to overwinter. Not connected to any other water body that is capable of providing overwinter habitat.

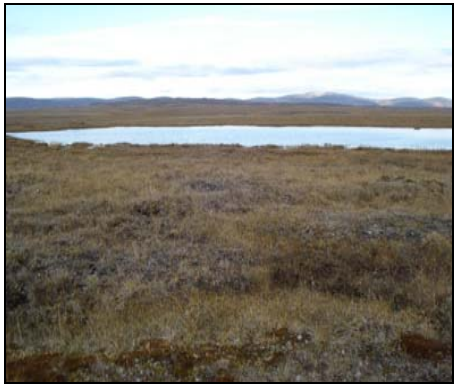
Rail Alignment Watercourse Crossing Assessment

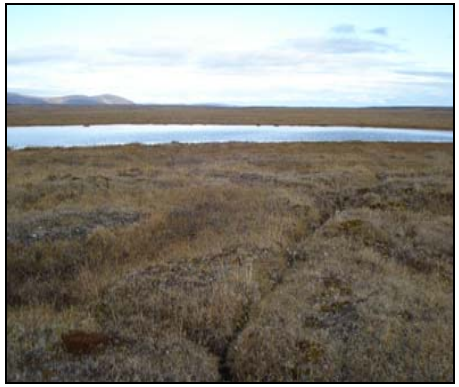
Location

Crossing ID: LE-R41
UTM Coordinates: 17 W 597137 7886910
Date/Time Surveyed: 3-Sept-2008

Photographs


A


B


C


D

Figure 1. Views of lake (A-C), and lake substrate (D).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-R42
UTM Coordinates: 17 W 597067 7886846
Date/Time Surveyed: 3-Sept-2008

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 2:30 **Electrofisher Settings:** 200V, 25Hz, 30%

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	No	No
NNST	No	No	No	No

Comments & Summary

The maximum water depth at the crossing was 0.30 m and the substrate was 70% flooded terrestrial and 30% algae. The water temperature was 6.0 °C.

This area cannot really be considered a lake. No access to overwintering sites.

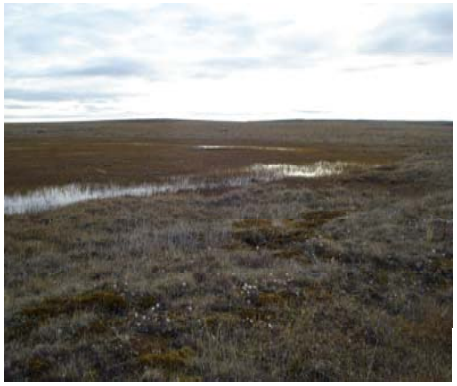
Rail Alignment Watercourse Crossing Assessment

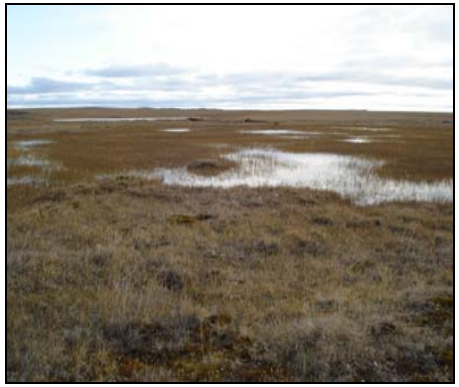
Location

Crossing ID: LE-R42
UTM Coordinates: 17 W 597067 7886846
Date/Time Surveyed: 3-Sept-2008

Photographs


A


B


C

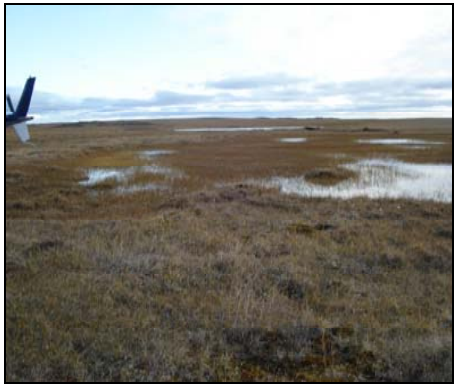

D

Figure 1. View of lake substrate (A), and lake from (B-D).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-47-1
UTM Coordinates: 17 W 597766 7883332
Date/Time Surveyed: 4-Sept-2008

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 3:18 **Electrofisher Settings:** 200V, 50Hz, 30%

