



2015 QIA and NWB Annual Report

March 31, 2016

APPENDIX D AS BUILT REPORTS





2015 QIA and NWB Annual Report

March 31, 2016

APPENDIX D.1 CONSTRUCTION SUMMARY REPORTS



March 31, 2015

Phyllis Beaulieu Manager of Licencing Nunavut Water Board PO Box 119 Gjoa Haven, NU X0B 1J0

Re: Issued for Construction Drawings for Mine Site Crusher Sedimentation Pond (NWB Licence No. 2AM-MRY1325)

Dear Ms Beaulieu,

We are transmitting the drawings:

Mine Site Crusher Sedimentation Pond

- Drawing H349001-4385-10-035-0001 Mine Site Crusher Sedimentation Pond Earthworks & Drainage Plan
- Drawing H349001-4385-10-035-0002 Mine Site Crusher Sedimentation Pond Earthworks & Drainage Sections

The drawings conform to Part D, Item 2 of the NWB Licence No. 2AM-MRY1325. Please do not hesitate to contact the undersigned should you have any questions, comments, or require any clarification.

Sincerely,

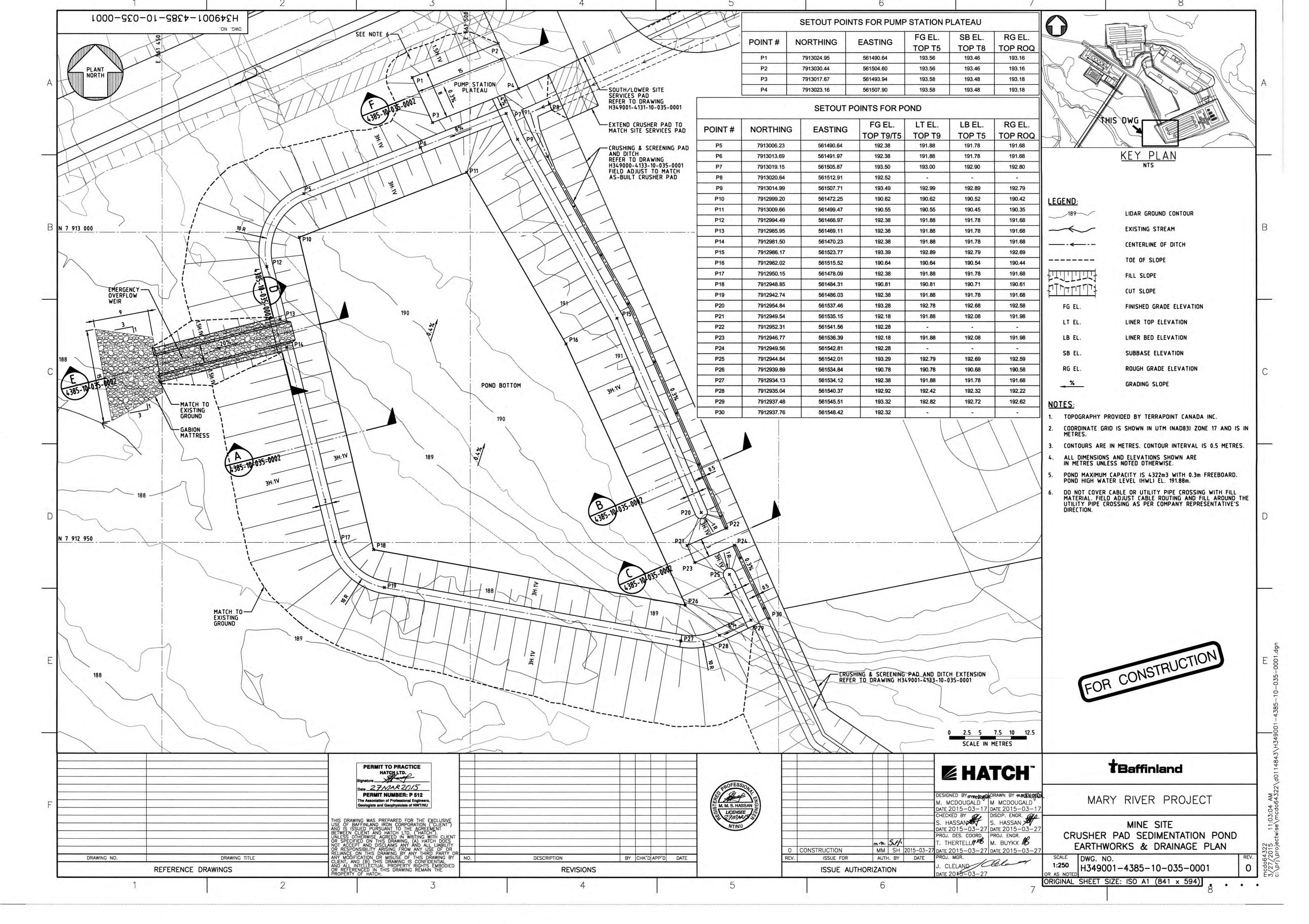
James Millard, M.Sc., P.Geo.

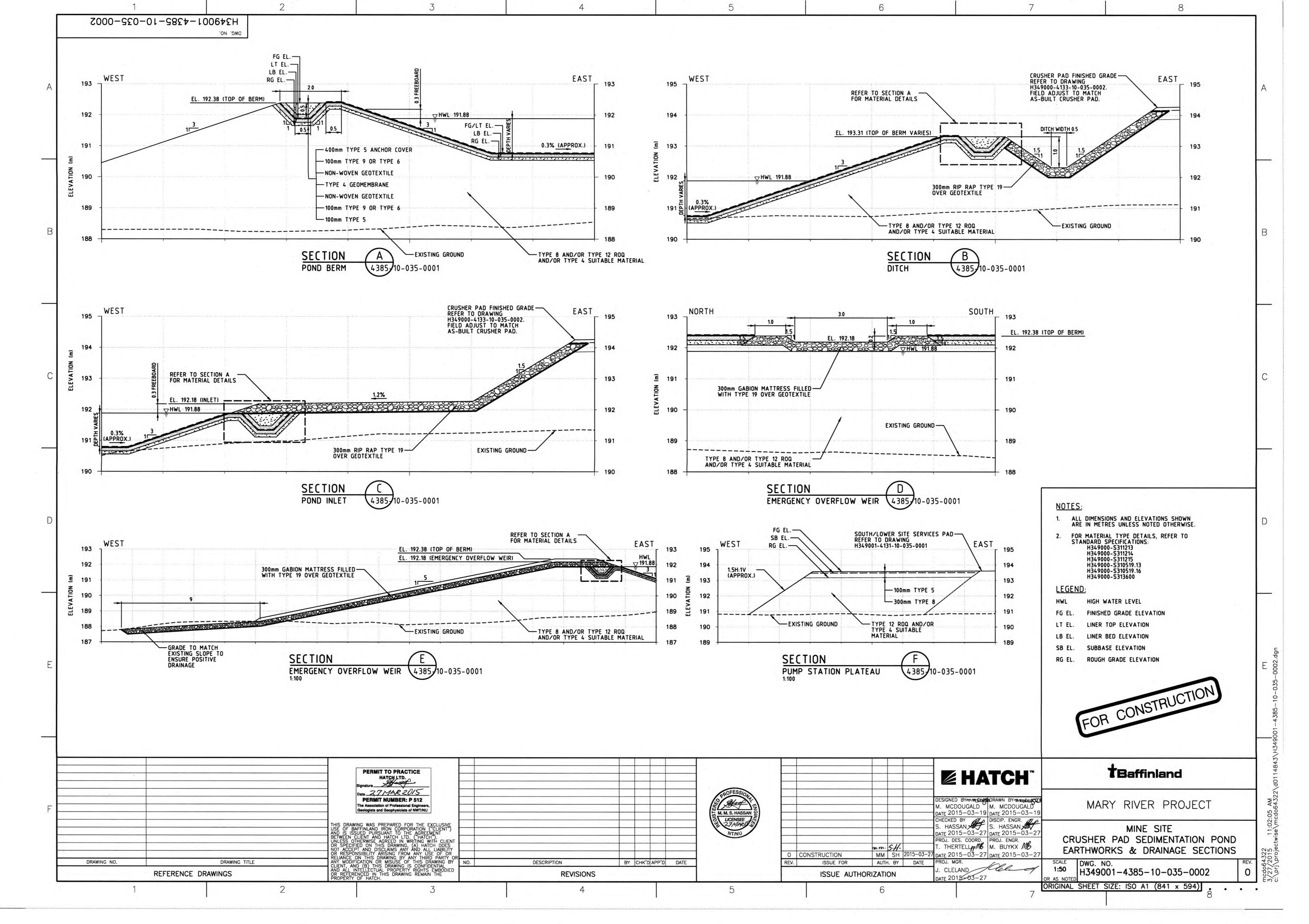
Environmental Manager

Cc: Sean Joseph, David Hohnstein (NWB)

Stephen Williamson Bathory (QIA) Justin Hack, Erik Allain (AANDC)

Oliver Curran, Erik Madsen (Baffinland)













2015 QIA and NWB Annual Report

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APPENDIX D.2 GEOTECHNICAL INSPECTIONS



October 2, 2015

Phyllis Beaulieu, Manager of Licensing Nunavut Water Board P.O. Box 119, Gjoa Haven NU X0B 1J0

Dear Ms. Beaulieu:

Re: Baffinland Iron Mines Corporation (Baffinland) - Submission of 2014 Annual Geotechnical Inspection, Water Licences Type 'A' No. 2AM-MRY1325

1. INTRODUCTION

Under Part D, Item 18, of Baffinland Iron Mines Corporation (BIMC) Type "A" Water Licence 2AM-MRY1325, Amendment No. 1, there is a requirement to conduct geotechnical inspections of specified Mary River Project (the 'Project") infrastructure. Part D, Item 19, of the Type 'A' Licence states that:

"The Licensee shall conduct inspections of the earthwork, geological regime, and the hydrological regime of the Project Biannually during the summer or as otherwise approved by the Board in writing. The inspection shall be conducted by a Geotechnical Engineer and the inspection report shall be submitted to the Board within sixty (60) days of the inspection, with a covering letter from the Licensee outlining an implementation plan to respond to the Engineer's recommendations."

During 2015, the geotechnical field inspection was conducted by Barry Martin of Barry H. Martin Consulting Engineer and Architect (BMCE) of Timmins, Ontario. The focus of the inspection was on Water Licence related infrastructure located at the main camp sites, known as the Mary River Mine Site and Milne Port Site Camps. Mr. Barry Martin has been conducting annual geotechnical inspections for the Project since 2008. This report covers the first of two biannual inspections that was conducted July 30th to August 4th. A second inspection was completed September 24th to September 29th, and that report is forthcoming.

During the July/August, 2015, inspection, the following site facilities were inspected:

Mary River Mine Site

- Bulk Fuel Storage Containment (Historical Bladder Farm)
- Generator Fuel Storage Facility Containment
- Polishing/Waste Stabilization Pond No. 1
- Polishing/Waste Stabilization Ponds Nos. 2 and 3 (constructed as a two-cell structure)
- Helicopter Fuel Cell Containment
- Barrel Fuel Containment (constructed as a two-cell structure)(MS-HWB-3 and MS-HWB-4)
- Hazardous Waste Storage (MS-HWB-2)
- Enviro-Tank Storage (constructed contiguous with hazardous waste storage and stove oil storage)
- Stove Oil Storage (MS-HWB-5)
- Jet Fuel Tank and Pump Containment
- Solid Waste Disposal Site



- Mine Site Steel Fuel Tank Farm Containment
- Quarry
- Crusher Pad Drainage Containment
- Waste Pile Drainage Containment
- Jet "A" Aircraft Containment
- Hazardous Waste Containment

Milne Inlet Site

- Existing Polishing/Waste Stabilization Pond
- Barrel Fuel Storage (constructed as a two-cell structure)
- Hazardous Waste Storage (constructed as a two-cell structure) (MP-HWB-3, MP-HWB-4, and MP-HWB-5)
- Fuel Tank Farm
- New Sewage Effluent Pond
- Land Farm
- Contaminated Snow Containment
- Ore Stockpile Sediment Ponds East and West
- Quarry

Attached, herewith, is BMCE's 2015 geotechnical report no. 1 (of two) which presents the findings of the July/early August inspection and recommendations for the aforementioned structures. Sections 2.0 and 3.0 of this letter summarize Baffinland's plan for implementing recommendations. Where this is no mention of particular infrastructure, there were no concerns identified by BMCE for same.

2. MARY RIVER MINE CAMP RECOMMENDATIONS

Barrel Fuel Containment (Now MS-HWB-3 and MS-HWB-4)

The north dyke in the north cell has had a track fork lift travel over the berm at the east end. It was recommended that signage be placed to prevent this before damage occurs to the liner.

<u>Baffinland Action</u>: This issue has been brought up by supervisors to their team members and the berms are being monitored to ensure no further disturbance. Consideration is being given to the strategic installation of barriers and/or signs. This will be further discussed with the AANDC Water Resource Inspector and the plan further developed/refined as appropriate to prevent this from reoccurring. Final measures to be implemented by end of October 2015.

Enviro Tank Storage (Now MS-HWB-1)

The cell was observed to be dry, raising concerns regarding the integrity of the liner. It was recommended that the geotextile over the liner be checked and the granular cover be made good prior to continuing use of this cell.

<u>Baffinland Action</u>: Site Services supervisors have already been made aware that this area shall no longer be used for the storage of hazardous waste or substances until it is fully examined and repaired.



Mine Site Steel Fuel Tank Farm Containment

All work was observed to be complete excepting the installation of the sump pits that are on site awaiting installation and which shall be utilized to facilitate the removal of water that collects from precipitation. It was recommended that at least one sump be installed as per the drawings prepared for this facility

<u>Baffinland Action:</u> A sump will be installed during the open water season of 2016, as soon as conditions allow.

QMR2 Quarry

At the time of the inspection, the quarry was being actively mined. Overburden from the top surface of the quarry was being cleaned and pushed as thawing permits, to serve as long term protection against moving aggregate and to promote long term stability. There were a number of cobbles and larger boulders above the upper bench of the quarry that may be unstable and potentially hazardous. It was recommended that at the time of closure, the quarry shall be closed in a manner as set out to maintain long term stability.

<u>Baffinland Action</u>: The quarry is still active and the unstable area noted in the inspection had already been identified and measures are planned for stabilizing. The QMR2 Quarry Management Plan and Interim Closure and Reclamation Plan include requirements to ensure for long term stability at the time of closure.

3. MILNE PORT CAMP RECOMMENDATIONS

• Hazardous Waste Storage (MP-HWB-3, MP-HWB-4, and MP-HWB-5)

A temporary containment cell (MP-HWB-5) was constructed in 2014 using a one piece liner and wood timber curb for the short term storage of excess hazardous waste. It was recommended that the use of this cell be discontinued when storage capacity is available elsewhere.

Baffinland Action: Containment cell MP-HWB-5 was decommissioned during August 2015.

Fuel Tank Farm

It was noted that the sump placed in the facility was located at the high end of the containment. There was water observed ponding in the low end of the containment. It was recommended that the sump be relocated to the low point at the north end of the containment or an addition sump be installed.

<u>Baffinland Action:</u> The design engineers for the facility have been notified of this observation and have been asked to develop an action plan to address this concern. An action plan will be presented in the cover letter that will accompany the second 2015 geotechnical inspection report to be provided in November 2015.

Landfarm

It was observed that the landfarm containment was complete with the exception of some soil cover in the area of the sump. It was recommended that the remaining dyke structure without protective cover over it be covered as per the design drawings.



<u>Baffinland Action</u>: This is duly noted and the geotextile liner will be covered prior to April 30, 2016.

• Ore Stockpile Sediment Ponds East and West

There were concerns noted regarding the stability of the liners. It was recommended that more soil ballast on the south edge be applied and possibly tire ballast over the liner which appears subject to impacts from wind. Used tires were suggested for this purpose.

<u>Baffinland Action:</u> The design engineers for these facilities have been notified of these observations and have been asked to develop an action plan to address the issues. Action plans will be presented in the cover letter that will accompany the second 2015 geotechnical inspection report to be provided in November 2015.

• Loading Area Contaminated Storage (Now MP-HWB-1)

It appeared that travel has taken place over the north dyke of the facility during the placing of containers. However, it did not appear that the liner had been damaged. It was recommended that action be taken to prevent travel over the berms to prevent potential damage to the liner.

<u>Baffinland Action</u>: This issue has been brought up by supervisors to their team members and the berms are being monitored to ensure no further disturbance. Consideration is being given to the strategic installation of barriers and/or signs. This will be further discussed with the AANDC Water Resource Inspector and the plan further developed/refined as appropriate to prevent reoccurrence. Final measures to be implemented by end of October 2015.

We trust that this submittal satisfies the requirements the geotechnical requirements as outlined in our Water Licence. Should you have any questions, please do not hesitate to contact Jim Millard, Environmental Manager, at 647-253-0596 or 902-403-1337 or by e-mail at jim.millard@baffinland.com.

Best Regards,

James Millard, M.Sc., P.Geo. Environmental Manager

Attach: Annual Geotechnical Inspections, Mary River Project, Initial Inspection of Two, July/August 2015, prepared by Barry Martin Consulting Engineer and Architect for Baffinland, dated August 5, 2015.

cc. Justin Buller (QIA)
Justin Hack, Erik Allain (AANDC)
Erik Madsen, Bernard Laflamme (Baffinland)



BHM Project No. 15-97

BAFFINLAND IRON MINES CORPORATION

ANNUAL GEOTECHNICAL INSPECTIONS MARY RIVER PROJECT INITIAL INSPECTION OF TWO JULY/AUGUST 2015



Prepared for:

Mr. Jeff Bush Site Services Superintendent Baffinland Iron Mines Corporation 2275 Upper Middle Road East, Suite 300 Oakville, Ontario L6H 0C3



Barry H. Martin, P. Eng., MRAIC, Consulting Engineer and Architect

149 Kraft Creek Road Timmins, Ontario P4N 7C5 Tel: 705-268-5621 Barrymartin1499@gmail.com

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Milne Inlet Drawings

August 5, 2015

Baffinland Iron Mines Corporation 2275 Upper Middle Road East, Suite 300 Oakville, Ontario L6H 0C3

Attention: Jeff Bush

jeff.bush@baffinland.com

RE: ANNUAL GEOTECHNICAL INSPECTIONS BAFFINLAND IRON MINES CORPORATION OUR REFERENCE NO. 15-097

1.0 INTRODUCTION

Barry H. Martin, P. Eng., Consulting Engineer, completed the eighth annual water licence geotechnical inspection of the following on-site engineered facilities as required by Licence No. 2AM-MRY 1325 of the Nunavut Water Board:

Pit Walls
Quarries
Landfills
Land Farms
Bulk Fuel Storage Facilities
Sediment Ponds
Collection Ponds
Polishing and Waste Stabilization Ponds

The inspection that took place July 30_{th} to August 4_{th} is the first phase of a biannual inspection to be carried out within the open water shipping season at the two Baffinland sites, in Mary River at the mine site, and at Milne Inlet at the port facility. A second inspection is planned for September 24_{th} to September 29^{th} of this year.

The inspections were carried out in accordance with the guidelines set out in "Dam Safety Guidelines 2007" as published by the Canadian Dam Association.

The inspections were completed by Mr. Barry H. Martin, P. Eng., the design Engineer for the initial containment facilities both at Mary River and Milne Inlet, the runaway extension, initial bridges on the connecting road plus the solid waste disposal site as well as continuing construction since the mine infrastructure construction.

The seven previous annual water licence geotechnical inspections were completed by Mr. Martin. You shall note that Hazardous Waste Containment Structure have been assigned new names.

The facilities inspected are as per the following:

Mary River Site

Bulk Fuel Storage Containment

Generator Fuel Storage Facility Containment

Polishing/Waste Stabilization Pond No. 1

Polishing/Waste Stabilization Ponds Nos. 2 and 3 (constructed as a two-cell structure)

Helicopter Fuel Cell Containment

Barrel Fuel Containment (constructed as a two-cell structure) (MS-HWB-3 and MS-HWB-4)

Hazardous Waste Storage (MS-HWB-2)

Enviro-Tank Storage (constructed contiguous with hazardous waste storage and stove oil storage)

Stove Oil Storage (MS-HWB-5)

Jet Fuel Tank and Pump Containment

Solid Waste Disposal Site

Minesite Steel Fuel Tank Farm Containment

Quarry

Crusher Pad Drainage Containment

Waste Pile Drainage Containment

Jet "A" Aircraft Containment

Hazardous Waste Containment

A site plan for the Mary River site showing most structures reviewed is attached.

Milne Inlet Site

Existing Polishing/Waste Stabilization Pond

Barrel Fuel Storage (constructed as a two-cell structure)

Hazardous Waste Storage (constructed as a two-cell structure) (MP-HWB-3, MP-HWB-4, and MP-HWB-5)

Fuel Tank Farm

New Sewage Effluent Pond

Land Farm

Contaminated Snow Containment

Sediment Ponds East and West

Quarry

Loading Area Contaminated Storage (MP-HwB-1)

2.0 METHODOLOGY FOR INSPECTION

The geotechnical inspector was Barry H. Martin, P. Eng., who reviewed the two sites for the first of the biannual inspections on July 30_{th} , 2015 to August 3_{rd} , 2015 just as the annual shipping season commenced with the arrival of the first ship into port.

The inspections primarily focused on the following aspects:

- 1. The structures were inspected for conformance with the design basis as presented in "as constructed" and "as-built" drawings (provided in the first and subsequent reports).
- 2. The structures were specifically inspected for settlement, cracking, and seepage through the berms.

- 3. The areas around the structures were examined for evidence of seepage.
- 4. Quarry walls were reviewed for relative stability. I note that the quarries were active removal areas and long term stability was not yet established.
- 5. New structures under construction were reviewed for conformity with design drawings.
- 6. Photographs were taken to document observations made during the inspection and are attached.

3.0 MARY RIVER CAMP

3.01 General

As with other years, there had been some rainfall at Mary River preceding the first inspection and it was expected that there would be some water in the containment dykes.

A monitoring program is in place to test storm water that does accumulate within the containment structures. As reviewed, the water that does not meet the water licence effluent requirements is treated on site prior to release.

At the Bulk Fuel Storage Facility Containment, the water that collects within the dyke is treated at the end of the containment structure.

We report on the Crusher Pad Drainage Containment Structure and the Waste Pile Drainage Containment for the first time.

The Bulk Fuel Storage Containment is coming due for decommissioning and was only in use to accommodate jet "A" fuel until the end of the last summer/autumn season. There is now a bladder of contaminated water in this containment area.

3.02 Bulk Fuel Storage Facility

General Conditions

The Bulk Fuel Storage Facility still exists but it is no longer utilized as a bulk fuel storage facility. There is only a single bladder in the facility being utilized although there are a number of empty bladders still in place.

The one bladder within the containment that is full at this time contains contaminated water (water/oil mixture).

The granular cover over the geotextile and liner is still in place within the containment structure awaiting land farming.

Stability

At the time of this initial review, water had not been removed for a period from within the containment and water was ponding above the level of the gravel within the bottom of the containment. There is still considerable factor of safety against failure of the one bladder within the dykes with the water level as it exists.

The structure was visually inspected for any signs of cracking or subsidence. There was no indication of any settlement, seepage, or cracking in the soil structures that formed the dykes. As well, there was no indication of seepage at the base of the structure around the exterior.

At the load-out end of the facility there was water ponding at the low point.

The soil structure is considered stable in the present condition and is in conformance with the design basis for the facility.

The presence of water within the structure and at the load-out area is an indication of the integrity of the liner.

Recommendations

We have no recommendations with respect to this containment structure as it awaits decommissioning.

3.03 Generator Fuel Storage Containment

This particular containment structure is currently being decommissioned. The fuel bladder that was contained within the dyke has been emptied and the fuel bladder is rolled up awaiting removal on the east dyke.

The granular fill over the geotextile and liner shall require landfarming with the material from the bulk fuel storage facility.

There is no indication that the liner is compromised and decommissioning should proceed when the granular cover is either moved to a land farm or other containment.

3.04 Polishing/Waste Stabilization Pond #1

General Conditions

PWSP No. 1 continues to be utilized as a holding facility for sewage plant effluent that does not meet water effluent quality criteria.

Currently the pond is being used primarily as a repository for sewage sludge that had been periodically removed from the RBC.

The supernatant from PWSP No. 1 is periodically decanted to PWSPs Nos. 2 and 3 where it is tested and treated as required to meet Water Licence effluent requirements.

At the time of our visit there was approximately fifty percent of capacity to accommodate further sewage and the structure readily conforms to its design intent.

Stability

Our review of this area around the pond at the base of the slopes showed no sign of seepage and hence we conclude that the liner has been effective in containing sewage and there are no tears or ruptures in the membrane, excepting some minor tears from past activity at the top of the dyke well above the allowable effluent level in the structure in the horizontal portion of the membrane.

A review of the top of the dyke showed no indication of cracking or settlement which would indicate stresses within the structure.

Many of the tears that had occurred in the liner on the top of the dyke have been patched during the period between reviews in 2008 and 2009 and are holding well. As well, there are no signs of weather related deterioration of the liner where it is exposed.

Monitoring points have been set up on the top of the dyke and have been monitored since 2009. Settlements have occurred since that time. These settlements have not led to any stress cracks in the structure. These small settlements are an indication of consolidation in the berm structures and the active layer beneath the dyke and are not considered to be of any concern.

It can be seen where the structure has settled slightly relative to the soils away from the structure. There appears to be no sign of erosion of the dykes, even with the precipitation that has occurred over the lifetime of the facility.

The settlements have had little effect on the integrity of the structure.

Recommendations

We have no recommendations with respect to this containment facility.

3.05 Polishing Ponds/Waste Stabilization Ponds #2 and #3

General Conditions

The structure was designed and constructed as a two-cell structure.

The supernatant from PWSP #1 is currently discharged to PWSPs Nos. 2 and 3. The treated effluent is tested for Water Licence effluent requirements, treated if necessary, and discharged to the environment.

At the time of our visit there was considerable freeboard to accommodate further sewage and the structure readily conforms to its design intent. There was fifty-percent remaining capacity in one cell and the second cell was almost empty at the time of our inspection.

Stability

Our review of the area around the pond at the base of the slopes showed no sign of seepage and hence we conclude that the liner has been effective in containing the sewage and there are no tears or ruptures in the membrane.

Longitudinal cracking which appeared in the dykes of PWSP #3 due to the melt of permafrost wedges in 2009 has not reoccurred and we consider this structure to be stable in its present condition.

Monitoring points have been set upon the top of the dyke and have been monitored since 2009. Settlements have occurred since that time. These settlements have not led to any stress cracks in the structure. Monitoring was discontinued over the last year.

There appears to be no sign of erosion of the dykes and plants are continuing to seed themselves on the dykes. This growth is minimal, however.

Recommendations

We have no recommendations with respect to this containment facility.

3.06 Helicopter Fuel Tank Containment

General Conditions

The structure was designed and constructed as a single cell structure that contains a 1000 gal fuel storage tank.

The structure currently conforms to its design intent.

In the past, a liner clad wood curb had been added to the top of the berm to prevent the erosion of gravel off the berm, caused by pulling the fuel hose from within the dyke out to the helicopters to provide them with fuel.

Stability

Our review of the area around the pond at the base of the slopes showed no sign of seepage. There is wet sand in the bottom of the containment indicating the integrity of the liner with the weather recently experienced.

A review of the exterior and the top of the berms showed no sign of cracking or settlement which would indicate stress within the structure.

The structure is considered to be stable in its present condition.

Recommendations

We have no recommendations with respect to this structure.

3.07 Barrel Fuel Containment (Now MS-HWB-3 and MS-HWB-4)

General Conditions

This particular structure which we called "Barrel Fuel Containment" in our previous inspection reports is a two-cell structure which is currently used to accommodate cubes of lubricant and barrels in the east cell and cubes of lubricant and antifreeze in the west cell.

There are currently contained closed barrels and cubes which are sitting at the entries that are not over the lined area. We assume this is a temporary situation.

Stability

Our review of the area around this containment structure showed no sign of seepage. This shows that there is reasonably little chance of tearing or rupture of the membrane having taken place.

A review of the exterior and top of the dyke showed no sign of cracking or settlement which would indicate stresses within the structure.

The structure is considered to be stable in its present condition.

Recommendations

The north dyke in the north cell has had a track fork lift travel over the berm at the east end. We recommend signage to prevent this before damage occurs to the liner.

3.08 Hazardous Waste Storage (Now MS-HWB-2)

General Conditions

This particular cell was constructed contiguous with an existing cell, which is referred to on site as the "Enviro Tank Storage", from drawings by our office in 2010 and conforms to our drawings. It is also contiguous with the Stove Oil Storage cell.

This structure contains barrels and bags of hazardous waste as well as stoves and refrigerators.

Stability

Our review of the area around this cell at the base of the slopes, showed no sign of seepage. There is water ponding in this structure.

The structure appears to be stable in its present condition. The water confirms the integrity of the liner.

Recommendations

There are no recommendations at this time.

3.09 Enviro Tank Storage (Now MS-HWB-1)

General Conditions

This particular structure is constructed contiguous with the Hazardous Waste Storage constructed in 2010 and the Stove Oil Storage cell. It was utilized as a wash down cell during the last season. It is not currently in use.

Stability

Last year there was concern for the integrity of this cell as the cell was dry and the geotextile was exposed from heavy traffic during our initial inspection. During our second inspection, the cell was holding a small amount of water confirming the integrity of the liner.

The cell is dry this year raising concerns anew on the integrity of the liner.

Recommendations

We recommend that the geotextile over the liner be checked and the granular cover be made good prior to continuing use of this cell as a wash down cell this season.

3.10 Stove Oil Storage (Now MS-HwB-5)

General Conditions

This particular structure had been used to store barrels of stove fuel in 2011.

The structure again contains barrels of stove oil and some Jet "A" fuel.

This structure was constructed in accordance with a standardized drawing provided by this office utilizing a one piece liner.

Stability

Our review of the exterior at the base of the dyke showed no sign of seepage. This shows that there is reasonably little chance of tearing or rupture of the membrane having taken place.

A review of the exterior and the top of the dyke showed no sign of cracking or settlement which would indicate stresses with the structure.

There is water contained within the cell confirming the integrity of the liner.

The structure is considered to be stable in its present condition.

3.11 Jet Fuel Tank and Pump Containment

General Conditions

This particular structure was reconstructed based on our recommendation of the 2012 Geotechnical Inspection.

The construction was completed in accordance with our recommendations for such structures and the liner was constructed as a one piece liner with geotextile protection on both sides and gravel over the geotextile as protection.

The construction appears proper and the structure is in good condition.

Minor water ponding confirms the integrity of the liner.

At this time the jet fuel tank and pump have been removed and the cell is empty.

Stability

Our review of the area around the cell at the base of the slopes showed no sign of seepage. The structure is stable in its present condition.

Recommendations

There are no recommendations at this time.

3.12 Solid Waste Disposal Site

Berms appear stable and no erosion appears to have taken place on the back and both sides of the site. Solid waste was being placed at the front edge of the site and was awaiting salvage of wood and lumber prior to the placing of cover at the time of our site review. There is also separation of metals from other waste taking place.

The disposal was being done in conformity with plans prepared and guidelines set out for the disposal of solid waste.

The current footprint as established by the existing covered material and the "blow control" fence at the front of the immediate site is full and the site footprint shall have to be expanded within the plans and guidelines set out for this solid waste disposal site.

3.13 Minesite Steel Fuel Tank Farm Containment

General Conditions

All work appears to be complete excepting the installation of the sump pits that are on site awaiting installation and which shall be utilized to facilitate the removal of water that collects from precipitation. There is water ponding in the bottom of the containment confirming the integrity of the liner.

Stability

All work appears to have been completed in accordance with drawings and we have no concerns with the stability of this containment structure.

Recommendations

We recommend that at least one sump be installed as per the drawings prepared for this facility.

3.14 Quarry

General Conditions

The quarry has well defined benches. The quarry faces at the benches shall be cleaned and berms placed at the edges of the bench to control the movement of weather induced loose in the long term.

Currently overburden from the top surface is being cleaned and pushed as thawing permits, to serve as long term protection against moving aggregate and the establishment of long term stability.

There are a number of cobbles and larger boulders at the upper edge however that appear to act as a hazard at this time.

Stability

The quarry shall be closed in a manner as set out to maintain long term stability.

3.15 Crusher Pad Drainage Containment

General Conditions

There is a new containment being constructed to catch surface water flow from the crushing area and stockpile area at the minesite.

The ditch at the entry to the recessed inlet on the east side of the containment is being shaped. The rip rap is currently being placed on the overflow on the west side.

The crusher pad appears only 50% complete and the containment although it is already collecting some runoff, is not yet operating exactly as proposed due to the fact that the crusher pad is not yet fully constructed.

3.16 Waste Stockpile Drainage Containment

General Conditions

This structure is just in the process of being completed and put into operation. It shall be fully reported on during the next review at the end of September.

3.17 Overview

This report is the seventh annual Geotechnical Inspection at Mary River and Milne Inlet completed by this author on behalf of Baffinland Iron Mines Corporation and the second year of reporting covering the first of two inspections in one shipping season.

As set out in our past reports, there has been little or no erosion taken place from wind or rain and the dykes constructed of the sand/gravel soil have remained stable at slopes of 3:1 and 4:1.

As noted last year, there are only just now signs of settlement appearing at PSWP's 1, 2 and 3. The settlements are not differential settlements of the dykes but are minor overall settlements of the total structures with respect to the surrounding area.

These settlements appear to be settlements within the one metre ± active layer above the permafrost and are of little concern as the PWSP's are temporary structures and the settlements have no effect on the dyke stability.

It is expected that many of the structures that form the basis for the inspections set out in the biannual Geotechnical inspections shall be decommissioned as the mine facilities are finalized.

Mary River Photos



Bulk Fuel Storage Facility showing one former fuel bladder in use.



Generator Fuel Containment in process of decommissioning.



Polishing/Waste Stabilization Pond #1.



Polishing/Waste Stabilization Pond #2.



Polishing/Waste Stabilization Pond #3.



Helicopter Fuel Cell Containment.



Barrel Fuel Containment. (Now MS-HWB-4)



Barrel Fuel Containment – Containers outside of cell. (Now MS-HWB-4)



Barrel Fuel Containment – Shows travel over side dyke of cell. (Now MP-HWB-3)



Hazardous Waste Containment. (Now MS-HWB-2)



Enviro Tank Storage – No longer in use. (Now MS-HWB-1)



Stove Oil Storage. (Now MS-HWB-5)



Jet Fuel and Pumping Containment – Now empty.



Waste Stockpile Drainage Containment.



Solid Waste Disposal – Top of cover.



Crusher Pad Settling Pond.

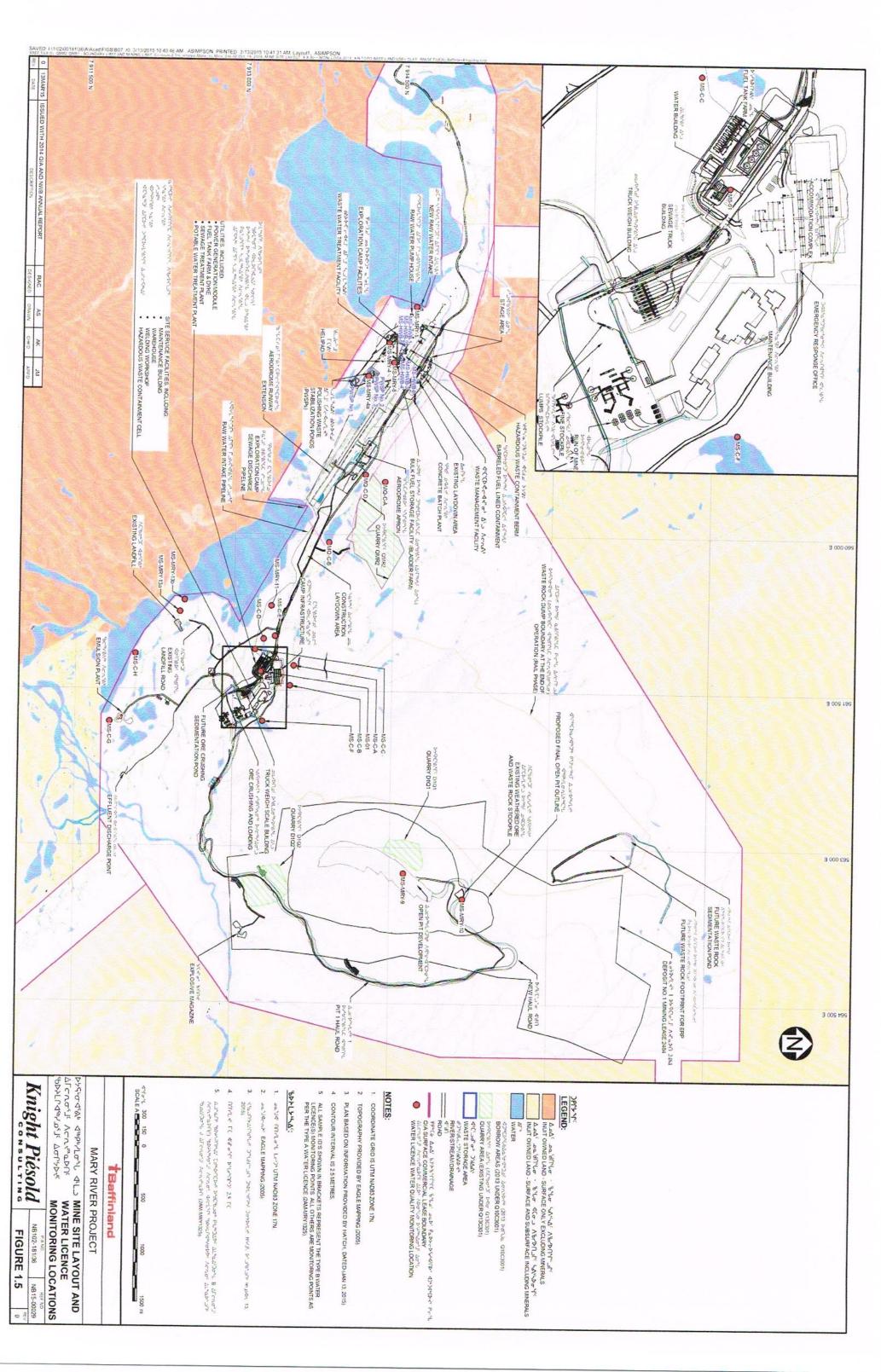


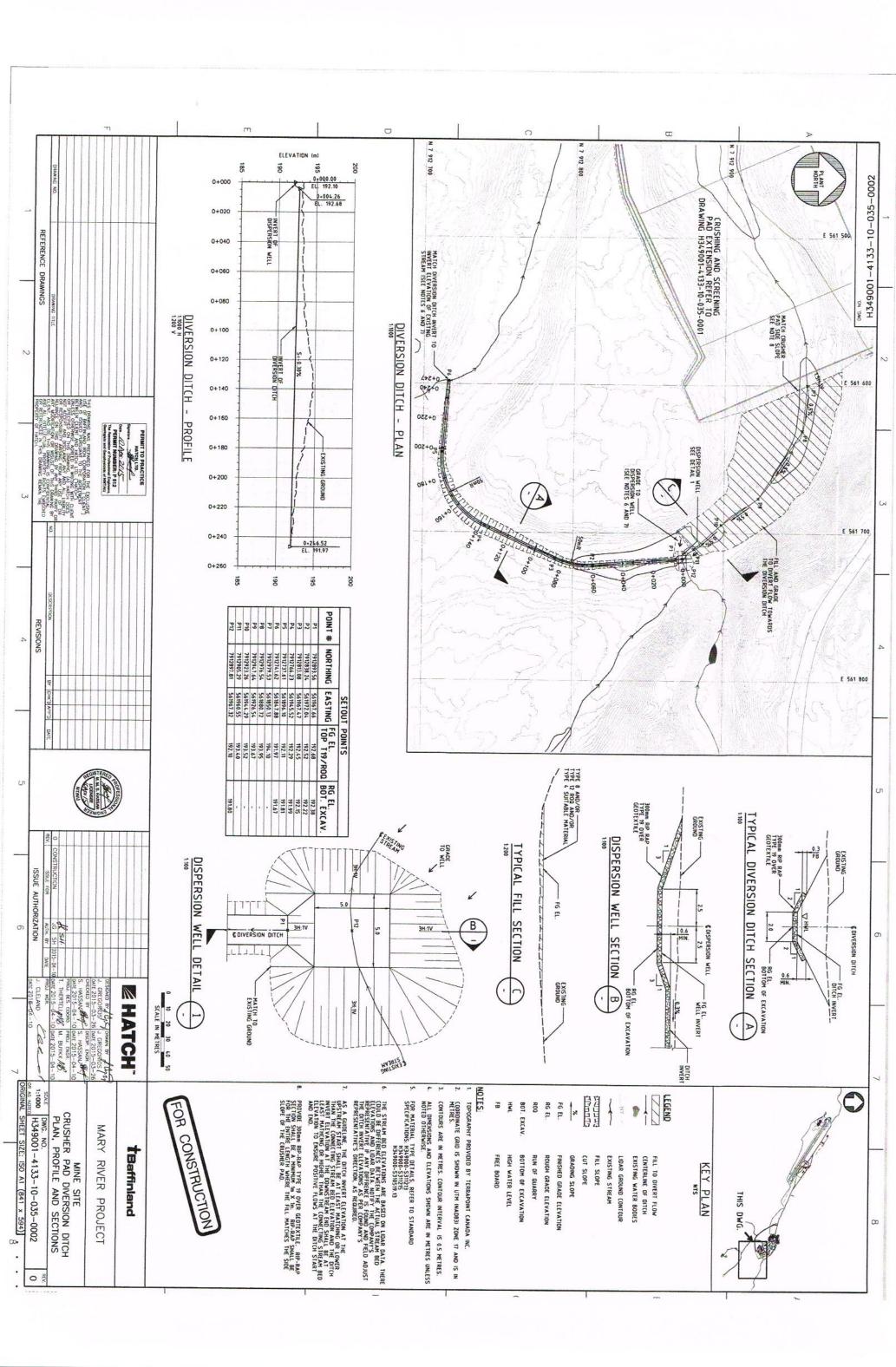
Mary River Quarry.

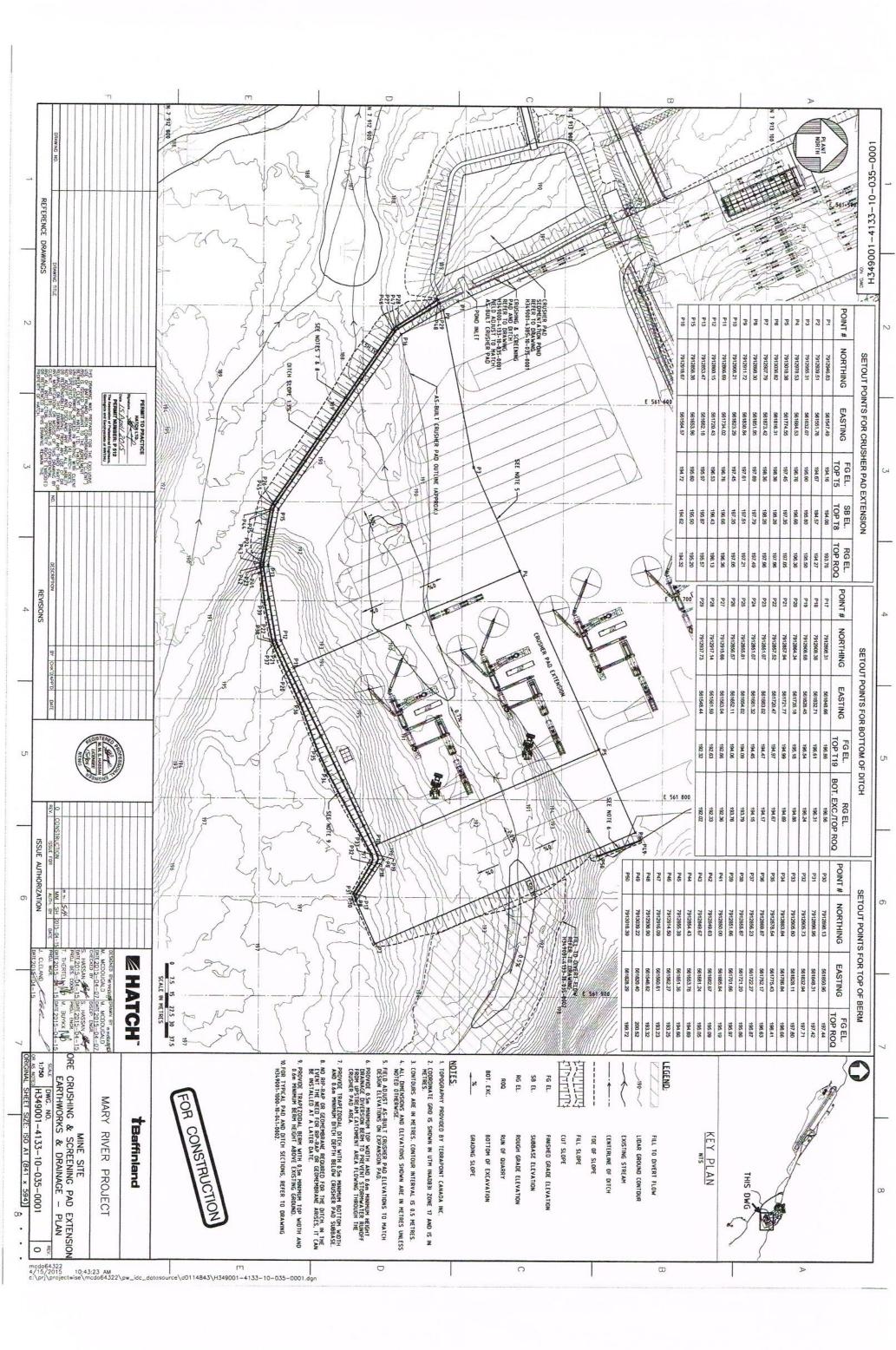


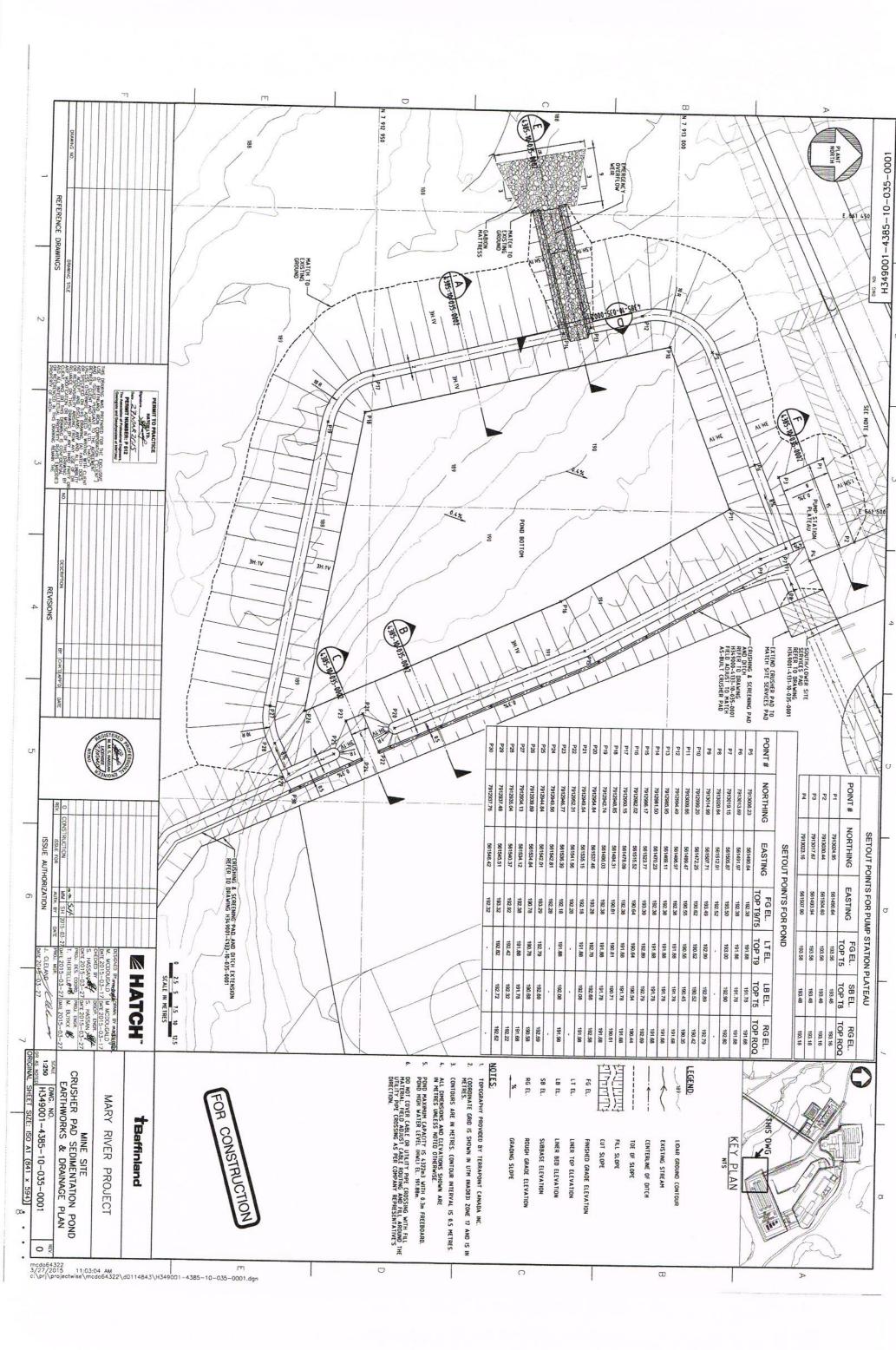
Mary River Steel Tank Containment.

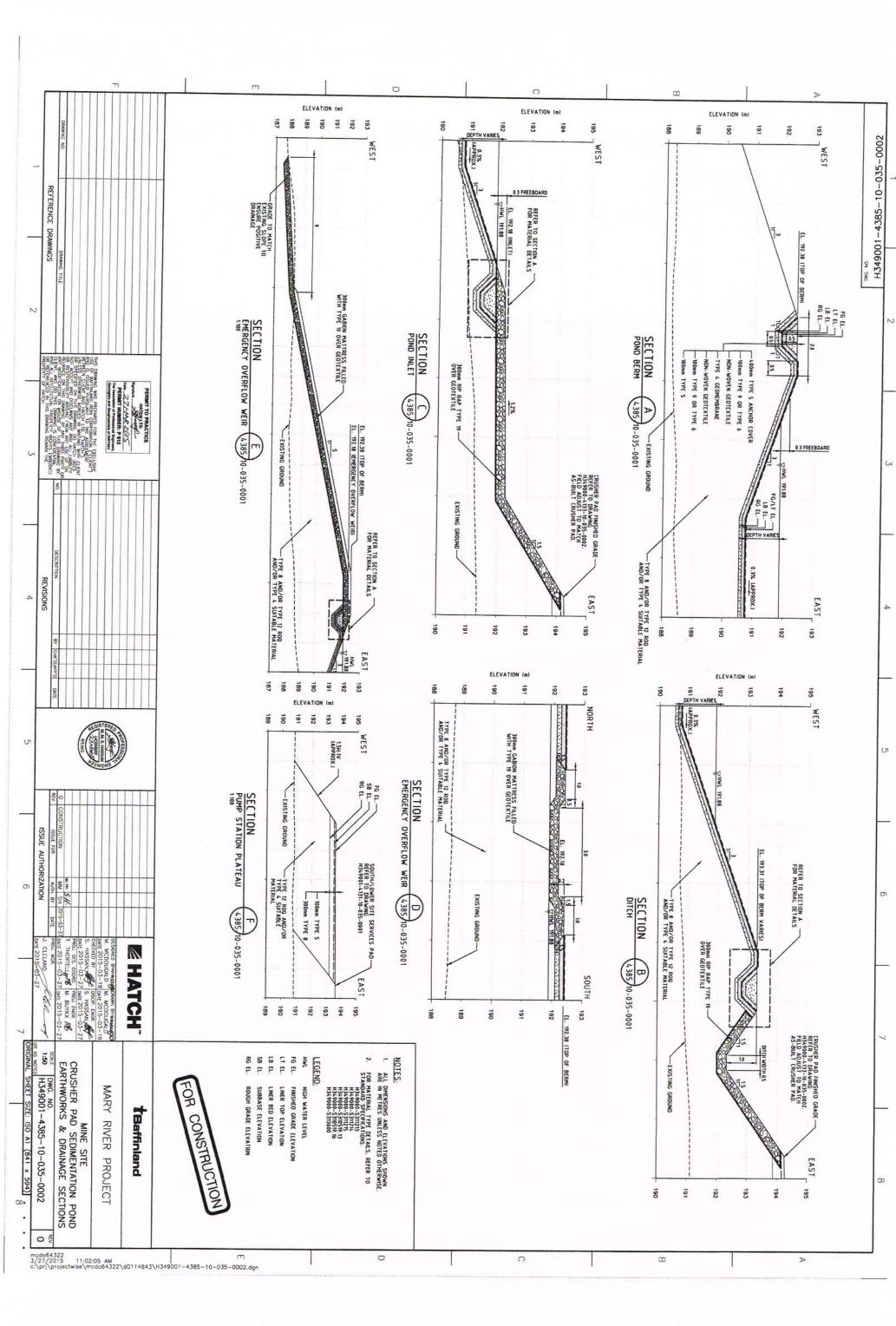
MARY RIVER DRAWINGS











4.0 MILNE INLET

4.01 General

The containment facilities that we have been doing inspections on for the last seven years are now rapidly changing in function with the further construction underway at the Milne Inlet site. Structures and facilities that were under construction during our inspection in 2014 have now been completed and new facilities are under construction.

Since last season, the large landfarm and contaminated snow containment facility have been completed and a new hazardous waste storage containment has been constructed near the loading area. As well, sediment ponds at the shore that were under construction last season are now operational.

4.02 Existing Polishing/Waste Stabilization Pond

This containment facility has been decommissioned since our last inspection.

4.03 Barrel Fuel Storage

This containment facility has been decommissioned since our last inspection.

4.04 Hazardous Waste Storage (MP-HWB-3, MP-HWB-4, and MP-HWB-5)

General Conditions

This particular structure has been constructed as a two-cell structure.

Due to an excess of hazardous waste in the two-cells, a third temporary cell has been constructed for the very short term until the ship picks up the hazardous waste at the end of the summer season.

The third cell is constructed with a one piece liner and wood timber curb for this very short term and is contiguous with the south side of the structure.

This cell actually stores hazardous waste in containers, barrel fuel, and lubricant cubes and does not have the integrity to resist a large spill. There are now bladders with contaminated water in each cell. A new hazardous waste storage facility has now been constructed near the loadout area for storing hazardous waste to be shipped out.

Stability

There is water ponding in both cells of the original structure confirming the integrity of the liner at this time.

Our review of the area around the dykes, at the base of the slopes, showed no sign of seepage. The structure is considered stable.

Recommendations

We recommend that the use of the temporary third cell, recently constructed, be discontinued when possible.

4.05 Fuel Tank Farm

General Conditions

Since both 2012 and 2013 the fuel tank farm has been expanded considerably with the addition of a number of new tanks.

At the time of our last inspection in 2014, the containment structure had been put in place for the entire tank farm and all tanks were in place.

We note that the sump placed in the containment is located at the high end of the containment. There is water ponding in the low end of the containment.

Stability

At our inspection we noted minor water ponding at the low end of the containment confirming the integrity of the liner.

Recommendations

We recommend that the sump be relocated to the low point at the north end of the containment or an addition sump installed.

4.06 New Effluent Pond

General Conditions

This particular effluent pond was first reported on in 2013 but had not yet been put into operation.

The pond was put into operation in 2014.

The containment pond was operating at approximately sixty-percent of capacity at the time of our inspection.

Stability

We noted no sign of weakness in any of the construction.

Recommendations

We have no recommendations with respect to the use of this structure having no negative comments on the construction of this structure.

4.07 Landfarm Containment

General Conditions

The landfarm containment is complete except for soil cover in the area of the sump.

The landfarm was constructed to accommodate approximately 9000 m₃ of oil contaminated soil and seasonal water accumulations.

At the time of our inspection the landfarm was in operation and sorting of contaminated materials was taking place.

The landfarm had been put into operation at the time of our September review last season. It appears as though the structure has been constructed in accordance with good construction practice for structures of this type.

Stability

The structure appears stable as constructed.

Recommendations

We recommend that the remaining dyke structure without protective cover over it be covered as per the design drawings, if any activity is expected in this area.

4.08 Contaminated Snow Containment

General Conditions

The construction of the contaminated snow containment structure is contiguous with the east end of the landfarm.

It appears as though the structure has been constructed in accordance with good construction practice for structures of this type.

The snow containment facility has a containment volume of 929 m₃ based on estimates of snow volume provided by the owner and only a small percentage of the capacity is utilized.

The structure has been constructed with good quality control.

Stability

The structure appears stable as constructed.

Recommendations

We have no recommendations with respect to this construction at this time.

4.09 Sediment Pond East

General Conditions

The construction of this sedimentation pond for drainage from the east side of the site is complete. The basin is shaped and the liner has been installed throughout the basin from inlet to the berms on the north side of the basin.

There has been no cover placed over the liner to this point and rip rap has not yet been placed in the outlet weir.

Stability

We have concerns over the stability of the liner and recommend more soil ballast on the south edge and possibly tire ballast over the liner which appears subject to wind damage. This shall provide a function for used tires.

Recommendations

We recommend review of the use of a ballast (possibly tires) on the exposed liner at the dyke to prevent wind uplift.

4.10 Sediment Pond West

General Conditions

The construction of this sedimentation pond for drainage from the west side of the site is nearing completion except for the west end on the south side where the liner must be "tucked" in.

Stability

We have some concern over the stability of the liner on this pond as we have with the east pond and further recommend that used tire ballast be considered.

Recommendations

Complete construction at the south side, west end, by "tucking" the edge of the liner under the soil.

4.11 Quarry

General Conditions

There is an active quarry to the south of the port development on the high rock outcrop. Quarrying was underway and benches had been developed for the removal of substantial quantities of rock.

Stability

Rock faces appear stable.

Recommendations

We have no recommendations to be made with respect to the existing operation.

4.12 Loading Area Contaminated Storage (Now MP-HwB-1

General Conditions

This area has been constructed near the loading dock to facilitate assembly of hazardous materials for shipment out. It appears that some material from the temporary hazardous storage containment have now been assembled here.

It appears that travel has taken place over the north dyke in the placing of containers. It does not appear that the liner has been damaged.

Construction appears to have taken place in accordance with standardized drawings prepared in the past.

Stability

Construction appears stable.

Recommendations

We recommend that action be taken to prevent travel over the berms before liner damage takes place.

4.13 Overview

Decommissioning is underway of the former structures constructed of sand and gravel and new long term structures are recently completed or under construction utilizing crushed quarried material with a projected long term serviceability.

Respectfully submitted,
Barry H. Martin, P. Eng., MRAIC





Hazardous Storage Containment. (Now MP-HWB-3)



Temporary Hazardous Storage. (Now MP-HWB-5)



Polishing/Waste Stabilization Pond.



Fuel Tank Farm Containment.





East Settling Pond.



West Settling Pond – "Tuck-in" liner this location.



West Settling Pond.



Load-out Area Hazardous Waste Containment. (Now MP-HwB-1)

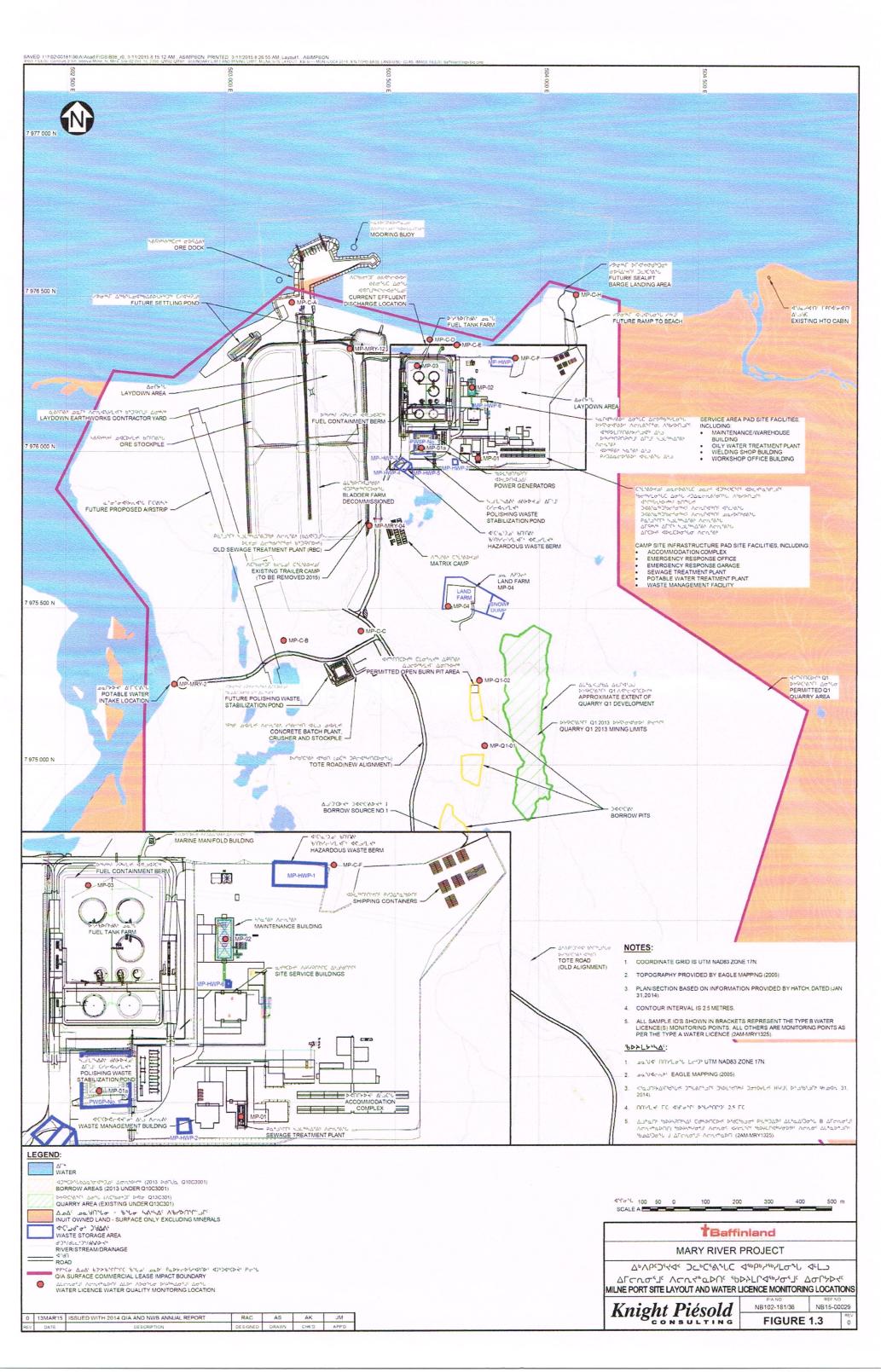


Land Farm Containment.



Contaminated Snow Melt Containment.







November 26, 2015

Phyllis Beaulieu, Manager of Licensing Nunavut Water Board P.O. Box 119, Gjoa Haven NU X0B 1J0

Dear Ms. Beaulieu:

Re: Baffinland Iron Mines Corporation (Baffinland) - Submission September 2015 Biannual Geotechnical Inspection Report No. 2 - Water Licence Type 'A' No. 2AM-MRY1325

1. INTRODUCTION

Under Part D, Item 18, of Baffinland Iron Mines Corporation (BIMC) Type "A" Water Licence 2AM-MRY1325, Amendment No. 1, there is a requirement to conduct biannual geotechnical inspections of specified Mary River Project (the 'Project") infrastructure. Part D, Item 19, of the Type 'A' Licence states that:

"The Licensee shall conduct inspections of the earthwork, geological regime, and the hydrological regime of the Project Biannually during the summer or as otherwise approved by the Board in writing. The inspection shall be conducted by a Geotechnical Engineer and the inspection report shall be submitted to the Board within sixty (60) days of the inspection, with a covering letter from the Licensee outlining an implementation plan to respond to the Engineer's recommendations."

During 2015, the biannual geotechnical field inspections were conducted by Barry Martin of Barry H. Martin Consulting Engineer and Architect (BMCE) of Timmins, Ontario. The focus of the inspections was on Water Licence related infrastructure located at the main camp sites, known as the Mary River Mine Site and Milne Port Site Camps. Mr. Barry Martin has been conducting annual geotechnical inspections for the Project since 2008. The first report covering the first inspection (July 30 to August 4) was submitted in early October. The second inspection was completed September 24 to 29, and the report for that inspection is attached, herewith.

During the September 2015 inspection, the following site facilities were inspected:

Mary River Mine Site

- Bulk Fuel Storage Containment (Historical Bladder Farm)
- Generator Fuel Storage Facility Containment
- Polishing/Waste Stabilization Pond No. 1
- Polishing/Waste Stabilization Ponds Nos. 2 and 3 (constructed as a two-cell structure)
- Helicopter Fuel Cell Containment
- Barrel Fuel Containment (constructed as a two-cell structure)(MS-HWB-3 and MS-HWB-4)
- Hazardous Waste Storage (MS-HWB-2)
- Enviro-Tank Storage (constructed contiguous with hazardous waste storage and stove oil storage)
- Stove Oil Storage (MS-HWB-5)
- Jet Fuel Tank and Pump Containment



- Solid Waste Disposal Site
- Mine Site Steel Fuel Tank Farm Containment
- QMR2 Quarry
- Crusher Pad Drainage Containment
- Waste Pile Drainage Containment
- Jet "A" Aircraft Containment
- Hazardous Waste Containment

Milne Inlet Site

- Existing Polishing/Waste Stabilization Pond
- Barrel Fuel Storage (constructed as a two-cell structure)
- Hazardous Waste Storage (constructed as a two-cell structure) (MP-HWB-3, MP-HWB-4, and MP-HWB-5)
- Fuel Tank Farm
- New Sewage Effluent Pond
- Land Farm
- Contaminated Snow Containment
- Ore Stockpile Sediment Ponds East and West
- Q1 Quarry

The attached report presents the findings of the September inspection and recommendations for the aforementioned structures. Sections 2.0 and 3.0 of this letter summarize Baffinland's plan for implementing recommendations. Where this is no mention of particular infrastructure, there were no concerns identified by BMCE for same.

2. MARY RIVER MINE CAMP RECOMMENDATIONS

Barrel Fuel Containment (Now MS-HWB-3 and MS-HWB-4)

During the July/August inspection, the north dyke in the north cell has had a track fork lift travel over the berm at the east end. Shortly after this observation was brought to light, the issue was resolved by means of warnings and trainings by supervisors to their personnel. During the September geotechnical inspection there was no evidence of this practice reoccurring.

<u>Baffinland Action</u>: All berms are currently being inspected on a bi-weekly inspection schedule by the Environment Department to ensure that this remains so. Consideration is being given to erecting signage at the berms.

Enviro Tank Storage (Now MS-HWB-1)

The integrity of the cell liner is questionable.

<u>Baffinland Action</u>: The cell is currently not being used and has been left empty. The Site Services Department supervisors were made aware that this area shall no longer be used for the storage of hazardous waste or substances until it has been repaired.



Solid Waste Disposal Site

The current footprint as established by the existing covered material and the "blow control" fence at the front of the immediate site is filling up and there is a requirement to expand the landfill footprint in accordance with plans and guidelines set out for this solid waste disposal site.

<u>Baffinland Action</u>: Plans are in place to extend the landfill berms and blow fence. These actions will be implemented by the end of December 2015. Biweekly inspections of the landfill are ongoing by the Environment Department.

• Mine Site Steel Fuel Tank Farm Containment

All work was observed to be complete excepting the installation of the sump pits that are on site awaiting installation and which shall be utilized to facilitate the removal of water that collects from precipitation. The recommendation remains the same as in the first inspection: it was recommended that at least one sump be installed as per the drawings prepared for this facility

<u>Baffinland Action:</u> A sump will be installed during the open water season of 2016, as soon as conditions allow and required resources are available.

QMR2 Quarry

It was observed that there was some instability with some undermining of surface on an upper bench.

<u>Baffinland Action</u>: The quarry is still active. The unstable area noted in the inspection is an active mining face (in the process of being mined) as the quarry expands. Once the area is mined, the slopes will be made stable in accordance with the approved QMR2 Quarry Management Plan and the Interim Closure and Reclamation Plan. These plans include requirements for long term stability at the time of closure.

• Crusher Pad Drainage Containment

Minor tears and perforations were observed in the liner near the crests of the berms. There may be a requirement for additional riprap along the sides of the facility.

<u>Baffinland Action</u>: Rip rap will be placed as required prior to the 2016 Freshet. The minor tears and punctures to the liner will be repaired during next spring when the liner contractor will next be at site. In the meantime the liner and structures appear stable.

3. MILNE PORT CAMP RECOMMENDATIONS

Fuel Tank Farm

The recommendation remains the same as in the first inspection: it was recommended that at least one additional sump be installed as per the drawings prepared for this facility.



<u>Baffinland Action:</u> When conditions permit and resources available a second sump will be installed at the low point at the north end of the facility.

Landfarm

It was observed that the landfarm containment was complete with the exception of some soil cover in the area of the sump. It was recommended that the remaining dyke structure without protective cover over it be covered as per the design drawings although it was also noted that this was not an absolute requirement.

<u>Baffinland Action</u>: This is duly noted and consideration will be given to covering the liner during the 2016 open water season.

• Ore Stockpile Sediment Ponds East and West

The inspection indicated concerns over the stability of the liner and recommended more soil ballast on the south edge / tire ballast over the liner which appears subject to minor wind damage.

<u>Baffinland Action:</u> Used tires will be placed as ballast on north side of the facility where there is exposed liner. This will be completed by December 6, 2015.

• Loading Area Contaminated Storage (Now MP-HWB-1)

During the previous inspection in July/August, travel over the berm that had been a concern, however, there was no evidence of this practice at the time of the September inspection.

<u>Baffinland Action</u>: This concern has been addressed by means of employee awareness and erected temporary barriers. Monitoring by the Environment Department is ongoing. Consideration is being given to erecting signage at the berms.

We trust that this submittal satisfies the requirements the geotechnical requirements as outlined in our Water Licence. Should you have any questions, please do not hesitate to contact Jim Millard, Environmental Manager, at 1.416-364.8820 ext 6016 or 1.902.403.1337 or by e-mail at jim.millard@baffinland.com.

Best Regards,

James Millard, M.Sc., P.Geo. Environmental Manager

Attach: Annual Geotechnical Inspections, Mary River Project, Second of Two Inspections, September 2015, prepared by Barry Martin Consulting Engineer and Architect for Baffinland, dated Nov 2015. cc. Justin Hack, Erik Allain (AANDC)

Erik Madsen, Tony Woodfine, Bikash Paul, Bernard Laflamme (Baffinland)



BHM Project No. 15-97

BAFFINLAND IRON MINES CORPORATION

ANNUAL GEOTECHNICAL INSPECTIONS
MARY RIVER PROJECT
SECOND INSPECTION OF TWO
September 2015



Prepared for:

Mr. Jeff Bush Site Services Superintendent Baffinland Iron Mines Corporation 2275 Upper Middle Road East, Suite 300 Oakville, Ontario L6H 0C3



Barry H. Martin, P. Eng., MRAIC, Consulting Engineer and Architect

1499 Kraft Creek Road Timmins, Ontario P4N 7C5

Tel: 705-268-5621

Barrymartin1499@gmail.com

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Milne Inlet Photos

Milne Inlet Drawing

September 30, 2015

Baffinland Iron Mines Corporation 2275 Upper Middle Road East, Suite 300 Oakville, Ontario L6H 0C3

Attention: Jeff Bush

jeff.bush@baffinland.com

RE: ANNUAL GEOTECHNICAL INSPECTIONS BAFFINLAND IRON MINES CORPORATION OUR REFERENCE NO. 15-097

1.0 INTRODUCTION

Barry H. Martin, P. Eng., Consulting Engineer, completed the eighth annual water licence geotechnical inspection of the following on-site engineered facilities as required by Licence No. 2AM-MRY 1325 of the Nunavut Water Board:

Pit Walls
Quarries
Landfills
Land Farms
Bulk Fuel Storage Facilities
Sediment Ponds
Collection Ponds
Polishing and Waste Stabilization Ponds

The inspection that took place September 25th to September 29th is the second phase of a biannual inspection to be carried out within the open water shipping season at the two Baffinland sites, in Mary River at the mine site, and at Milne Inlet at the port facility.

The inspections were carried out in accordance with the guidelines set out in "Dam Safety Guidelines 2007" as published by the Canadian Dam Association.

The inspections were completed by Mr. Barry H. Martin, P. Eng., the design Engineer for the initial containment facilities both at Mary River and Milne Inlet, the runway extension, initial bridges on the connecting road, the solid waste disposal site as well as continuing construction of select mine infrastructure.

The seven previous annual water licences geotechnical inspections were completed by Mr. Martin. You shall note that Hazardous Waste Containment Structures have been assigned new designations in the report as compared to previous years.

The facilities inspected are as per the following:

Mary River Site

Bulk Fuel Storage Containment

Generator Fuel Storage Facility Containment

Polishing/Waste Stabilization Pond No. 1

Polishing/Waste Stabilization Ponds Nos. 2 and 3 (constructed as a two-cell structure)

Helicopter Fuel Cell Containment

Barrel Fuel Containment (constructed as a two-cell structure)(MS-HWB-3 and MS-HWB-4)

Hazardous Waste Storage (MS-HWB-2)

Enviro-Tank Storage (constructed contiguous with hazardous waste storage and stove oil storage) (MS-HWB-1)

Stove Oil Storage (MS-HWB-5)

Jet Fuel Tank and Pump Containment

Solid Waste Disposal Site

Minesite Steel Fuel Tank Farm Containment

Quarry

Crusher Pad Drainage Containment

Waste Pile Drainage Containment

Jet "A" Aircraft Containment

Hazardous Waste Containment (MS-HWB-6)

A site plan for the Mary River site showing most structures reviewed is attached.

Milne Inlet Site

Hazardous Waste Storage (constructed as a two-cell structure) (MP-HWB-3, and MP-HWB-4,)

Fuel Tank Farm

New Sewage Effluent Pond (PWSP)

Land Farm

Contaminated Snow Containment

Sediment Ponds East and West

Quarry

Loading Area Contaminated Storage (MP-HWB-1)

Fuelling Facility Containment

A site plan for the Milne Inlet site showing most structures reviewed is attached.

2.0 METHODOLOGY FOR INSPECTION

The geotechnical inspector was Barry H. Martin, P. Eng., who also reviewed the two sites for the first of the biannual inspections on July 30th, 2015 to August 3rd, 2015 just as the annual shipping season commenced with the arrival of the first ship into port. This inspection was planned to take place at the end of the shipping season.

The inspections primarily focused on the following aspects:

- 1. The structures were inspected for conformance with the design basis as presented in "as constructed" and "as-built" drawings (provided in the first and subsequent reports).
- 2. The structures were specifically inspected for settlement, cracking, and seepage through the berms.
- 3. The areas around the structures were examined for evidence of seepage.
- 4. Quarry walls were reviewed for relative stability. I note that the quarries are active removal areas and long term stability was not yet established.
- 5. New structures under construction were reviewed for conformity with design drawings.
- 6. Photographs were taken to document observations made during the inspection and are attached.

3.0 MARY RIVER CAMP

3.01 General

As with other years, there had been some rainfall at Mary River preceding the second inspection and it was expected that there would be some water in the containment dykes.

A monitoring program is in place to test storm water that does accumulate within the containment structures. As reviewed, the water that does not meet the water licence effluent requirements is treated on site prior to release.

At the Bulk Fuel Storage Facility Containment, the water that collects within the dyke is treated at the end of the containment structure.

We report on the new Jet "A" Fuelling Containment Structure and Hazardous Waste Containment for the first time.

As with the August report of this year there are new code names assigned to hazardous waste structures.

The Bulk Fuel Storage Containment (Exploration Phase Bladder Farm) is coming due for decommissioning and is currently used to store barrels of fuel, lubricant cubes, and a large fuel tank at this time.

3.02 Bulk Fuel Storage Facility (Exploration Phase Bladder Farm)

General Conditions

The Bulk Fuel Storage Facility still exists but it is no longer utilized as a bulk fuel storage facility. There are a number of full fuel barrels and lubricant cubes now stored within the berms, as well as a large fuel tank.

The granular cover over the geotextile and liner is still in place within the containment structure awaiting land farming and a fair amount of water at one end awaiting treatment.

Stability

At the time of this initial review, water had not been removed for a period from within the containment and water was ponding above the level of the gravel within the bottom of the containment at the north of the facility.

At the load-out end of the facility there was water ponding within the dykes.

The soil structure is considered stable in the present condition and is in conformance with the design basis for the facility.

The presence of water within the structure and at the load-out area is an indication of the integrity of the liner.

Recommendations

We have no recommendations with respect to this containment structure as it awaits decommissioning.

3.03 Generator Fuel Storage Containment (Exploration Phase)

This particular containment structure is currently being decommissioned. The fuel bladder that was contained within the dyke has been removed.

The granular fill over the geotextile and liner shall require landfarming with the material from the bulk fuel storage facility.

There is no indication that the liner is compromised and decommissioning should proceed when the granular cover is either moved to a land farm or other containment. There is water ponding within the structure.

3.04 Polishing/Waste Stabilization Pond #1

General Conditions

PWSP No. 1 continues to be utilized as a holding facility for sewage plant effluent that does not meet water effluent quality criteria.

Currently the pond is being used primarily as a repository for off spec sewage and sewage sludge forming in lift stations.

The supernatant from PWSP No. 1 is periodically decanted to PWSPs Nos. 2 and 3 where it is tested and treated as required to meet Water Licence effluent requirements.

At the time of our visit there was approximately fifty percent of capacity to accommodate further sewage and the structure readily conforms to its design intent.

Stability

Our review of this area around the pond at the base of the slopes showed no sign of seepage and hence we conclude that the liner has been effective in containing sewage and there are no tears or ruptures in

the membrane, excepting some minor tears from past activity at the top of the dyke well above the allowable effluent level in the structure in the horizontal portion of the membrane.

A review of the top of the dyke showed no indication of cracking or settlement which would indicate stresses within the structure.

Many of the tears that had occurred in the liner on the top of the dyke have been patched during the period between reviews in 2008 and 2009 and are holding well. As well, there are no signs of weather related deterioration of the liner where it is exposed.

There appears to be no sign of erosion of the dykes, even with the precipitation that has occurred over the lifetime of the facility.

The minor settlements have had little effect on the integrity of the structure.

Recommendations

We have no recommendations with respect to this containment facility.

3.05 Polishing Ponds/Waste Stabilization Ponds #2 and #3

General Conditions

The structure was designed and constructed as a two-cell structure.

The supernatant from PWSP #1 is currently discharged to PWSPs Nos. 2 and 3. The treated effluent is tested for Water Licence effluent requirements, treated if necessary, and discharged to the environment.

At the time of our visit there was considerable freeboard to accommodate further sewage and the structure readily conforms to its design intent. There was fifty-percent remaining capacity in one cell and the second cell was almost empty at the time of our inspection.

Stability

Our review of the area around the pond at the base of the slopes showed no sign of seepage and hence we conclude that the liner has been effective in containing the sewage and there are no tears or ruptures in the membrane.

Longitudinal cracking which appeared in the dykes of PWSP #3 due to the melt of permafrost wedges in 2009 has not reoccurred and we consider this structure to be stable in its present condition.

Monitoring points have been set upon the top of the dyke and have been monitored since 2009. Settlements have occurred since that time. These settlements have not led to any stress cracks in the structure. Monitoring was discontinued last year.

There appears to be no sign of erosion of the dykes and plants are continuing to seed themselves on the dykes. This growth is minimal, however.

There are three small bubbles formed by air trapped under the enviroliner that were present in the first review that are probably the result of wrinkles in the liner that should disappear if further liquid is added to the cell.

Recommendations

We have no recommendations with respect to this containment facility.

3.06 Helicopter Fuel Tank Containment

General Conditions

The structure was designed and constructed as a single cell structure that contains a 1000 gal fuel storage tank.

The structure currently conforms to its design intent.

In the past, a liner clad wood curb had been added to the top of the berm to prevent the erosion of gravel off the berm, caused by pulling the fuel hose from within the dyke out to the helicopters to provide them with fuel.

Stability

Our review of the area around the pond at the base of the slopes showed no sign of seepage. There is water in the bottom of the containment indicating the integrity of the liner.

A review of the exterior and the top of the berms showed no sign of cracking or settlement which would indicate stress within the structure.

The structure is considered to be stable in its present condition.

Recommendations

We have no recommendations with respect to this structure.

3.07 Barrel Fuel Containment (Now MS-HWB-3 and MS-HWB-4)

General Conditions

This particular structure which we called "Barrel Fuel Containment" in our previous inspection reports is a two-cell structure which is currently used to accommodate cubes of lubricant and barrels in the east cell and cubes of lubricant and antifreeze in the west cell.

Stability

Our review of the area around this containment structure showed no sign of seepage. This shows that there is reasonably little chance of tearing or rupture of the membrane having taken place.

A review of the exterior and top of the dyke showed no sign of cracking or settlement which would indicate stresses within the structure.

The structure is considered to be stable in its present condition.

Recommendations

We have no recommendations at this time.

3.08 Hazardous Waste Storage (Now MS-HWB-2)

General Conditions

This particular cell was constructed contiguous with an existing cell, which is referred to on site as the "Enviro Tank Storage", from drawings by our office in 2010 and conforms to our drawings. It is also contiguous with the Stove Oil Storage cell.

This structure contains barrels and bags of hazardous waste.

Stability

Our review of the area around this cell at the base of the slopes, showed no sign of seepage. There is water ponding in this structure.

The structure appears to be stable in its present condition. The water confirms the integrity of the liner.

Recommendations

There are no recommendations at this time.

3.09 Enviro Tank Storage (Now MS-HWB-1)

General Conditions

This particular structure is constructed contiguous with the Hazardous Waste Storage constructed in 2010 and the Stove Oil Storage cell. It was utilized as a wash down cell during the last season. It is currently in use storing cubes of lubricant and barrels.

Stability

Last year there was concern for the integrity of this cell as the cell was dry and the geotextile was exposed from heavy traffic during our initial inspection. During our second inspection, the cell was holding a small amount of water confirming limited integrity of the liner.

The cell is dry this year at both of the 2015 inspections raising concerns anew on the integrity of the liner.

Recommendations

We recommend that the geotextile over the liner be checked and the granular cover be made good prior to continuing use of this cell

3.10 Stove Oil Storage (Now MS-HwB-5)

General Conditions

This particular structure had been used to store barrels of stove fuel in 2011.

The structure again contains barrels of stove oil and some Jet "A" fuel.

This structure was constructed in accordance with a standardized drawing provided by this office utilizing a one piece liner.

Stability

Our review of the exterior at the base of the dyke showed no sign of seepage. This shows that there is reasonably little chance of tearing or rupture of the membrane having taken place.

A review of the exterior and the top of the dyke showed no sign of cracking or settlement which would indicate stresses with the structure.

There is water contained within the cell confirming the integrity of the liner.

The structure is considered to be stable in its present condition.

3.11 Jet Fuel Tank and Pump Containment

General Conditions

This particular structure was reconstructed based on our recommendation of the 2012 Geotechnical Inspection.

The construction was completed in accordance with our recommendations for such structures and the liner was constructed as a one piece liner with geotextile protection on both sides and gravel over the geotextile as protection.

The construction appears proper and the structure is in good condition.

Minor water ponding confirms the integrity of the liner.

At this time as in our earlier inspection report this year, the jet fuel tank and pump have been removed and the cell is empty.

Stability

Our review of the area around the cell at the base of the slopes showed no sign of seepage and water is ponding within the cell.

The structure is stable in its present condition.

Recommendations

There are no recommendations at this time.

3.12 Solid Waste Disposal Site

Berms appear stable and no erosion appears to have taken place on the back and both sides of the site. Solid waste was being placed at the front edge of the site and was awaiting salvage of wood and lumber

prior to the placing of cover at the time of our site review. There is also separation of metals taking place.

The disposal was being conducted in conformity with plans prepared and applicable guidelines and operating plans set out for the disposal of solid waste.

The current footprint as established by the existing covered material and the "blow control" fence at the front of the immediate site has now reached capacity. It is our understanding that the footprint of the facility and blow fence shall be expanded in the near future in accordance with plans and guidelines set out for this solid waste disposal site.

3.13 Minesite Steel Fuel Tank Farm Containment

General Conditions

All work appears to be complete excepting the installation of the sump pits that are on site awaiting installation and which shall be utilized to facilitate the removal of water that collects from precipitation.

There is water ponding in the bottom of the containment confirming the integrity of the liner. This ponding of water is now well above the cover on the bottom of the containment.

Stability

All work appears to have been completed in accordance with drawings and we have no concerns with the stability of this containment structure.

Recommendations

We recommend that at least one sump be installed as per the drawings prepared for this facility and that when weather permits, removal of water within the containment.

3.14 Quarry QMR2

General Conditions

The quarry has well defined benches. The quarry faces at the benches are clean.

The current work site is undermining the road on the bench above it (see photo). However, it is recognized that the road area referred to is restricted access. The quarry is active, and the area of instability will soon be removed as part of ongoing quarry development.

Stability

The current work site is underming road on the bench above it. (see photo)

3.15 Crusher Pad Drainage Containment

General Conditions

There is a new containment being constructed to catch surface water flow from the crushing area and stockpile area at the minesite.

The ditch at the entry to the recessed inlet on the east and west side of the containment is now complete and the facility has now been completed.

Stability

The structure has been completed in accordance with drawings included in our last report in a most satisfactory manner.

Recommendations

We have no recommendations with respect to this containment structure.