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	No	No
NNST	No	No	No	No

Comments & Summary

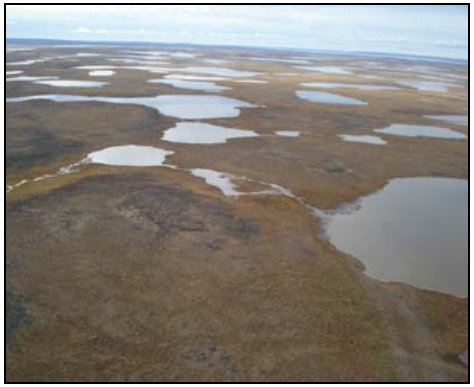
Small pond connected to larger pond. It is currently indirectly connected to the big downstream river at UTM 17 W 597787 7884098. Very close to encroachment, a channel of water that drains from the pool into an adjacent pond. Substrate in the channel is 100% FT. At best this pond is used as a migration corridor, but no fish were seen in good habitat in downstream pond at UTM 17 W 597814 7883386. The water depth at 75% was 0.75 m.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-47-1
UTM Coordinates: 17 W 597766 7883332
Date/Time Surveyed: 4-Sept-2008

Photographs


A


B


C


A


B


C

Figure 1. Aerial view of crossing between two ponds (A), crossing downstream (B), substrate and flow in downstream channel (C), crossing substrate (D), crossing upstream (E), and upstream pond (F).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-48-1
UTM Coordinates: 17 W 598097 7881675
Date/Time Surveyed: 4-Sept-2008

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 3:56 **Electrofisher Settings:** 300V, 50Hz, 30%

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	No	No
NNST	No	No	No	No

Comments & Summary

The lake is not currently connected to any other water body. It is on an elevated piece of land and does not appear to ever have anything except run-off streams running into it. The maximum water depth at the crossing ranged from 0.75-1.0 m. The substrate at the crossing was 10% flooded terrestrial, 40% sand, 48% silt and 2% large cobble.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-48-1
UTM Coordinates: 17 W 598097 7881675
Date/Time Surveyed: 4-Sept-2008

Photographs

A

B

C

D

E

F

Figure 1. Aerial view of lake 1 (A), lake 2 (B), lake from ground (C), lake substrate (D), substrate of waypoint (E), and view of lake from waypoint (F).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-51-1
UTM Coordinates: 17 W 596614 7879326
Date/Time Surveyed: 4-Sept-2008

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 2:46 **Electrofisher Settings:** 400V, 50Hz, 30%

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	No	No
NNST	Low	No	Moderate	No

Comments & Summary

Indirectly connected to large downstream river. Saw NNST along shore at UTM 17 W 596602 7879287. Poor fish habitat, but they can get here. The maximum water depth at the crossing was 0.5 m. The substrate composition was 1% flooded terrestrial, 97% silt and 2% small cobble.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-51-1
UTM Coordinates: 17 W 596614 7879326
Date/Time Surveyed: 4-Sept-2008

Photographs

A B C D

Figure 1. Dead fish found along shore (A), lake (B), and substrate of lake (C-D).

MID-RAIL CAMP

Mid-rail Camp Lake

LE-057-1

LE-057-2

LE-062-1

LE-068-1

LE-074-1

LE-082-1

SCALE 1 0.5 0 1 2 3 4 km

LEGEND:

LAKE ENCROACHMENT SURVEY YEAR
- 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 ADJUSTEMENTS
6. CONTOUR INTERVAL IS 25 AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

Railway Lake Encroachment Sites (MAP C)

North/South Consultants Inc.
Aquatic Environment Specialists

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

Path: G:\MARYRIV_GDB\EIS_GDB\EIS_Figures_2010EIS_Figures\MXD\Synthesis_RailLine_AccessRoad\Rev2Apdx\20101119_ApdxLE_sg.mxd

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-57-1
UTM Coordinates: 17 W 599442 7874619
Date/Time Surveyed: 4-Sept-2008

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 4:04 **Electrofisher Settings:** 600V, 50Hz, 30%

Species	Total Caught/Observed	CPUE	Length Range (mm)	Weight Range (g)
ARCH	0	-	-	-
NNST	2(1 observed)	0.74	21-24	-

Fish Habitat Potential

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

Comments & Summary

Currently isolated, but in the spring connected to the lake at UTM 17 W 599208 7874592 through one of the 2 currently dry pools. The fish in this pond will freeze during the winter. Maximum depth at the crossing ranged form 0.5-1.0 m. The substrate composition was 10% flooded terrestrial and 90 % silt.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-57-1
UTM Coordinates: 17 W 599442 7874619
Date/Time Surveyed: 4-Sept-2008

Photographs

A

B

C

D

Figure 1. Aerial view of dry connection to overwintering lake (A-B), lake (C), and lake substrate (D).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-57-2
UTM Coordinates: 17 W 599389 7874250
Date/Time Surveyed: 5-Sept-2008/15:00

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 16:25 **Electrofisher Settings:** 200V. 50Hz, 30%

Species	Total Caught/Observed	CPUE	Length Range (mm)	Weight Range (g)
ARCH	1	0.06	46	1
NNST	26	1.52	21-59	1-2

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	No	No	Low	No
NNST	High	Low	High	No

Comments & Summary

From the air this lake looks potentially deep enough for fish to overwinter. The maximum water depth at the crossing was approximately > 3 m. The substrate was 20% flooded terrestrial, 20% small cobble, 40% large cobble and 20% boulders. The water temperature was 5.0 °C.