3.16 Waste Stockpile Drainage Containment

General Conditions

This structure was in operation only for one summer as a temporary containment for waste rock runoff. It is our understanding that this structure will no longer be used in 2016 and will be replaced by a more permanent structure before freshet in 2016. The existing structure will be buried within the footprint of the expanding waste rock pile.

This pond is a collection pond wherein the front end of the pond is not lined with an eviroliner and only the end dykes are.

There are swales constructed to contain runoff from the waste pile and conduct it into the settlement pond where it can be tested and released when acceptable quality is found, by pumping it out.

There are other swales constructed to divert normal runoff away from this collection area to prevent it from mixing with the runoff from the waste pile where PAG (possibly acid generating) rock is encapsulated.

As there was snow windswept across this area at the time of our inspection, it was reviewed from aerial photography done prior to the snow.

Stability

The area appears stable at this time.

3.17 Jet "A" Fuel Containment

General Conditions

This cell was constructed to replace the containment structure near the Weatherhaven Camp.

This cell now contains two double walled tanks and is located north of the air terminal buildings.

Stability

The cell was constructed using a one piece enviroliner with geotextile and was constructed in accordance with standardized drawings prepared in the past for such construction by our office.

There is water ponding in the bottom of the cell confirming the integrity of the liner.

There were no signs of cracking of the dykes.

Recommendations

We have no recommendations with respect to this structure.

3.18 Hazardous Waste Containment (MS-HW-6)

General Conditions

Although it was constructed in 2012, we have not reported on it in the past.

It is located near the incinerator and is utilized to store barrels of ash from the incinerator. It is, however, empty at this time.

Stability

The cell was constructed utilizing a one piece enviroliner with geotextile and was constructed in accordance with standardized drawings prepared in the past for such construction by our office.

There is water ponding in the bottom of the cell confirming the integrity of the liner.

There were no signs of cracking of the dykes or seepage around the exterior of the dykes.

Recommendations

We have no recommendations with respect to this structure.

3.19 Overview

This report is the seventh annual Geotechnical Inspection at Mary River and Milne Inlet completed by this author on behalf of Baffinland Iron Mines Corporation and the second year of reporting covering the first of two inspections in one shipping season.

As set out in our past reports, there has been little or no erosion taken place from wind or rain and the dykes constructed of the sand/gravel soil have remained stable at slopes of 3:1 and 4:1.

As noted last year, there are only just now signs of settlement appearing at PSWP's 1, 2 and 3. The settlements are not differential settlements of the dykes but are minor overall settlements of the total structures with respect to the surrounding area.

These settlements appear to be settlements within the one metre ± active layer above the permafrost and are of little concern as the PWSP's are temporary structures and the settlements have no effect on the dyke stability.

It is expected that many of the structures that form the basis for the inspections set out in the biannual Geotechnical inspections shall be decommissioned as the mine facilities are finalized.

MARY RIVER PHOTOS



Generator Fuel Storage Containment



Helicopter Fuel Tank Containment



PWSP #2



PWSP #3



PWSP #1



Bulk Fuel Storage



Barrel Fuel Containment MS-HWB-4



Barrel Fuel Containment MS-HWB-3



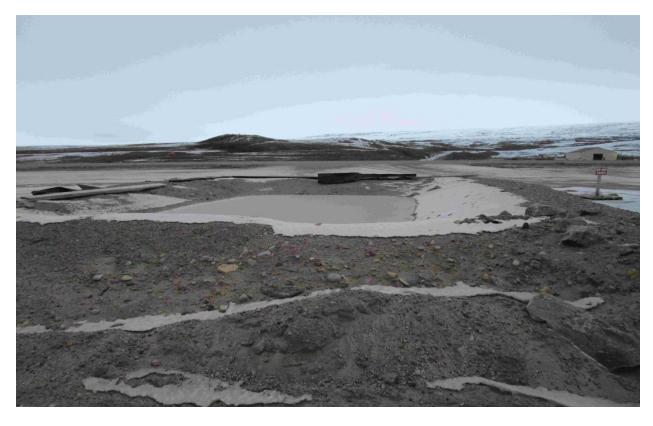
Hazardous Waste Containment MS-HWB-2



Enviro Tank Containment MS-HWB-1



Stove Oil Storage MS-HWB-5



Jet "A" Fuel Containment from 2014



Jet "A" Fuelling Containment



Hazardous Waste Containment MS-HWB-6



Edge and Top of Solid Waste Disposal Site



Crusher Pad Drainage Pond and Swale



Mary River Tank Farm Containment

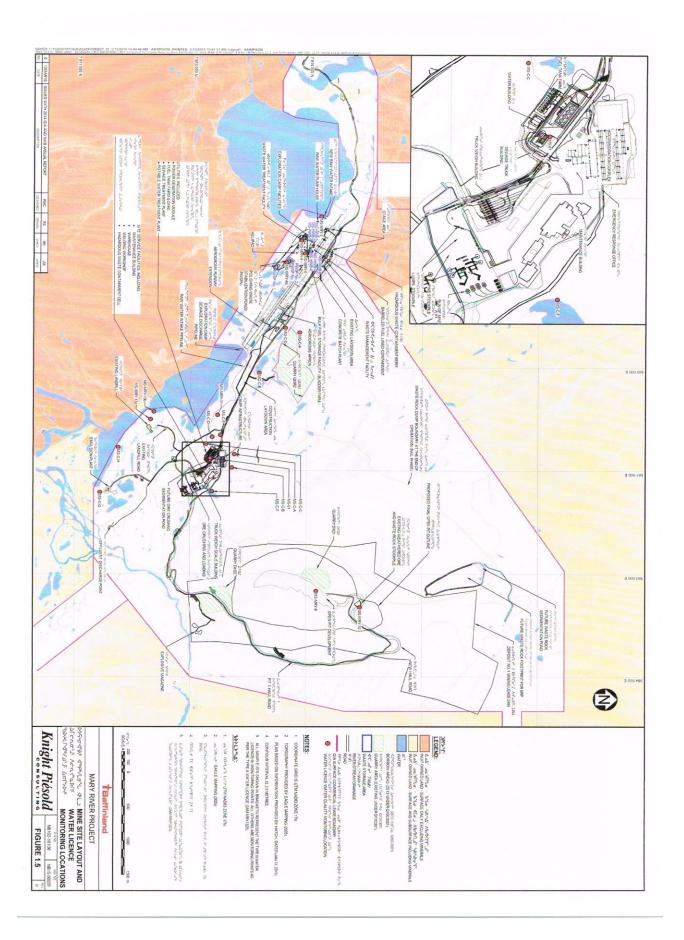


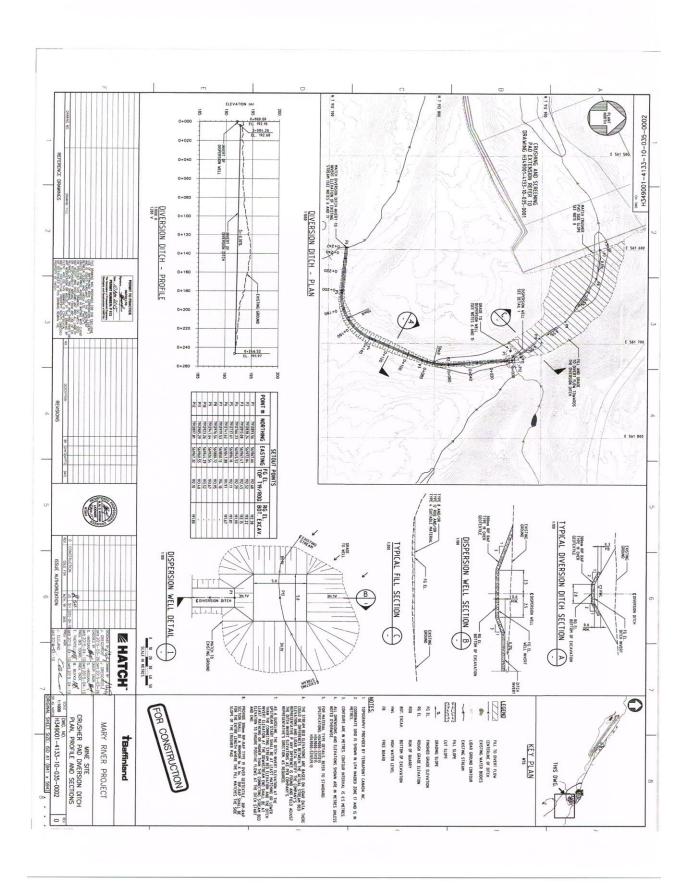
Mary River Quarry Bench Undermining

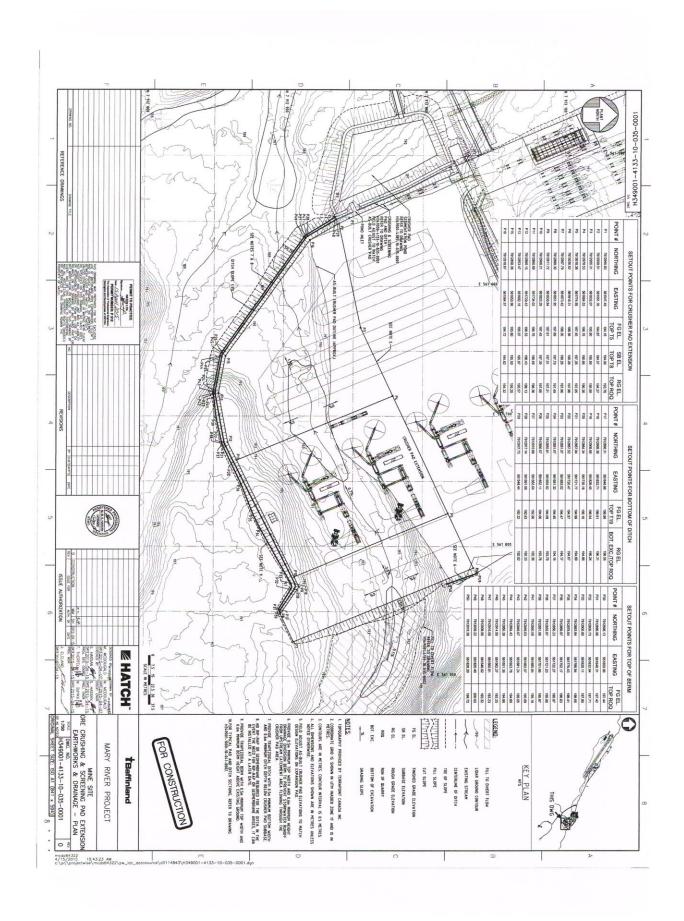


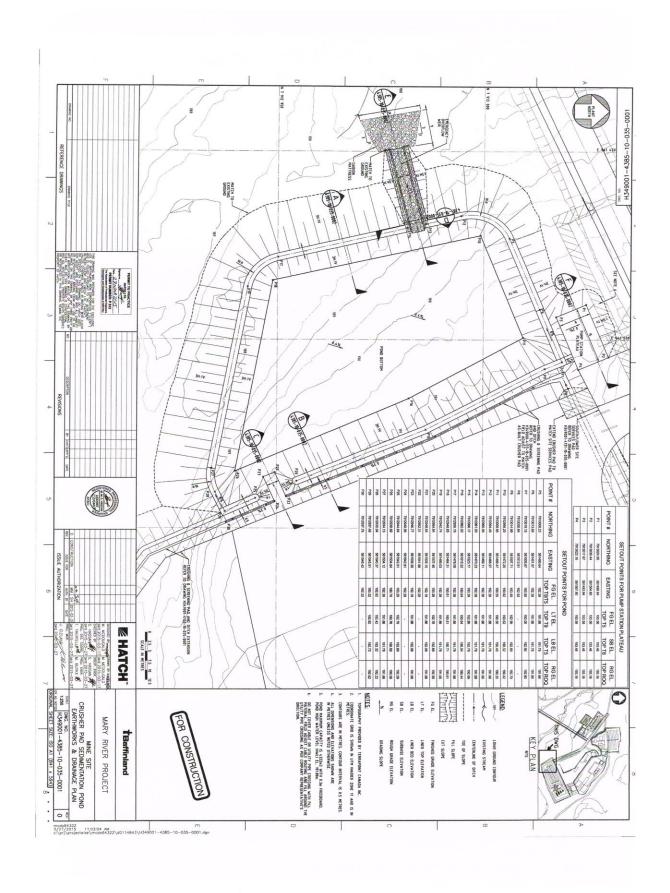
Waste Rock Containment (Verified via Aerial Photography)

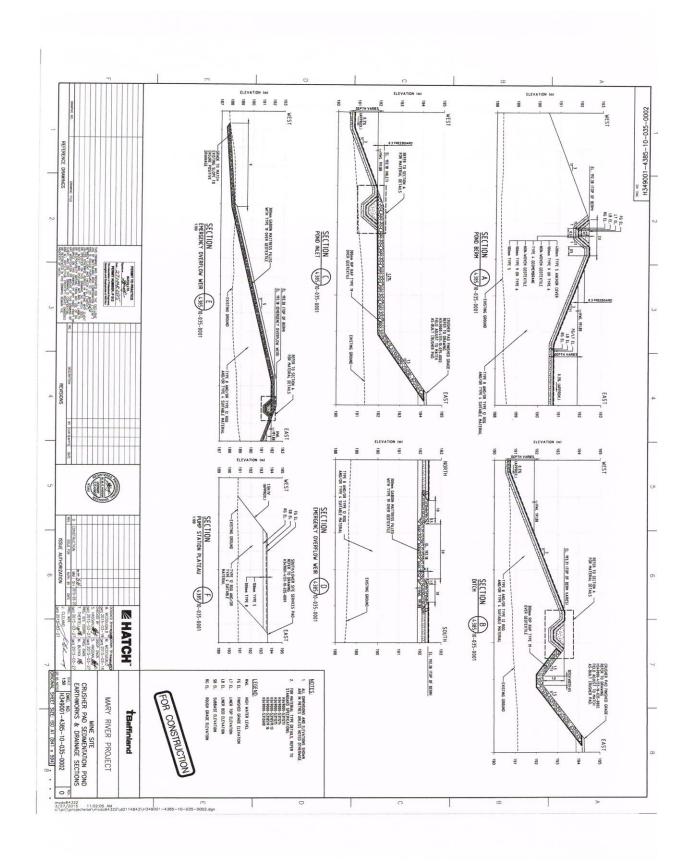
MARY RIVER DRAWINGS











4.0 MILNE INLET

4.01 General

There are still changes taking place at Milne Inlet, even since our last inspection in July/August of this current year.

There is now a B train fuelling facility containment, designed by our office, under construction.

Since last season, the large landfarm and contaminated snow containment facility have been completed and a new hazardous waste storage containment has been constructed near the loading area. As well, sediment ponds at the shore that were under construction last season are now operational.

Since our last review, in July/August, these facilities, are all fully functional.

4.02 Hazardous Waste Storage (MP-HWB-3, and MP-HWB-4)

General Conditions

This particular structure has been constructed as a two-cell structure.

Due to an excess of hazardous waste in the two-cells, a third temporary cell had been constructed for the very short term. This temporary cell has now been decommissioned.

The bladders that had been present in the two cells during our July/August review, have now been removed.

A new hazardous waste storage facility has now been constructed near the loadout area for storing hazardous waste to be shipped out and is in full operation at this time.

Stability

There is water ponding in both cells of the original structure confirming the integrity of the liner at this time.

Our review of the area around the dykes, at the base of the slopes, showed no sign of seepage. The structure is considered stable.

Recommendations

We have no recommendations with respect to the use of these two cells at this time.

4.03 Fuel Tank Farm

General Conditions

Since both 2012 and 2013 the fuel tank farm has been expanded considerably with the addition of a number of new tanks.

At the time of our last inspection in 2014, the containment structure had been put in place for the entire tank farm and all tanks were in place, as is the case at this time.

We note that the sump placed in the containment is located at the high end of the containment. There is water ponding in the low end of the containment. Water has been pumped from the low end of the containment since our review in July/August and there is considerably less water in the containment

Stability

We have minor water ponding at the low end of the containment confirming the integrity of the liner.

Recommendations

We recommend that a sump be considered at to the low point at the north end of the containment, to better facilitate the removal of water to minimize the treatment of water should a minor spill occur within the containment.

4.04 New Effluent Pond (PWSP)

General Conditions

This pond was put into operation in 2014.

The containment pond was operating at approximately thirty percent of capacity at the time of our inspection.

Stability

We noted no sign of weakness in any of the construction.

Recommendations

We have no recommendations with respect to the use of this structure having no negative comments on the construction of this structure.

4.05 Landfarm Containment

General Conditions

The landfarm containment is complete except for soil cover in the area of the sump.

The landfarm was constructed to accommodate approximately 9000 m₃ of oil contaminated soil and seasonal water accumulations.

At the time of our inspection the landfarm was in operation and sorting of contaminated materials had taken place.

The landfarm had been put into operation at the time of our September review last season.

It appears as though the structure has been constructed in accordance with good construction practice for structures of this type.

Stability

The structure appears stable as constructed.

Recommendations

We recommend that the remaining dyke structure, without protective cover over it, be covered as per the design drawings This however, is not an absolute requirement..

4.06 Contaminated Snow Containment

General Conditions

The construction of the contaminated snow containment structure is contiguous with the east end of the landfarm.

It appears as though the structure has been constructed in accordance with good construction practice for structures of this type.

The snow containment facility has a containment volume of 929 m₃ based on estimates of volume provided by the owner and only a small percentage of the capacity is utilized. Hydrocarbon contaminated water was treated and discharged to the environment in the late summer by means of a portable oily water treatment plant.

The structure has been constructed with good quality control.

Stability

The structure appears stable as constructed.

Recommendations

We have no recommendations with respect to this construction at this time.

4.07 Sediment Pond East

General Conditions

The construction of this sedimentation pond for drainage from the east side of the site is complete.

The basin is shaped and the liner has been installed throughout the basin from inlet to the berms on the north side of the basin.

There has been no cover placed over the liner to this point and rip rap has not yet been placed in the outlet weir.

Our comments remain the same as in our July/August report.

Stability

We have concerns over the stability of the liner and recommend more soil ballast on the south edge and possibly tire ballast over the liner which appears subject to wind damage. This shall provide a function for used tires.

A review of the south edge of the liner shows very minor movement in the liner at the south edge probably due to wind uplift of the liner. This was forecast in our July/August report.

Recommendations

We recommend review of the use of a ballast (possibly tires) on the exposed liner at the dyke to prevent wind uplift.

4.08 Sediment Pond West

General Conditions

The construction of this sedimentation pond for drainage from the west side of the site is nearing completion except for the west end on the south side where the liner must still be "tucked" in as set out in our July/August report.

Stability

We have some concern over the stability of the liner on this pond as we have with the east pond and further recommend that used tire ballast be considered.

Recommendations

Complete construction at the south side, west end, by "tucking" the edge of the liner under the soil.

4.09 Quarry

General Conditions

The quarry was inactive at the time of our review and all blasted rock had been removed from the quarry site.

Stability

Rock faces appear stable.

Recommendations

We have no recommendations to be made with respect to the quarry.

4.10 Loading Area Contaminated Storage (Now MP-HWB-1)

General Conditions

This area has been constructed near the loading dock to facilitate assembly of hazardous materials for shipment out. It appears that all material from the temporary hazardous storage containment have now been assembled here.

The travel over the berm that had taken place over the north berm has been dealt with since our last review in July/August and this is not expected to be a future problem.

Construction appears to have taken place in accordance with standardized drawings prepared in the past.

Stability

Construction appears stable.

Recommendations

We have no recommendations with respect to this structure.

4.11 Fueling Facility Containment

General Condition

A new fueling facility for the fueling of B trains is under construction utilizing design drawings prepared by our office.

All work is proceeding well and work conforms to the design drawing which is included in this report.

The liner utilized in the construction is a one piece liner, which minimizes the possibility of failure.

4.12 Overview

Decommissioning is underway of the former structures constructed of sand and gravel and new long term structures are recently completed or under construction utilizing crushed quarried material with a projected long term serviceability.

Respectfully submitted,

Barry H. Martin, P. Eng., MRAIC

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MILNE INLET PHOTOS



Contaminated Snow Containment



Land farm Containment



Milne Inlet Quarry



Sediment Pond West



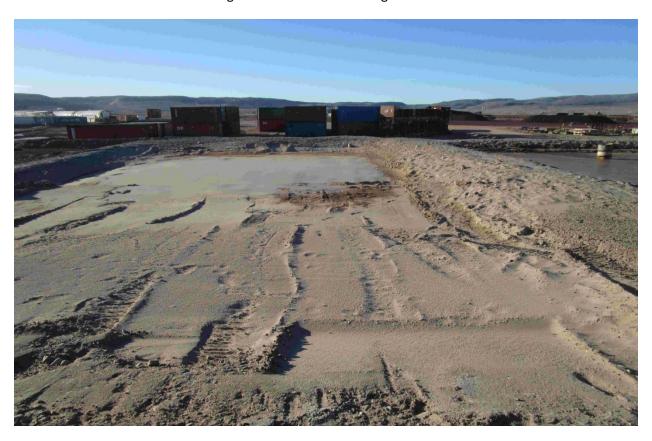
Sediment Pond East



Indicates Movement in Anchorage at Sediment Pond East



Loading Area Containment Storage MP-HWB-1



Hazardous Waste Containment MP-HWB-4



Hazardous Waste Containment MP-HWB-3



Polishing Waste Stabilization Pond

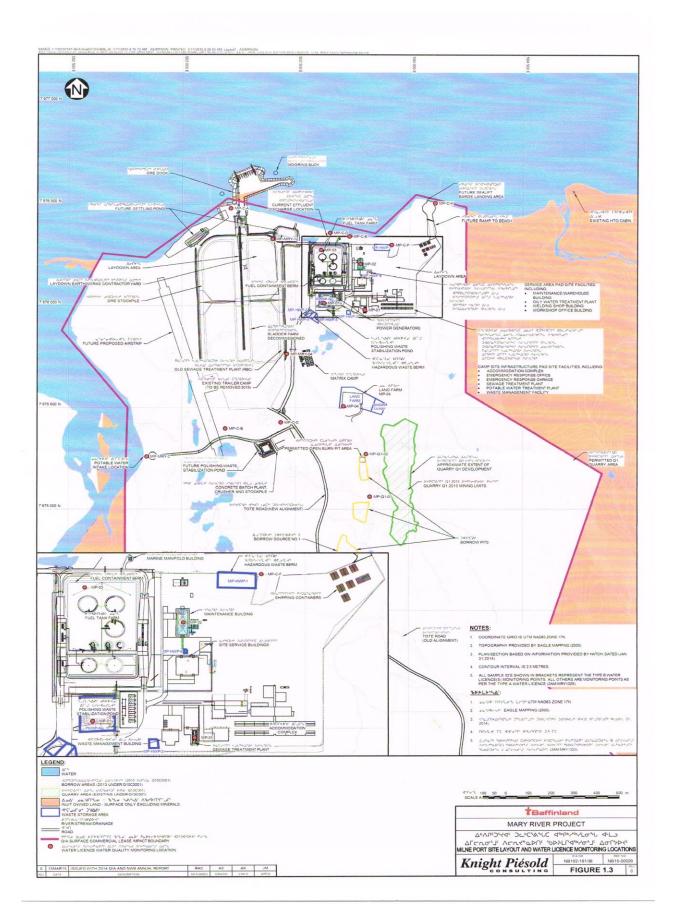


Steel Fuel Tank Containment



New fuel Dispensing Containment

MILNE INLET DRAWINGS







2015 QIA and NWB Annual Report

March 31, 2016

APPENDIX D.3
2015 PHOTO JOURNAL
(English & Inuktitut)

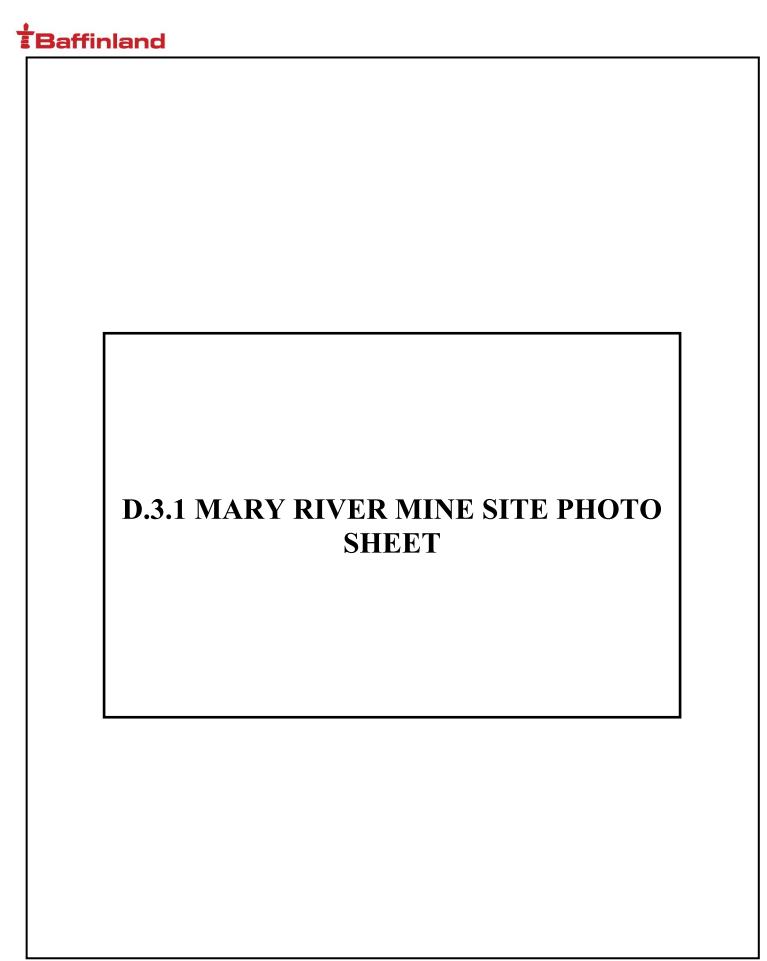






PHOTO 1 - Mary River Mine Site Deposit 1 and Mine Haul Road, July 2015



PHOTO 2 - Mary River Mine Site Open Pit Bench, July 2015

Baffinland



PHOTO 3 - Loading Mary River Ore at Nuluujaak Pit



PHOTO 4 - 777 traffic on Mine Haul Road





PHOTO 5 - QIA Audit – August 9, 2015



PHOTO 6 - Mary River Mine Site Waste Rock Stockpile and Temporary Waste Rock Sedimentation Pond, July 2015





PHOTO 7 - Mary River Mine Site Crusher Pad Ore Stockpile and Sedimentation Pond



PHOTO 8 - Mary River Mine Site Accommodations Complex and Steel Tank Bulk Fuel Storage Facility





PHOTO 9 - Mary River Mine Site Apron and Aircraft Runway



PHOTO 10 - Mary River Mine Site Quarry (QMR2)



PHOTO 11 - Mary River Mine Site Weatherhaven



PHOTO 12 - New HTO cabin located at the outlet of Camp Lake





PHOTO 13 - Mary River Mine Site Water Jetty at Camp Lake with siltation mitigation measures in place



PHOTO 14 - Mary River Mine Site Landfill berm walls and working face, March 2015



PHOTO 15 - Sampling on Camp Lake for the Aquatic Effects Monitoring Program (AEMP)



PHOTO 16 - Hydrological Monitoring on Mary River

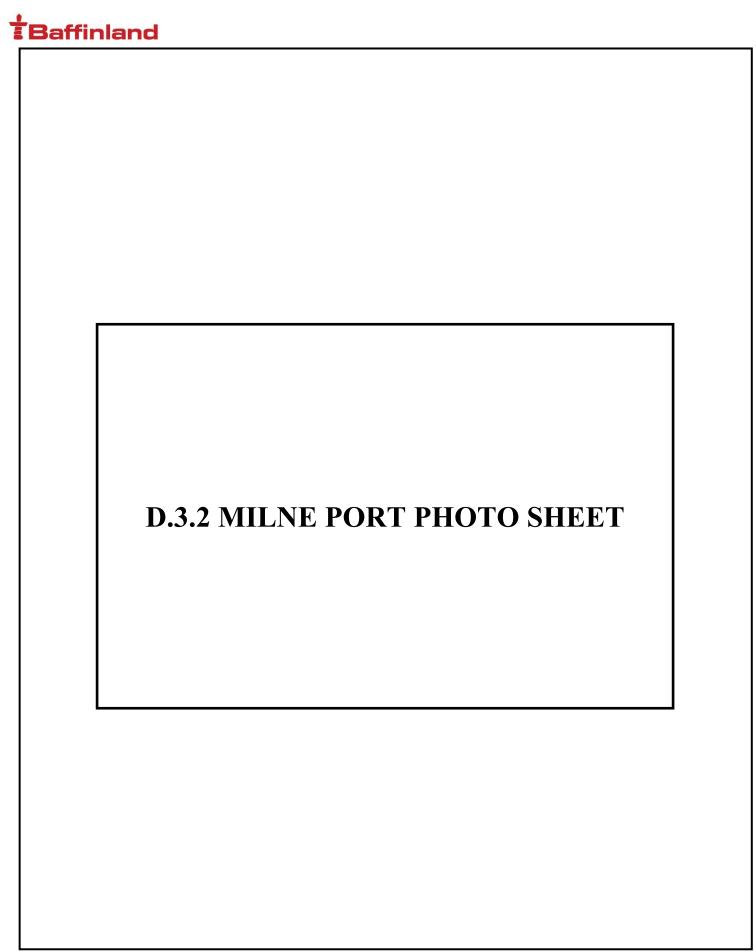




Photo 1 - Milne Port infrastructure August 2015



PHOTO 2 - Milne Port Ship loader and Ore Dock - August 2015



PHOTO 3 - First Ore Ship to leave Milne Port carrying 53,624 tonnes of Mary River Ore – August 7, 2015



PHOTO 4 - Nordic Odin berthed at Ore Dock awaiting Loading of Ore

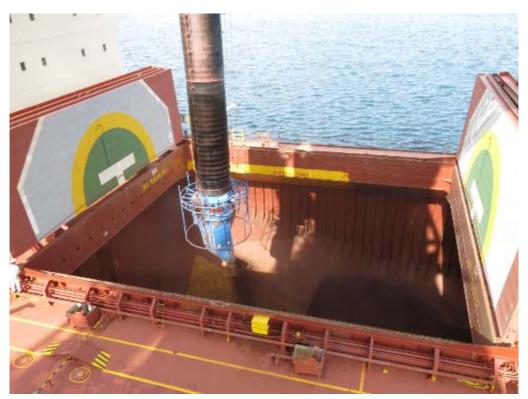


PHOTO 5 - Loading Ore into Hull of Federal Tiber, August 2015



PHOTO 6 - Loading Ore onto the Conveyer belt





PHOTO 7 - Milne Port Ship loader Conveyor



PHOTO 8 - Milne Port Ship loader with Ore freighter berthed at Ore Dock



PHOTO 9 - Aerial view of Milne Port Accommodations Complex and Cargo Loading Dock, 2015



PHOTO 10 - Aerial view of Steel Tank Bulk Fuel Storage Facility





PHOTO 11 - Aerial view of Landfarm and Contaminated Snow Dump



PHOTO 12 - Aerial view of Milne Port Quarry



PHOTO 13 - Aerial view of Milne Port Weatherhaven Complex and Ore Stockpile



PHOTO 14 - Aerial view of the Milne Port Ore Stockpile and Sedimentation Ponds



PHOTO 15 - Milne Port Salt clean up July 2015



PHOTO 16 - Milne Port Historic Ash clean up July 2015





PHOTO 17 - Bruce Head Marine Mammal Monitoring Camp outside Milne Port August, 2015



PHOTO 18 - Bruce Head Marine Mammal Monitoring Observation Station outside Milne Port, August 2015

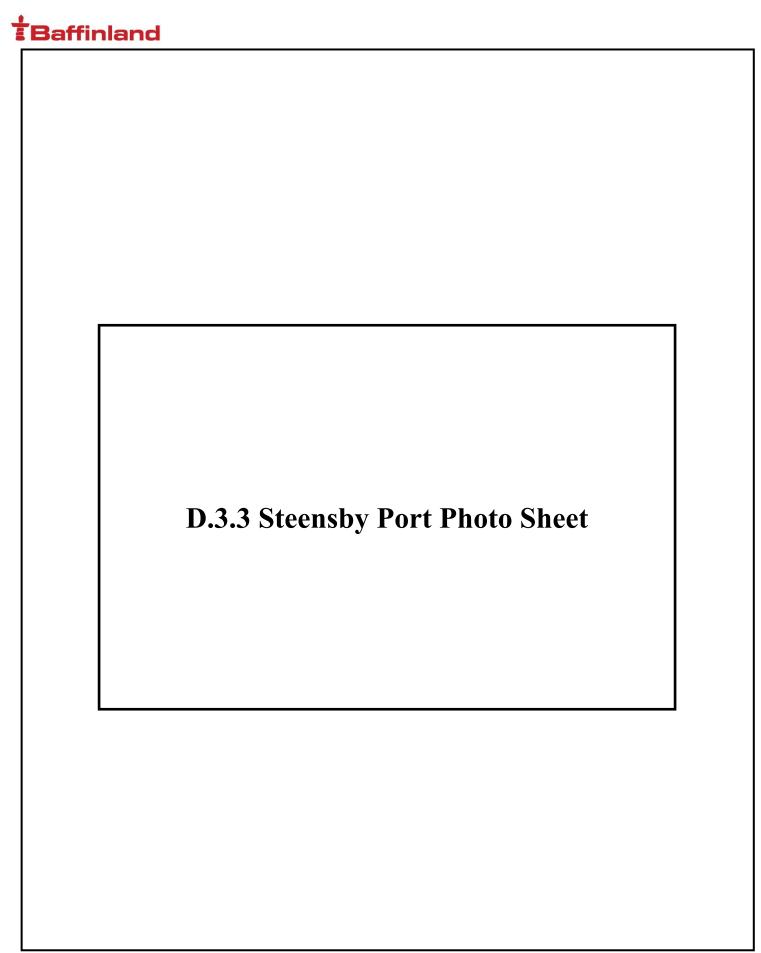






PHOTO 1 - Aerial View of Steensby Port exploration camp July 2015 - Camp was not occupied in 2015



PHOTO 2 - Aerial View of Steensby Port exploration camp July 2015 - Camp was not occupied in 2015

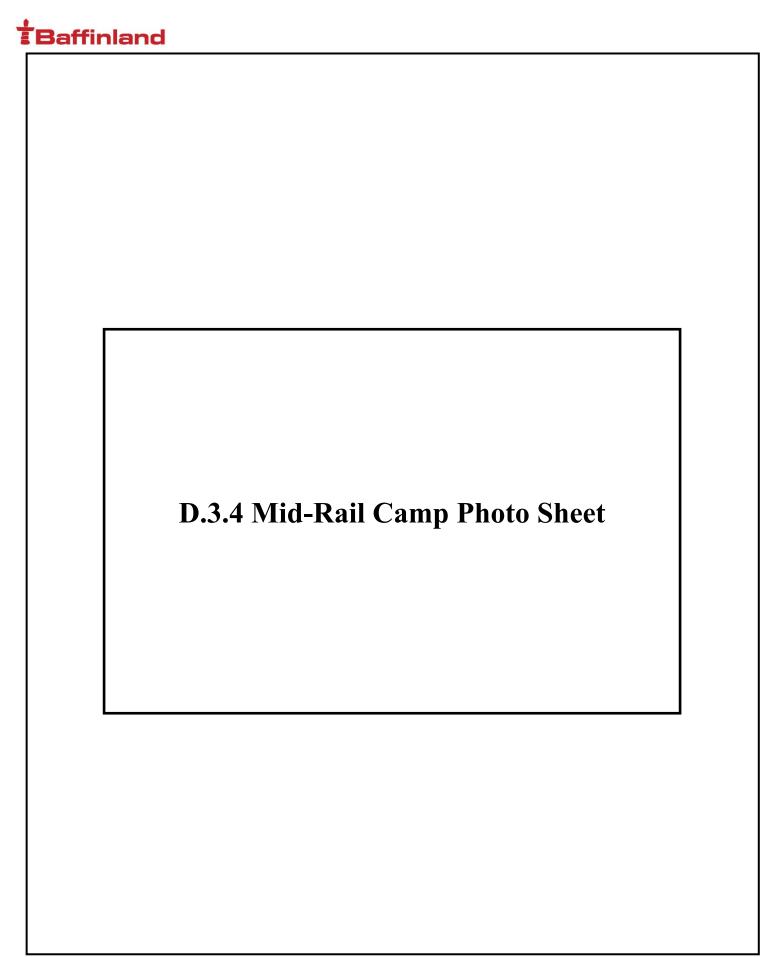


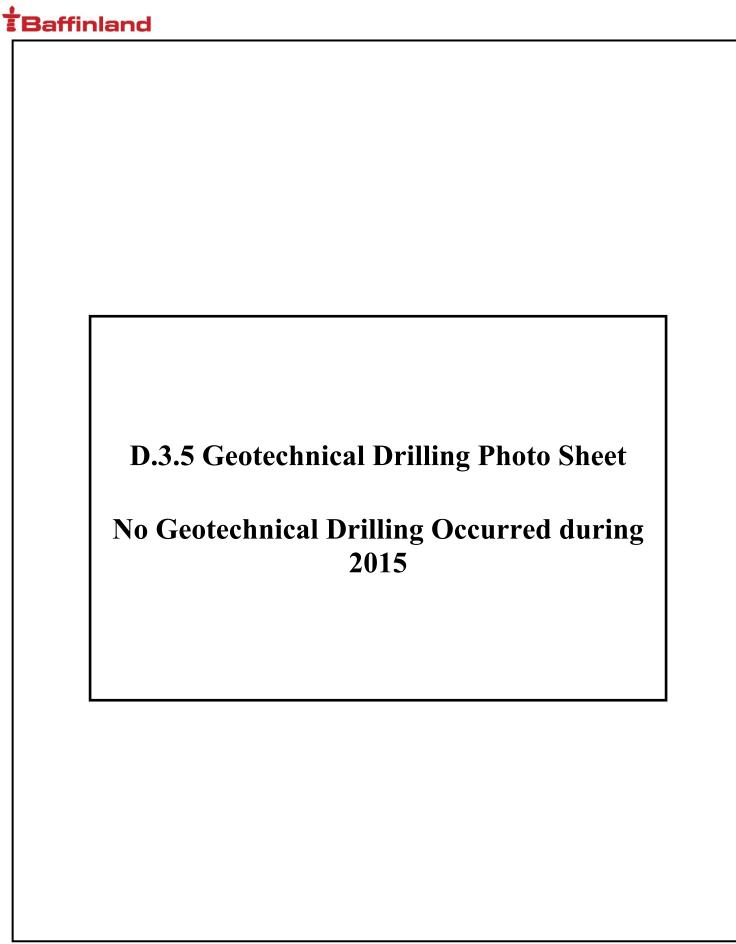




PHOTO 1 - Aerial View Mid-Rail Camp Close-Out - Camp was not occupied in 2015



PHOTO 2 - Aerial View Mid-Rail Camp Close-Out - Camp was not occupied in 2015



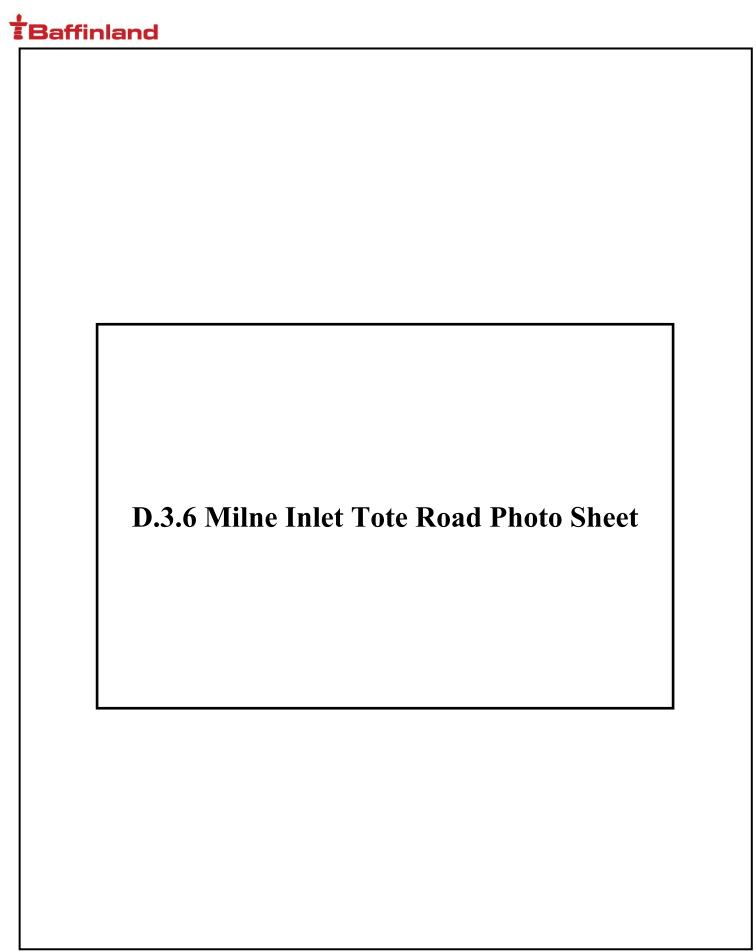




PHOTO 1- Milne Inlet Tote Road Km 62 Bridge



PHOTO 2 - Ore Hauling on the Milne Port Tote Road



PHOTO 3 - Aerial View of Milne Port Tote Road Bridge Km 97



PHOTO 4 – Milne Port Tote Road Km 98 CV 225 Culvert Install, January 2015

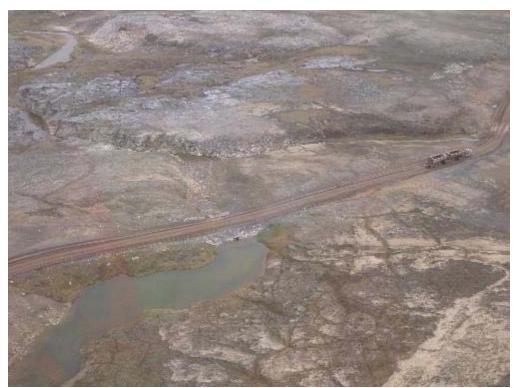


PHOTO 5 - Aerial view of the Milne Port Tote Road Km 84 rustic fish ladder stream



PHOTO 6 - Aerial view of the Milne Port Tote Road Km 80 Bridge



PHOTO 7 - Milne Port Tote Road Km 37 CV 099 Culvert Install, January 2015



PHOTO 8 - Aerial view of the Milne Port Tote Road Km 17 Bridge

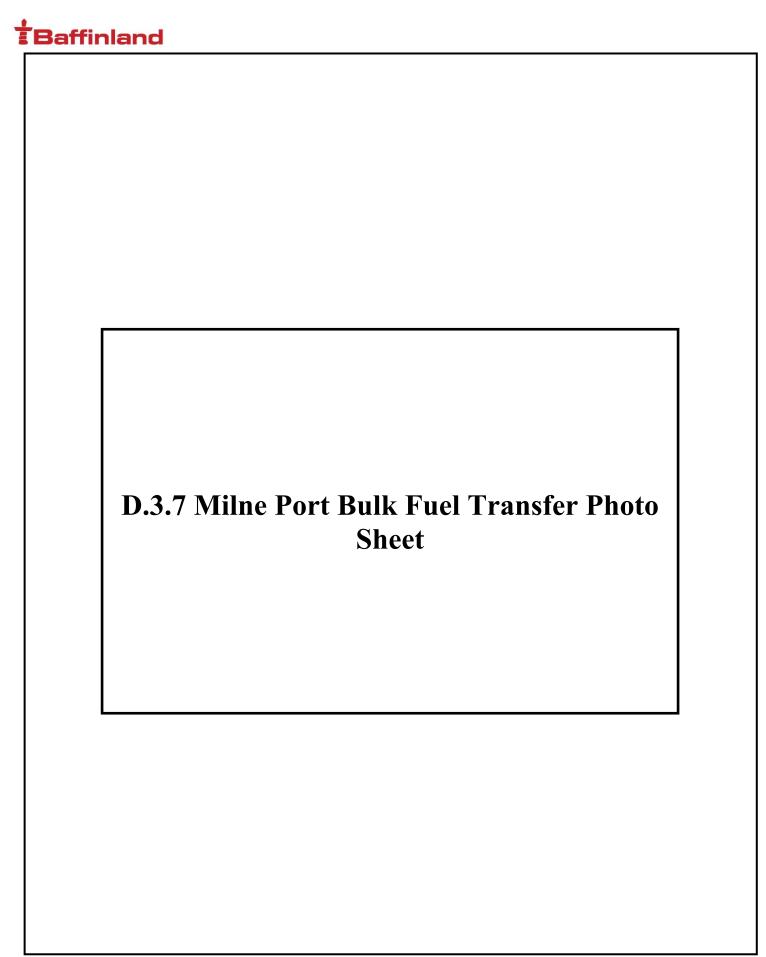




PHOTO 1 Bulk Fuel Tanker in Milne Inlet, August 2015



PHOTO 2 Bulk fuel tanker anchored outside Milne Port, August 2015





PHOTO 3 Deploying a containment boom during the Marine Spill Response Training August 2015



PHOTO 4 Deploying a hydrocarbon skimming unit during the Marine Spill Response Training August 2015



PHOTO 5 - Marine Spill Response Training at Milne Port August 2015



PHOTO 6 Marine Spill Response Training at Milne Port August 2015

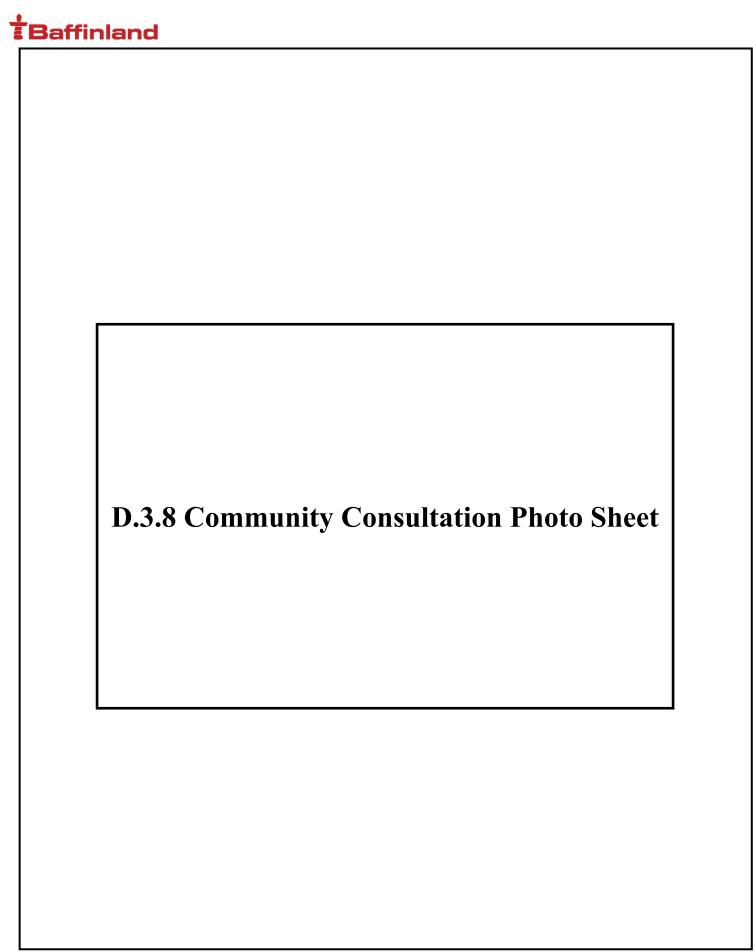




PHOTO 1 "Mining Matters" course in North Baffin Classrooms



PHOTO 2 Pond Inlet Hunters and Trappers Organization talking about year round shipping across Eclipse Sound with Baffinland Ore shipping



PHOTO 3 Laptop presentation with the High School Graduates in Igloolik



PHOTO 4 Bruce Head Marine Mammal Monitoring Program Training in Pond Inlet



PHOTO 5 QIA Audit - August 9, 2015



D.3.1 MARY RIVER MINE SITE PHOTO SHEET

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D.3.2 MILNE PORT PHOTO SHEET Δ^bΛρ^cン^cd^c ン C^bC^cδ^cbC d^bA^cJd^c Δ C J δ^cb











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D.3.5 Geotechnical Drilling Photo Sheet $\Delta = \Delta^{c} \cap \Delta^{c} \cap$

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D.3.6 Milne Inlet Tote Road Photo Sheet Δ^bΛρ^cン^cd^c b^cγ^cb^cc^cδ^b d^cbdγ d^cb





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D.3.7 Milne Port Bulk Fuel Transfer Photo Sheet



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2015 QIA and NWB Annual Report

March 31, 2016

APPENDIX D.4 DFO TOTE ROAD ANNUAL REPORT

Environment

Document #: BAF-PH1-830-P19-0001

Baffinland Iron Mines Corporation

MARY RIVER PROJECT

EARLY REVENUE PHASE - TOTE ROAD UPGRADES FISH HABITAT MONITORING 2015 ANNUAL REPORT TO **DEPARTMENT OF FISHERIES AND OCEANS**

BAF-PH1-830-P19-0001

Rev 1

Prepared By: William Bowden Department: Environment

Title:

Environmental Coordinator

Date:

December 22, 2015

Signature:

Approved By: James Millard Department: Environment

Title:

Environmental Manager

Date:

December 22, 2015

Signature:



Environment

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ACKNOWLEDGEMENTS

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FIGURE 1- Map of the HADD and compensation crossings along the tote road, showing both the old and new alignments.

Appendix A- Applicable DFO Letters of Advice

Appendix B-Turbidity and Construction Monitoring Field Notes



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1 INTRODUCTIONS

1.1 Mary River Project

The Mary River Project (the Project) is an iron ore mining operation located in the North Baffin region of Baffin Island, Nunavut. The Mary River Mine Site coordinates are approximately Latitude 71 degrees, 19' 35" North and Longitude 79 degrees 22' 30" West. Detailed descriptions of the Project and annual activities can be found in reports from Knight Piésold (2007b, 2008) and Baffinland (2009, 2010, 2011, 2012, 2013, and 2014).

Currently, the Tote Road (the "Road") is used as a means of transport of iron ore, personnel, equipment, and supplies between the Mary River Mine Site and Milne Port Site. There is an approved plan in place to upgrade portions of the Road as part of the construction and operation of the Early Revenue Phase (ERP) for the Project. In order to safely and efficiently transport iron ore from the Mine Site to Milne Inlet during the early operational period of the mine, the existing Tote Road has been upgraded (sections were straightened, widened and/or moved) to accommodate large haul trucks. Work on these upgrades was initiated during the winter of 2013/14 and are still ongoing. Upgrades have included the replacement of sea container crossings with free-span bridges (completed in 2014) and the continued installation, reinstallation, and/or extension of culverts at a number of crossing locations.

1.2 AUTHORIZATION FOR WORKS

The Department of Fisheries and Oceans (DFO) (1998) defined Harmful Alteration, Disruption or Destruction (HADD) as, "any meaningful change in one or more habitat components that can reasonably be expected to cause a real reduction in the capacity of the habitat to support the life requisites of fish." A HADD occurs when the physical, chemical, or biological features of a water body are sufficiently altered, such that habitat becomes less suitable for one or more life history processes of fish. Detailed descriptions of the 2007 HADD authorization and any related amendments and Letters of Advice can be found in previous annual reports (Knight Piésold 2007b, 2008; Baffinland 2009, 2010, 2011, 2012, 2013, 2014) and the Fish Habitat No Net Loss and Monitoring Plan is described by Knight Piésold (2007a).

A total of 25 crossings were identified (as HADD) under the August 2007 Fisheries Act Authorization, and 14 crossing were identified (as Habitat Compensation) in the August 2007 No Net Loss and Monitoring Plan. The locations of these crossings along the Tote Road are presented in Figure 1. Of these 25 crossings, three have since been identified as not fish-bearing and they no longer qualify as HADD sites (Baffinland 2010).

The 2015 Letters of Advice from DFO are provided for reference in Appendix A.



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1.3 REPORTING

A written report summarizing the monitoring results is to be submitted to the specified office locations of the Department of Fisheries and Oceans, Fish Habitat Management, Eastern Arctic Area, on or before December 31 of each year. Annual reports have already been submitted for the years 2007 to 2014, incl. (Knight Piésold 2007b, 2008 and Baffinland 2009, 2010, 2011, 2012, 2013, 2014).

This 2015 Annual Report, herein, covers the period of activity up to and including November 30, 2015. It summarizes the fish habitat monitoring results for additional works or undertakings completed in accordance with the approved No Net Loss and Monitoring Plan (Knight Piésold 2007a) and conditions of the authorization, subsequent amendments, and recent Letters of Advice.

2 PROJECT DESCRIPTION

2.1 CONSTRUCTION WORK

Design summaries and descriptions of work along the Tote Road completed up to the end of 2009 are presented, in detail, in Knight Piésold (2007c) and Baffinland (2009). Recent road construction activities and installation of fish access improvement structures at some crossings are described in Baffinland (2010, 2011, 2012, 2013, 2014).

In order to safely and efficiently transport iron ore from the Mine Site to Milne Inlet during the early operational period of the mine, the existing Tote Road has been further upgraded (sections were straightened, widened and/or moved) to accommodate large haul trucks. The first phase of the upgrades involved replacement of sea container crossings with bridges, which was completed during the winter of 2013/14. Culvert replacement and extension work was initiated during 2014 and remains ongoing. Numerous new culvert installations/replacements were completed between December 2014 and the end of November 2015; however, the majority of these works occurred in non-fish-bearing streams and are not considered further within the scope of this report. A total of seven new culvert installations, replacements or extensions were completed on fish-bearing streams between December 2014 and the end of November 2015. A summary of this completed work on fish bearing streams is provided in Table 1.

2.2 FISH HABITAT ASSESSMENT

Watercourses initially identified as HADD (n = 25) and compensation (n = 14) sites (Knight Piésold 2007a) were each assessed for the quality of available fish habitat at least once between 2006 and 2009 (Baffinland 2009). Detailed assessments for these sites are provided in Knight Piésold (2007b, 2008) and Baffinland (2009, 2010, 2011, 2012, 2013, 2014).



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In 2015, monitoring was conducted at all fish-bearing crossings that had been affected by the ERP upgrades. Changes to the Tote Road included the replacement of sea container crossings with bridges (completed during the winter of 2013/14), and the installation/extension of new culverts at existing crossings to accommodate road widening, straightening, and/or realignment. The emphasis of the 2015 monitoring program was to assess the presence of fish, habitat quality, and fish passage at the sites where upgrades were completed prior to freeze-up in fall 2015 and provide recommendations for sites yet to receive upgrades (Table 1, Table 4).

Habitat surveys involved observations of substrate, gradient, flow characteristics, and potential fish use along 50 m reaches upstream and downstream of each crossing. Fish presence was determined through visual surveys and the use of a backpack electrofisher. In previous years, both methods have proven to be highly reliable techniques for determining fish presence/absence in the clear, shallow streams that are typical of the study area. Descriptions of habitat and condition of culverts were noted and photographs were taken. Results of aquatic monitoring are presented in Section 3.0.

Monitoring will continue in 2016 with descriptions of changes and potential impacts to be provided upon completion of upgrades on all crossings for fish bearing streams (Table 2). It is expected that there will be some habitat gains (replacement of sea container crossings with bridges) and losses (extension/lengthening of some existing culverts) that will need to be documented as work continues.

2.3 FISH HABITAT COMPENSATION

Compensation works completed for the Tote Road prior to 2009 are described in detail in Knight Piésold (2007a) and the results of more recent compensation works (e.g., rustic fishway at BG-30) and detailed fish habitat and fish use surveys from 2009 to 2014 are presented in Baffinland (2009, 2010, 2011, 2012, 2013, 2014). Following successful completion of habitat works at BG-30 (Baffinland 2012), there was a net habitat gain of approximately 1,050 km2, which together with other gains met the compensation goals described in Knight Piésold (2007a). Fish presence upstream of the fishway in BG-30 has been confirmed during site visits from 2013-2015, indicating structural integrity and successful fish passage has been maintained. Fish salvage at BG-30 was performed in 2015, where low water levels were expected to lead to stranding.

2.4 SUMMARY OF DESIGN CHANGES

Modifications to accommodate upgrades to the Tote Road and specific water crossings to support the Early Revenue Phase of the Project that were completed in 2015 are presented in Table 1. These upgrades were presented in letter applications to the DFO during 2013. Baffinland received approvals from the DFO in the form of Letters of Advice (refer to Appendix A) to proceed with these changes. As of November 30, 2015, work had been completed on the four bridge crossings and seven culvert crossings. Currently the schedule of the planned Tote Road improvements/realignments have been temporally delayed but are anticipated to continue during 2015.



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3 AQUATIC MONITORING

A monitoring plan was developed to ensure that all measures and works specified in the No Net Loss and Monitoring Plan (Knight Piésold 2007a), as well as the Fisheries Act Authorization and amendments, have been implemented and are functioning as intended. Details of aquatic monitoring conducted up to 2014 are provided in Knight Piésold (2007b, 2008) and Baffinland (2009, 2010, 2011, 2012, 2013, 2014). Aquatic monitoring in 2015 focussed on assessing any changes to fish, habitat, and accessibility at fish-bearing crossings where replacement/installation of culverts occurred during the winter of 2014/2015.

3.1 CONSTRUCTION AND TURBIDITY MONITORING

There was no in-stream construction work in 2015 during periods of flow that required turbidity monitoring. However turbidity and flow monitoring was performed on 12 HADD crossings during June and July of 2015 (Table 3). Monitoring field sheets are provided in Appendix B.

3.2 FISH USE ASSESSMENTS AT SELECT CROSSINGS

Fish use assessments in 2015 were conducted at all fish-bearing sites, including those where ERP upgrades had been completed by early August and those where potential future upgrades may be implemented. Table 4 summarizes assessments conducted in 2015 and provides recommendations for future monitoring or construction works for 2016

Some of the marginal quality streams were dry or nearly dry in 2015 and did not contain fish at the time of the survey in early August. Fish were observed at all remaining known fish-bearing crossings. At the seven fish-bearing crossings where new construction works had been completed by the time of the survey, two showed no issues with fish use of habitat or passage potential through the culverts. At CV-225, the road was realigned and the new crossing is upstream of the old one, which has been removed. There are no issues with fish use of habitat at the new crossing or with fish passage, though there is potential for perching to occur in the future (close monitoring will be required). At BG-50, the new bridge continues to provide unobstructed access to upstream areas and offers suitable habitat at the crossing. However, the old sea container crossing is becoming perched in certain sections and may limit access only to larger size classes of juveniles. All obsolete sea container bridges are scheduled to be removed no later than December 31, 2016 as agreed upon and documented within Department of Fisheries and Oceans correspondence. In addition, the new culverts installed in the right-hand channel are perched and impassable. Reinstallation of these culverts will restore upstream access for fish using habitat in the righthand channel. At CV 049 extensions were added to the existing culverts to accommodate the new road. One of the two culverts at the time of survey was obstructed with snow/ice due to the thickness of the road providing insulation. At CV-076 and CV-129 new culverts were installed on the new road alignment.

Fish habitat use and passage upstream of culverts was confirmed at all of the 34 fish-bearing crossings in 2015. However, 11 of these were assessed to have some minor issues that will require further monitoring



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and, possibly, mitigation. Detailed descriptions of observations and recommendations are provided in Table 4. The crossing with the greatest potential to affect fish passage is BG-01. The existing culverts have been perched since they were first installed (2008) and, although the rocky ramp that was constructed to mitigate the perching remains functional, substrate downstream of the crossing continues to erode and undercut the culverts. There is potential for this crossing to become impassable in the future.

3.3 FISH USE ASSESSMENTS AT COMPENSATION SITES

All compensation works remain successful (including fish use of the rustic fishway installed at BG-30). For more details on habitat compensation activities, see Baffinland (2009, 2010, 2011, 2012, 2013, and 2014).

It is expected that there will be a reduction in the original HADD footprint size at crossings where bridges replaced sea containers and some change to the footprint size at crossings where new culverts are being installed and others replaced. Following completion of ERP upgrades, HADD and compensation will be revisited to determine if sufficient compensation remains or if additional works will be required.

4 AUTHORIZED HADD CROSSING INSTALLATION SUMMARY

The locations for all current authorized HADD crossings and habitat compensation sites are presented in Figure 1. As of November 30, 2008, all authorized HADD water crossings were installed, as of August 2009 remedial work at the habitat compensation sites was substantially completed, and as of October 2011 additional habitat compensation investigations and access structure installation were complete at select crossings. In 2012, new culverts were installed at two HADD crossings (BG-04 and BG-32) and habitat compensation works were completed at BG-30. No additional work was completed in 2013 due to pending potential upgrades to large portions of the Tote Road as part of the Early Revenue Phase of the Project. In 2013/14 bridges were installed at four crossings and culvert replacement/extension was initiated on another crossing. The now obsolete sea containers were removed from the CV-223 crossing during late fall 2014, but have not yet been removed from the three other bridge crossings. A complete and updated list of the HADD crossings and habitat compensation sites, including crossing IDs, is provided in Table 5. The data in this table reflect those that were presented in detail in previous reports (Knight Piésold 2007b and 2008, Baffinland 2009), as well as the results from the most recent Tote Road surveys that were completed in 2010 (Baffinland 2010), 2011 (Baffinland 2011), 2012 (Baffinland 2012), 2013 (Baffinland 2013), and 2014 (Baffinland 2014).

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TABLE 1- SUMMARY OF CHANGES TO TOTE ROAD CROSSINGS AT FISH-BEARING STREAMS COMPLETED FROM DECEMBER 1, 2014 TO NOVEMBER 30, 2015

Crossing	Koad Chainage (km.m)	Road Chainage Completed Work (km.m)	Current Crossing Configuration	Fisheries Survey
CV-169	5+149	\bullet Existing culvert replaced on same road alignment $~\bullet$ 1 x 0.5m diameter	t •1 x 0.5m diameter	natural habitat exists only downstream of crossing; passage unnecessary
CV-129	16 + 800	 Existing culvert replaced with large diameter culverts on new road alignment 	•2 × 1.2m diameter	 no issues with fish habitat or passage but potential for issues in the future; remove old upstream crossino
CV-099	37+343	 Existing culverts replaced with large diameter culverts on new road alignment 	• 2 x 2m diameter	 no issues with fish habitat or passage
CV-076	52+250	Existing culvert replaced with large diameter culvert 1 x 1.2m diameter on new road alignment	rt 1 x 1.2m diameter	 no issues with fish habitat or passage but potential for issues in the future; remove old downstream crossing
BG-50	62+081	 bridge installed to replace old sea container crossing in 2014 	New bridge & old sea containers (to be removed in 2016)	habitat under bridge ideal for Arctic Char use (cobble/riffle); old sea containers starting to become perched
		 Existing culverts replaced with large diameter culverts on new road alignment in right-hand channel 	• 2 × 1.2m diameter	 culverts are perched, preventing upstream access to fish in the right-hand channel
CV-049	62+540	Existing culverts extended to accommodate the new 2 x 1.2m diameter road alignment	w 2 x 1.2m diameter	Ice blockage present in one culvert at time of survey. The thickness of road provides insulation for ice retention in culverts. Ensure ice blockages are removed.
CV-225	A96+983	 Existing culverts replaced with large diameter culverts on new road alignment 	• 2 x 1.2m diameter	 currently no issues with passage, but potential for perching in the future

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TABLE 2- TECHNICAL SUMMARY OF EXISTING CROSSING STRUCTURES INSTALLED AT FISH-BEARING STREAMS ALONG THE TOTE ROAD.

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	Chainage (km + m)	A5+149	A5+820	A16+800	A16+803	A16+807	A27+193	A27+200	A29+151	A30+947	A30+951	A30+953	A31+489	A32+681	A33+301	A33+307	A35+540	A35+543	A35+544	A35+545	A37+351	A37+343	A45+741	A45+737	A45+752	A50+002	A50+109
	Culvert No.			ω	ပ		∢	æ		<	89	ပ			∢	œ	٧	8	ပ	٥	٧	89	∢	æ	ပ		۷
	Water Crossing	CV169	CV167	CV129		CV128	CV115		CV114	CV112			CV111	CV106	CV104		CV102				CV099		CV087			CV080	CV079

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No. modemod emodementation em						CSP Cul	CSP Culvert Diameters (m) 1	ers (m) 1				
May May	Water Crossing	Culvert No.	Existing Road Chainage (km + m)	Ø = 2.0	Ø=1.2	Ø = 1.0	Ø = 0.5	Ø= 0.25	Ø= 0.15	Ø= 0.10	Fish Habitat Quality Rating ³	Notes 4
B				(m)	(m)	(m)	(E)	(m)	(m)	(m)		
C A50+225		a	A50+066	١.	×			i.			IMP	
D A50+226 IMP C NA NA . <td< td=""><td></td><td>ပ</td><td>A50+225</td><td>•</td><td>,</td><td>•</td><td>×</td><td></td><td></td><td>•</td><td>IMP</td><td></td></td<>		ပ	A50+225	•	,	•	×			•	IMP	
A A50+680 . X . . IMP B NA IMP D NA IMP A A52+536 .		٥	A50+226	,	1	,	×	i	4	ý	IMP	
B NA - X - IMP C NA - - X - - IMP D NA - - - - - - IMP B A624536 - - - - - - IMP B A634379 - - - - - - IMP B A634414 - - - - - - IMP B A634114 - - - - - - IMP A A634114 - - - - - - IMP B A634216 - - - - - - - IMP B A634216 - - - - - - - IMP B A634216 - - -	CV078	∢	A50+680		×		•	ं	i e	ij,	IMP	
C NA X X Y NARB A A524536 X X Y Y Y Y YAB YAB <td></td> <td>60</td> <td>N A</td> <td></td> <td>•</td> <td>×</td> <td></td> <td>ě</td> <td>10</td> <td>e</td> <td>IMP</td> <td>C</td>		60	N A		•	×		ě	10	e	IMP	C
D NA A52+536 .<		ပ	NA	£		×	,	,	e	3.	IMP	
A 52-536 X A 62-536 X A 63-830 X A 63-830 Y A 63-830 Y A 63-830 Y A 63-830 Y <t< td=""><td></td><td>۵</td><td>AN</td><td>•</td><td></td><td>×</td><td></td><td>¥</td><td></td><td>٠</td><td>IMP</td><td></td></t<>		۵	AN	•		×		¥		٠	IMP	
A A53+830 X IMP C A53+345 X - - - IMP B A53+345 - - - - IMP B A54+005 - - - - - IMP A A58+114 - - - - - IMP B A58+217 - - - - - IMP C A59+216 - - - - - IMP C A59+216 - - - - - IMP D A59+216 - - - - - IMP D A59+279 - - - - - - IMP D A59+279 - - - - - - - IMP A A59+279 - - - -	CV076		A52+536	•	×	•	•	37	9	•	MAR	New
B A53+345 . </td <td>CV072</td> <td>∢</td> <td>A53+830</td> <td>•</td> <td>×</td> <td></td> <td>,</td> <td></td> <td></td> <td></td> <td>IMP</td> <td>•</td>	CV072	∢	A53+830	•	×		,				IMP	•
C A53+379 X - </td <td></td> <td>ω</td> <td>A53+345</td> <td>•</td> <td>×</td> <td></td> <td></td> <td></td> <td>•</td> <td>٠</td> <td>IMP</td> <td>ĸ</td>		ω	A53+345	•	×				•	٠	IMP	ĸ
B A54+005 - X - - MAR B A58+114 - - X - - IMP A A58+217 - - X - - IMP B A58+217 - - X - - MAR C A58+217 - - X - - MAR D A58+217 - - X - - MAR D A58+218 - - X - - MAR B A58+779 - - X - - MAR B A58+970 - - X - - MAR B A58+966 - - X - - MAR C A58+967 - - X - - MAR B A58+967 - - X - - MAR C A58+967 - - X<		ပ	A53+379		×		i	ı		1	IMP	
A A58+114 . X . . IMP A A58+217 .	CV071	æ	A54+005	×	ï	×	Y	ï	,	×	MAR	
B A58+114 . </td <td>CV060</td> <td>∢</td> <td>A58+114</td> <td>i e</td> <td>4</td> <td>×</td> <td>•</td> <td></td> <td>•</td> <td>,</td> <td>IMP</td> <td>9</td>	CV060	∢	A58+114	i e	4	×	•		•	,	IMP	9
A A59+217 . </td <td></td> <td>80</td> <td>A58+114</td> <td></td> <td>·</td> <td>×</td> <td>•</td> <td></td> <td></td> <td></td> <td>IMP</td> <td>·</td>		80	A58+114		·	×	•				IMP	·
B A59+216 . </td <td>CV059</td> <td>4</td> <td>A59+217</td> <td>,</td> <td>ì</td> <td>ì</td> <td>×</td> <td>· ·</td> <td>ĸ</td> <td>r.</td> <td>MAR</td> <td></td>	CV059	4	A59+217	,	ì	ì	×	· ·	ĸ	r.	MAR	
C A59+217 . </td <td></td> <td>œ</td> <td>A59+216</td> <td>•</td> <td>•</td> <td></td> <td>×</td> <td></td> <td>٠</td> <td>,</td> <td>MAR</td> <td>,</td>		œ	A59+216	•	•		×		٠	,	MAR	,
D A59+718 . </td <td></td> <td>ပ</td> <td>A59+217</td> <td></td> <td></td> <td></td> <td>×</td> <td>v</td> <td></td> <td>,</td> <td>MAR</td> <td>,</td>		ပ	A59+217				×	v		,	MAR	,
A A59+779 <th< td=""><td></td><td>۵</td><td>A59+218</td><td>•</td><td></td><td>٠</td><td>×</td><td>-</td><td></td><td></td><td>MAR</td><td>9</td></th<>		۵	A59+218	•		٠	×	-			MAR	9
B A59+773 X - - - - MAR A A59+96 - - - - - - - - MAR C A59+967 - - - - - - - MAR A A62+054 - <td< td=""><td>CV058</td><td>∢</td><td>A59+779</td><td></td><td></td><td></td><td>×</td><td>r</td><td></td><td>, c</td><td>MAR</td><td>•</td></td<>	CV058	∢	A59+779				×	r		, c	MAR	•
A A59+970		ω	A59+773		×	٠		r	ĸ	c	MAR	
B A59+966 . </td <td>CV057</td> <td>∢</td> <td>A59+970</td> <td>r</td> <td>٠</td> <td>٠</td> <td>×</td> <td>ī</td> <td></td> <td>٠</td> <td>MAR</td> <td>,</td>	CV057	∢	A59+970	r	٠	٠	×	ī		٠	MAR	,
C A59+967 - X - MAR A A62+054 - MAR B A62+081 - X - MAR C A62+081 X - MAR A A62+550 - X - MAR MR MR MR		60	A59+966	æ	•	•	×	ā	4	,	MAR	•
A A62+054 IMP IMP IMP IMP IMP IMP IMP IMP IMP IMP IMP IMP IMP IMP IMP IMP IMP IMP IMP		ပ	A59+967	2	्र	,	×	ñ		Э	MAR	
B A62+081 . X IMP C A62+081 X IMP A A62+550 . X IMP B A62+536 . X IMP	BG50	∢	A62+054	S				ï	e	10	IMP	bridge
C A62+681 X IMP IMP A62+550 X IMP IMP B A62+536 X IMP		ω	A62+081	,	×		•	ï	÷	*	IMP	New
A A62+550 - X IMP B A62+536 - X IMP		ပ	A62+081		×						IMP	New
A62+536 X IMP	CV049	∢	A62+550	2	×	•	•	v	i)	ı	IMP	New
		മ	A62+536		×						IMP	New

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Water Crossing					CSP Cul	CSP Culvert Diameters (m) 1	ers (m) 1				
	Culvert No.	Chainage (km + m)	Ø=2.0	Ø = 1.2	Ø = 1.0	Ø = 0.5	Ø = 0.25	Ø= 0.15	0.10	Fish Habitat Quality Rating ³	Notes 4
		ì	(E)	Œ	Œ	Œ	Ξ	(E)	(<u>m</u>		
CV030	∢	A77+495		×						MAR	
	ш	A77+435	•			×			•	MAR	,
BG32	∢	A78+123		×			•		•	IMP	•
	œ	A78+120		×		•		,		IMP	
CV217	∢	79+854	×	c	,	,		,	•	IMP	1
	ω	80+000		£	6	•	ı	,	ı	IMP	bridge
CV216	∢	A80+951		×	•			,		MAR	•
	æ	A80+580	•	×	,	,	3	•	1	MAR	1
	ပ	A80+582	•	×	,				•	MAR	ı
BG30		A84+636	•		×			•	•	IMP	ı
BG29		A84+706		•	×	•	•		,	IMP	٠
BG27		A86+499	,		*	×	,		ŧ	MAR	•
BG24	∢	A87+588	•	×	1	•	1		•	IMP	•
	₩.	A87+610	•	×	•			•		IMP	•
	ပ	A87+612	e	×			,			IMP	
BG17	∢	A90+016		×	•	•	,			IMP	ı
	Φ	A90+019		×		,	•			IMP	•
BG04	∢	A93+992		×						IMP	•
	80	A93+993	•	×	•	•	•	•		IMP	•
	ပ	A93+996	×							iMP	
CV001	∢	A94+606		15		×				IMP	•
	∞	A94+351	•		×		•		,	IMP	•
	ပ	A94+353				×	•	,	,	IMP	•
CV223	∢	A97+007			•	,	•	•	•	IMP	bridge
	c a	A97+050	×					,		IMP	
	O	A97+052	•	×	•	•	,	•	•	IMP	•
	٥	A97+082	,	×	•	•	,			IMP	•
	Ш	A97+084		×	1		,			IMP	

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	Notes 4				New	New		,			,	
	Fish Habitat Quality Rating 3		IMP	IMP	IMP	IMP	IMP	IMP	IMP	IMP	MAR	MAR
	Ø= 0.10	<u>m</u>	e		2	¢	,				K	,c
	Ø= 0.15	Œ		,	ĵ.	ı	×	,				
ırs (m) 1	0.25	Œ			5	ī	r		,	,		
CSP Culvert Diameters (m)	Ø = 0.5	(E)		•	•		,	,	×		×	•
CSP Culv	Ø = 1.0	Œ	×	×	,	•		•		×	,	×
	Ø = 1.2	Œ			×	×	×	×			•	
	Ø = 2.0	Œ		,		ď		,	21			,
Evieting Boad	Chainage (km + m)	•	A97+576	A97+578	A98+845	A98+804	A99+483	A99+483	N A	A102+812	A102+856	NA
	Culvert No.		∢	6 0	∢	ω	∢	œ	ပ	∢	∢	6 0
	Water Crossing		CV224		CV225		BG01			CV186	CV187	

1 - CSP = Corrugated steel pipe; Ø = culvert diameter
2 - Final length and survey culvert installation data to be provided in issued for construction drawings
3 - MAR = marginal, IMP = important
4 - New = culvert installed or worked on in 2015 along realigned section of the road

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TABLE 3-CONSTRUCTION AND TURBIDITY MONITORING FOR 2015 AT FISH BEARING CROSSINGS.

Culvert ID	Sample Date	Crossing Location	Distance from Crossing (m)	Turbidity (NTU)	Average Wetted Channel Width (m)	Depth (m)	Approximate Surface Velocity (m/s)
		Upstream	99	13.3			
CV225	15-06-07	Crossing	0	12.8	က	0.15	0.325
-		Downstream	75	9.3			
		Upstream	100	8.5			
CV223	15-06-07	Crossing	25	46.8	30	0.3	0
		Downstream		•			
		Upstream	50	7.4			
BG04	15-06-07	Crossing	2	6.0	Ŋ	0.3	-
		Downstream	50	3.0			
		Upstream	90	12.0			
BG17	15-06-07	Crossing	2	19.5	80	0.5	0.2
		Downstream	90	14.0			
		Upstream	75	18.2			
BG29	15-06-07	Crossing	2	25.0	ເລ	0.2	0
		Downstream	75	18.4			
		Upstream	09	27.0			3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
CV217	15-06-07	Crossing	೮	38.5	æ	0.15	0
		Downstream	09	11.2			
•		Upstream	75	5.8			•
BG32	15-06-07	Crossing	2	4.4	1.5	0.2	0.7
		Downstream	75	4.9			

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\Box																					
Velocity (m/s)		0.5			0.2			0.5			0.25			1			0.5			0.32	
Depth (m)		0.2			0.5			0.4			0.1			,			0.15			0.25	
Average Wetted Channel Width (m)		S			ဗ			2.5			2			,			က			30	
Turbidity (NTU)	6.0	7.3	4.6	1.2	1.2		6.1	4.4	4.8	9.1	13.0	18.0	Iced over	Iced over	Iced over	28.8	20.0	22.3	62.3	•	•
Distance from Crossing (m)	75	0	75	15	0	75	100			0 0 100				50		50	50				
Crossing Location	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream									
Sample Date		15-06-07			15-06-08			15-06-08			15-06-08			15-06-08			15-06-08			15-06-08	
Culvert ID		CV049			CV078			CV099			CV111		BG50			CV225			CV223		

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I																					
Approximate Surface Velocity (m/s)		0.56			0.35			0.85			0			0.54			0.19			0.57	
Depth (m)		0.3			0.5			-			0.15			0.2	-		0.5			0.4	
Average Wetted Channel Width (m)		ເວ			æ			1.5			8			1.5			က			2.5	
Turbidity (NTU)	37.4	22.2	18.7	22.2	50.1	23.7	28.7	28.9	31.1	21.1	0.09	15.3	6.5	6.0	11.1	2.7	3.1	5.7	2.7	4.9	4.7
Distance from Crossing (m)	20	0	20	20	0	09	0 02			50 2 100		60		70	0	70	70	0	50		
Crossing Location	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream
Sample Date		15-06-08			15-06-08			15-06-08			15-06-08		15-06-09			15-06-09				15-06-09	
Culvert ID		BG04			BG17			BG29	_		CV217		BG32			CV078			CV099		

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				_						_			_			_			_		_
Approximate Surface Velocity {m/s}		0.49			1,45			1.6			0.3			1.52			0.18			90.0	
Depth (m)		0.1			0.3			0.15			2.0			0.3			0,5			0.2	
Average Wetted Channel Width (m)		2			10		8			е				4			89			က	
Turbidity (NTU)	8.7	20.1	18.9	2.0	3.2	3.0	4.6			8,0	11.0	•	3.2 4.1 2.6			24.8			3.5		1.3
Distance from Crossing (m)	20	0	75	100	0	100	60 0 75			100			60 0			0 020			70	0	100
Crossing Location	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream									
Sample Date		15-06-09		15-06-09			15-06-09			15-06-09				15-06-09			15-06-09				
Culvert ID	CV112				CV049		CV225			CV223				BG04			BG17				

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Approximate Surface Velocity (m/s)		0.61			0			2			0.47			0.25			0.48			1.42	
Depth (m)		9.0			0.15		-	0.3			0.4			0.07			0.1			0.1	
Average Wetted Channel Width (m)		-		:	o		10				2.5			2			2			9	
Turbidity (NTU)	13.4	0.0	14.6	18.2	34.0	30.5	1.2	3.6	0.0	6.1	2.6	4.4	6.9	3.0	6.5	3.2	7.4	5.4	4.0	3.7	4.3
Distance from Crossing (m)	20	0	70	75	0	70	75	0	75	70	0	75	09	0	75	75	0	75	09	0	100
Crossing Location	Upstream	Crossing	Downstream																		
Sample Date		15-06-09					15-06-09			15-06-10			15-06-10				15-06-10				
Culvert ID	BG29				CV217		CV049			CV099				CV111	_	-	CV112		CV225		

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11———				_	_		_	_	_		_		_	_		_					
Approximate Surface Velocity (m/s)		0			0.97			0.33			0.79			0.04			0			1.15	
Depth (m)		0.3			0.15			9.0			•			0.4			0.15			0.2	
Average Wetted Channel Width (m)		30			ო			1.5						4			6			6	
Turbidity (NTU)	3.4			3.6	1.6	2.6	11.1	15.6	12.0	22.3	18.0	14.0	1.0			11.2	43.5	29.6	0.9		
Distance from Crossing (m)		0	02	0 08			0 02			09			06	0	09	75	0	20	75		75
Crossing Location	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream
Sample Date	15-06-10			15-06-10			15-06-10			15-06-10			15-06-10				15-06-10				
Culvert ID	CV223 15-06-10			BG04 15-			BG17			BG29				CV078			CV217				

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Approximate Surface Velocity (m/s)		1.3			0.2			0.33			•			0.01			0.4			6.0		c	8.0	
Depth (m)		0.3			9'0			9.0			1			0.25			0.3			-		-	0.2	
Average Wetted Channel Width (m)	2				-			1.5			•		2.5			. D				15		c	7	
Turbidity (NTU)				11	12.1	15.4	19.8	32.7	21.9	10.9	53.9	33.8	18.7 32.3 32.2			4.7			0.1			4.2		
Distance from Crossing (m)				60 11 0 12.1 75 15.4			50 0		100		100		70	0	80	100		100	70	٥				
Crossing Location	Upstream 100 Crossing 0 Downstream 100			Upstream Crossing Downstream			Upstream Crossing Downstream			Upstream Crossing Downstream			Upstream Crossing Downstream			Upstream Crossing Downstream			Upstream	Crossing	Downstream	Upstream		
Sample Date	15-06-12			15-06-12			15-06-13			15-06-13			15-06-14			15-07-03			15-07-03			15-07-03		
Culvert ID	BG24 15-06-12				BG29		BG17 1			CV046			CV223			CV225				CV223		8G17		

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Approximate Surface Velocity (m/s)			0.09			0.2			0.4			0.45			1.5			0.25			ı	
Depth (m)			,			2			0.3			90'0			0.1			0.1			1	
Average Wetted Channel Width (m)			-			100		1			ເດ				9			2			٠	
Turbidity (NTU)	6,5	8.1	15.8	34.4	1,1	0.0	0.1	0.1	28.8	15.5	1.1	13.5	0.5	0.0		13.0			iced over iced over iced over		iced over	
Distance from Crossing (m)	70	60	0	100	70	0	90	70	0	70	70	0	100	100	0	100	70	0	100	-	•	1
Crossing Location	Downstream	Upstream	Crossing	Downstream	Upstream	Crossing	Downstream	Upstream Crossing Downstream			Upstream Crossing Downstream		Upstream Crossing Downstream		Upstream Crossing Downstream			Upstream		Downstream		
Sample Date			15-07-03			15-07-03		15-07-03			15-07-03			15-07-03			15-07-03			15-07-03		
Culvert ID			BG29	CV217					CV046			CV049			CV099			CV111		BG50		

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TABLE 4- SUMMARY OF FISH HABITAT STATUS AT EXISTING FISH-BEARING STREAMS ALONG THE TOTE ROAD IN 2015

Recommendations	None	None	Remove culvert on old road or ensure steaming for passage	None	None	None	Careful and regular monitoring at this crossing. If passage conditions worsen, mitigation may be required.
Detailed Observations	No natural upstream habitat (low water, steep gradient), so passage is unnecessary.	Stream is connected to CV169 stream. One fish (juvenile ARCH) observed about 200 m downstream. Habitat near crossing is low quality and there is no natural upstream habitat, so passage is unnecessary.	Fish observed upstream and downstream. No issues with passage or habitat.	Fish observed upstream and downstream. No issues with passage or habitat.	Stream dry or nearly dry at time of visit. No fish observed. Culverts should not affect passage during high water periods, when fish have access to the crossing.	Stream dry or nearly dry at time of visit. No fish observed. Culverts should not affect passage during high water periods, when fish have access to the crossing.	Fish observed upstream and downstream. Right-hand culvert (looking upstream) currently has a 5 cm perch; however, right channel was nearly dry and not being used. May be some passage issues in the right-hand channel during spring if perch becomes greater.
Potential Fish Passage/Habitat Issues	z	z	z	z	z	z	>
Fish Observed during 2015 Survey	z	> -	>	>	Z	z	>
New or Replaced Culverts ²	>	z	>	Bridge Only	z	z	z
Fish Habitat Quality Rating 1	MAR	MAR	IMP	IMP	MAR	MAR	dWI
Water Crossing No.	CV169	CV167	CV129	CV128	CV115	CV114	CV112

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Water Crossing No.	Fish Habitat Quality Rating ¹	New or Replaced Culverts ²	Fish Observed during 2015 Survey	Potential Fish Passage/Habitat Issues	Detailed Observations	Recommendations
CV111	IMP	z	>	>	Fish observed upstream and downstream. A large boulder is currently partially obstructing passage and causing a slight perch.	Removal of obstructing boulder will alleviate passage issues.
CV106	MAR	Z	z	z	Stream dry or nearly dry at time of visit. No fish observed. Culverts should not affect passage during high water periods, when fish have access to the crossing.	None
CV104	MAR	Z	>	>	Fish observed upstream and downstream. Though fish passage was observed, the upstream end of the culvert is damaged and a little steep, which may limit passage success.	Repair culvert prior to fish use of the stream in spring 2016.
CV102	М	z	>-	>	Fish observed upstream and downstream. However, periods of low water (such as those observed in 2015) will strand some fish in upstream pools that are off the main channel and these may require fish salvage operations before freeze-up.	Conduct fish salvage at the end of each year, as necessary.
660AO	MP	>	>	z	Fish observed upstream and downstream. No issues with passage or habitat.	None
CV087	MAR	z	Z	z	Stream dry or nearly dry at time of visit. No fish observed. Culverts should not affect passage during high water periods, when fish have access to the crossing.	None
CV080	IMP	z	>	Z	Fish observed upstream and downstream. No issues with passage or habitat.	None
CV079	IMP	z	>	>	Fish observed upstream and downstream. No issues with passage, but isolated pool downstream of right-hand culvert had stranded some ARCH in 2015.	Conduct fish salvage at the end of each year, as necessary, or prevent isolated pool from forming.