Rail Alignment Watercourse Crossing Assessment

Location

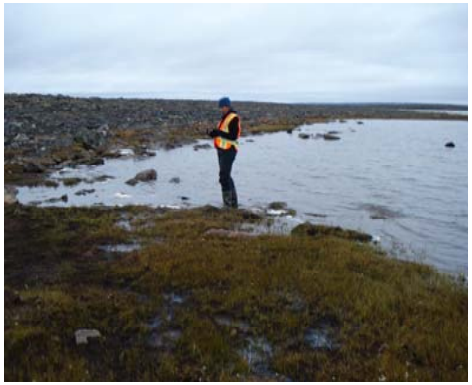
Crossing ID: LE-57-2
UTM Coordinates: 17 W 599389 7874250
Date/Time Surveyed: 5-Sept-2008/15:00

Photographs


A


B


C


A


B


C

Figure 1. Views across lake (A-D), and lake substrate (E-F).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-62-1
UTM Coordinates: 17 W 598254 7869613
Date/Time Surveyed: 5-Sept-2008/17:03

General Physical Characteristics

N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 9:39 **Electrofisher Settings:** 700V, 40Hz, 30%

Species	Total Caught/Observed	CPUE	Length Range (mm)	Weight Range (g)
ARCH	0	-	-	-
NNST	12	1.24	18-37	1-<1

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	No	No	No	No
NNST	High	Low	High	No

Comments & Summary

Shallow pond upstream of CV-062-1. The maximum water depth at the crossing was < 1.0 m and the substrate composition was 4% flooded terrestrial, 95% silt, and 1% boulders.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-62-1
UTM Coordinates: 17 W 598254 7869613
Date/Time Surveyed: 5-Sept-2008/17:03

Photographs

A

B

C

Figure 1. View of crossing across (A-B), and crossing substrate (C).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-068-1
UTM Coordinates: 17 W 601085 7865468
Date/Time Surveyed: 4-Aug-08 / 4:15

General Physical Characteristics

N/M

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
0	95.10 X 64.0		0.20	1.6	0.25	1.6	N/M	N/M	N/M	N/M

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
0		20	80				99			1	

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

The flow regime was permanent and the water temperature was 15.0 °C. Overwintering doesn't appear possible and this lake is isolated. Fish use unlikely.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-068-1
UTM Coordinates: 17 W 601085 7865468
Date/Time Surveyed: 4-Aug-08 / 4:15

Photographs

A

Figure 1. View of habitat (A).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-074-1
UTM Coordinates: 17 W 603758 7860035
Date/Time Surveyed: 26-Jul-08 / 23:30

General Physical Characteristics

Floodplain Width (m):	N/M	**Channel Pattern:**	Pond	**Stage:**	N/M
Channel Confinement:	N/M	**Channel Gradient (range):**	N/M	**Flow Regime:**	PER
Bank Height (range in m):	0.25	**Bank Shape:**	STR	**T_W (°C):**	11.0

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

The water body (10 X 20 m) had a maximum water depth of 0.50 m. The water body was 90% pool (< 0.2 m) and 10% pool (> 0.2 m) and made up of 50% small cobble, 45% large cobble and 5% boulders.

Pond not deep enough for overwintering and not connected to anything else. No habitat, therefore no need to electrofish.

Baffinland Iron Mines
Mary River Project

North/South Consultants Inc.
Aquatic Environment Specialists

Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-074-1
UTM Coordinates: 17 W 603758 7860035
Date/Time Surveyed: 26-Jul-08 / 23:30

Photographs

A

B

Figure 1. View of habitat (A) and substrate (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-082-1
UTM Coordinates: 17 W 606379 7852516
Date/Time Surveyed: 4-Aug-08 / 11:45

General Physical Characteristics

N/M

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
0	60.35X44.80		0.2	0.4	0.2	0.5				

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
0		60	40				80		5	10	5

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

Isolated pond. No inflows/outflows. The flow regime was permanent and the water temperature was 14.0 °C.

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: LE-082-1
UTM Coordinates: 17 W 606379 7852516
Date/Time Surveyed: 4-Aug-08 / 11:45

Photographs

A

B

Figure 1. View of habitat (A-B).