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Recommendations	None	Monitor for connectivity prior to freeze-up.	Remove old culvert crossing as soon as possible as it may start to obstruct movements as the old road erodes.	None	None	None	None	None	Remove old sea containers as soon as possible and restore habitat. Culverts in the right-hand channel should be re-installed or properly embedded.
Detailed Observations	Fish observed upstream and downstream. No issues with passage or habitat.	Fish observed upstream in large pond. Crossing stream was dry, so no access during survey. No issues with passage, but fish in upstream pond may be stranded for the winter due to dry year. Overwintering capacity of upstream pond unknown, but it likely freezes to the bottom.	Fish observed upstream and downstream. No issues with passage or habitat. Old crossing culverts downstream were still in place during August survey.	Fish observed upstream and downstream. No issues with passage or habitat.	Fish observed upstream and downstream. No issues with passage or habitat.	Fish observed upstream and downstream. No issues with passage or habitat.	Fish observed upstream and downstream, No issues with passage or habitat.	Fish observed upstream and downstream. No issues with passage or habitat.	Fish observed upstream and downstream, Culverts in right-hand channel are impassable due to perch. Old sea container crossing is becoming perched, limiting passage to larger juveniles in the left-hand channel.
Potential Fish Passage/Habitat Issues	z	z	>	z	z	z	z	Z	>
G G									
Fish Observed during 2015 Survey	>	>	>	>	>	>	>	>	>
New or Replaced Culverts 2	z	z	Z	z	z	z	z	z	>
Fish Habitat Quality Rating 1	IMP	MAR	ΜΡ	MAR	₽	MAR	MAR	MAR	<u>M</u>
Water Crossing No.	CV078	CV076	CV072	CV071	CV060	CV059	CV058	CV057	BG50

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Recommendations	The road is thick above this crossing, providing insulation to the culvert; ensure, every year, that all ice has been removed.	None	None	None	None	Fish ladder functioning, but will need regular monitoring.	None	None	None	None
Detailed Observations	Fish observed downstream only. Left-hand culvert was still blocked by ice at time of survey, obstructing access to upstream habitat. Culvert itself should be fine for passage.	Stream dry or nearly dry at time of visit. No fish observed. Culverts should not affect passage during high water periods, when fish have access to the crossing.	Fish observed upstream and downstream. No issues with passage or habitat.	Fish observed upstream and downstream. No issues with passage or habitat, though old sea containers should be removed at the earliest convenience.	Fish observed upstream and downstream. No issues with passage or habitat.	Fish observed upstream and downstream. Passage is confirmed, but the fish ladder will need to be monitored annually for any changes.	Fish observed upstream and downstream. No issues with passage or habitat.	Fish observed downstream only. Very low water levels are likely limiting fish use of entire stream at time of survey. Should be no issues at normal water levels.	Fish observed upstream and downstream. No issues with passage or habitat.	Fish observed upstream and downstream. No issues with passage or habitat.
Potential Fish Passage/Habitat Issues	>-	z	z	Z	Z	z	z	Z	Z	z
Fish Observed during 2015 Survey	>	z	>	>	>	>	>	>	>	>-
New or Replaced Culverts ²	z	z	z	>	z	z	z	z	z	z
Fish Habitat Quality Rating 1	AM!	MAR	IMP	₩	MAR	IMP	IMP	MAR	IMP	JWP
Water Crossing No.	CV049	CV030	BG32	CV217	CV216	BG30	BG29	BG27	BG24	BG17

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Recommendations	None	None	None	Closely monitor culvert for any worsening of the perch. May need to properly reinstall or mitigate with a fish ladder if perch increases.	Closely monitor new culverts for perching issues.	This crossing needs one or two properly embedded, larger culverts to replace the existing ones. Continue to closely monitor for change.	Diligent dust control in the vicinity of this crossing and higher, rip-rapped road embankments may alleviate much of the deposition. Closely monitor.
Detailed Observations	Fish observed upstream and downstream. No Issues with passage or habitat.	Fish observed upstream and downstream. No issues with passage or habilat.	Fish observed upstream and downstream. No issues with passage or habitat.	Fish observed upstream and downstream. Culvert has become slightly perched (< $5\mathrm{cm}$), which is not currently a problem.	Fish observed upstream and downstream. New culvert installation is currently okay, but there is potential for passage obstruction. Old culverts downstream were still in place and are becoming increasingly perched, which may block passage as early as spring 2016 if not removed.	Fish observed upstream and downstream. Culvert remains perched, making passage during periods of high velocity or low water difficult, particularly for smaller juveniles. Rocky ramp remains intact, but any change will likely prevent all passage.	Fish observed downstream only. Though there are no issues with passage through the culvert, there is a layer of road sediment affecting the substrate within 50 m of the crossing upstream and downstream - this sedimentation may be affecting lish use of this stream during the late summer feeding period.
Potential Fish Passage/Habitat Issues	z	z	Z	>	>	>	>
Fish Observed during 2015 Survey	>	>	>	>	>	>	>
New or Replaced Culverts ²	z	>	z	z	>-	z	z
Fish Habitat Quality Rating 1	IMP	IMP	IMP	ШМР	MP	<u>M</u>	<u>M</u>
Water Crossing No.	BG04	CV001	CV223	CV224	CV225	BG01	CV186

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Recommendations	Similar recommendations to CV-186				
Detailed Observations	Though there are no issues with passage through the culvert, there is an obvious layer of road sediment affecting the substrate within 50 m of the crossing upstream and downstream - this sedimentation may be affecting fish use of this important stream during the late summer feeding period.				
Potential Fish Passage/Habitat Issues	F = 0 00 0 0 0				
Fish Observed during 2015 Survey	z				
New or Replaced Culverts 2	z				
Fish Habitat Quality Rating 1	MAR				
Water Crossing No.	CV187				

^{1 -} Habitat status assessed for current crossings prior to pending upgrades; NFB = not fish-bearing, MARG = marginal, IMP = important 2 - Fish habitat status assessed for new crossings following road upgrades; NC = no change

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TABLE 5- INSTALLATION SUMMARY OF HADD AND HABITAT COMPENSATION SITES ALONG THE TOTE ROAD

Additional Monitoring Required	None	5 Routine Only	I, Routine Only	5 Routine Only	Routine and confirm fish passage following removal of obstructing boulder	Routine and monitor fish use of habitat following repairs to culvert	Routine and confirm changes completed in 2015 remain intact in 2016	Routine and conduct fish salvage, as necessary, in isolated side channel pools	5 Routine Only	Routine and monitor fish use following removal of old downstream culvert crossing	S Routine Only
Years Monitored	2009-2010	2008-2012, 2015	2009-2010, 2014, 2015	2009-2012, 2015	2009-2010, 2015	2009-2010, 2015	2008-2010, 2015	2008-2010, 2015	2008-2012, 2015	2009-2010, 2015	2009-2010, 2015
Additional Work Completion Date ³	N/A N/A	Jufy 2011 Winter 2014/15	Winter 2013/14	July 2011	N/A	N/A	Winter 2014/15	N/A	N/A	N/A	N/A
Initial Work Completion Date ²	Oct-08 24-Jul-09	17-Sep-07	23-Sep-07	29-Sep-07	28-Sep-07	01-Oct-07	04-Oct-07	80-Jul-80	80-Jul-60	05-Mar-08	27-Feb-08
Authorization (HADD or Compensation)¹	Compensation Compensation	HADD	HADD	HADD	HADD	HADD	НАВВ	HADD	HADD	НАВВ	HADD
Crossing Size Classification	Extra-large Medium	Large	Extra-large	Medium	Medium	Medium	Large	Large	Large	Large	Medium
Road Chainage (km + m)	0+145 0+583	15+650	17+486	29+647	31+990	33+794	37+840	20+600	51+171	53+878	58+856
Crossing ID	CV-183 CV-181	CV-129	CV-128	CV-114	CV-111	CV-104	CV-099	CV-079	CV-078	CV-072	CV-060

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BG-50 62+604 Extra-large HADD 30-Oct-07 Winter 2013/14 winter 2013/14 bit 2008-2010, 2014 removal of old sea conclusions and constitutes and conclusions and concl	Crossing ID	Road Chainage (km + m)	Crossing Size Classification	Authorization (HADD or Compensation)¹	Initial Work Completion Date ²	Additional Work Completion Date ³	Years Monitored	Additional Monitoring Required
63+302 Large HADD 10-Mar-08 NIA 2009-2010, 2015 78+161 Large HADD 04-Apr-08 August 2012 2009-2010, 2015 79+915 Extra-large HADD 17-Apr-08 Winter 2013/14 bring 2014, 15 2009-2010, 2015 80+646 Large HADD 08-Jun-08 NIA 2009-2010, 2015 87+710 Medium HADD 15-May-08 NIA 2009-2010, 2015 90+167 Large HADD 06-May-08 NIA 2009-2010, 2015 90+167 Large HADD 06-May-08 NIA 2009-2010, 2015 90+167 Large HADD 06-May-08 NIA 2009-2010, 2015 94+148 Medium HADD 06-May-08 Winter 2014/15 2009-2010, 2015 94+728 Small Compensation 06-May-08 Winter 2014/15 2009-2010, 2015 97+758 Medium HADD 03-May-08 Winter 2014/15 2009-2010, 2015 98+989 Large HADD 21-Sep-07 </td <td>BG-50</td> <td>62+804</td> <td>Extra-large</td> <td>HADD</td> <td>30-Oct-07</td> <td>Winter 2013/14 Winter 2014/15</td> <td>2008-2010, 2014, 2015</td> <td>Significant monitoring post- removal of old sea containers and reinstallation of currently perched culverts</td>	BG-50	62+804	Extra-large	HADD	30-Oct-07	Winter 2013/14 Winter 2014/15	2008-2010, 2014, 2015	Significant monitoring post- removal of old sea containers and reinstallation of currently perched culverts
78+161 Large HADD 04-Apr-08 August 2012 2009-2010, 2014, 2015 79+915 Extra-large HADD 17-Apr-08 Winner 2014/15 2009-2010, 2014, 2015 80+646 Large HADD 08-Jun-08 N/A 2009-2010, 2014, 2015 84+636 Small Compensation 2012 August 2012 2010-2013, 2015 90+167 Large HADD 09-May-08 N/A 2008-2010, 2015 90+167 Large HADD 05-May-08 N/A 2009-2010, 2015 90+218 Extra-small Compensation 06-May-08 N/A 2009-2010, 2015 94+148 Medium HADD 05-May-08 Winter 2014/15 2009-2010, 2015 97+758 Extra-large HADD 03-May-08 Winter 2014/15 2008-2010, 2015 98+898 Large HADD 21-Sep-07 Winter 2014/15 2008-2011, 2015 99+672 Medium HADD 20-Sep-07 August 2010 2008-2011, 2015	CV-049	63+302	Large	HADD	10-Mar-08	ΝΆ	2009-2010, 2015	Routine Only
79+915 Extra-large HADD 17-Apr-08 Winter 2014/15 winter 2013/14 2009-2010, 2014 2015 80+646 Large HADD 08-Jun-08 N/A 2009-2010, 2015 84+636 Small Compensation 15-May-08 N/A 2009-2010, 2015 90+167 Large HADD 09-May-08 N/A 2009-2010, 2015 90+167 Large HADD 05-May-08 N/A 2009-2010, 2015 90+167 Extra-small Compensation 06-May-08 N/A 2009-2010, 2015 94+148 Medium HADD 05-May-08 Winter 2014/15 2009-2010, 2015 97+156 Extra-large HADD 03-May-08 Winter 2014/15 2009-2010, 2015 98+989 Large HADD 21-Sep-07 Winter 2014/15 2008-2011, 2015 99+672 Medium HADD 21-Sep-07 Winter 2014/15 2008-2011, 2015	BG-32	78+161	Large	HADD	04-Apr-08	August 2012	2009-2010, 2015	Routine Only
84 + 636 Large HADD 08-Jun-08 NI/A 2009-2010, 2015 84 + 636 Small Compensation 2012 August 2012 2010-2013, 2015 87 + 710 Medium HADD 15-May-08 NI/A 2008-2010, 2015 90 + 167 Large HADD 09-May-08 NI/A 2009-2010, 2015 90 + 178 Medium HADD 05-May-08 Winter 2014/15 2009-2010, 2015 97 + 758 Small Compensation 06-May-08 Winter 2014/15 2008-2010, 2015 97 + 758 Medium HADD 03-May-08 Winter 2014/15 2008-2010, 2015 98 + 989 Large HADD 21-Sep-07 Winter 2014/15 2008-2011, 2015 99 + 672 Medium HADD 21-Sep-07 Winter 2014/15 2008-2011, 2015	CV-217	79+915	Extra-large	HADD	17-Apr-08	Winter 2013/14 Winter 2014/15	2009-2010, 2014, 2015	Routine Only
84+636 Small Compensation 2012 August 2012 2010-2013, 2015 87+710 Medium HADD 15-May-08 N/A 2008-2010, 2015 90+167 Large HADD 09-May-08 N/A 2008-2010, 2015 90+218 Extra-small Compensation 0ct-08 N/A 2009-2010, 2015 94+148 Medium HADD 05-May-08 Winter 2014/15 2009-2010, 2015 97+155 Extra-large HADD 03-May-08 Winter 2013/14 2008-2010, 2015 97+156 Medium HADD 04-May-08 Winter 2013/14 2008-2010, 2015 98+989 Large HADD 21-Sep-07 Winter 2014/15 2008-2011, 2015 99+672 Medium HADD 20-Sep-07 August 2010 2008-2011, 2015	CV-216	80+646	Large	HADD	08-Jun-08	N/A	2009-2010, 2015	Routine Only
87+710 Medium HADD 15-May-08 N/A 2008-2010, 2015 90+167 Large HADD 09-May-08 N/A 2009-2010, 2015 90+218 Extra-small Compensation Oct-08 N/A 2009-2010, 2015 94+728 Small Compensation 08-May-08 Winter 2014/15 2009-2010, 2015 97+758 Medium HADD 03-May-08 Winter 2013/14 2008-2010, 2014 98+989 Large HADD 21-Sep-07 Winter 2014/15 2008-2011, 2015 99+672 Medium HADD 20-Sep-07 August 2010 2008-2011, 2015	BG-30	84 + 636	Small	Compensation	2012	August 2012	2010-2013, 2015	Routine monitoring and maintenance of constructed fishway
90+167 Large HADD 09-May-08 N/A 2009-2010, 2015 90+218 Extra-small Compensation Oct-08 N/A 2009 94+148 Medium HADD 05-May-08 August 2012 2009-2010, 2015 94+728 Small Compensation 08-May-08 Viniter 2014/15 2009-2010, 2015 97+155 Extra-large HADD 03-May-08 Viniter 2013/14 2008-2010, 2015 97+758 Medium HADD 21-Sep-07 Viniter 2014/15 2008-2011, 2015 98+989 Large HADD 21-Sep-07 Viniter 2014/15 2008-2011, 2015 99+672 Medium HADD 20-Sep-07 August 2010 2008-2011, 2015	BG-24	87+710	Medium	HADD	15-May-08	N/A	2008-2010, 2015	Routine Only
90+218 Extra-small Compensation Oct-08 N/A 2009 94+148 Medium HADD 05-May-08 August 2012 2009-2010, 2015 94+728 Small Compensation 08-May-08 Winter 2014/15 2009-2010, 2015 97+155 Extra-large HADD 03-May-08 Winter 2013/14 2008-2010, 2014, 2015 97+758 Medium HADD 21-Sep-07 August 2010 2008-2011, 2015 98+989 Large HADD 21-Sep-07 Winter 2014/15 2008-2011, 2015 99+672 Medium HADD 20-Sep-07 August 2010 2008-2011, 2015	BG-17	90+167	Large	HADD	09-May-08	N/A	2009-2010, 2015	Routine Only
94+148 Medium HADD 05-May-08 August 2012 2009-2010, 2015 94+728 Smalf Compensation 08-May-08 Winter 2014/15 2009-2010, 2015 97+155 Extra-large HADD 03-May-08 Winter 2013/14 2008-2010, 2014, 2015 97+758 Medium HADD 21-Sep-07 August 2010, Winter 2014/15 2008-2011, 2015 98+989 Large HADD 20-Sep-07 Viniter 2014/15 2008-2011, 2015 99+672 Medium HADD 20-Sep-07 August 2010 2008-2011, 2015	BG-16	90+218	Extra-small	Compensation	Oct-08	N/A	2009	Routine Only
94+728 Small Compensation 08-May-08 Winter 2014/15 2009-2010, 2015, 2014, 2015 97+155 Extra-large HADD 03-May-08 Winter 2013/14 2008-2010, 2014, 2015, 2015 97+758 Medium HADD 21-Sep-07 August 2010, Winter 2014/15 2008-2011, 2015 98+989 Large HADD 20-Sep-07 August 2010 2008-2011, 2015 99+672 Medium HADD 20-Sep-07 August 2010 2008-2011, 2015	BG-04	94+148	Medium	НАББ	05-May-08	August 2012	2009-2010, 2015	Routine Only
97+155 Extra-large HADD 03-May-08 Winter 2013/14 2008-2010, 2014, 2015 97+758 Medium HADD 04-May-08 N/A 2008-2010, 2015 98+989 Large HADD 21-Sep-07 Winter 2014/15 2008-2011, 2015 99+672 Medium HADD 20-Sep-07 August 2010 2008-2011, 2015	CV-001	94+728	Small	Compensation	08-May-08	Winter 2014/15	2009-2010, 2015	Routine Only
97+758 Medium HADD 04-May-08 N/A 2008-2010, 2015 98+989 Large HADD 21-Sep-07 Winter 2014/15 2008-2011, 2015 99+672 Medium HADD 20-Sep-07 August 2010 2008-2011, 2015	CV-223	97+155	Extra-large	HADD	03-May-08	Winter 2013/14	2008-2010, 2014, 2015	Routine Only
98+989 Large HADD 21-Sep-07 August 2010 2008-2011, 2015 99+672 Medium HADD 20-Sep-07 August 2010 2008-2011, 2015	CV-224	97+758	Medium	HADD	04-May-08	N/A	2008-2010, 2015	Routine Only
99+672 Medium HADD 20-Sep-07 August 2010 2008-2011, 2015	CV-225	686+86	Large	HADD	21-Sep-07	August 2010 Winter 2014/15	2008-2011, 2015	Monitoring post-removal of old culvert crossing
	BG-01	99+672	Medium	HADD	20-Sep-07	August 2010	2008-2011, 2015	Monitor closely for increasing obstruction of passage

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Additional Monitoring Required	Monitor for the effects of road dust on stream habitat
Years Monitored	2008-2010, 2015
Additional Work Completion Date ³	N/A
Initial Work Completion Date ²	14-Jun-08
Authorization (HADD or Compensation)¹	Compensation
Crossing Size Classification	Small
Road Chainage (km + m)	103+078
Crossing ID	CV-187

^{1 -} Includes only current HADD and compensation sites and not those eliminated from calculations following 2010 surveys
2 - Includes work outlined during the initial planning and construction phase
3 - Includes repair work, installation of fish access improvement structures, and ERP upgrades



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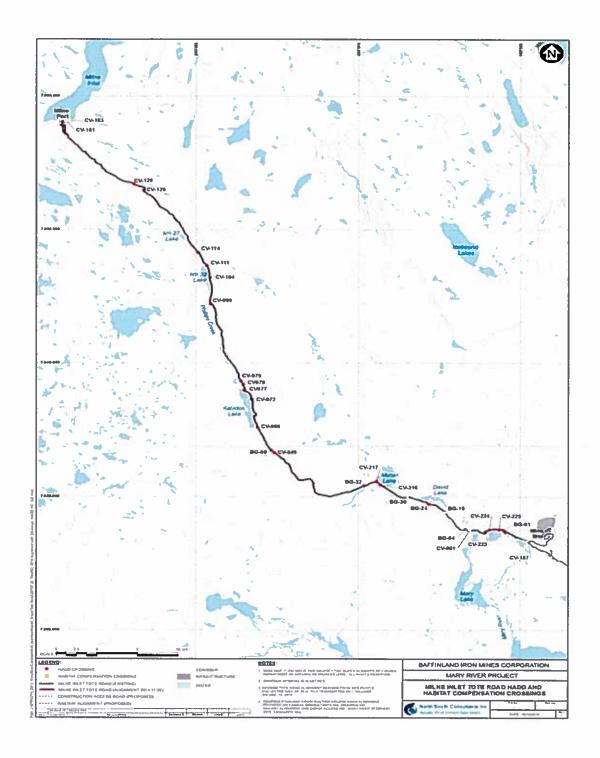
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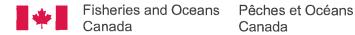
FIGURE 1- MAP OF THE HADD AND COMPENSATION CROSSINGS ALONG THE TOTE ROAD, SHOWING BOTH THE OLD AND NEW ALIGNMENTS.





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Appendix A- Applicable DFO Letter of Advice



Canada

301-5204 50th Avenue Yellowknife, NT X1A 1E2

September 20, 2013

our file Votre référence

Our file Notre référence 07-HCAA-CA7-00050

Oliver Curran Baffinland Iron Mines Corporation 2275 Upper Middle Road East, Suite 300 Oakville, ON L6H 0C3

Dear Mr. Curran:

Subject: Proposal not likely to result in impacts to fish and fish habitat.

Fisheries and Oceans Canada – Fisheries Protection Program (DFO) received your proposal on August 29, 2013. Please refer to the file number and title below:

DFO File No.: 07-HCAA-CA7-00050

Title: Mary River Iron Ore Project, Baffin Island (Baffinland), Nunavut

You may be aware of changes to the *Fisheries Act*, however these have not affected the review of your project at this time. For more information on current changes to the Fisheries Act please refer to the DFO website at www.dfo-mpo.gc.ca/media/infocusalaune/2012/habitat-eng.htm.

Your proposal has been reviewed to determine whether it is likely to result in impacts to fish and fish habitat which are prohibited by the habitat protection provisions of the Fisheries Act or those prohibitions of the Species at Risk Act that apply to aquatic species.*

Our review consisted of:

Changes to Culverts along the Tote Road, Submission dated August 29, 2013 from Oliver Curran - Baffinland Iron Mines Corporation

Freshwater Aquatic Baseline Synthesis Report 2005-2011 (January 2012), Baffinland Iron Mines Corporation, Mary River Project, Prepared by North/South Consultants Inc.

^{*}Those sections most relevant to the review of development proposals include 20, 22, 32 and 35 of the Fisheries Act and sections 32, 33 and 58 of the Species at Risk Act. For more information please visit www.dfo-mpo.gc.ca.



We understand that you propose to carry out the following culvert upgrades along the Tote Road:

Culvert ID	Proposed Culvert Diameter (m)	Proposed Culvert Length (m)	Area of Rip Rap (m2)	Proposed Culvert Upgrate
BG31A	1.2	19.5	24.96	Extend 1m left & 2.5m right
BG30	1	22	17.33	Extend 7m right
BG29	1	31	0	Extend 7.5m left & 8.5m right
BG27B	0.5	31	4.33	Extend 5m left & 8m right
BG27C	0.5	31	0	Extend 5m left & 8m right
BG27A	0.5	31	0	Extend 4.5m left & 8.5m right
BG17A	1.2	36.5	24.96	Extend 8m left & 13.5m right
BG17B	1.2	37.5	24.96	Extend 15.5m left & 7m right
BG04A	1.2	24	0	Extend 5.5m left & 3.5m right
BG04B	1.2	24	0	Extend 5m left & 4m right
CV224A	1	26	0	Extend 6m left & 5m right
CV224B	1	26.5	0	Extend 6.5m left & 5m right
CV225B	1.2	18	0	Replace with new length of 18m
				Replace with new length of
CV225A	1	18.5	17.33	18.5m
BG01C	1.2	37	24.96	Extend 11m left & 8m right
BG01A	1.2	36.5	24.96	Extend 11.5m left & 7m right
BG01B	1.2	37	24.96	Extend 12m left & 7m right
BG01D	0.5	10	0	New Culvert
BG01F	0.5	18	0	New Culvert
BG01E	1.0	10	0	New Culvert
BG01G	0.5	23	0	New Culvert
CV186	1	27	0	Extend 6m left
CV187A	0.5	20.5	0	Extend 6m left & 4.5m right
CV187B	0.5	16	0	New Culvert
CV166A	1	23.5	17.33	Extend 8.5m right
CV166B	0.5	22.5	0	Extent 7.5m right
CV115A	0.5	17.5	0	Extend 2.5m left
CV115B	1	17	0	Extend 2m left

Provided that your plans are implemented as described DFO has concluded that your proposal is not likely to result in impacts to fish and fish habitat.

You will not need to obtain a formal approval from DFO in order to proceed with your proposal.

If the plans have changed or if the description of your proposal is incomplete you should contact this office to determine if the advice in this letter still applies.

Please be advised that any unauthorized impacts to fish and fish habitat which result from a failure to implement this proposal as described could lead to corrective action such as enforcement.

If you have any questions please contact the undersigned at (867) 669-4927 or by email at Georgina. Williston@dfo-mpo.gc.ca.

Yours sincerely,

Georgina Williston

Fisheries Protection Biologist

cc. Stuart Niven- Fisheries and Oceans Canada
Jim Millard- Baffinland Iron Mines Corporation

Bevin LeDrew- Sikumiut Environmental Management Ltd.

301-5204 50th Ave Yellowknife, NT X1A 1E2

> Our file Notre référence NU-07-0050

December 16, 2013

Baffinland Iron Mines Corp. 275 Upper Middle Road East Suite 300 Oakville, ON L6H 0C3

Dear Mr. Curran:

Subject: Implementation of mitigation measures to avoid and mitigate serious harm to fish.

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada received your proposal on August 28, 2013.

Your proposal has been reviewed to determine whether it is likely to result in serious harm to fish which is prohibited under subsection 35(1) of the Fisheries Act.

Our review consisted of:

Baffinland Submission: Tote Road Upgrade-Four Seacan Bridge Replacements, Tote Road Upgrade- Fish Bearing Culvert submission, Attachments 1 &2, August 2013.

We understand that you propose to: Upgrade the following crossings along the Tote Road.

The following seacan crossings will be removed and replaced with clear span bridges

- STA 17 (CV 128)
- STA 62 (BG50)
- STA 80 (CV 217)
- STA 97 (CV223)



The following culvert crossings will be upgraded as follows:

Culvert ID	Proposed Culvert Diameter (m)	Proposed Culvert Length (m)	Area of Rip Rap (m2)	Proposed works to be completed
CV217B	1.2	16	24.96	Extend 1m right
CV217C	1.2	16	24.96	Extend 1m right
CV217A	1.2	16	24.96	Extend 1m right
CV217D	0.15		0	Abandon
CV216B	1.2	17.5	0	Extend 1.5m left & 1m right
CV216C	1.2	16.5	0	Extend 1.5m left
CV216A	1.2	18.5	0	Extend 1.5m left & 2m right
CV216D	0.5	14.5	0	Replace with new length of 14.5m
CV216E	0.5	14	0	Abandon and replace with new length of 14m
CV216F	0.5	12	0	Replace with new length of 12m
CV223B	1.2	28	24.96	Extend 13m left
CV223C	1.2	28	24.96	Extend 13m left
CV223D	1.2	29	24.96	Extend 14m left
CV223A	2	24	69.33	Extend 14m left
CV223E	1.2	19.5	0	Extend 4.5m left
CV223F	1.2	19	0	Extend 4m left
CV115C	0.5	15.5	0	Extend 3.5m right
CV115D	0.5	17	4.33	Extend 8m left
CV114A	1	15.5	17.33	Extend 0.5m right
CV114B	0.5	14	0	Extend 5m left
CV114C	0.5	11	4.33	Replace with new length of 11m
CV114D	0.5	11.5	4.33	Extend 2m left & 0.5m right
CV112A	1.2	17.5	24.96	Extend 2.5m right
CV112B	0.5	24	0	Extend 9m right
CV112C	0.5	21	4.33	Extend 9m left
CV111	1	24	17.33	Extend 4.5m left & 1.5m right
CV106	1	19	17.33	Extend 4m left
CV104A	1.2	19	24.96	Extend 4m left
CV104B	1.2	19	24.96	Extend 4m left
CV102A	1	22.5	17.33	Extend 7.5m left
CV102B	0.5	21.5	0	Extend 6.5m left
CV102C	0.5	21.5	0	Extend 6.5m left
CV102D	0.5	20.5	0	Extend 5.5m left
CV099B	1.2	17	24.96	Replace with new length of 17m

Culvert ID	Proposed Culvert Diameter (m)	Proposed Culvert Length (m)	Area of rip rap (m2)	Proposed works to be completed
CV099A	1.2	201.841 (11.17	0	Remove culvert
	1.10			Replace with new length of
CV099C	2	18.5	69.33	18.5m
CV099D	0.5	11	0	Remove culvert
CV099E	0.5		0	Remove culvert
CV099F	0.5	14	0	Extend 2m right
CV087B	1.2	19	24.96	Extend 6.5m left & 0.5m right
CV087A	1.2	18.5	24.96	Extend 6m left & 0.5m right
CV087C	0.5	18	0	Extend 6m right
CV079B	1.2	16.5	0	Extend 1.5m left
CV079A	1.2	16.5	0	Extend 1.5m left
CV079C	0.15		0	Remove culvert
CV079D	0.15		0	Remove culvert
CV078A	1.2	16.5	0	Extend 1.5m left
CV078B	1	19.5	0	Extend 1.5m left
CV078C	1	19.5	0	Extend 1.5m left
CV078D	2	22	0	Extend 2m right
	-			Replace with new length of
CV076	1	11.5	0	11.5m
				Replace with new length of
CV072B	1.2	17.5	0	17.5m
CV072C	1.2	17.5	0	Replace with new length of 17.5m
CV072C	1.2	17.5		Replace with new length of
CV072A	1.2	17.5	0	17.5m
CV060A	1	16.5	0	Extend 1.5m left
CV060B	1	16.5	0	Extend 1.5m left
CV059B	0.5	16.5	0	Extend 3.5m left & 1m right
CV059A	0.5	16	0	Extend 3m left & 1m right
CV059C	0.5	16.5	0	Extend 4m left & 0.5m right
CV059D	0.5	16.5	0	Extend 4m left & 0.5m right
CV057B	0.5	16.5	0	Extend 1.5m left
CV057C	0.5	16.5	0	Extend 1.5m left
CV057A	0.5	16.5	0	Extend 1.5m left
BG50A	1.2	33.5	24.96	Extend 15.5m left
BG50B	1.2	32	24.96	Extend 14m left
CV049A	1.2	24.5	24.96	Extend 5.5m left & 4m right
CV049B	1.2	24.5	24.96	Extend 4.5m left & 5m right
CV030A	1	16	0	Extend 1m left
CV030B	0.5	16	0	Extend 1m left

To avoid the potential of serious harm to fish and their habitat, we are recommending that the following mitigation measures be included into your plans.

- If in-stream work is required during the open water season it should be completed in the dry by de-watering the work area and diverting and/or pumping flows around cofferdams placed at the limits of the work area.
- Existing stream flows should be maintained downstream of the de-watered work area without interruption, during all stages of the work.
- A fish stranding program should be implemented if necessary by a qualified fisheries person, who is experienced in this area, immediately following isolation and prior to de-watering to ensure that fish are removed from any dewatered area and released alive immediately downstream of the work area.
- Flow dissipaters and/or filter bags, or equivalent, should be placed at water discharge points to prevent erosion and sediment release.
- Silt or debris that has accumulated around the temporary cofferdams should be removed prior to their withdrawal.

Provided that these mitigation measures are incorporated into your plans, the Program is of the view that your proposal will not result in serious harm to fish. No formal approval is required from the Program under the Fisheries Act in order to proceed with your proposal.

If your plans have changed or if the description of your proposal is incomplete, or changes in the future, you should consult our website (http://www.dfo-mpo.gc.ca/pnwppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review is required by the Program.

Please notify this office at least 10 days before starting your project. A copy of this letter should be kept on site while the work is in progress.

If you have any questions, please contact Georgina Williston at our Yellowknife office at 867-669-4927, by fax at 867-669-4940 or by email at geogina.williston@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Senior Fisheries Protection Biologist

Fisheries and Oceans Canada

Georgina Williston-Fisheries and Oceans Canada Bevin LeDrew- Sikumiut Environmental Management Ltd.

Tessa Mackay- Hatch

Suite 301 - 520459 th Ave. Yellowknife NT, X1A 1E2

Our file Notre référence NU-07-0050

February 20, 2015

James Millard **Environmental Manager** Baffinland Iron Mines Corp. 275 Upper Middle Road East Suite 300 Oakville, ON L6H 0C3

Dear Mr. Millard:

Subject: Implementation of mitigation measures to avoid and mitigate serious harm to fish - Mary River Project, Tote Road Realignment.

The Fisheries Protection Program of Fisheries and Oceans Canada received your proposal on February 15, 2015.

Your proposal has been reviewed to determine whether it is likely to result in serious harm to fish which is prohibited under subsection 35(1) of the Fisheries Act.

Your proposal has also been reviewed to determine whether it will adversely impact listed aquatic species at risk and contravene sections 32, 33 or 58 of the Species at Risk Act (SARA).

Our review considered the following:

- Letter from Baffinland Iron Mines Re: Mary River Project Request for Advice on Realignment of Tote Road at Culvert CV076, Km 53 Tote Road, DFO File dated February 15, 2015 and submitted by James Millard with 1 attachment.
- Attachment 1 Mark-up of proposed field change, Drawing H349000-3000-10-012-0073

We understand that you propose to:

- Realign the existing Tote Road at Culvert CV076, 160 meters upstream from the existing crossing and install one culvert which is 1.2m in diameter and 18 m in length.
- Install culverts during the winter months when the stream is frozen to bottom.
- Remove existing culvert from the old Tote Road alignment.

Since there are no SARA species or their habitats identified in the project area, no additional approvals under SARA will be required for your proposed activities. To avoid the potential for serious harm to fish that is prohibited under the Fisheries Act, the mitigation measures set out in your project plans are to be followed.



Provided that you implement the required mitigation measures for your project, and follow the guidance available on the DFO website at http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html, the Program is of the view that your proposal should not result in serious harm to fish or contravene sections 32, 33 or 58 of the Species at Risk Act. No formal approval is required from the Program under the Fisheries Act or the Species at Risk Act in order to proceed with your proposal.

It remains your responsibility to ensure you avoid causing serious harm to fish in compliance with the *Fisheries Act*, and that you meet the requirements under the *Species at Risk Act* as it may apply to your project. If your plans have changed or if the description of your proposal is incomplete, or changes in the future, you should consult our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review is required by the Program.

Please be advised that it is also your *Duty to Notify* DFO if you have caused, or are about to cause, serious harm to fish that are part of or support a commercial, recreational or Aboriginal fishery. Such notifications should be directed to http://www.dfo-mpo.gc.ca/pnw-ppe/violation-infraction/index-eng.html.

A copy of this letter should be kept on site while the work is in progress. It remains your responsibility to meet all other federal or territorial requirements that apply to your project.

If you have any questions, please contact Georgina Williston at our Yellowknife office at (867) 669-4927, by fax at (867) 669-4940, or by email at georgina.williston@dfompo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Julie Dahl

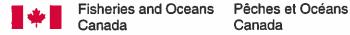
Regional Manager, Regulatory Reviews

Fisheries Protection Program

CC.

Georgina Williston- Fisheries and Oceans Canada Oliver Curran-Baffinland Iron Mines Corp. Erik Madsen-Baffinland Iron Mines Corp.





Canada

5204-50th Avenue Yellowknife, NT XIA 1E2

December 9, 2014

Your file Votre référence

Our file Notre référence NU-07-0050

Baffinland Iron Mines Corp. Attention: Jim Millard, Environmental Manager 2275 Upper Middle Road, Suite 300 Oakville, ON L6H 0C3

Dear Mr. Millard:

Implementation of mitigation measures to avoid and mitigate impacts to fish and fish habitat and listed aquatic species at risk - Mary River **Project**

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada received your proposal on November 27, 2014.

Your proposal has been reviewed to determine whether it is likely to result in serious harm to fish which is prohibited under subsection 35(1) of the Fisheries Act.

Your proposal has also been reviewed to determine whether it will adversely impact listed aquatic species at risk and contravene sections 32, 33 or 58 of the Species at Risk Act (SARA).

Our review considered the following:

- Letter from Baffinland Iron Mines RE: Realignment of Tote Road at Culvert CV099. Dated November 27, 2014 and submitted by James Millard, with 1 attachment.
- Attachment 1- Mark up of proposed field change, Drawing H349000-3000-10-012-0052

We understand that you propose to:

Realign the existing Tote Road and install one 2 metre diameter culvert in the stream bed and two 1.2 metre overflow culverts. Culverts will be approximately 27 metres in length.



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• Install culverts during the winter months when the stream is frozen to bottom.

-2-

• Remove existing culverts along the old Tote Road alignment.

Since there are no SARA species or their habitats identified in the project area, no additional approvals under SARA will be required for your proposed activities.

To avoid the potential for serious harm to fish that is prohibited under the *Fisheries Act*, the mitigation measures set out in your project plans are to be followed.

Provided that you implement the required mitigation measures for your project, and follow the guidance available on the DFO website at http://www.dfo-mpo.gc.ca/pnw-ppe/measures/index-eng.html, the Program is of the view that your proposal should not result in serious harm to fish or contravene sections 32, 33 or 58 of the Species at Risk Act. No formal approval is required from the Program under the Fisheries Act or the Species at Risk Act in order to proceed with your proposal.

It remains your responsibility to ensure you avoid causing serious harm to fish in compliance with the *Fisheries Act*, and that you meet the requirements under the *Species at Risk Act* as it may apply to your project. If your plans have changed or if the description of your proposal is incomplete, or changes in the future, you should consult our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review is required by the Program.

Please be advised that it is also your *Duty to Notify* DFO if you have caused, or are about to cause, serious harm to fish that are part of or support a commercial, recreational or Aboriginal fishery. Such notifications should be directed to http://www.dfo-mpo.gc.ca/pnw-ppe/violation-infraction/index-eng.html.

A copy of this letter should be kept on site while the work is in progress. It remains your responsibility to meet all other federal or territorial requirements that apply to your project.

If you have any questions, please contact Georgina Williston at our Yellowknife office at 867-669-4927 or by email at Georgina. Williston@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

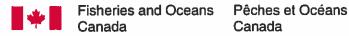
Yours sincerely,

Julie Dahl

Regional Manager, Regulatory Reviews

Fisheries Protection Program

cc. Oliver Curran- Baffinland Iron Mines Erik Madsen – Baffinland Iron Mines



Canada

5204-50th Avenue Yellowknife, NT X1A 1E2

October 27, 2014

Your file Votre référence

Our file Notre référence NU-07-0050

Baffinland Iron Mines Corp. Attention: Jim Millard, Environmental Manager 2275 Upper Middle Road, Suite 300 Oakville, ON L6H 0C3

Dear Mr. Millard:

Subject: Implementation of mitigation measures to avoid and mitigate impacts to fish and fish habitat and listed aquatic species at risk - Mary River **Project**

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada received your proposal on October 17, 2014.

Your proposal has been reviewed to determine whether it is likely to result in serious harm to fish which is prohibited under subsection 35(1) of the Fisheries Act.

Your proposal has also been reviewed to determine whether it will adversely impact listed aquatic species at risk and contravene sections 32, 33 or 58 of the Species at Risk Act (SARA).

Our review considered the following:

- Letter from Baffinland Iron Mines RE: Realignment of Tote Road at Culvert CV225B. Dated October 16, 2014 and submitted by James Millard, with 2 attachments.
- Attachment 1- Mark of proposed field change, Drawing H349000-3000-10-012-0139
- Attachment 2- Project Wide, Civil Standard Drawing, Typical Culvert Detail, H349000-1000-10-041-0003

We understand that you propose to:

Realign the existing Tote Road and install two new 1.2 metre culverts in the stream bed and one 1.0 metre culvert 45 m away as an overflow. Culverts will be approximately 27metres in length.



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- Install culverts during the winter months when the stream is frozen to bottom.
- Remove the two existing 1.2m culverts along the old Tote Road alignment.

Since there are no SARA species or their habitats identified in the project area, no additional approvals under SARA will be required for your proposed activities.

To avoid the potential for serious harm to fish that is prohibited under the *Fisheries Act*, the mitigation measures set out in your project plans are to be followed.

Provided that you implement the required mitigation measures for your project, and follow the guidance available on the DFO website at http://www.dfo-mpo.gc.ca/pnw-ppe/measures/index-eng.html, the Program is of the view that your proposal should not result in serious harm to fish or contravene sections 32, 33 or 58 of the Species at Risk Act. No formal approval is required from the Program under the Fisheries Act or the Species at Risk Act in order to proceed with your proposal.

It remains your responsibility to ensure you avoid causing serious harm to fish in compliance with the *Fisheries Act*, and that you meet the requirements under the *Species at Risk Act* as it may apply to your project. If your plans have changed or if the description of your proposal is incomplete, or changes in the future, you should consult our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review is required by the Program.

Please be advised that it is also your *Duty to Notify* DFO if you have caused, or are about to cause, serious harm to fish that are part of or support a commercial, recreational or Aboriginal fishery. Such notifications should be directed to http://www.dfo-mpo.gc.ca/pnw-ppe/violation-infraction/index-eng.html.

A copy of this letter should be kept on site while the work is in progress. It remains your responsibility to meet all other federal or territorial requirements that apply to your project.

If you have any questions, please contact Georgina Williston at our Yellowknife office at 867-669-4927 or by email at Georgina. Williston@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Julie Dahl

Regional Manager, Regulatory Reviews

Fisheries Protection Program

cc. Oliver Curran- Baffinland Iron Mines
Erik Madsen – Baffinland Iron Mines
Stu Niven – Fisheries and Oceans Canada

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	Environment	Document #: BAF-PH1-830-P19-0001
‡ Baffinland	2015 Annual Report to the DFO	Issue Date: Dec. 22, 2015 Revision: 1

Appendix B- Turbidity and Construction Monitoring Field Notes

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
₌ 3.6	Turbidity Monitoring Data Form	A	June 4, 2008

Field Crew:	Mach+Nin	•		Date: Ju	27,215	Time:	
LOCATION			Zone: 7 - 11 /			20:28	
Easting (m):	Datum: NAD	Northing (m):	zone: 17W	Elevation (fro	m magginal-	Other notes:	
	ATHER: Wind:		Manual a Manual A Manual			Other ribles:	
		Air Temp: 2°C	Precipitation:	N Gong	Cover (%): 3/4		1662
Recent Weath	ner Events: Pry I	Preshet					
CONSTRUCTIO	N Construct	ion Phase (circle one): P	re-Construction	During Construc	tion ost-Construction		36
Type of Activi	ty:	Equipment (in Use:			0	
Date Construc	tion Began:		· · · · · · · · · · · · · · · · · · ·				-
Is the crossing	focation changing? (i.e. is the o	rossing moving upstream	or downstream of its	s original location?	How far? Which direction?)		27
N /9							
SITE SKETCH,	NOTES, REMARKS: (i.e. high war	ter table, high turbidity na	itural bank eroslor,	water color, char	observed in stream, algae in w	ater, etc.)	
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No	u wak, no toul esosion, I culve ls (·	J. 2. 0. 7	-			
	7 -1 /2	5 (-1)					
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					ation and Shading (describe):		
	icles % Areal Coverage (e % sand/slit/clay (<2r	st.) J 100	55		ation and Shading (describe):	, , , , , , , , , , , , , , , , , , ,	
	% Areal Coverage (e % sand/slit/clay (<2r - % gravel (2 - 64 mm) % cobble (64 - 256 m	st.) 5 10 10 10 10 10 10 10			ation and Shading (describe):	, t	
	% Areal Coverage (e % sand/slit/clay (<2r · % gravel (2 - 64 mm)	st.) 5 10 10 10 10 10 10 10			ation and Shading (describe):		
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Substrate Pari IN SITU TURBI Meter Make a	icles % Areal Coverage (e % sand/slit/clay (<2n % gravel {2 - 64 mm} % cobble (64 - 256 m % boulder (> 256 mm % bedrock DITY READINGS {complete nd Model: Distance from	st.] nm] - 708 21 at least one measurement	50 g	Riperian Vegat	ng) Distance from		Time
Substrate Part IN SITU YURBI Meter Make a Location Upstream	icles % Areal Coverage (e % sand/sit/clay (<2n % gravel {2 - 64 mm} % cobble (64 - 256 m % boulder (> 256 mm % bedrock DITY READINGS {complete nd Model: Distance from crossing {m}	st.) nm) - 708 20 at least one measurement Turbidity (NTU) 13.3	Time	Riperian Veget	ng) Distance from		Time
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IN SITU TURBI Meter Make a Location Upstream Crossing Dwnstrm HOW ESTIMAT	## Areal Coverage (e ## sand/silt/clay (<2n ## syswel (2 - 64 mm) ## cobble (64 - 256 mm ## boulder (> 256 mm ## bedrock DITY READINGS {complete and Model: Distance from crossing {m} ## Complete Comple	at least one measurement Turbidity (NTU) 13.3 12.8 9.3	Distance between time (min):	Riperian Veget matream of crossin Location Upstream Crossing Downstream even points (m):	Distance from crossing (m) 3 m 0.325 n/6		Time
IN SITU TURBI Meter Make a Location Upstream Crossing Dwnstrm	## Areal Coverage (e	at least one measurement Turbidity (NTU) 13.3 12.8 9.3	Distance between Average Velo	Riperian Veget mstream of crossin Location Upstream Crossing Downstream S S / ity estimate:	Distance from crossing (m) 3 m 0.325 m/6 ace Velocity) (V) =		Time

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	A	June 4, 2008

Field Crew:	Make	17.		Date:	-	Time:	
LOCATION	Mark + a	2 na	Zone: 17		L 7.201	Z1:04	
Easting (m):		e Al-Al-Z A-l		Elevation (from	m manning)	Other notes:	
	079,439219	Air Temp: 13 * C	36831		Cover (%): 3/	Other hotes.	
Recent West	the France		N	<u>L</u>	1/8		
CONSTRUCTIO	Dry	treshet					
		action Phase (circle one): P		During Construct	don Post-Construction		
Type of Activ		Equipment i	in Use:				
	ection Began:						
Is the crossing I OM	location changing? (i.e. is the	e crossing moving upstream	or downstream of it	ts original location?	How far? Which direction?)		
SITE SKETCH,		water table, high turbidity, ra	itural bank erosion,	water color, char o	observed in stream, algae in wate	r, etc.)	- 4
- 100 L	· vele						
4 C . L	verts AlB	(142)					
·NoF	low through	colorsts, unil	er heiler	s £11			
	7.0004	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	d Direy				
	157)				1/2		
Substrate Par	tirlas — Kārnal Coucona	(and 1 1 / 4 /		Minus II - No - N	-1		
Substrate Par	% sand/slit/clay (<	2mm) - 60%			ntion and Shading (describe):	-	Ŧ18
Substrate Par	% sand/sltt/clay (< % gravel (2 - 64 m % cobble (64 - 256	2mm) - 60% m) 20% mm) - 20%		Riparian Vegets	ation and Shading (describe):	· ·	Ŧ*@
Substrate Par	% sand/slit/clay (< % gravel (2 - 64 mi	2mm) - 60% m) 20% mm) - 20%			ation and Shading (describe):	·	7.6
<i>N SITU</i> TURB	% sand/sltt/clay (% gravel {2 - 64 mi % cobble {64 - 255 % boulder {> 256 r % bedrock IDITY READINGS (comple	2mm) - 60% m) 20% mm) - 20%	upstream and dow	grass	<i></i>		F 75
IN SITU TURB	% sand/sltt/clay (% gravel {2 - 64 mi % cobble {64 - 255 % boulder {> 256 r % bedrock IDITY READINGS (comple	2mm) - 6 %. m) 2 ° 6 %. mm) - 7 %. nm)	upstream and dov	grass	<i></i>	Turbidity	Time
IN SITU TURB Meter Make e Location	% sand/sltt/clay (< % gravel (2 - 64 m) % cobble (64 - 236 % boulder (> 256 r) % bedrock IDITY READINGS (comple	m) 20°C mm) 20°C mm) - 20°C mm) - 20°C nm)		gnals	18)	Turbidity (NTU)	Time
IN SITU TURB Meter Make e Location	% sand/sitt/clay (< % gravel {2 - 64 m; % cobble {64 - 256 m} % boulder {> 256 m} % bedrock IDITY READINGS {compleand Model: Distance from	te at least one measurement		g naus	Distance from	1	Time
IN SITU TURB Meter Make e Location Upstream	% sand/sitt/clay (% gravel {2 - 64 miles % cobble {64 - 256 miles % boulder {> 256 miles % bedrock IDITY READINGS (comples and Model: Distance from crossing {m}	m) 20°C (mm) - 70°C (mm) - 70°	7ime 22:59	gnals	Distance from	1	Time
IN SITU TURB Meter Make e Location Upstream	% sand/sitt/clay (% gravel {2 - 64 m} % cobble {64 - 256 m} % boulder {> 256 m} % bedrock IDITY READINGS (completed and Model: Distance from crossing {m}	m) 20°C, mm) - Zo °C, mm) - Zo °C, mm) - Zo °C, mm) te at least one measurement Turbidity (NTU) 8.5	Time	grazis	Distance from	1	Time
IN SITU TURB: Meter Make a Location Upstream Crossing Dwnstrm	% sand/sltt/day (% gravel {2 - 64 m} % cobble {64 - 256 m} % boulder {> 256 m} % bedrock IDITY READINGS (completed and Model: Distance from crossing {m} / O O Z S No Flour	Turbidity (NTU) 8.5	7ime 22:59	grazis vistream of crossin Location Upstream Crossing	Distance from	1	Time
IN SITU TURB: Meter Make of Location Upstream Crossing Dwnstrm	% sand/sltt/clay (% gravel {2 - 64 m; % cobble {64 - 256 m} % boulder {> 256 m} % bedrock IDITY READINGS (completand Model: Distance from crossing {m} / O O Z S No Flour TES Location: U/	Turbidity (NTU) 8.5	7ime 22:59	grazis vistream of crossin Location Upstream Crossing	Distance from	1	Time
W SITU TURB Meter Make a Location Upstream Crossing Dwnstrm	% sand/sitt/clay (% gravel (2 - 64 m) % cobble (64 - 256 m) % cobble (64 - 256 m) % boulder (> 256 m) % bedrock iDITY READINGS (complet and Model: Distance from crossing (m) / O O 2 5 No Flau TES Location: U/ Idth (m):	Turbidity (NTU) 8.5	Zo: 59	grazis viristream of crossin Location Upstream Crossing	Distance from	1	Time
IN SITU TURB. Mater Make a Location Upstream Crossing Dwnstrm FLOW ESTIMA	% sand/sitt/clay (% gravel (2 - 64 m) % cobble (64 - 256 m) % cobble (64 - 256 m) % boulder (> 256 m) % bedrock iDITY READINGS (complet and Model: Distance from crossing (m) / O O 2 5 No Flau TES Location: U/ Idth (m):	Turbidity (NTU) 8.5	Zo: 59	ynstream of crossin Location Upstream Crossing Downstream	Distance from	1	Time
W SITU TURB: Meter Make o Location Upstream Crossing Dwnstrm LOW ESTIMA Iligh Water W	% sand/sitt/clay (% gravel {2 - 64 m} % cobble {64 - 256 m} % boulder {> 256 m} % bedrock iDITY READINGS {comple and Model: Distance from crossing {m} / O O 2 \$ No Flau TES Location : U/ Idth {m}:	Turbidity (NTU) 8.5	Zo: 5 9 21.17 Distance bet	grass unstream of crossin Location Upstream Crossing Downstream	Distance from crossing (m)	1	Time
W SITU TURB: Meter Make o Location Upstream Crossing Dwnstrm LOW ESTIMA Iligh Water W	% sand/sitt/clay (% gravel {2 - 64 m} % cobble {64 - 256 m} % boulder {> 256 m} % bedrock iDITY READINGS {comple and Model: Distance from crossing {m} / O O 2 \$ No Flau TES Location : U/ Idth {m}:	Turbidity (NTU) 8.5	Zo: 5 9 21.17 Distance bet Time (min):	Joanstream of crossing Location Upstream Crossing Downstream ween points (m):	Distance from crossing (m)	1	Time
IN SITU TURB: Meter Make o Location Upstream Crossing Dwnstrm FLOW ESTIMA: High Water W Wetted Chann	% sand/sitt/clay (% gravel {2 - 64 m} % cobble {64 - 256 m} % boulder {> 256 m} % bedrock iDITY READINGS {comple and Model: Distance from crossing {m} / O O 2 \$ No Flau TES Location : U/ Idth {m}:	Turbidity (NTU) 8.5	Zo: 5 9 21.17 Distance bet Time (min):	Joanstream of crossing Location Upstream Crossing Downstream ween points (m):	Distance from crossing (m)	1	Time
Location Upstream Crossing Dwnstrm FLOW ESTIMA High Water W Wetted Chann Approx. Avera	% sand/sitt/clay (% gravel {2 - 64 m} % cobble {64 - 256 m} % boulder {> 256 m} % bedrock iDITY READINGS {comple and Model: Distance from crossing {m} / O O 2 \$ No Flau TES Location : U/ Idth {m}:	20 Cm 30 Cm 0.8 for rough, loose rocks on	Distance bet Time (min): Surface veloce	Jocation Location Upstream Crossing Downstream ween points (m):	Distance from crossing (m) 25 m/S face Velocity) (V) =	1	Time

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SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	Α	June 4, 2008

3604	
Field Crew: Mach + Nina Date: June 7, 2015 Time: 2	2/130
LOCATION Datum: NAD 83 Zone: 17W	
Easting (m): 079.5 3965 Northing (m): 71.3726 Elevation (from mapping): 581	ptes:
CURRENT WEATHER: Wind: Air Temp: 2 Precipitation: V Cloud Cover (%): 7/8	
Recent Weather Events: Dry Grahet	
CONSTRUCTION Construction Phase (circle one): Pre-Construction During Construction (Post-Construction)	
Type of Activity: Equipment in Use:	
Date Construction Began:	
Is the crossing location changing? (i.e. is the crossing moving upstream or downstream of its original location? How far? Which direction?)	
The state of the s	
SITE SKETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream, algae in water, etc.)	
-id covering banks	
- ill covering to on his	
alcar vitr	
the state of the s	
Substrate Particles % Area Coverage (est.) VS PS Riparian Vegetation and Shading (describe): % sand/slit/clay (<2mm) - 4 0	
% gravel (2 - 64 mm) - 30 20 3 7 a 5 5 % cobble (64 - 256 mm) - 30	
% boulder (> 256 mm)	
% bedrock IN SITU TURBIDITY READINGS (complete at least one measurement upstream and downstream of crossing)	
Meter Make and Model:	
A 100 A	urbidity Time (NTU)
Liostream Lineman	(110)
Crossing	
2 42 6 21:39 Crossing	
Dwnstrm 50 3 21:41 Downstream	1.0
FLOW ESTIMATES Location : US	
High Water Width (m): Distance between points (m):	
Wetted Channel Width: Time (min): /	
Approx. Average Depth: 30cm Surface velocity estimate: 1 m / 5	
Average Velocity (0.8 (1) x Surface Velocity) (V) =	
Note [1] - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock	
PHOTOS: (upstream, crossing, downstream)	
NOTES:	- 10

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SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	Α	June 4, 2008

CROSSING ID							
	B6174						
Field Crew:	Hack + Nin			Date: Ju-	7/15	Time: 21:50	
LOCATION	Datum: N AL	20n	170				
Easting (m): (179.57890' H	Northing (m): N 7 1 · 3 5 5 5	7 -	Elevation (from	mapping):	Other notes:	
	ATHER: Wind:		Precipitation:	Cloud C	over (%): 7/8	- 200	
Recent Weath	Her Events: Day For	whet	41	1989			
CONSTRUCTIO		ion Phase (circle one): Pre-C	Construction	During Construction	on Past-Construction		
Type of Activi	ty:	Equipment in U	lse:				
Date Construc	tion Began;				-32		
	location changing? (i.e. is the c	rossing moving upstream or o	downstream of it	ts original focation?	How far? Which direction?)		
_	/A						
	NOTES, REMARKS: (I.e. high wat		ar bank erosion,	water color, char of	iserved in stream, algae in wai	ter, etc.)	
- SUA	Brothe to Co	- Cu					_
- 91	ey/seen wat					34	12
- 51	ight bank en	oslin					- 2
-	9 803 W	•	12				- 3
Substrate Part		L	DS	Riperian Vegetai	tion and Shading (describe):		
	% sand/slit/clay (2 n % gravel (2 - 64 mm)		33-	LAN	a grass	57	
	% cobble (64 - 256 m % boulder (> 256 mm	m) - 10	5	1400	a 5, 478		
_ ±	% bedrock	-	40	4:			
<i>IN SITU</i> TURBI Meter Make a		at least one measurement up	pstream and dov	vnstream of crossing	z)		- 15
Location	Distance from	Turbidity	Time	Location	Distance from	Turbidity	Time
Upstream	crossing (m)	(NTU)		Upstream	crossing (m)	(UTV)	-
Crossing	50	10	22.02				
Crossing	2	19.5	21:55	Crossing			
Dwnstrm	50	14	21:59	Downstream			
FLOW ESTIMAT	TES Location :		-	X			- 10
High Water Wi		>5	Distance hat	ween points (m):			6
	dth (m):	- 20	Distance Set	want points (m):			
Wetted Channe	i Width:		Time (min):	1			
Approx. Averag	pe Depth: 0.5		Surface veloc	city estimate:	0.2 m/s		
	0. 0		Average Velo	ocity (0.8 ⁽¹⁾ x Surfa			
lote (1) - dance	nds on substrate composition; 0	8 for much leave make as a			100.00	41 ²	
	ream, crossing, downstream)	a for rough, roose rocks of co	perse gravel / U.9	ior smooth mud, sa	nu, or naru pan rock		- 17
NOTES:							
IV 183;							
			ait		3		

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
_ 3.6	Turbidity Monitoring Data Form	Α	June 4, 2008

Pic

CROSSING ID							
	B629						
Field Crew:	Mach + N	na		Date: 7 c	77/15	Time: 22:19	
LOCATION	Datum: NA-1		170				
Easting (m):	70287	Northing (m): ~ 71 3763		Elevation (fro	m mapping): 535	Other nates:	
	ATHER: Wind:		Precipitation:	Cloud	Cover (%): 7/8		<u></u>
Recent Weath	er Events: 0 ~	Fresher					
CONSTRUCTIO	N Construct	tion Phase (circle one): Pre-C	Construction	During Construc	tion Fost-Construction		
Type of Activit		Equipment In U	lse:				
Date Construc	tion Began:		<u> </u>				
is the crossing	location changing? (i.e. is the	crossing moving upstream or d	lownstream of i	ts original location	? How far? Which direction?)		
		ter table, high turbidity, natur	al bank erosion,	water color, char	observed in stream, algae in wat	er, etc.)	
	upstream						
- red	upstream						
					**		
		5 II - 13		•			
Substrate Part	icles % Areal Coverage (g	st.) V 7	PS	Blooden Manua	ation and Shading (describe):		
	% sand/slit/clay (<2	mm) /00	105				
	% gravel (2 - 64 mm) % cobble (64 - 256 n			95	455		
	% boulder (> 256 mr % bedrock	n) }					
IN SITU TURBI		at least one measurement up	ostream and do	vestream of crossi	ng)		
Meter Make a							
Location	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Time
Upstream			22:23	Upstream	County (in)	(810)	-
Crossing	Ph 75	18,2		Crossing			
	2	25	22.20				
Dwnstrm	75	18.4	22:25	Downstream			
FLOW ESTIMAT	ES Location :) ১	Th 190				
High Water Wi			Distance bet	ween points (m):			
Wetted Channe	A Width:	1 (12) 1 (20)	Time (min):				
		(US),1(OS)					
Approx. Averag	Depth:	. 2	Surface velo	city estimate:	0 m/s	10	
			Average Vel	pcity (0.8 ⁽¹⁾ x Sur	face Velocity) (V) =	- <u>/-</u>	
Note (1) - deper	nds on substrate composition: ().8 for rough, loose rocks or co	arse gravel / 0.9	for smooth mud,	sand, or hard pan rock		
	eam, crossing, downstream)				11.963		
NOTES:	20 1829,	101/					-

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	A	June 4, 2008

Easting (m): NATO 83 Zone: /7 W Easting (m): Northing (m): Elevation (from mapping): 504 Other notes N 71.37848 CURRENT WEATHER: Wind: Air Temp: Precipitation: Cloud Cover (%): 7/8 Recent Weather Events: DM (VCS NC4)	138
Easting (m): Northing (m): Northin	
CURRENT WEATHER: Wind: Air Temp: Precipitation: N Cloud Cover (%): 7/8 Recent Weather Events: PM (1/4/5/h-4/4)	5:
Recent Weather Events: PM (IVES hex	
COMPTRICTION CONTRACTOR BY CALL OF THE CONTRACTOR BY CONTR	
CONSTRUCTION Construction Phase (circle one): Pre-Construction During Construction Past-Construction	
Type of Activity: Equipment in Use:	
Data Construction Began:	
is the crossing location changing? (i.e. is the crossing moving upstream or downstream of its original location? How far? Which direction?)	
SITE SKETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream, algae in water, etc.)	
- sandy banks, slight erosion	
- trabid retur slightly red	
- sandy banks, slight erosion - turbid retur, slightly red Lo dearer upstream	
Substrate Particles % Areal Coverage (est.) U6 D5 Riparian Vegetation and Shading (describe):	
% santu/sm/clay (<2mm)	
% cobble (64 - 256 mm)	
% bedrock // SITU TURBIDITY READINGS (complete at least one measurement upstream and downstream of crossing)	
Meter Make and Model:	
Location Distance from Turbidity Time Location Distance from Turbidity Crossing (m) (NTU) Crossing (m) (NTU)	oldity (TU)
Upstream 6 0 27 72.45 Upstream	
Crossing 3 38.5 22.41 Crossing Dwnstrm 60 11.2 22.43 Downstream	
FLOW ESTIMATES Location :	
Distance between points (m):	
Wetted Channel Width:	
Approx. Average Depth: Surface velocity estimate: 6 (no flow)	
Average Velocity (0.8 (3) x Surface Velocity) (V) =	-
Note (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock	
PHOTOS: (upstream, crossing, downstream)	

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	А	June 4, 2008

	Mach +1	Vina		Date:	7/15	Time: ZZ:50	
LOCATION	Datum:	AD 83	tone: 17レ				
Easting (m):	5664.C M	Northing (m): 9 2	200	Elevation (from r	mapping): 49/	Other notes:	
- , ,	ATHER: Wind:	Air Temp: 150		Cloud Co	over (%): 7/8		-
Recent Weath	her Events:	4 Fresh et		<u>′</u>			
CONSTRUCTIO		tion Phase (circle one): P	re-Construction	During Construction	Post-Construction		_
Type of Activi	ity:	Equipment i	in Use:				
Date Construc	tion Began:	V.					
is the crossing	focation changing? (i.e. is the	crossing moving upstream	or downstream of it	s original location? H	ow far? Which direction?)		
_				- 33	100 PGS9		
	NOTES, REMARKS: (i.e. high w	ater table, high turbidity, na	itural bank erosion,	water color, char obs	served in stream, algae in wa	ter, etc.)	- 10
	ar water						
~ W+	the bank en	5100			1		
					22		
153	• 11				4		
				7			
Substrate Part	% sand/slit/ciay (२ % gravel (2 - 64 mn	traini) - 50	75	_	on and Shading (describe):		
<i>IN SITU</i> TURBI	% sand/sit/ctay (% gravel (2 - 64 min % cobble (64 - 256 min % boulder (> 256 min 	(mm) 3	795 55	gra	23		1
W SITU TURBI Meter Make e	% sand/sit/ctay (< % gravel (2 - 64 min % cobble (64 - 256 m % boulder (> 256 m % bedrock IDITY READINGS (complet and Model:	mm) 3 mm) 3 mm) at least one measurement	181	9ra			
<i>IN SITU</i> TURBI	% sand/sit/ctay (% gravel (2 - 64 min % cobble (64 - 256 min % boulder (> 256 min % bedrock DITY READINGS (complet	mm) 3 mm) 3	t upstream and dow	gra	23	Turbidity (NTU)	Time
Meter Make e	% sand/sit/ctay (% gravel (2 - 64 min % cobble (64 - 256 m) % boulder (> 256 m) % bedrock IDITY READINGS (complet and Model:	mm) 3 mm) 3 mm) Turbidity	181	9ra	S S Distance from		Time
IN SITU TURBI Meter Make a Location	% sand/sit/ctay (% gravel (2 - 64 min % cobble (64 - 256 m) % boulder (> 256 m) % bedrock IDITY READINGS (complet and Model:	mm) 3 mm) 3 mm) Turbidity {NTU}	Time	gra-	S S Distance from		Time
N SITU TURBI Meter Make e Location Jostream	% sand/sit/ctay (% gravel (2 - 64 min % cobble (64 - 256 m) % boulder (> 256 m) % bedrock IDITY READINGS (complet and Model:	triim) 70 mm) 3 e at least one measurement Turbidity {NTU}	71me	gra Instream of crossing)	S S Distance from		Time
W SITU TURBI Meter Make a Location Upstream Crossing Ownstrm	% sand/sit/ctay (% gravel (2 - 64 mm) % cobble (64 - 256 mm) % boulder (> 256 mm) % bedrock IDITY READINGS (complet) and Model: Distance from crossing (mm)	triming 70 mm) 3 mm) 3 mm) 3 mm) 3 mm) 5 mm) 6 mm) 6 mm) 6 mm) 70 mm) 7	22:53 22:55	gramore upstream Crossing	S S Distance from		Time
N SITU TURBI Weter Make a Location Jostream Crossing Dwnstrm LOW ESTIMAT	% sand/sit/ctay (< % gravel (2 - 64 min % cobble (64 - 256 min % bedrock (complet sind Model: Distance from crossing (m)	mm) 3 mm) 3 mm) 3 mm) 3 mo) 1 Turbidity (NTU) 5.8 444	22:53 22:55 22:57	Jra Instream of crossing) Location Upstream Crossing Downstream	S S Distance from		Time
N SITU TURBI Weter Make a Location Jostream Crossing Dwnstrm LOW ESTIMAT	% sand/sit/ctay (< % gravel (2 - 64 min % cobble (64 - 256 min % bedrock (complet sind Model: Distance from crossing (m)	triming 70 mm) 3 mm) 3 mm) 3 mm) 3 mm) 5 mm) 6 mm) 6 mm) 6 mm) 70 mm) 7	22:53 22:55 22:57	gramore upstream Crossing	S S Distance from		Time
W SITU TURBI Meter Make a Location Upstream Crossing Ownstrm FLOW ESTIMA:	% sand/sit/ctaly (% gravel (2 - 64 min % cobble (64 - 256 m) % boulder (> 256 m) % bedrock IDITY READINGS (complet and Model: Distance from crossing (m)75275Idth (m):	triming 70 mm) 3 mm) 3 mm) 3 mm) 3 mm) 5. 8 mm MTU) 5. 8 mm MTU) 5. 8 mm MTU) 5. 8 mm MTU) 7. 9	22:53 22:55 22:57	Jra Instream of crossing) Location Upstream Crossing Downstream	S S Distance from		Time
W SITU TURBI Meter Make e Location Upstream Crossing Dwnstrm Crossing	% sand/sit/ctay (% gravel (2 - 64 mm) % cobble (64 - 256 mm) % boulder (> 256 mm) % bedrock IDITY READINGS (complet and Model: Distance from crossing (mm) 75 2 75 16th (mm): el Width:	triming 70 mm) 3 mm) 3 mm) 3 mm) 3 mm) 5. 8 mm MTU) 5. 8 mm MTU) 5. 8 mm MTU) 5. 8 mm MTU) 7. 9	ZZ:53 ZZ:57 Distance bet	Jra Instream of crossing) Location Upstream Crossing Downstream	S S Distance from		Time
W SITU TURBI Meter Make e Location Upstream Crossing Dwnstrm Crossing	% sand/sit/ctaly (% gravel (2 - 64 min % cobble (64 - 256 m) % boulder (> 256 m) % bedrock IDITY READINGS (complet and Model: Distance from crossing (m)75275Idth (m):	triming 70 mm) 3 mm) 3 mm) 3 mm) 3 mm) 5. 8 mm MTU) 5. 8 mm MTU) 5. 8 mm MTU) 5. 8 mm MTU) 7. 9	22:53 22:57 Distance bets Time [min]:	Jra Instream of crossing) Location Upstream Crossing Downstream	Distance from crossing (m)		Time
IN SITU TURBI Meter Make a Location Upstream Crossing Dwnstrm FLOW ESTIMA: High Water Wi Wetted Channel	% sand/sit/ctaly (% gravel (2 - 64 min % cobble (64 - 256 m) % boulder (> 256 m) % bedrock IDITY READINGS (complet and Model: Distance from crossing (m)75275Idth (m):	e at least one measurement Turbidity (NTU) 5.8 4.4 4.9	22:53 27:55 27:57 Distance bett	Joanstream of crossing) Location Upstream Crossing Downstream ween points (m):	Distance from crossing (m) 9.7 m/s		Time

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	A	June 4, 2008

Field Crew:	Mach + N	lina		Date:	n 7/15	Time: 2.3 360	
LOCATION	Mach + N	4.0 8.4 Zor	me: /フレ		777	2-00	
Easting (m):	1.043	Northing (m): 7 1. 43 8 7		Elevation (from	n mapping):	Other notes:	
W MED.	ATHER: Wind:	Alr Temp: 0 2 2	Dendaltables	_ DV7	Cover (%):		
Recent Weath	er Events:	- 1		N	Cover (%): 6/8		
CONSTRUCTION	N Constru	ction Phase (circle one): Pre-	Construction	During Construct	don Post-Construction		
Type of Activit				Dorning Constitution	2 TOST-CONSULCTION		
	·	Equipment in (_
Data Construct							
a the crossing		crossing moving upstream or	downstream of	its original location?	How far? Which direction?)	_	_
SITE SKETCH.	/Om NOTES, REMARKS: (i.e. high w	vater table, high turbidity, natu	ral bank erosion	, water color, char o	observed in stream, algae in water	er, etc.)	
				,		,,	
· -CI	lear water chy bed	2					
~ (7)	they bed		•		¥2 = 21		
, 0	· / .	194				. 4	
					V4		
ubstrate Parti	icles % Areal Coverage	(est.) U.S.	75	Riperian Vocata	tion and Shading (describe):	X	
Substrate Parti	% saind/slit/clay (<	2mm)		Riparian Vegata	ntion and Shading (describe):		-
Substrate Parti		2mm) #55 m) 50 -	80	Riparian Vegata	4	<u>*</u>	
ubstrate Parti	% sand/sltt/clay (< % gravel (2 - 64 mr	2mm) 455 m) 50 mm) 225	80 -		4	. *	
V <i>SITU</i> TURBIE	% sänd/sik/clay (< % gravel (2 - 64 mr % cobble (64 - 256 m % boulder (> 256 n % bedrock DITY READINGS (complete)	2mm) 455 m) 50 mm) 225	80 20	NY	1 223	. =	Ť
V <i>SITU</i> TURBIS Aetar Maka ar	% sānd/sik/clay (< % gravel (2 - 64 mr % cobble (64 - 256 m % boulder (> 256 n % bedrock DITY READINGS (completed model)	2mm) 50 mm) 50 mm) 50 nm) 5	80 20	NY	1 223	. *	
N SITU TURBIS Matar Make er Location	% sänd/sik/clay (< % gravel (2 - 64 mr % cobble (64 - 256 m % boulder (> 256 n % bedrock DITY READINGS (complete)	2mm) 45 m) 50 mm) 42 nm) 5	80 20	NY	1 223	Turbidity (NTU)	Time
<i>N SITU</i> TURBIS Aatar Maka ar	% sand/skt/ctay (< % gravel (2 - 64 mr % cobble (64 - 256 % boulder (> 256 n % bedrock DITY READINGS (completed model: Distance from crossing (m)	2mm) ## 50 mm) ## 50 mm) ## 50 te at least one measurement u Turbidity	80 20	N /	Distance from	1 ' /	Time
N SITU TURBIS Meter Make er Location	% sand/sitr/ctay (< % gravel (2 - 64 mr % cobble (64 - 256 % boulder (> 256 n % bedrock DITY READINGS (complete and Model: Distance from	2mm) 35 mm) 45 mm) 5 te at least one measurement u	80 20	wnstream of crossin	Distance from	1 ' /	Time
V SITU TURBIS Reter Make er Location Spstream rossing	% sand/sitr/ctay (< % gravel (2 - 64 mr % cobble (64 - 256 % boulder (> 256 n % bedrock DITY READINGS (completed model: Distance from crossing (m)	2mm) 35 mm) 45 mm) 45 mm) 5 te at least one measurement u Turbidity (NTU) 6 7. 3	80 20	wnstream of crossin Location Upstream	Distance from	1 ' /	Time
N SITU TURBIE Mater Make er Location Jostream Crossing Dwnstrm	% sand/sitr/clay (< % gravel (2 - 64 mr % cobble (64 - 256 % boulder (> 256 n % bedrock DITY READINGS (complete and Model: Distance from crossing (m)	2mm) 35 mm) 45 mm) 5 te at least one measurement u	80 20	Winstream of crossin Location Upstream Crossing	Distance from	1 ' /	Time
N SITU TURBIE Aster Make er Location Jostream Crossing	% sand/sitr/clay (< % gravel (2 - 64 mr % cobble (64 - 256 % boulder (> 256 n % bedrock DITY READINGS (complete and Model: Distance from crossing (m)	2mm) 35 mm) 45 mm) 45 mm) 5 te at least one measurement u Turbidity (NTU) 6 7. 3	80 20	Winstream of crossin Location Upstream Crossing	Distance from	1 ' /	Time
N SITU TURBIE Mater Make at Location Location Jostream Crossing Dwnstrm	% sand/sitr/clay (< % gravel (2 - 64 mr % cobble (64 - 256 m) % boulder (> 256 m) % bedrock DITY READINGS (complete and Model: Distance from crossing (m)	Turbidity (NTU)	20 20 Instream and do	Winstream of crossin Location Upstream Crossing	Distance from	1 ' /	Time
N SITU TURBIE Aster Make ar Location Jostream Crossing Dwistrm LOW ESTIMATI	% sand/sitr/ctay (< % gravel (2 - 64 mr % cobble (64 - 256 % boulder (> 256 n % bedrock DITY READINGS (complet and Model: Distance from crossing (m) 76 Completed	Turbidity (NTU)	20 20 Ipstream and do Time Distance be	Upstream Crossing Downstream	Distance from	1 ' /	Time
N SITU TURBIE Aster Make ar Location Jpstream Crossing Dwnstrm LOW ESTIMATI igh Water Wik	% sand/sitr/clay (< % gravel (2 - 64 mr % cobble (64 - 256 % boulder (> 256 n % bedrock DITY READINGS (completed from crossing (m) 75 Es Location: dth (m):	Turbidity (NTU)	Distance be	Upstream Crossing Downstream	Distance from	1 ' /	Time
N SITU TURBIE Aster Make ar Location Jpstream Crossing Dwnstrm LOW ESTIMATI igh Water Wik	% sand/sitr/clay (< % gravel (2 - 64 mr % cobble (64 - 256 % boulder (> 256 n % bedrock DITY READINGS (completed from crossing (m) 75 Es Location: dth (m):	Turbidity (NTU)	Distance be	Upstream Crossing Downstream	Distance from crossing (m)	1 ' /	Time
V SITU TURBIE Reter Make er Location /pstream rossing winstrm LOW ESTIMATI igh Water Wik /etted Channe	% sand/sitr/clay (< % gravel (2 - 64 mr % cobble (64 - 256 % boulder (> 256 n % bedrock DITY READINGS (complet and Model: Distance from crossing (m) 75 ES Location : dth (m):	Turbidity (NTU)	Distance be Time (min):	Upstream Crossing Downstream	Distance from crossing (m)	1 ' /	Time
N SITU TURBIE Aster Make ar Location Jpstream Crossing Dwistrm LOW ESTIMATI igh Water Wik Jetted Channe	% sand/sitr/clay (< % gravel (2 - 64 mr % cobble (64 - 256 m) % boulder (> 256 m) % bedrock DITY READINGS (complete and Model: Distance from crossing (m) 75 ES Location: dth (m): st Width: 5 pa Depth: 0.2	Turbidity (NTU) 6 7.3 4.6	Distance be Time (min): Surface velo Average Ve	Upstream Crossing Downstream tween points (m):	Distance from crossing (m) O. S / S. Page Velocity) (V) =	1 ' /	Time
N SITU TURBIS Mater Make at Location Location Jostream Crossing Dwnstrm LOW ESTIMAT ligh Water Wike Vetted Channe pprox. Average ote (1) - depen	% sand/sitr/clay (< % gravel (2 - 64 mr % cobble (64 - 256 m) % boulder (> 256 m) % bedrock DITY READINGS (complete and Model: Distance from crossing (m) 75 ES Location: dth (m): st Width: 5 pa Depth: 0.2	2mm) Turbidity (NTU) 7.3 4.6	Distance be Time (min): Surface velo Average Ve	Upstream Crossing Downstream tween points (m):	Distance from crossing (m) O. S / S. Page Velocity) (V) =	1 ' /	Time

SECTION	OPERATIO	NAL ENVIRONMENT STA	NDARD	REVISION #	REVISION DATE
3.6	Turbidity N	Monitoring Data Form		Α	June 4, 2008
CROSSING ID:	Croz	8	· · · · · · · · · · · · · · · · · · ·		<u> </u>
Field Crew:	ach + N	lua	Date:	9, 2015	Time: 00 : 23
LOCATION	Datum:	4D \$3 Zone: /-	7 <i>は</i>	<u> </u>	
Easting (m):	·	Nerthing (m): 53120	Elevation (from)	mapping): 572	Other notes:
CURRENT WEATHER	920 W	Air Tomp: O'C Precipitati	ion: Cloud Co	nune (%):	/8
Recent Weather Eve	nts:	M Freshet			
CONSTRUCTION	Construc	tion Phase (circle one): Pre-Construction	on During Construction	Post-Construction	<u> </u>
Type of Activity:	 -	Equipment in Use:			.
Date Construction Bo	egan;				
	NA	crossing moving upstream or downstream		·	
SITE SKETCH, NOTES,	REMARKS: (i.e. high wa	eter table, high turbidity, natural bank en	osion, water color, char obs	erved in stream, algae in wate	r, etc.}
- fairly	. clear .ve	iter	-	51	
- veny 1.	Hle ersi	on (gravel /co b	blebed		.0ts
		,			**

Substrate Par	% Arani Coverage (a % sand/sht/clay (<2: % grave) (2 - 64 mm; % cobble (64 - 256 ms; % boulder (> 256 ms; % bedrock	mm) /5 80 mm) 5	80		ion and Shading (describe): /: Hiz grass		
IN SITU TURB		at least one measurement	upstream and dov	vostream of crossing	ð	12	
Location	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Time
Upstream	15	1-2	00.25	Upstream			_
Crossing	0	1.4	50 27	Crossing			
Dwnstrm	75	3. 8	00:29	Downstream			
FLOW ESTIMA	TES Location :	55m				<u> </u>	
High Water W			Distance bet	ween points (m):		4	
Wetted Chann	el Width: 3 m		Time (min):	_ /			
Approx. Averag	ge Depth: 0.5 m		Surface velo	eity estimate 7	m/s	w	
			Average Velo	ocity (0.8 ⁽¹⁾ x Surface	ce Velocity) (V) =		1 -
Note (1) - depe	nds on substrate composition: 0	8 for rough, loose rocks or	coarse gravel / 0.9	for smooth mud, sai	nd, or hard pan rock		
	ream, crossing, downstream) -1826	9					
NOTES:							

3.6	Turbidity	Monitoring Data	Form		A	June 4, 2008	3
COMPANIA AND							
CROSSING ID:	CV09	7					
Field Crew:	Mach s Deturn: N	hi.		Date:		Time:	
LOCATION	Datum:	10 x3	Zone:		28/15	1-00	
Easting (m):	37654"	Northing (m): 96.		Elevation (fe	Tom manologi:	Lou	
CURRENT WEAT	THER: Wind:	Air Temp: 8	Precipitation:		om mapping):	Other notes:	
Recent Weather	r Events: Dry	Freshet					
CONSTRUCTION		ction Phase (circle one): (Pre-Construction	During Constru	ection Post-Construction		
Type of Activity:	:	Equipment	in Use:				
Date Construction	on Began:						
is the crossing to	cation changing? (i.e. is the	crossing moving upstream	or downstream o	f its original location	7 How far? Which direction?)		
	nny	9 70 m 1	\checkmark				
- c lea	a Le	ater table, high turbidity, ni	itural bank erosio	n, water color, char	observed in stream, algae in water	r, etc.)	
_	- •						
no	erosion (roo	thy bed)					
<u> </u>		_					
Substrate Particle	% Areal Coverage (<2 % sand/slit/clay (<2	est.)	DS	Riparian Veget	tation and Shading (describe):		
	% gravel (2 - 64 mm % cobble (64 - 256 r	63	500	NU	A, novegeta	1	
	% boulder (> 256 m) % bedrock		⊈ ∍	14 /	7, 10 Viger	れかへ	
V SITU TURBIDIT		at least one measurement	upstream and do	wnstream of crossi	ng)		
Location	Distance from	Turbidity	T ====				
J _{pstream}	crossing (m)	(NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Time
1	100	6.1	1:05	Upstream			
rossing	0	44	1:08	Crossing			
Wnstrm	130	4.8	1-11	Downstream			- 1
OW ESTIMATES	Location :		1		<u> </u>		
gh Water Width	(m):	<u> </u>	-				
			Distance bet	tween points (m):			1175
etted Channel W	2.5	n	Time (min):	1	= - 321		al al heading
prox. Average D	epth: 0 4 v		Surface velo	city estimate:	0.5 m/s		E 19
			Average Velo	ocity (0.8 ⁽¹⁾ x Surf	sce Velocity) (V) =		203
te (1) - depends o	on substrate composition: 0.	8 for rough, loose rocks or c					
o 103: Inhattasui	3 D - 183	_					
TES:	103						1
							1

REVISION #

REVISION DATE

OPERATIONAL ENVIRONMENT STANDARD

SECTION

SECTION	OPERATIO	NAL ENVIRONME	NT STANDA	ARD	REVISION #	REVISION DAT	<u>t </u>
3.6	Turbidity M	lonitoring Data Fo	rm	-	A	June 4, 2008	
ROSSING ID:							
CRUSSING ID:	CIII						
Field Crew:	Markt a	Jina		Date: The	8th 7015	Time: 03:38	
OCATION	Datum: NAO	20	ne: 174	1		•	
	.39077°W	Northing (m): 71.69	071° N	Elevation (from	mapping): 4071	Other nates:	
URRENT WEATHER	: Wind:	Air Temp:	Precipitation:	Cloud C	over (%): 1/8		
lecent Weather Ever	nts: DC4	Freshet					
CONSTRUCTION	Construct	tion Phase (circle one): Pre	-Construction	During Construction	on Post-Construction		
Type of Activity:		Equipment in	Use:				
Data Construction Be	egan:						
ITE SKETCH, NOTES,	REMARKS: (i.e. high wa	ter table, high turbidity, hatu	ral bank erosion,	water color, char ob	Colocs to	r, etc.)	_
RESKETCH, NOTES,	REMARKS: (i.e. high wa ate 6/14/hd mairily	ment, Maly tertable, high turbidity, hatu yellow (vilour land)	Z Li ural bank erosion,	water color, char ob	Colus V- served in stream, algae in wate	r, etc.)	
SITE SKETCH, NOTES,	REMARKS: (i.e. high wa	ment, Maly ter table, high turbidity, hatu yallow (valous lad	The large transfer of	Tyc Yuw water color, char ob	Colus レ・ served in stream, algae in wate	r, etc.)	
, Wi	ate Slight mainly of	UIS SEL) - 406	n/S	: :	ion and Shading (describe):	r, etc.)	
ubstrate Particles	% Areal Coverage (e % sand/sitr/clay (<2: % gravel (2 - 64 mm) % cobble (64 - 256 mm % bedrock EADINGS (complete	UIS SEL) - 406	D15 50 p	Riparian Vegetat	ion and Shading (describe):	r, etc.)	
ubstrate Particles V SITU TURBIDITY Ri Reter Make and Mod	% Areal Coverage (e % sand/sitr/clay (<2: % gravel (2 - 64 mm) % cobble (64 - 256 mm % bedrock EADINGS (complete	UIS SEL) - 356 406 70 - 70 - 256 70 - 70 - 70 - 70 - 70 - 70 - 70 -	D15 50 p	Riparian Vegetat	ion and Shading (describe):	Turbidity (NTU)	Tle
W SITU TURBIDITY RI Reter Make and Mod	% Areal Coverage (e % sand/slit/clay (<2r % gravel (2 - 64 mm) % cobble (64 - 256 mr % boulder (> 256 mr % bedrock EADINGS (complete del:	at least one measurement of Turbidity (NTU)	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Riparian Vegetat	ion and Shading (describe):	Turbidity	Tle
N SITU TURBIDITY REMAINS Make and Module Location D	% Areal Coverage (e % sand/slit/clay (<2: % gravel (2 - 64 mm) % cobble (64 - 256 mm) % boulder (> 256 mm) % bedrock EADINGS (complete lef: istance from crossing (m)	at least one measurement of Turbidity (NTU)	5 5 5 6 5 6 1 5 6	Riparian Vegetat	ion and Shading (describe):	Turbidity	Tle
W SITU TURBIDITY REALER Make and Mod	% Areal Coverage (e % sand/slit/clay (<2r % gravel (2 - 64 mm) % cobble (64 - 256 mr % boulder (> 256 mr % bedrock EADINGS (complete del: sistance from crossing (m)	at least one measurement of Turbidity (NTU)	5 5 5 6 5 6 1 5 6	Riparian Vegetat Instream of crossing Location Upstream	ion and Shading (describe):	Turbidity	Tle

FLOW ESTIMATES Location :	
High Water Width (m):	Distance between points (m):
Wetted Channel Width: ZM	Time (min): /
Approx. Average Depth:	Surface velocity estimate: ~ 0,25m/s
	Average Velocity (0.8 (1) x Surface Velocity) (V) =
Note (1) - depends on substrate composition: 0.8 for rough, los	ose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock
PHOTOS: (upstream, crossing, downstream)	ココ ・インガ パンフ

1833 1834, 1832

NOTES:

SECTIO	N OPERATI	ONAL ENVIRONM	ENT STAND	DARD	REVISION #	REVISION D	ΔTF
3.6	Turbidity	Monitoring Data F	orm		A	June 4, 2008	
	8						
CROSSING ID	BG50	7					
Field Crew:	Muck + Datum: NA	Nina		Date:	e 8 2015	Time: 4: 36	
LOCATION	Datum: NA	0 83	tone: 17				
Easting (m):	\$0,17438	Northing [m]: H . 11 Ll	1140	Elevation (from	0141	Other notes:	
Recent Weath	-	-2	Precipitation:	JIC Cloud	Cover (%): 1/2		92E
CONSTRUCTION	Viy.	Trusht. ruction Phase (circle one): Pi	to Construction	Double State of			
Type of Activit	17.	Equipment in		During Constructi	on Post-Construction		
Date Construct	1	equipment ii					
		re crossing moving upstream of	or downstream of	its original location?	How far? Which direction?)		
	1)/5 by 10	m					
SITE SKETCH, I	NOTES, REMARKS: (i.e. high	water table, high turbidity, na	tural bank erosion	, water color, char ol	served in stream, algae in water	r, etc.)	
					7		
		S 35			CEDE	7/1/2	
					CEVE		
						-	
وبراء و	<u> </u>	- US+ OS			- 6		
Substrate Parti	des % Areal Coverage % sand/slit/clay (-	(est.)		Riperian Vegetat	ion and Shading (describe):		
	% gravel (2 - 64 m % cobble (64 - 256						
	% boulder (> 256 : % bedrock	mm) 700					
IN SITU TURBID Meter Make an		te at least one measurement	upstream and do	winstream of crossing)		
Location	Distance from	Turbidity	Time	Location	Distance from	Turbidity	Time
Upstream	crossing (m)	(NTU)			crossing (m)	(NTU)	THING
-				Upstream			2.57
Crossing				Crossing			27.00
Dwnstrm	N/A	No Flau		Downstream		-	1602.7
LOW ESTIMATE			+	<u> </u>			44.1
ligh Water Wid	th (m):	_	Distance her	tween points (m):			-
Vetted Channel	1831.462.			<u> </u>			
vertee Charapet	walchi:		Time (min):	/	7 -00	100	
pprox. Average	Depth:		Surface velo	city estimate:			32/17
		·	Average Vel	ocity (0.8 ⁽¹⁾ x Surfac	■ Velocity) (V) =		-
ote (1) - depend	is on substrate composition:	0.8 for rough, loose rocks or r	1			15T_st	
HOTOS: (upstre	am, crossing, downstream)	1835, 18			- F-11 veen	14.5	100
IOTES:		10721 (1)	<u>ر</u> , ا				

			ENT STAND	AND	REVISION #	REVISION DATE
3.6	Turbidity	Monitoring Data F	orm		Α	June 4, 2008
CROSSING ID	CUZZS				<u> </u>	
Field Crew:		<u> </u>		Date:		Time:
LOCATION	Nince + 1			Jun	e 8 Zas	Zi: 39
asting (m):	<u>NAI</u>	87	tone: 17			
	79,343595	Northing (m): 71,	33Zo5°	Elevation (from	mapping): 57/1	Other notes:
lecent Weath	er Events:	4			/4	
ONSTRUCTIO	N Consti	ruction Phase (circle one): Pr	re-Construction	During Construction	on Post-Construction	- 0
ype of Activit		Equipment Is			osi-consudence	
ate Construc	tion Began;					
the crossing	location changing? (i.e. is the	ne crossing moving upstream o	or downstream of l	its original location?	Constant deliber Cart week	
		n ~ 100m		and the state of t	ow last winch offections)	
TE SKETCH, I	NOTES, REMARKS: (I.e. high	water table, high turbidity, na	tural bank erosion,	, water color, char of	served in stream, algae in water	r, etc.)
o (la	y waks	only Nation	ul eras	ion Ac	vs.ble torb	11. A.
					9	
					3.	
: 8	7	US = 0)/S.	ki .	:	
ibstrate Parti	cles % Areal Coverage % sand/sit/clay ((est.) <2mm) ZO 25	•	Riparian Vegetat	ion and Shading (describe):	
ibstrata Parti		(est.) <2mm) 20 25 um) 10 25		Riparian Vegetat	ion and Shading (describe):	
ibstrata Parti	% sand/silt/clay (% gravel {2 - 64 m	(est.) <2mm)		Riparian Vegetat	ion and Shading (describe):	
	% sand/sit/clay (% gravel {2 - 64 m % cobble (64 - 256 % boulder (> 256 % bedruck OTY READINGS {comple	(est.) <2mm)				
SITU TURBIC eter Make an	% sand/sit/clay (% gravel {2 - 64 m % cobble (64 - 256 % boulder (> 256 % bedruck OTY READINGS {comple	(est.) cZmm) ZO ZS im) 10 ZS imm) 70 SO mm) rte st least one measurement	upstream and dov	wnstream of crossing		
SITU TÜRBIC ster Make un ocation	% sand/sit/clay (% gravel {2 - 64 m % cobble (64 - 25: % boulder (> 256 % bedrock OFFY READINGS {completed Model:	(est.) (2mm) ZO				Turbidity {NTU}
SITU TÜRBIC eter Make en ocation	% sand/sit/clay (% gravel {2 - 64 m % cobble (64 - 254 % boulder (> 256 % bedrock OTY READINGS {completed Model: Distance from	(est.) cZmm) ZO ZS smm) 10 ZS smm) 70 SO mm) tte at least one measurement	upstream and dov	wnstream of crossing	Distance from	
SITU TURBIC eter Make un	% sand/sit/clay (% gravel {2 - 64 m % cobble (64 - 256 % boulder (> 256 % bedrock OTY READINGS {completed for the complete for the complete for the costing {m}	(est.) cZmm) ZO ZS smm) 10 ZS smm) 70 SO mm) tte at least one measurement Turbidity (NTU)	upstream and dov	wnstream of crossing	Distance from	
SITU TURBIC eter Make an acation stream	% sand/sit/clay (% gravel {2 - 64 m % cobble (64 - 256 % boulder (> 256 % bedrock OTY READINGS (completed Model: Distance from crossing (m)	(est.) c2mm) ZO ZS mm) 10 ZS mm) 70 SO mm) tte at least one measurement Turbidity (NTU) ZS. 8	upstream and dov	Location Upstream	Distance from	
situ TURBIC eter Make en ocation ostream ossing vnstrm	% sand/sit/clay (% gravel {2 - 64 m % cobble (64 - 256 % boulder (> 256 % bedrock OTY READINGS {comple and Model: Distance from crossing {m}	(est.) c2mm) ZO ZS smm) 10 ZS smm) 70 SO mmn) tte at least one measurement Turbidity (NTU) Z3.8	upstream and dov	Location Upstream Crossing	Distance from	
	% sand/sit/clay (% gravel {2 - 64 m % cobble (64 - 256 % boulder (> 256 % bedrock OTY READINGS (completed Model: Distance from crossing (m)	(est.) c2mm) ZO ZS smm) 10 ZS smm) 70 SO mmn) tte at least one measurement Turbidity (NTU) Z3.8	upstream and do	Location Upstream Crossing	Distance from	
situ TURBIC eter Make en .ocation ostream ossing vnstrm OW ESTIMATI	% sand/sit/clay (% gravel {2 - 64 m % cobble (64 - 256 % boulder (> 256 % bedrock OTY READINGS {completed from crossing {m}} SO C SO C	(est.) (2mm) ZO ZS (mm) 10 ZS (mm) 70 SO (mm) tte at least one measurement Turbidity (NTU) ZS. 8 ZO10 Z2.3	upstream and do	Location Upstream Crossing Downstream	Distance from	
stru TURBIC eter Make en .ocation ostream ossing vnstrm DW ESTIMATI	% sand/sit/clay (% gravel {2 - 64 m % cobble (64 - 256 % boulder (> 256 % bedrock OTY READINGS {completed from crossing {m}} SO C SO C	(est.) (2mm) ZO ZS (mm) 10 ZS (mm) 70 SO (mm) tte at least one measurement Turbidity (NTU) ZS. 8 ZO10 Z2.3	upstream and do	Location Upstream Crossing Downstream	Distance from crossing (m)	
stru TURBIC ster Make en ocation istream ossing vnstrm W ESTIMATI	% sand/sit/clay (% gravel {2 - 64 m % cobble (64 - 256 % boulder (> 256 % bedrock OTY READINGS {completed from crossing {m}} SO C SO C	(est.) c2mm) ZO ZS smm) 10 ZS smm) 70 SO mmn) tte at least one measurement Turbidity (NTU) Z3.8	Distance bet Time (min):	Location Upstream Crossing Downstream ween points (m):	Distance from crossing (m)	
stru TURBIC eter Make en Location stream ossing vnstrm DW ESTIMATI th Water Wid etted Chennel	% sand/sit/clay (% gravel {2 - 64 m % cobble (64 - 256 % boulder (> 256 % bedrock OTY READINGS {comple and Model: Distance from crossing {m} SO SO ES Location : Ith {m}: Under (**) O (**) ** ** ** ** ** ** ** ** **	(est.) (2mm) ZO ZS (est.) (2mm) 10 ZS (est.) (est.) (est.) (2mm) 20 ZS (est.) (Distance bet Time Distance bet Time [min]: Surface velo	Location Upstream Crossing Downstream ween points (m):	Distance from crossing (m) O. S. M/S. Distance from crossing (m)	
SITU TURBIC eter Make en ocation ostream ossing vnstrm DW ESTIMATI th Water Wid etted Channel	% sand/sit/clay (% gravel {2 - 64 m % cobble (64 - 256 % boulder (> 256 % bedrock OTY READINGS {comple and Model: Distance from crossing {m} SO SO ES Location : Ith {m}: Under (**) O (**) ** ** ** ** ** ** ** ** **	(est.) (2mm) ZO ZS (m) 10 ZS (mm) 70 SO (mm)	Distance bet Time Distance bet Time [min]: Surface velo	Location Upstream Crossing Downstream ween points (m):	Distance from crossing (m) O. S. M/S. Distance from crossing (m)	

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	Α	June 4, 2008

CROSSING I	D:						
	CUZIS						
Field Crew:	Muck + N	inn		Date: 1	In 8 7015	Time: 27!00	-
LOCATION	Datum: NAO	₹⊃. Zone	" <i>17</i>		0 7015	22:00	<u> </u>
Easting (m):	79 L13021 5	Northing (m): 7/ 2:	2851	Elevation (fro	om mapping):	Other notes:	
CURRENT W	EATHER: Wind:		Precipitation:	Cloud	Cover (X):		
Recent Wea	ther Events: P(y	No It			79		
CONSTRUCTI		tion Phase (circle one): Pre-C	onstruction	During Construc	ction Post-Construction		
Type of Acti	vity:	Equipment In Us	Ie:				
Date Constru	action Began:		<u> </u>			<u> </u>	
la the crossin	g location changing? (i.e. is the	crossing moving upstream or do	ownstream of its	s original location	? How far? Which direction?)	<u> </u>	
	O m						
SITE SKETCH,	, NOTES, REMARKS: (i.e. high wa	ter table, high turbidity, natura	bank erosion,	water color, char	observed in stream, algae in wat	er, etc.)	
· A	The receip	asmes ~	- [10r	1 X 5 M	on both	5, 82,	
e N.	or Flow throw	who colvert	Unac	bridge			
. 10	, , , , , , , , , , , , , , , , , , , ,	1.1 001		<i>5</i> - 7			
		UKS					
Substrate Pa		· · · · · ·	.~	Riperian Veget	tation and Shading (describe):		
	% sand/silt/clay (<2r % gravel (2 - 64 mm)		小二	que	5		
	% cobble (64 - 256 m % boulder (> 256 mm						
IN SITH THE	% bedrock BIDITY READINGS (complete	at feast one measurement up)			
Meter Make		with the state of	SUCESIII BIIG GOW	Instream of Crossi	ngj		-
Location	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Time
Upstream	60	x162.3 8		Upstream			
Crossing		Unsucc		Crossing			- 3
Dwnstrm			į.	Downstream			100
FLOW ESTIMA	ITES Location :						77
High Water W	/idth (m);		Distance betw	veen points (m):			10
101 1							
Wetted Chann	iel Width: 30m		Time (min):	/			1 - 1 - 1
Approx. Avera	ige Depth: Z5C/r	1	Surface veloci	ity estimate:	0.32 m/s.	19 0	9
			Average Velo	city (0.8 ⁽¹⁾ x Sur	face Velocity) (V) =		
	ends on substrate composition: 0	B for rough, loose rocks or coa	rse gravel / 0.9	for smooth mud, :	sand, or hard pan rock		
PHOTOS: (ups	tream, crossing, downstream)					<u> </u>	
NOTES:							

							_
_3.6	Turbidity N	Monitoring Data Fo	rm		A	June 4, 2008	
						· · · · · · · · · · · · · · · · · · ·	
CROSSING ID							
	136704						
Field Crew:	Muck + N	Nan		Date:	- 0 2	Time:	
LOCATION			na:		June 8 7015	72:22	
	Datum: NAP		17		<u> </u>	rc	
Easting (m):	79.6962	Northing (m): 71.3	346	Elevation (from	m mapping): 58 t	Other notes:	
CURRENT WE	ATHER: Wind:	Air Temp:	Precipitation:	Cloud	Cover (%): 2/2		
Recent West	her Events:	melt			/3		
CONSTRUCTIO		tion Phase (circle one): Pre-	-Construction	During Construct	tion Post-Construction		
The of Activi					TON CONTRACTOR	<u> </u>	
Type of Activi		Equipment in (Use:				
Date Constru	tion Began:				· · · · · · · · · · · · · · · · · · ·		
Is the crossing	location changing? (i.e. is the	crossing moving upstream or	downstream of	Its original location?	How far? Which direction?)		_
		a culvest					
					observed in stream, algae in wate	r, etc.)	
- 4	ews ~ 50	mx 5m asn	nau	105 C105	.,00		
10	do do						
o illi	005 0/5	•					
	ce is deal	no U.S	ible	Solid	Σ.		
· Mul							
e (wat							
		US P		Riperium Veceb	ation and Shading (describe)		
	ticles % Areal Coverage (% sand/sitt/clay (<2	est') r/O 20	<u>.</u>		ation and Shading (describe):		
	ticles % Areal Coverage (est.) (mm) 4/0 50	3	Riparian Veget	ation and Shading (describe):		
	% Areal Coverage (% sand/sitt/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m	est.) (mm) 40 50 1) 30 20 mm) 30 20	3		ation and Shading (describe):	•	_
Substrate Pari	% Areal Coverage (% sand/sitt/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock	est.) (mm) 40 50 mm) 30 20 mm) 30 30	5	d ass		•	
Substrate Pari	% Areal Coverage { % sand/sitt/clay { % sand/sitt/clay { 2 % gravel {2 - 64 mm % cobble {64 - 256 m} % boulder {> 256 m} % bedrock DITY READINGS {complete	est.) (mm) 40 50 1) 30 20 mm) 30 20	5	d ass		-	
Substrate Pari	% Areal Coverage (c) % sand/sit/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from	est.) (mm) 40 50 (mm) 30 30	5	d ass		Turbidity	Tim
Substrate Peri IN SITU TURBI Meter Make a Location	% Areal Coverage (c) % sand/slt/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model:	est.) (mm) 4/0 5t mm) 30 70 mm) 30 70 mm) 30 70 Turbidity (NTU)	pstream and do	g acc SS	ng)	Turbidity (NTU)	Tlm
Substrate Peri IN SITU TURBI Meter Make a	% Areal Coverage (% sand/sitt/clay (< % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m)	est.) (mm) 40 50 (mm) 30 30	pstream and do	wnstream of crossin	Distance from	L. '	Tler
Substrate Parl IN SITU TURBI Meter Make a Location Upstream	% Areal Coverage (% sand/sltt/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m)	est.) (mm) 46 56 (mm) 30 76 (mm)	pstream and do	g acc SS	Distance from	L. '	Tleri
Substrate Parl IN SITU TURBI Meter Make a Location Upstream Crossing	% Areal Coverage (% sand/sitt/clay (< % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m)	est.) (mm) 46 56 (mm) 30 30 (mm) 30 (mm) 30 30 (mm)	pstream and do	winstream of crossin Location Upstream Crossing	Distance from	L. '	The
Substrate Peri IN SITU TURBI Meter Make a Location	% Areal Coverage (% sand/sltt/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m)	est.) (mm) 46 56 (mm) 30 76 (mm)	pstream and do	wnstream of crossin	Distance from	L. '	Tler
Substrate Part IN SITU TURBI Meter Make a Location Upstream Crossing	% Areal Coverage (% sand/sit/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m)	est.) (mm) 46 56 (mm) 30 30 (mm) 30 (mm) 30 30 (mm)	pstream and do	winstream of crossin Location Upstream Crossing	Distance from	L. '	Tler
Substrate Part IN SITU TURBI Meter Make a Location Upstream Crossing Dwnstrm	% Areal Coverage (% sand/sity/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m) 70 50	est.) (mm) 46 56 (mm) 30 30 (mm) 30 (mm) 30 30 (mm)	pstream and do	winstream of crossin Location Upstream Crossing	Distance from	L. '	The
Substrate Part IN SITU TURBI Meter Make a Location Upstream Crossing Dwnstrm	% Areal Coverage (% sand/sity/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m) 70 50	est.) (mm) 46 56 (mm) 30 30 (mm) 30 (mm) 30 30 (mm)	pstream and do	winstream of crossin Location Upstream Crossing	Distance from	L. '	Tler
Substrata Pari IN SITU TURBI Meter Make a Location Upstream Crossing Dwnstrm FLOW ESTIMAT	% Areal Coverage (% sand/silt/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m) 70 50 50 TES Location ;	est.) (mm) 46 56 (mm) 30 30 (mm) 30 (mm) 30 30 (mm)	pstream and do	wnstream of crossin Location Upstream Crossing Downstream	Distance from	L. '	Tler
Substrate Part IN SITU TURBI Meter Make a Location Upstream Crossing Dwnstrm FLOW ESTIMAT	% Areal Coverage (% sand/sit/ctow % sand/sit/ctow % sand/sit/ctow % gravel (2 - 64 mm % cobble (64 - 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m) 70 50 ES Location :	est.) (mm) 46 56 (mm) 30 30 (mm) 30 (mm) 30 30 (mm)	pstream and do	wnstream of crossin Location Upstream Crossing Downstream	Distance from	L. '	Tim
Substrate Part IN SITU TURBI Meter Make a Location Upstream Crossing Dwnstrm FLOW ESTIMAT	% Areal Coverage (% sand/sit/ctow % sand/sit/ctow % sand/sit/ctow % gravel (2 - 64 mm % cobble (64 - 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m) 70 50 ES Location :	sest.) (mm) 46 56 (mm) 30 76 (mm) 40 76	pstream and do Time Distance be	wnstream of crossin Location Upstream Crossing Downstream	Distance from crossing (m)	L. '	Tim
Substrate Part IN SITU TURBI Meter Make a Location Upstream Crossing Dwnstrm FLOW ESTIMAT	% Areal Coverage (% sand/silty/clay (< % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m) 70 50 TES Location :	sest.) (mm) 46 56 (mm) 30 76 (mm) 40 76	pstream and do Time Distance bet Time (min):	wnstream of crossin Location Upstream Crossing Downstream	Distance from crossing (m) 0.56m/s	L. '	Tler
Substrate Part IN SITU TURBI Meter Make a Location Upstream Crossing Dwnstrm FLOW ESTIMAT High Water Will Approx. Average	icles % Areal Coverage (% sand/sity/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m) 70 50 50 ES Location : dth (m): a Depth: 30c m	est.) (mm) 46 56 (mm) 30 30 (mm) 4 4 (mm) 4 4 (mm) 4 4 (mm) 5 4 (mm) 7 (mm) 7 (mm) 8 7 (mm) 9 7 (mm)	pstream and do Time Distance bei Time (min): Surface velo Average Vel	winstream of crossin Location Upstream Crossing Downstream tween points (m): / / / / / / / / / / / / /	Distance from crossing (m) 0:56m/s	L. '	Tler
Substrate Pari	% Areal Coverage (% sand/silty/lay % sand/silty/lay % gravel (2 - 64 mm % cobble (64 - 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m) 70 50 50 TES Location : dth (m): al Width: 5m 30c m	est.) (mm) 40 56 (mm) 30 70 mm) 30 70 at least one measurement u Turbidity (NTU) S7.4 72.2 18,7	pstream and do Time Distance bei Time (min): Surface velo average Vel	wnstream of crossin Location Upstream Crossing Downstream tween points (m): / city estimate: ocity (0.8 (1) x Surf. of or smooth mud, s	Distance from crossing (m) O . 56 m/s aca Valocity) (V) =	L. '	Tini
Substrate Pari	icles % Areal Coverage (% sand/sity/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m) 70 50 50 ES Location : dth (m): a Depth: 30c m	est.) (mm) 40 56 (mm) 30 70 mm) 30 70 at least one measurement u Turbidity (NTU) S7.4 72.2 18,7	pstream and do Time Distance bei Time (min): Surface velo average Vel	winstream of crossin Location Upstream Crossing Downstream tween points (m): / / / / / / / / / / / / /	Distance from crossing (m) O . 56 m/s aca Valocity) (V) =	L. '	Tin

REVISION DATE

REVISION#

OPERATIONAL ENVIRONMENT STANDARD

SECTION

7.6	OI ERATIC	MAL LIVER ON THE	NT STAND	ARD	REVISION #	REVISION DA	TE
3.6	Turbidity (Monitoring Data Fo	orm		Α	June 4, 2008	
CROSSING ID:							
CROSSING ID:	BG17.					and the state of t	
Field Crew:	Mock + N:	/la		Date:	0 70-	Time:	
LOCATION		087 20	one: 17		ne 8 2015	22:45	
Easting (m): 79	.57890 N	Northing (ml+	35559 N	Elevation (fro	m mapping):	Other notes:	
CURRENT WEATHE		Air Temp: Z	Precipitation:	Cloud	Cover (%): Z/2		
Recent Weather Ev	ents:						
CONSTRUCTION	Constru	ction Phase (circle one): Pr	e-Construction	During Construc	tion Post-Construction		
Type of Activity:		Equipment in	Use:				
Data Construction E							
is the crossing locati	on changing? (i.e. is the	crossing moving upstream of	r downstream of	its original location?	How far? Which direction?)		
SITE SKETCH, NOTES				, water color, char o	observed in stream, algae in wat	er, etc.)	_
					16sn Bu	107000	
	· Well	armared o	(bry)	וחשוני	MIN DA	ik or	
	" waks	s basn	to.b.D	1 colone	Pou	> r town	m
			int -	- 6.1	be essent he	ess aman	
	اه ۱۵۵۶ ه	n appers nei	bul, 5	ome but	k wosion he	ens arman	n.
	ام (۲۵۶ ه			ome bal	k wosibn he	es alman	n.
iubstrata Particles	a CCOS (O)	(est.)	os		k esosion ne ne stion and Shading (describe):	es alman	n.
substrata Particles	% Areal Coverage (% sand/slt/clay (<:	(est.)	os	Riperian Vegetz	ation and Shading (describe):	ens arman	n.
Substrata Particles	% Areal Coverage % sand/slit/clay (< % gravel (2 - 64 mm % cobbie (64 - 256	(est.) 2mm) 70 mm) (0	os	Riperian Vegetz	ation and Shading (describe):	es a man	n.
iubstratn Particles	% Areal Coverage (% sand/sllt/clay (<: % gravel (2 + 64 mn	(est.) 2mm) 70 mm) (0		Riperian Vegetz	A con-tion	es arman	n.
Substrata Particles N SITU TURBIDITY R	% Areal Coverage (% sand/slit/clay (<: % gravel (2 + 64 mm % cobble (64 + 256 m % boulder (> 256 m % bedrock READINGS (complet	(est.) 2mm) 70 mm) (0	DS So	Riperian Veget	ation and Shading (describe):	eds arman	n.
V <i>STU</i> TURBIDITY R Reter Make and Mo	% Areal Coverage (% sand/slit/clay (<: % gravel (2 - 64 mm % colable (64 - 256 m % boulder (> 256 m % bedrock (complet idel:	(est.) 2mm) 70 n) 70 mm) (o	Upstream and do	Riperian Vegeta	ation and Shading (describe):	es as man	n.
V <i>STTU</i> TURBIDITY R Reter Make and Mo Location	% Areal Coverage (% sand/slit/clay (<: % gravel (2 + 64 mm % cobble (64 + 256 m % boulder (> 256 m % bedrock READINGS (complet	(est.) 2mm) 70 mm) 70 mm) (o	DS So	Riperian Veget	ation and Shading (describe):	Turbidity (NTU)	γ· .
V STTU TURBIDITY R Reter Make and Mo Location	% Areal Coverage (% sand/slit/clay (<) % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock READINGS (complet side): Distance from	(est.) 2mm) 70 mm) 70 mm) (o e at least one measurement	Upstream and do	Riperian Vegeta	ation and Shading (describe):	Turbidity	
V SITU TURBIDITY Reter Make and Mo Location I	% Areal Coverage (% sand/sitt/clay (<) % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock ** **EADINGS (complet odel: **Distance from crossing (m)	(est.) 2mm) 70 mm) 70 mm) (o am) e at least one measurement Turbidity (NTU) 22.2	Upstream and do	Riperton Vegets Westream of crossin	ation and Shading (describe):	Turbidity	
V SITU TURBIDITY Reter Make and Mo Location I pstream rossing	% Areal Coverage (% sand/sitt/clay (<) % gravel (2 - 64 mm % cobbin (64 - 256 m % boulder (> 256 m % bedrock ** **EADINGS (complet odel: **Distance from crossing (m)	(est.) 2mm) 70 mm) 70 mm) 10 e at least one measurement Turbidity (NTU) 22.2 50.1	Upstream and do	Riperton Vegets wnstream of crossin Location Upstream	ation and Shading (describe):	Turbidity	
V SITU TURBIDITY R Acter Make and Mo Location I I Ipstream rossing	% Areal Coverage (% sand/sitt/clay (<) % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock ** **EADINGS (complet odel: **Distance from crossing (m)	(est.) 2mm) 70 mm) 70 mm) (o am) e at least one measurement Turbidity (NTU) 22.2	Upstream and do	Riperion Vegets Westream of crossin Location Upstream Crossing	ation and Shading (describe):	Turbidity	
V SITU TURBIDITY Refer Make and Mo Location I pstream rossing wnstrm	% Areal Coverage (% sand/sltt/clay (<: % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock READINGS (complet del: Distance from crossing (m) CO Location :	(est.) 2mm) 70 mm) 70 mm) 10 e at least one measurement Turbidity (NTU) 22.2 50.1	upstream and do	Riperion Vegets Westream of crossin Location Upstream Crossing Downstream	ation and Shading (describe):	Turbidity	
V STU TURBIDITY Reter Make and Mo Location I pstream rossing wnstrm	% Areal Coverage (% sand/sltt/clay (<: % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock READINGS (complet del: Distance from crossing (m) CO Location :	(est.) 2mm) 70 mm) 70 mm) 10 e at least one measurement Turbidity (NTU) 22.2 50.1	upstream and do	Riperion Vegets Westream of crossin Location Upstream Crossing	ation and Shading (describe):	Turbidity	

Note (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock PHOTOS: (upstream, crossing, downstream)

0 15m

1841 1842 1843

Surface velocity estimate:

Average Velocity (0.8 (1) x Surface Velocity) (V) =

0.35m/s.

NOTES:

Approx. Average Depth:

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	Α	June 4, 2008

CROSSING I							
CRUSSING II	36,29						
Field Craw:	Much +	a)tra		Date:	ne 8 7015	Time: 23 ! 70	
LOCATION	Datum: AO 8		· 17		2 8 7013	23.00	
Easting (m):	79. 90787	Northing (m)21 33	-6371	Elevation (from	n mapping): <2 < 7	Other notes:	
CURRENT W	ATHER: Wind:	Air Temp:	Precipitation:	Cloud	Cover (%): 901		
Recent Wear	her Events: Day	, melt					
CONSTRUCTION	ON Construc	tion Phase (circle one): Pre-C	onstruction	During Construct	on Past-Construction		
Type of Activ	ity:	Equipment In U	ie:				1979
Date Constru	ction Began:						
is the crossin	location changing? (i.e. is the		ownstream of	its original location?	How far? Which direction?)		
PITT PUPTON		colver?					
			H Dank erosion	, water color, char o	bserved in stream, algae in water	r, etc.)	
0 V	saler Slightle	totals of Ay	C	~(+)	25 xZ ou both six	ne /	
* 10	ري المر وا	الم		News	/ 1: -sk	~Q	
					both Siv	· · · · · · · · · · · · · · · · · · ·	
		1.					
		U/S/0	/ S.				_ 20 2
Substrate Par	ticles % Areal Coverage (- % sand/silt/clay (<2	est.) (mm) 70			tion and Shading (describe):		
	% gravel (2 - 64 mm % cobble (64 - 256)	mm) 70		q rus	S,		
	% boulder (> 256 m			U			
IN SITU TURB	% bedrock IDITY READINGS (complete	at least one measurement up	stream and do	wnstream of crossin	gl		-
Meter Make	and Model:			4 200			
Location	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Time
Upstream	60	3年 297		Upstream			
Crossing	0	23.9		Crossing			
Dwnstrm	70	7577 31.1		Downstream			
FLOW ESTIMA		177 3.11					
High Water W	Sidth (m)		Distance Au				
			Distance De	tween points (m):			
Wetted Chann	el Width: 1.5m		Time (min):	/			-0,
Approx. Avera	ge Depth: 1.0m	3	Surface velo	city estimate:	0,85 m/s.		- 1
	4		Average Vel	ocity (0.8 ⁽¹⁾ x Surf			
Note (1) - depr	ends on substrate composition:	0.8 for rough, loose racks or co	irse gravel / 0.5	for smooth mud, s	and, or hard pan rock		
PHOTOS: (upsi	ream, crossing, downstream)	way buck		200			
NOTES:						-	

2.6	UPERATION	NAL ENVIRONMEN	AL STAIND	AKD	REVISION #	REVISION DA	TE
3.6	Turbidity M	onitoring Data Fo	rm		_A	June 4, 2008	
CROSSING ID:	CUZ17			5-1/2		<u> </u>	
	lock + N			Date: June	8 5015	73:30	
LOCATION	Datum: NAO	Sil-	17				
Easting (m): \mathcal{H} .	81330W	Northing (m): 71.34	848 N	Elevation (from	mapping): 504'	Other notes:	
CURRENT WEATHER:	Wind:	Air Temp: ZC	Precipitation:	Cloud Co			
Recent Weather Even	ts: Diy,	mest.			0.		
CONSTRUCTION		ion Phase (dirde one): Pre-	Construction	During Construction	Post-Construction		
Type of Activity:		Equipment in I	Use:				
Date Construction Be	Zeu:					- 10	
is the crossing location		rossing moving upstream or			ow far? Which direction?)	-	
-		clikest, n			served in stream, algae in wate		
0		US DS. st.) nm) 95 95		va, just	on and Shading (describe):	No F	
I SITU TURBIDITY REA	% boulder (> 256 mm % bedrock ADINGS (complete	at least one measurement u	pstream and do	wnstream of crossing)			
Neter Make and Mode				pr			
	ressing (m)	Turbidity (NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Tim
lpstream (٥٥	21.1		Upstream			
rossing	2	60.0		Crossing			-
wnstrm	100	15.3		Downstream			
	Location :	15.3.	- 64	Downstream			
LOW ESTIMATES	Location :	15:3-	Distance bet	Downstream			
LOW ESTIMATES	Location :	15.3	Distance bet				
LOW ESTIMATES ligh Water Width (m): Vetted Channel Width ppprox. Average Depth	Location :		Time (min):	ween points (m): / city estimate:	8		
LOW ESTIMATES ligh Water Width (m):	Location :		Time (min):	ween points (m):	e Velocity) (V) =		
LOW ESTIMATES igh Water Width (m): /etted Channel Width pprox. Average Depth	Location : Sm I Scm		Time (min): Surface velo Average Velo	ween points (m): / city estimate: pocity (0.8 ⁽¹⁾ x Surfac			

SECTIO	ON OPERATION	NAL ENVIRONMEN	IT STAND	ARD	REVISION #	REVISION DAT	E
3.6	Turbidity N	lonitoring Data Fo	rm		Α	June 4, 2008	
CROSSING II	3632						
Field Crew:	Muck + No	n		Date: Jun	e \$ 2015	Time: 00.01	
LOCATION	Datum: NAO	Y7 Zor	e:17				
Easting (m):	79.956661° W	Northing [m]:	290° N	Elevation (from	mapping): 4911	Other notes:	
CURRENT WI	EATHER: Wind:	Air Temp: Z C	Precipitation:	Cloud C	over (%):		
Recent West	ther Events: Day	melt.					
CONSTRUCTION	ON Construc	tion Phase (circle one): Pre-	Construction	During Construction	n Post-Construction	None	
Type of Activ	vity:	Equipment in C	lse:				. ~
	uction Began:						
	g location changing? (i.e. is the						
SITE SKETCH,	High Sca., NOTES, REMARKS: (i.e. high wa	ter table, high turbidity, natur	al bank erosion	, water color, char ob	served in stream, algae in water	etc.)	
, <	sind, bink w	I melt 6	las	monibrie	LITU.	,,	
. 1	1	1 6	the co	res (
° 11	remail ~ 40	ox sm v	טים אים	Ls.		25	-
5)							
		~					
Substrate Par	rticles % Areal Coverage (e	US (75.	-	Riperian Vegetati	on and Shading (describe):		
	% sand/silt/clay (<2: % gravel (2 - 64 mm				1 5% B		
	% cobble (64 - 256 m % boulder (> 256 m)			1 96	L S S		
A CITIL TIND	% bedrock	at least one measurement u		0			
Meter Make	, ,	er seast one successification of	pstream and go	wnstream of crossing	1		
Location	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Time
Jpstream	60.			Upstream		(MO)	
rossing		6.5		Crossing			-
Ownstrm	0	10	-	Downstream			
	70	11.1		Downsu asin	<u> </u>		
LOW ESTIMA	ATES Location :		100				
ligh Water W	/idth (m):		Distance bet	tween points (m):			- 127
Vetted Chann	nel Width:		Time (min):	1			
	1,5,	n -					
	nge Depth: ZOC	n	Surface velo	ocity estimate:	0.54 L	stre-	
ipprox. Avera	رکدا	м			0,54 m/s		
pprox. Avera	nge Depth: ZOC		Average Vel	locity (0.8 ⁽¹⁾ x Surfac	ve Velocity) (V) =		
ote (1) -depo	ends on substrate composition: Otream, crossing, downstream)		Average Vel	locity (0.8 ⁽¹⁾ x Surfac	ve Velocity) (V) =		

NOTES:

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	А	June 4, 2008

Crow: Mark + Wina Data: Jone 9 7015 III 67 III 67
Muck + Wina Detum: NAO 87 Zone: 17 Some 9 2015 Itoz It
Datum: NAO 87 [m]: Northing [m]: 71.53/20 N Elevation (from mapping): 572 Other notes: NT WEATHER: Wind: Air Temp: 12 Precipitation: Cloud Cover [%]: 100 [Weather Events: Dry. Met. Construction Phase (circle one): Pre-Construction During Construction Post-Construction of Activity: Equipment in Use: Construction Began: Construction changing? (i.e. is the crossing moving upstream or downstream of its original location? How far? Which direction?) Also Columnt ETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream, algae in water, etc.) Class Gloss, Ab Justicid! And Surved. Natural Cossion.
RECEIVITY: Equipment in Use: Construction Began: Construction changing? (i.e. is the crossing moving upstream or downstream of its original location? How far? Which direction?) ETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream, algae in water, etc.) Class Flow, the first original construction of the construct
NTWEATHER: Wind: Weather Events: Play Melt. RUCTION Construction Phase (circle one): Pre-Construction During Construction Post-Construction During Construction Post-Construction During Construction Post-Construction Post-Construction
RUCTION Construction Phase (circle one): Pre-Construction During Construction Post-Construction Post-Con
Equipment in Use: Construction Began: Colort Not Colort ETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream, algae in water, etc.) Binks on load look makrial flaving dan bank. Clas Flav, to fishidity of the red. Natural crosson.
Equipment in Use: Construction Began: Construction Began: Coluct Coluct ETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream, algae in water, etc.) Binks on 1000 look makeral flaving dan bank. Class Flow, to fisbidity of house. Natural crosson.
ETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream, algae in water, etc.) Binks on 1000 look makerial flaving dann hank. Clas Flow, no fisbidity of the red. Natural crosson.
No Coluct ETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream, algae in water, etc.) Binks on loud look makerial flowing down hank. Clas Flow, no fisbidity of housed. Natural arosion.
No Coluct ETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream, algae in water, etc.) Binks on loud look makerial flowing down hank. Clas Flow, no fisbidity of housed. Natural arosion.
Binks on soud look makerial flaving down bink. Clas Flow, no furbidity of the following the binks. Natural crosson.
Natural crosson.
Natural crosson.
Natural crosson.
US DS
te Particles % Areal Coverage (est.) Riparian Vegetation and Shading (describe):
% sand/sitt/clay (<2mm) 15
% gravel (2-64 mm) 8 0 90 1 Sone (4.85.
% boulder (> 256 mm)
% bedrock
TURBIDITY READINGS (complete at least one measurement upstream and downstream of crossing) Make and Model:
on Distance from Turbidity Time Location Distance from Turbidity 11 crossing (m) (NTU) (NTU)
m 70 2.7 Upstream
O 3.1 Crossing
70. 5.7 Downstream
STIMATES Location :
ster Width (m): Distance between points (m):
Channel Width: Distance between points (m): Time (min): /
Channel Width: 3 Time (min): / Average Depth: Surface velocity estimate:
Channel Width: 3 Time (min): /
Channel Width: 3 Time (min): / Average Depth: Surface velocity estimate: O. 19 m (S.
Channel Width: 3 Average Depth: O.5. Surface velocity estimate: O. 19 m (S. Average Velocity (0.8 (1) x Surface Velocity) (V) =
Channel Width: Average Depth: O. 5. Surface velocity estimate: O. 19 m (S. Average Velocity (0.8 (3) x Surface Velocity) (V) = -depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock

3.6							
	Turbidity N	onitoring Data Fo	rm		Α	June 4, 2008	
CROSSING ID	C VO 99						
Field Crew:				Date:			
	Muk + N	lina		Jul. 201	e 9 2015	Time: 1:37	
LOCATION	Datum: NA	0 9 7	17	2.74610		* * * * * * * * * * * * * * * * * * * *	
Easting (m):	~ 80.37654°		3463	Elevation (from	n mapping): 425	Other notes:	
	ATHER: Wind:	Air Temp: 10C	Precipitation:	Cloud	Cover (%): 100		
Recent West	her Events:						
CONSTRUCTIO	N Construc	tion Phase (circle one): Pre-	Construction	During Construct	fon Ost-Construction		
Type of Activi	ity:	Equipment in l	Jse:				
Date Construc	ction Began;					7 7	- 200
Is the crossing	location changing? (i.e. is the	crossing moving upstream or	downstream of I	its original location?	How far? Which direction?)		
	U/S 150m			(30)			
					bserved in stream, algae in water	, etc.)	
	· Clas Voy well						
	Mary well	amares, 1	10 50	son n	ee		
0	40 4 0-0H	•		•	/	<	
		us Drs.					
Substrate Pari	ticles % Araal Coverage (c % sand/slit/clay (<2	est.)) =	Riparian Vegets	ntion and Shading (describe):		
Substrate Pari	% sand/slit/clay (<2 % gravel (2 - 64 mm	est.) (mm) () () () ()	<u> </u>	Riparian Vegeta	ntion and Shading (describe):		
Substrate Pari	% sand/slit/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m	mm) 50 50 nm) 50 Li0	<u> </u>	Riparian Vegeta	ntion and Shading (describe):	382	
=	% sand/slit/ctay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock	est.) mmn) 1 50 mm) 50 mm)			>		
<i>N SITU</i> TURBI	% sand/sitr/ctay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete	mm) 50 50 nm) 50 Li0			>		
<i>N SITU</i> TURBI	% sand/slit/ctay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DHY READINGS (complete and Model:	est.) mm) 50 mm) 6 at least one measurement u			g} Distance from	Turbidity	Tim
<i>N SITU</i> TURBI Meter Make a Location	% sand/slit/ctay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m)	est.) mm)) 50 nm) 50 m) r at least one measurement u Turbidity (NTU)	pstream and do	wnstream of crossin	g)	Turbidity (NTU)	Tim
<i>N SITU</i> TURBI Meter Make a Location	% sand/slit/ctay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DHY READINGS (complete and Model:	est.) mm) 50 mm) 6 at least one measurement u	pstream and do	Location Upstream	g} Distance from		Tim
W SITU TURBI Meter Make a Location	% sand/slit/ctay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m)	est.) mm)) 50 nm) 50 m) r at least one measurement u Turbidity (NTU)	pstream and do	wnstream of crossin	g} Distance from		Tim
N SITU TURBI Meter Make a Location Upstream	% sand/slit/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock Dity READINGS (complete and Model: Distance from crossing (m)	est.) mmn) 1 50 mm) 50 mm) 50 to 50	pstream and do	Location Upstream	g} Distance from		Tim
Meter Make a	% sand/slit/ctay (<2 % gravel (2 - 64 rnm % cobble (64 - 256 m % boulder (> 256 m % bedrock) DITY READINGS (complete and Model: Distance from crossing (m)	est.) mmn) 50 mm) 50 mm) at least one measurement u Turbidity (NTU) 2.7 41.9	pstream and do	Location Upstream Crossing	g} Distance from		Tim
W SITU TURBI Meter Make a Location Jostream Trossing Dwinstrm	% sand/slit/ctay (<2 % gravel (2 - 64 rnm % cobble (64 - 256 m % boulder (> 256 m % boulder (> 256 m % bodrock DITY READINGS (complete and Model: Distance from crossing (m) 7 0 6 50	est.) mmn) 50 mm) 50 mm) at least one measurement u Turbidity (NTU) 2.7 4.9	pstream and do	Location Upstream Crossing Downstream	g} Distance from		Tim
W SITU TURBI Weter Make a Location Jostream Trossing Dwinstrm	% sand/slit/ctay (<2 % gravel (2 - 64 rnm % cobble (64 - 256 m % boulder (> 256 m % bodrock DITY READINGS (complete and Model: Distance from crossing (m) 70 6 50 TES Location :	est.) mmn) 50 mm) 50 mm) 10 50 mm) 10 50 ci0 mi) Turbidity (NTU) 2.7 4.7	pstream and do	Location Upstream Crossing	g} Distance from		Tim
W SITU TURBI Meter Make a Location Jostream Trossing Dwnstrm LOW ESTIMAT	% sand/slit/ctay (<2 % gravel (2 - 64 rnm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m) 70 6 50 TES Location :	est.) mmn) 50 mm) 50 mm) 10 50 mm) 10 50 ci0 mi) Turbidity (NTU) 2.7 4.7	pstream and do	Location Location Upstream Crossing Downstream	g} Distance from		Tim
W SITU TURBI Aleter Make a Location Ipstream Irossing Inwistrm LOW ESTIMAT Igh Water Wi	% sand/slit/ctay (<2 % gravel (2 - 64 rnm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m) 70 6 50 TES Location :	est.) mmn) 50 mm) 50 mm) 10 50 mm) 10 50 ci0 mi) Turbidity (NTU) 2.7 4.7	Distance bei	Location Location Upstream Crossing Downstream	g) Distance from creasing (m)		Tim
W SITU TURBI Aleter Make a Location Ipstream Irossing Inwistrm LOW ESTIMAT Igh Water Wi	% sand/slit/ctay (<2 % gravel (2 - 64 rnm % cobble (64 - 256 m % boulder (> 256 m % boulder (> 256 m % bodrock) DITY READINGS (complete and Model: Distance from crossing (m) 7 0 6 50 TES Location :	est.) mmn) 50 mm) 50 mm) 10 50 mm) 10 50 ci0 mi) Turbidity (NTU) 2.7 4.7	Distance bei	Location Upstream Crossing Downstream tween points (m):	Distance from crossing (m)		Tim
W SITU TURBI Meter Make a Location Jpstream Crossing Dwnstrm LOW ESTIMAT ligh Water Wi Vetted Channel pprox. Average	% sand/slit/ctay (<2 % gravel (2 - 64 rnm % cobble (64 - 256 m % boulder (> 256 m % bould	est.) mm) 50 nm) 50 nm) 10 50 nm) 10 50 nm) 10 70 10 10 70 70 70 70 70 70 70 70 70 70 70 70 70	Distance bei Time (min): Surface vela	Location Location Upstream Crossing Downstream tween points (m):	Distance from crossing (m) 0.54 m/S, see Velocity) (V) =		Tim
W SITU TURBI Weter Make a Location Jpstream Trossing Dwnstrm LOW ESTIMAT ligh Water Wi Wetted Channel pprox. Average ote (1) - deper	% sand/slit/ctay (<2 % gravel (2 - 64 rnm % cobble (64 - 256 m % boulder (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m) 7 0 6 50 TES Location : Idth (m): all Width: 2 Sm ge Depth: 0 Mm	est.) mm) 50 mm) 50 cit) Turbidity (NTU) 2.7 4.7	Distance bed Time (min): Surface velo Average Vel	Location Upstream Crossing Downstream tween points (m): / poity estimate:	Distance from crossing (m) O,57 M/S, see Velocity) (V) = and, or hard pan rock		Tim
W SITU TURBI Meter Make a Location Upstream Crossing Dwnstrm LOW ESTIMAT ligh Water Wi Vetted Channel pprox. Average	% sand/slit/ctay (<2 % gravel (2 - 64 rnm % cobble (64 - 256 m % boulder (> 256 m % bould	est.) mm) 50 nm) 50 nm) 10 50 nm) 10 50 nm) 10 70 10 10 70 70 70 70 70 70 70 70 70 70 70 70 70	Distance bed Time (min): Surface velo Average Vel	Location Upstream Crossing Downstream tween points (m): / poity estimate:	Distance from crossing (m) 0.54 m/S, see Velocity) (V) =		Tier

REVISION #

REVISION DATE

SECTION

OPERATIONAL ENVIRONMENT STANDARD

SECTIO	N OPERATIO	NAL ENVIRONME	NT STAND	ARD	REVISION #	REVISION DA	TE
3.6		Monitoring Data Fo			A	June 4, 2008	110
						34110 47 2000	
CROSSING II							
	COlis						
Field Crew:	Mack + Nine			Date:	9 20,5	7:30	
LOCATION	Datama	O 60	ine: 17	T Gold	_ 1 2013	1 2 30	
Easting (m):	70.400831	Northing (m): 71.69	1/12/ 1	Elevation (from	mapping): 3%	Other notes:	
CURRENT WE	ATHER: Wind:	Air Temp:	Precipitation:	Cloud (Cover (%): /00		
Recent West	her Events:				100		
CONSTRUCTIO	ON Constru	ction Phase (circle one): Pro	r-Construction	During Constructi	on Post-Construction		
Type of Activ	ity:	Equipment In	Use:		<u>\</u> \	مد	
Data Constru	ction Began:						
Is the crossing	g location changing? (i.e. is the	crossing moving unstream of	downstream of	its original location?	How fac2 tarkich direction 2)		
		ly bunks, che			now int Autor Disciput)		
	NOTES, REMARKS: (i.e. high v	vater table, high turbidity, nat	ural bank erosion	, water color, char ol	served in stream, algae in water		
. 1	Jake cles	5000 Fill	A 80	1	reune hottom	(111 -	
	, , ,	2.14	preserve	·A 37	recivit 10 mont	Ca Do Ca.	
	•						
		- 4-					
<u>.</u>		U/S + 0 K.	Suine.				
Substrate Par	ticles % Areal Coverage % sand/silt/clay {<			••	ion and Shading (describe):	20.	
	% gravel (2 - 64 mi % cobble (64 - 256	n) 410		Cas	s + willow		
	% boulder (> 256 n	· 10					
IN SITU TURB	% bedrock IDITY READINGS (complet	e at least one measurement	upstream and do	wastream of crossing			
Meter Make s					·		
Location	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from	Turbidity	Time
Upstream			 	Upstream	crossing (m)	(ити)	-
Crossing	70	8.7					
Crossing	٥	Zo. 1		Crossing			
Dwnstrm	75	18.9		Downstream	-		
FLOW ESTIMA					<u> </u>		
		-					
High Water W	idth (m):		Distance be	tween points (m):			
Wetted Chann	el Width: 2m		Time (min):	1			
Approx. Averag			Surface velo	city estimate:	- 110 /s		
	pu Depth:		2.1		0.49 m/s		25
			I	ocity (0.8 ⁽¹⁾ x Surfa			
			Average Vel	ocity (u.s · · x Suita	ce Velocity) (V) =		
	nds on substrate composition:	0.8 for rough, loose rocks or a	1				
	nds on substrate composition: ream, crossing, downstream)	0.8 for rough, loose rocks or o	coarse gravel / 0.9) for smooth mud, sa			

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	Α	June 4, 2008

				<u>_</u>			
CROSSING I	* BASID	CV049					
Field Crew:	Mack + Ninc	3		Date:	9,2015	11me: 3:30	
LOCATION	Datum: NAD	83 Zoo	ne: /7				
Easting (m):		Northing (m): 71. 43908 N		Elevation (from		Other notes:	
CURRENT W	EATHER: Wind:	Air Temp: / C	Precipitation:		Cover (%): /00'/		
Recent West	ther Events: Doe #	robet			7007.		<u> </u>
CONSTRUCTION		tion Phase (circle one): Pre-	-Construction	During Construct	ion Post-Construction		
Type of Activ	vity:	Equipment in	Use:				
Date Constru	ection Began:						
Is the crossin	g location changing? (i.e. is the	crossing moving upstream or	downstream of it	ts original location?	How far? Which direction?)		<u></u>
	10/2/11/11/14						
	, NOTES, REMARKS: (i.e. high wa				observed in stream, algae in w	ater, etc.)	
- St	obje bank:	; little e	ل و الاص				
- 01	ear water	6. (*)			20 10 10	•	11
							ee •
to	ist flowing						
							0
Substrate Par		•		Riparian Vegeta	ation and Shading (describe):		
	% sand/slit/clay (<2: % gravel (2 - 64 mm)	mm) - 20 } both	h		(0.5)		
	% cobble (64 - 256 n % boulder (> 256 mi	nm) 50 J Sic	des	- gra	ss (OS)		
44. 0002. 3140	% bedrock SIDITY READINGS (complete						
Meter Make		at least one measurement u	ipstream and dow	vistream of crossin	183		
Location	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Time
Upstream		2.0	 	Upstream	Commit (III)	(1110)	
Crossing	100		-	Crossing			
	0	3,2					
Dwnstren	100	3.0	ļ	Downstream			
FLOW ESTIMA	TES Location :	<u></u>		<u> </u>			
High Water W	vidth (m):		Distance bet	ween points (m):		-	
Wetted Chann	and taristoha		W 1-1-b	- 105			
William Chain	10 m		Time (min):	/			ve e
Approx. Avers	lo m loga Depth: 30 cm	8	Surface veloc	city estimate:	1-45 m/s		
			Average Velo	ocity (0,8 ⁽¹⁾ x Surf	ace Velocity) (V) =		_
	ends on substrate composition: 0	1.8 for rough, loose rocks or c	oarse gravel / 0.9	for smooth mud, s	and, or hard pan rock		
	tream, crossing, downstream)	155, Cros	609:10	254 +	15-1456		
NOTES:		, , , , , ,			, - O		



SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
_3.6	Turbidity Monitoring Data Form	Α	June 4, 2008

CROSSING I	CV225						
Field Crew:	Mach + Datum: NAC	Nina		Date:	9,2015	Time: 20:08	
LOCATION	Datum: NAC	20	ne: 17	- Quito	1,700	700	
Easting (m):	9378°W	Northing (m): 71. 3 3203° /	vi	Elevation (from	n mapping): 56%	Other notes:	
CURRENT W	EATHER: Wind:	Alr Temp: 2	M 1 N 12	N Cloud	Cover (%): 100%		3
Recent West	ther Events: Dry P	ant			7,0		
CONSTRUCTION		tion Phase (circle one): Pro	-Construction	During Construct	don Post-Construction		9
Type of Activ	vity:	Equipment in	Use:			10	
Date Constru	ection Began:					" "	
is the crossing	g location changing? (i.e. is the		downstream of	ts original location?	How far? Which direction?)		
SITE SKETCH,	NOTES, REMARKS: (I.e. high wa		rral bank erosion,	water color, char o	observed in stream, algae in wat	ter, etc.)	
	5 enouls by					is 87	
		US 1	0.0				
Substrate Par	rticles % Areal Coverage (e		05	Riperian Vegeta	ition and Shading (describe):		
	% sand/silt/clay (<2 % gravel (2 - 64 mm	mm) 2-	25		• •		
	% cobble (64 - 256 n % boulder (> 256 mi	nm) 7.0	r ·	gras	3		
	% bedrock	m) /		1			140
IN SITU TURE Meter Make		at least one measurement	upstream and do	wnstream of crossic	g)		
Location	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Time
Upstream	60	4./		Upstream			
Crossing	0	4.2		Crossing	-		
Dwnstrm	75	4.6		Downstream			1
FLOW ESTIMA	TT to the state of						
		ک ر	-				
High Water W	Vidth (m):		Distance bei	tween points (m):	8		- 100
Wetted Chann	nel Width: 3 m		Time (min):	1			
Approx. Avers	o. 45m		Surface velo	city estimate:	1.6 m/s		- 3
			Average Vel	ocity (0.8 ⁽¹⁾ x Surf	isce Velocity) (V) =	\$100 m	
	ends on substrate composition: (1.8 for rough, loose rocks or c	oarse gravel / 0.1	for smooth mud, s	and, or hard pan rock		
	356 1957	14.59					= 4
NOTES:							

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	Α	June 4, 2008

SECTION	OPERATIO	NAL ENVIRONME	NT STANDARD	REVISION #	REVISION DA
3.6		Monitoring Data Fo		Α	June 4, 2008
CROSSING ID:	CV223				
Field Crew:	Mark + 1	Vina	Date:	2 9, 2018	Time: 20:27
LOCATION		40 83	one: 17		
Easting (m): 079.4356	2 W	Northing (m): 7/-32 8 7/	N Elevation (from	mapping):	Other notes:
CURRENT WEATH		Air Temp:		Cover (%): /55%	- 312
Recent Weather Ev	ents: Day F				
CONSTRUCTION		ction Phase (circle one): Pr	e-Construction During Construct	ion Post-Construction	
Type of Activity:		Equipment in	ı Use:		
Date Construction	Began:				
is the crossing locat	ion_changing? (i.e is the	crossing moving upstream o	r downstream of its original location?	How far? Which direction?)	
	10m 1		rural bank erosion, water color, char o		
	,				
Substrate Particles	% Areal Coverage % sand/slit/clay (<: % gravel {2 - 64 mn % cobble {64 - 256 % boulder {> 256 m	2mm) - 6 = 5 c n) - 2= 5 c mm) - 20 5 c	15 +D5	tion and Shading (describe):	
N SITU TURBIONY	% sand/slit/clay (<: % gravel {2 - 64 mm % cobble {64 - 256 % boulder {> 256 m % bedrock	2mm) - 6 - 2 - 5 (mm) - 2 - 5 (mm) - 2 - 5 (mm)	15 +D5	155	
N SITU TURBIOTY Meter Make and Mi Location	% sand/slit/clay (<: % gravel {2 - 64 mm % cobble {64 - 256 % boulder {> 256 m % bedrock	2mm) - 6 - 2 - 5 (mm) - 2 - 5 (mm) - 2 - 5 (mm)	upstream and downstream of crossin	155	Turbidity {NTU}
N SITU TURBIDITY Meter Make and Mi Location	% sand/slit/clay (<: % gravel {2 - 64 mm % cobble {64 - 256 % boulder {> 256 m % bedrock READINGS (complet odel: Distance from	mm) - 6 - 2 - 3 - 2 - 3 - 2 - 3 - 2 - 3 - 2 - 3 - 3	upstream and downstream of crossin	A S S	1
V SITU TURBIOTY Reter Make and M Location	% sand/slit/clay (<: % gravel {2 - 64 mm % cobble {64 - 256 % boulder {> 256 m % bedrock READINGS (complet odel: Distance from crossing {m}	e at least one measurement Turbidity (NTU)	upstream and downstream of crossin	A S S	1
V SITU TURBIDITY After Make and M Location Upstream Trossing	% sand/slit/clay (<: % gravel {2 - 64 mn % cobble {64 - 256 % boulder {> 256 m % bedrock READINGS (complet odel: Distance from crossing {m}	mm) - 6 - 2 - 3 - 2 - 3 - 2 - 3 - 2 - 3 - 2 - 3 - 3	upstream and downstream of crossin Time Location Upstream	A S S	1
N SITU TURBIOITY Meter Make and Me Location Jpstream Crossing	% sand/slit/clay (<: % gravel {2 - 64 mm % cobble {64 - 256 % boulder {> 256 m % bedrock READINGS (complet odel: Distance from crossing {m}	e at least one measurement Turbidity (NTU)	upstream and downstream of crossin Time Location Upstream Crossing	A S S	1
V SITU TURBIOTY After Make and Mo Location Ipstream rossing winstrm	% sand/sitr/clay (<: % gravel (2 - 64 mm % cobble (64 - 256 mm % boulder (> 256 mm % bedrock READINGS (complet odel: Distance from crossing (m) / UN 3 Location :	e at least one measurement Turbidity (NTU)	upstream and downstream of crossin Time Location Upstream Crossing	A S S	1
V SITU TURBIDITY Meter Make and Me Location Upstream Irossing Winstrm LOW ESTIMATES	% sand/slit/clay (<: % gravel (2 - 64 mm % cobble (64 - 256 % boulder (> 256 m % bedrock READINGS (complet odel: Distance from crossing (m) / U D 3 Location :	P S	upstream and downstream of crossin Time Location Upstream Crossing Downstream	A S S	1
V SITU TURBIOTY Meter Make and Me Location Upstream rossing wastrm LOW ESTIMATES igh Water Width (re	% sand/slit/clay (<: % gravel (2 - 64 mm % cobble (64 - 256 % boulder (> 256 m % bedrock READINGS (complet odel: Distance from crossing (m) / U D 3 Location :	P S	upstream and downstream of crossin Time Location Upstream Crossing Downstream Distance between points (m):	A S S	1
Jpstream Crossing Dwnstrm LOW ESTIMATES ligh Water Width (r Vetted Channel Wid	% sand/slit/clay (<: % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock READINGS (complet odel: Distance from crossing (m) / UD 3 Location : n): Ith: Distance from crossing (m)	e at least one measurement Turbidity (NTU) 8 11.0 P5	upstream and downstream of crossin Time Location Upstream Crossing Downstream Distance between points (m):	Distance from crossing (m) 7.30 ~ /s	1

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3.6 TURBIDITY MONITORING DATA FORM

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	А	June 4, 2008
CROSSING ID:	8604	-11	12

CROSSING	D: 8604						
Field Crew:	Mack +	Nina		Date: 70	2 9/15	Time: 27: 55	
LOCATION	Datum: A	MD 83	Zone:	17		29.04	
Easting (m)	079.8032.W	Northing (m): 71.	33252 -	Elevation (fron	n mapping): 586	Other notes:	
CURRENT W	EATHER: Wind:	Air Temp:	Preci	pitation: N		1057.	
Recent Wea	ther Events: Dry	Frehet	7				_
CONSTRUCT	ION Cor	nstruction Phase (circle	one): Pre-Const	ruction During	Construction Port Con	nstruction	_
Type of Acti			ment In Use:				_
Date Constr	uction Began:						
Is the crossin	ng location changing? (i.e. i	s the crossing moving up.	stream or downs	tream of its original	l location? How far? Which	direction?)	- "
SITE SKETCH	, NOTES, REMARKS: (i.e. hi	gh water table, high turb	idity, natural ba	nk erosion, water co	olor, char observed in stres	m, algae in water, etc.)	
*1	% sand/silt/cia % gravel (2 - 64 % cobble (64 -	Areal Coverage (est.) y (<2mm) mm) amm 256 mm)	watercourses? (on and Shading (describe)		
IN SITU TURI	% boulder (> 2) % bedrack	splete at least one measu	30			95	
Meter Make		-p.u-w messeast Glic HIGHSL	ermene upstrea	iii anu upwistream	oi crossing)		
Location	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Ti me
Upstream	60	3.2		Upstream		1 23 6 6	1
Crossing	0	4.1		Crossing		7.5	-
Dwnstrm	10 .	2.5		Downstream			-
FLOW ESTIMA		D5					1
High Water V		ν3					- 83 - 1
Wetted Chan				tween points (m):			9
ANELLED CURUI		`	Time (min)				- 19
Annes Acces		- Parker	Surface vel	ocity estimate:	1.52 m/	5	100 m 200
Approx. Aver	ige Depth: 30 c					700	
	30		Average Ve	locity (0.8 ⁽¹⁾ x Sui	face Velocity) (V) =		
Note (1) - dep	ends on substrate composit		rocks or coarse (travel / 0.9 for smoo	face Velocity) (V) = oth mud, sand, or hard pan	rock	
Note {1} - dep	30		Average Verocks or coarse (travel / 0.9 for smoo	face Velocity) (V) = th mud, sand, or hard pan	rock	

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3.6 TURBIDITY MONITORING DATA FORM

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	A	June 4, 2008

Field Crew:				_			
ARCATION	Mark +	Nina			ne 9, 215	Time: 2/:/5	
LOCATION	Datum:	IAD TS		17			122
	679.57855 W				mapping): 567	Other notes:	
	ATHER: Wind:	Air Temp:	/*C Preci	pitation: N	Cloud Cover (%): /c	13.1/-	3
Recent West							
CONSTRUCTION		struction Phase (circle		ruction During	Construction Post-Cor	istruction	
Type of Activ		Equip	oment in Use:				
	iction Began:						
is the crossin	g location changing? (i.e. la	A (new	stream or downs	tream of its original	location? How far? Which	direction?)	
SITE SKETCH,	NOTES, REMARKS: (i.e. hlg	gh water table, high turb	idity, natural bar	nk erosion, water co	lor, char observed in strea	m, algae in water, etc.)	
	vous/green			-			
Is there anyth	olng unique about this cross	sing compared to other					
		and combated to other	watercourses (l.e. steep banks, cla	y in water, etc.)		
			watercourses? (i.e. steep banks, cla	y in water, etc.)		
	rticles %	Areal Coverage (est.)	watercourses? (y in water, etc.) m and Shading (describe)	<u> </u>	
Substrate Par	rticles % % sand/silt/cla	Areal Coverage [est.] y (<2mm)	50			1	
	rticles %	Areal Coverage Jest.) y (<2mm) mm)	50	Riparian Vegatio	m and Shading (describe)		
	% sand/slt/cta % sand/slt/cta % gravel (2 - 64 % cobble [64 - 2 % boulder (> 25	Areal coverage (est.) y (<2mm) mm) 256 mm)	watercourses? (Riparian Vegatio			
	% sand/silt/cla % gravel (2 - 64 % cobble (64 - 2	Areal coverage (est.) y (<2mm) mm) 256 mm)	50	Riparian Vegatio	m and Shading (describe)		
Substrate Par	% sand/silt/cla % sand/silt/cla % gravel (2 - 64 % cobble [64 - % boulder (> 25 % bedrock	Areal coverage (est.) y (<2mm) mm) 256 mm)	50	Riparian Vegatio	m and Shading (describe)		
Substrate Par	% sand/silt/cla % gravel (2 - 64 % cobble [64 - % boulder (> 25 % bedrock	Areal coverage (est.) y (<2mm) mm) 256 mm)	50 40	Riparian Vegation	m and Shading (describe)		
Substrate Par	% sand/silt/ctal % gravel (2 - 64 % cobble (64 - 25 % boulder (> 25 % bedrock IDITY READINGS (com and Model: Distance from	Areal Coverage (est.) y (<2mm) 7 9 mm) 256 mm) 66 mm)	50 40	Riparian Vegation	m and Shading (describe)		- π
Substrate Par IN SITU TURB Meter Make :	% sand/silt/cta % gravel (2 - 64 % cobble (64 - : % boulder (> 25 % bedrock	Areal Coverage [est.] y (<2mm) 7 0 mm) 256 mm) 66 mm)	45 urement upstream	Riparian Vegation	and Shading (describe) SS / W// SV of crossing)	7	П
Substrate Par IN SITU TURB Meter Make : Location	% sand/silt/ctal % gravel (2 - 64 % cobble (64 - 25 % boulder (> 25 % bedrock IDITY READINGS (com and Model: Distance from	Areal Coverage [est.] y (<2mm) 7 8 mm) 256 mm) 66 mm) plete at least one measu	45 urement upstream	Riparian Vegation	and Shading (describe) So / W// O (of crossing)	Turbidity	- 22.2
Substrate Par IN SITU TURB Meter Make a Location	% sand/silt/cta % gravel (2 - 64 % cobble (64 - : % boulder (> 25 % bedrock IDITY READINGS (com and Model: Distance from crossing (m)	Areal Coverage (est.) y (<2mm) 7 e mm) 256 mm) plete at least one measu Turbidity (NTU)	45 urement upstream	Riparian Vegation S ~ Q m and downstream	and Shading (describe) So / W// O (of crossing)	Turbidity	1000
Substrate Par N SITU TURB Meter Make a Location Upstream Crossing	% sand/silt/cta % gravel (2 - 64 % cobble (64 - : % boulder (> 25 % bedrock IDITY READINGS (com and Model: Distance from crossing (m)	Areal Coverage (est.) y (<2mm) 7 256 mm) 266 mm) plete at least one measu Turbidity (NTU)	45 urement upstream	Riparian Vegation A and downstream Location Upstream	and Shading (describe) So / W// O (of crossing)	Turbidity	1 200
Substrate Par N SITU TURB Meter Make a Location Upstream Cressing Dwnstrm	% sand/silt/cla % gravel (2 - 64 % cobble (64 - 25 % boulder (> 25 % bedrock IDITY READINGS (com and Model: Distance from crossing (m)	Areal Coverage [est.] y (<2mm) 70 6 mm) 256 mm) plete at least one measu Turbidity {NTU} 72 24.6	45 urement upstream	Riparian Vegation A and downstream Location Upstream Crossing	and Shading (describe) So / W// O (of crossing)	Turbidity	1 1000
N SITU TURB Weter Make : Location Jpstream Cressing Dwnstrm	% sand/silt/cla % gravel (2 - 64 % cobble (64 - 25 % boulder (> 25 % bedrock IDITY READINGS (com and Model: Distance from crossing (m) TES Location :	Areal Coverage (est.) y (<2mm) 7 256 mm) 266 mm) plete at least one measu Turbidity (NTU) 24.8	trement upstreament upstreamen	Riparian Vegation 3 ~ Q m and downstream Location Upstream Crossing Downstream	and Shading (describe) So / W// O (of crossing)	Turbidity	
N SITU TURB Weter Make : Location Jpstream Crossing Dwnstrm LOW ESTIMA	% sand/silt/ctal % gravel (2 - 64 % cobble (64 - 1 % boulder (> 25 % bedrock IDITY READINGS (command Model: Distance from crossing (m) TES Location :	Areal Coverage [est.] y (<2mm) 70 6 mm) 256 mm) plete at least one measu Turbidity {NTU} 72 24.6	Time Distance be	Riparian Vegation 3 ~ Q m and downstream Location Upstream Crossing Downstream	and Shading (describe) So / W// O (of crossing)	Turbidity	
N SITU TURB Weter Make : Location Jpstream Crossing Dwnstrm LOW ESTIMA	% sand/silt/clar % gravel (2 - 64 % cobble (64 - 25 % boulder (> 25 % bedrock IDITY READINGS (com and Model: Distance from crossing (m) TES Location : Fidth (m): sel Width: 8	Areal Coverage [est.] y (<2mm) 7 5 mm) 25 mm) 36 mm) splete at least one measu Turbidity (NTU) 72 24.6 77.4	Time Distance be Time (min):	Riparian Vegation 3 ~ Q m and downstream Location Upstream Crossing Downstream	of crossing) Distance from crossing (m)	Turbidity	
Substrate Par W SITU TURB Meter Make : Location Upstream Crossing Dwnstrm CLOW ESTIMA High Water W	## Sand/silt/ctal ## gravel (2 - 64 ## cobble (64 - 1) ## boulder (> 25 ## bedrock ## IDITY READINGS (come and Model: Distance from crossing (m)	Areal Coverage [est.] y (<2mm) 7 5 mm) 25 mm) 36 mm) splete at least one measu Turbidity (NTU) 72 24.6 77.4	Time Distance be Time (min):	Riparian Vegation S A A m and downstream Location Upstream Crossing Downstream stween points [m]:	of crossing) Distance from crossing (m)	Turbidity	
Substrate Par W SITU TURB Meter Make : Location Upstream Crossing Dwnstrm CLOW ESTIMA High Water W Wetted Chann Approx. Avera	## Sand/silt/cfa ## gravel (2 - 64 ## cobble (64 - 17) ## boulder (> 25 ## bould	Areal Coverage [est.] y (<2mm) 70 mm) 256 mm) plete at least one measu Turbidity {NTU} 72 24.8 77.4	Distance be Time (min): Surface vel	Riparian Vegation 3 ~ Q m and downstream Location Upstream Crossing Downstream etween points (m): // ocity estimate:	of crossing) Distance from crossing (m)	Turbidity (NTU)	
Substrate Par IN SITU TURB Meter Make : Location Upstream Cressing Dwnstrm FLOW ESTIMA High Water W Wetted Chann Approx. Avera	## Sand/silt/cfa ## gravel (2 - 64 ## cobble (64 - 25 ## boulder (> 25 ## bedrock ## IDITY READINGS (come and Model: Distance from crossing (m) TES Location: ## Idith (m): ## Idith: ## Idit Idit Idit Idit ## Idit Idit Idit Idit Idit Idit Idit ## Idit Idit Idit Idit Idit Idit Idit ## Idit Idit Idit Idit Idit Idit Idit Idit ## Idit Idit Idit Idit Idit Idit Idit Idit Idit ## Idit Idit	Areal Coverage [est.] y (<2mm) 70 0 mm) 256 mm) 266 mm) plete at least one measu Turbidity (NTU) 72 24.6 77.4 DS	Distance be Time [min]: Surface vel Average Verocks or coarse	m and downstream Location Upstream Crossing Downstream etween points [m]: // colly estimate:	of crossing) Distance from crossing (m)	Turbidity (NTU)	- 22.2
Substrate Par IN SITU TURB Meter Make : Location Upstream Cressing Dwnstrm FLOW ESTIMA High Water W Wetted Chann Approx. Avera	## Sand/silt/cfa ## gravel (2 - 64 ## cobble (64 - 17) ## boulder (> 25 ## bould	Areal Coverage [est.] y (<2mm) 7 e mm) 256 mm) plete at least one measu Turbidity {NTU} 24.6 /7.4 DS	Distance be Time [min]: Surface vel Average Verocks or coarse	m and downstream Location Upstream Crossing Downstream etween points [m]: // colly estimate:	of crossing) Distance from crossing (m)	Turbidity (NTU)	1 1000

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3.6 TURBIDITY MONITORING DATA FORM

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	Α	June 4, 2008

CROSSING ID: CVO78		Jacob St.			
Field Crew: Mack & Mina		Date: 7 u.	ne 9, 2015	Time: 23:55	-
LOCATION Datum: VAD 83	Zone:	17	11 11		_
Easting (m): 080.2695/W Northing (m): 7/.	5-317/- N	Elevation (fro	om mapping): 51 K	Other notes:	
		pitation:	ST Cloud Cover (%):	20%	
Recent Weather Events: Dry Freshet		******	/	5078	
CONSTRUCTION Construction Phase (circle	one): Pre-Consti	ruction Duri	ng Construction Post-Cons	truction	
	oment in Use:				
Date Construction Began:					_
is the crossing location changing? (i.e. is the crossing moving up:	stream or downs	tream of its origin	nal location? How far? Which	direction?)	
SITE SKETCH, NOTES, REMARKS: (i.e. high water table, high turb	idity, natural bar	nk erosion, water	color, char observed in stream	n, algae in water, etc.)	
- very low flow			(1)		
•		14.0			
- rocky bed, but los	se n	ateria	I on banks		
			9		
1 3					
is there anything unique about this crossing compared to other	watercourses? (i	i.e. steen banks e	lav in water, etc.)		
A1040	,		of its worter, etc.,		
Substrate Particles % Areal Coverage (est.)	125	Riparian Vegat	tion and Shading (describe):		
% sand/slit/clay (<2mm)	10	1	, , , , , , , , , , , , , , , , , , , ,		
% gravel (2 - 64 mm)	\$6	Sone	gran		
% cobble (54 - 256 mm) \$\frac{\sigma}{\sigma} \text{boulder (> 256 mm)}	1-				
% bedrock					
1					
IN SITU TURBIDITY READINGS (complete at least one me		1			-
IN SITU TURBIDITY READINGS (complete at least one medium Meter Make and Model):	rement upstrea	m and downstream	n of crossing)		
Location Distance from Turbidity	1 =				
Location Distance from Turbidity crossing (m) (NTU)	Time	Location	Distance from	Turbidity	η π
	900		crossing (m)	(NTU)	me
Upstream 60).2		Upstream	La maria		
2.3		Crossing			
Dwestrm 1, 3		Downstream			
FLOW ESTIMATES Location :	13 0		The Barrett		
High Water Width (m):	Distance be	tween points (m):		
Wetted Channel Width: 3 m	Time (min):	/			
Approx. Average Depth: O . Z	Surface velo	ocity estimate:	0.06 m/s		
	Average Va	locity (0.8 (1) , s	urface Velocity) (VI =		
Note (1) - depends on substrate composition: 0.8 for rough, loose i	rocks or coarse a	ravel / 0.9 for sme	ooth mud, sand, or hard pan i	ock	
PHOTOS: (upstream, crossing, downstream) 1879, 18	78. 189				
NOTES:	10, 101				

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3.6 TURBIDITY MONITORING DATA FORM

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OPERATIONAL ENVIRONMENT STANDARD

1 2 0	(f) = 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1					ILL VIDIOIA E	MIL
3.6	Turbidit	y Monitoring Da	ta Form		A	June 4, 200	8
CROSSIN	G In: Date O						10
Fleld Cre	0001	Ter.					
LOCATIO	TI GEA +			Date: Ju	ane 9/15	Time: 2/:40	-
2.7	O D LOTT	NAD 83	Zone:	17		15 to 10 to	
CURRENT	m): 079. 70337 - W	Northing (m): 7/. 3	-		rom mapping): 540	Other notes:	
_		Air Temp:	Pre	dpitation: 📈	Claud Cover (%):	00%	
CONSTRU	214	Frahet					
Type of A		onstruction Phase (circle		truction Du	ring Construction Post-Co	nstruction	
	struction Began:	Equi	oment in Use:				
		In the arrest of					
		N 1/7			inal location? How far? Which		
SITESKET	CH, NOTES, REMARKS: (I.e.	high water table, high turb	idity, natural bi	ink erosion, water	color, char observed in strea	Im. algae in water atc \	
	slightly to			ous ly			
Is there an		Areal Coverage (est.)	vatercourses? (clay in water, etc.)		
	% sand/slit/cl; % gravel (2 - 6 % cobble (64 - % boulder (> 2 % bedrock	4 mm) 30 256 mm) /0	ös		ra 55		
	RBIDITY READINGS (con	iplete at least one measur	ement upstrea	m and downstream	III Di cross per		
Meter Make	e and Model:		,		or crossing)		
Location	Distance from	Turbidity	Time	Location	Distance		
	crossing (m)	(NTU)	1,1110	Location	Distance from crossing (m)	Turbidity	Ti
Upstream	50	13,4	-	Upstream	crossing (iii)	(שדא)	me
Crossing	0		-	Crossing			
Dwnstrm	70	14.6		Downstream			5
FLOW ESTIN				COMISTICAL			
High Water		D\$					
Wetted Char	4 100 10	18.0	Distance be	tween points (m)			1
		Ham /m	Time (min):	/			
-phiox Ave	rage Depth:	0.6~	_	city estimate:	0.61m/s		100
late (at a			Average Vel	ocity (0.8 ⁽¹⁾ x St	0.007-0.0		
vote (1) - de	penas on substrate compositi	on: 0.8 for rough, loose ro	cks or coarse g	ravel / 0.9 for smo	urface Velocity) (V) = oth mud, sand, or hard pan r	ock	
MOTOS: Jup	stream, crossing, downstrea	m) /870, /8					$\overline{}$
IOTES:		ar as Carlotte as a second					

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TURBIDITY MONITORING DATA FORM 3.6

SECT	ION OPERATI	IONAL ENVIRO	NMENT STAN	IDARD	REVISION #	REVISION DA	TE
3.6		Monitoring Da					16
		The desired services and the services are services as a service services and the services are services as a service services are services as a service services are services as a service service services are services as a service service services are services as a service service service service services are services as a service service service service services are services as a service service service service services are services as a service service service service services are services as a service service service service services are services as a service service service service services are services as a service service service service service service services are services as a service ser	ata i oimi		I A	June 4, 2008	_
CROSSING	ID: A1/2/	2					
Field Cre	w: Mark +	Aluna		Date:			
LOCATION	W: Mach + Datum: A	141) 87	Zone: /7	Date: JU	ne 9/15	Time: 22:04	
Easting (1079. 8/178.W	Northing (m): 7/	39***	Elevation (from	manufact.	-	127
CURRENT	WEATHER: Wind:		/ C_ Precipita			Other notes:	
Recent W	eather Events: Dry	Freshet		~	cloud cover (sc): / D	سر د	
CONSTRU		nstruction Phase (circle	one): Pre-Construct	on During	Construction Fost-Const	THE PARTY OF THE P	_
Type of A			ipment in Use:		Contraction (Contraction)	ruction 5	_
	truction Began:						
	sing location changing? (i.e.	3 (ALW)					
SITE SKET	H, NOTES, REMARKS: (I.e. h	igh water table, high tur	bidity, natural bank e	rosion, water col	or, char physivad in stream	algae la viota - 4- h	_
-n	· flow				, and waster in actionin,	algee in water, etc.)	
~ 6	andy bank	5 - 50 m	e ep s	24			
- mi	id la turbid	water					
7011	10.19						
Is there any	thing unique about this cros	sing compared to other	watercourse? (i.e.	ttana hantu atuu	7		
			VWCC1CCG(3C31 (1.E. 3	reeb banks, clay	in water, etc.)		
Substrate F		Areal Coverage (est.)	R	iparian Vegation	and Shading (describe):		_
	7= Sand/Slit/cla	y (<2mm)	_		The state of the s		
	% grave! (2 - 64 % cobble (64 - ;		ls.	A /	11		
	% boulder (> 25			N	1/4		
	% bedrock	1	1				
20-10-			1				
	REIDITY READINGS (COM	plete at least one measi	urement upstream ar	nd downstream o	f crossing)		_
vieter Make	and Model:				•		
Location	Distance from	Turbidity	Time L	ocation	Distance from	Turbidity	n
	crossing (m)	(NTU)			crossing (m)	(NTU)	me
Jpstream	75	18-2	U	pstream			
rossing	0	34.0	Cr	ossing			188
wnstrm	70	30.5	Do	wastream			
LOW ESTIM	ATES Location :	7 - Britania	1				_
igh Water	Width (m):		Distance between	en points (m):			
etted Channel Width: 9 -			Time (min):	/			
pprax. Ave	rage Depth: 0./	5-	Surface velocity	estimate:	0 m/		
		54	A	ra - (1)			_
ote (1) - de	pends on substrate composition	on: 0.8 for rough, loose	tocks or coarse flave	/ 0.9 for smooth	mud, sand, or hard pan ror		_
IOTOS: (up	stream, crossing, downstrea	m) /873, /8	72, 1874		or read part for		-
DTES:			6,1017				



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3.6 TURBIDITY MONITORING DATA FORM

OPERATIONAL ENVIRONMENT STANDARD

3.6	Turbidity	Monitoring Dat	ta Form		A	June 4, 2008	3
			52/31	W Ball			
CROSSING ID:	CVO49						
Field Crew:	Mach +			Date: Ju	e9/ft	Time: 23:0=	-
LOCATION	Datum: N	A0 831	Zone:	17			
Easting (m): 0	10.16604° W	Northing (m): 71.4	13908'N	Elevation (from	n mapping): 526	Other notes:	
CURRENT WEA	THER: Wind:	A Temp: ()		pitation: 19/1	A	374	
Recent Weathe	r Events: Dry	Freshet			Light)		
CONSTRUCTION		struction Phase (circle	one): Pre-Const	ruction Durin	Construction Post-Con	struction	-
Type of Activity	<i>p</i> :	Equip	pment in Use:				
Date Constructi	lon Began:						
is the crossing i	ocation changing? (i.e. I	s the crossing moving up	stream or down	stream of its origina	I location? How far? Which	direction?)	
						•	
SITE SKETCH, N	OTES, REMARKS: (l.e. hi	gh water table, high turb	oldity, natural ba	nk erosion, water c	olor, char observed in stream	m, algae in water, etc.)	
0	01						
- tas	ty bank						
	1 1 1	1/200					
NU	ny bank	1 bea					
	32						
÷						*	
iubstrate Partic	% sand/silt/cla	Areal Coverage (est.) by (<2mm) t mm) - 30 (256 mm) - 70	5 604		on and Shading (describe):		
	% boulder (> 2	56 mm)		9/0	r 20		
	% bedrock						
	2-11						
N SITU TURBID	TY READINGS (com	splete at least one meass	urement upstrea	m and downstream	of crossing)		
Aeter Make and	d Model:						
Location	Distance from	Turbidity	Time	Location	Distance from	Turbidity	175
	crossing (m)	(NTU)	1		crossing (m)	(NTU)	
pstream	75	1.2	1 2	Upstream			+
rossing	0	3.6		Crossing			+
wnstrm	75	6.0		Downstream		-	+
OW ESTIMATE		0.0	+ =				
igh Water Wid				etween points (m)	- 20,00		
etted Channel		<u> </u>	Time (mln)	Commence of the Commence of th			
pprox. Average	Depth: 0.	30m		locity estimate:	2,0 -18		
	921		Average V	elocity (0.8 ⁽¹⁾ x Su	rface Velocity) (V) =	1 H 1	
			rocks or coarse	gravel / 0.9 for smo	oth mud, sand, or hard pan	rock	
HOTOS: (upstre	am, crossing, downstre	am) /875.19	76, 18-	77		1-1/33	
OTES:	7.2						

tes	iffin	land

FLOW ESTIMATES

NOTES:

High Water Width (m):

Wetted Channel Width:

Approx. Average Depth:

PHOTOS: (upstream, crossing, downstream)

Location :

2.5m

0.4m

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3.6 **TURBIDITY MONITORING DATA FORM**

SECTIO	ON OPERAT	ONAL ENVIRONM	MENT ST	ANDARD	REVISION #	REVISION D	DATE
3.6	Turbidity	Turbidity Monitoring Data Form			A	June 4, 2008	
CURRENT W Recent Wea CONSTRUCT Type of Acti Date Constr Is the crossle SITE SKETCH	Datum: N SO. 37762 W EATHER: Wind: wither Events: Don vity: uction Began: ng focation changing? (i.e. NOTES, REMARKS: (i.e. I	AD 82 Northing (m): 71.6 Air Temp: Color of the circle on Equipm	Zone: 7 3980A O'C Prec ne): Pre-Const nent in Use: ream or down	TElevation (from pitation: Variety of the process of the original of the process	mapping): 4341 Cloud Cover (%): 10 Construction Post-Construction? How far? Which	Other notes:	,
Substrate Pa	% sand/silt/ct % gravel (2 - 6 % cobble (64 % boulder (> 2 % bedrock	4 mm) - 50 - 256 mm) - 50	DS -10 - 10	Riparian Vegatio	n and Shading (describe):	Turkidite	
	crossing (m)	(NTU)	1,,,,,	Cocation	crossing (m)	Turbidity (NTU)	TI me
Upstream	70	6.1		Upstream			
Crossing	e	2.6		Crossing			
Dwnstrm	35	4.4		Downstream	7		1

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Distance between points (m):

Average Velocity (0.8 (1) x Surface Velocity) (V) =

Surface velocity estimate:

Time (min):

Note (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock

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3.6 TURBIDITY MONITORING DATA FORM

OPERATIONAL ENVIRONMENT STANDARD

SECTION

NOTES:

3.6	Turbidity I	Monitoring Dat	a Form		Α	June 4, 2008		
	20							
CROSSING				1000 E 2 E 2	a the same and the			
Field Crew:	Mack	+ Nina			15 /D, 20/51	Time: Z:00	-	
LOCATION	Datum: NS3		Zone: 1					
Easting (m)	80,39077" W	Northing (m):	69071° N	Elevation (from	mapping): 427	Other notes:		
CURRENT W	EATHER: Wind:	Air Temp:		pitation:	Cloud Cover (%): 10	0		
Recent Wes	other Events: Ty. M	elt	V.,61	W 15 W	- VI			
CONSTRUCT		truction Phase (circle	one): Pre-Const	ruction During	Construction (Post-Constr	ruction	_	
Type of Act	ivity:	Equir	ment in Use:				_	
Date Consti	uction Began:							
	ng location changing? (i.e., is	the crossing moving up	trans andawa	etrane of its estates.	Innertural time to 3 test in the			
	D: 12	h Digging ne	nd to	stream of its original	locations now last which d	rection()		
SITE SKETCH	I, NOTES, REMARKS: (i.e. hig	h water table, bigh such	iditie material has	ek eresies, weter est	an about the second to second			
						algae in water, etc.)		
. Ch.	water, mi	1.	List &	~ ~ ~	active.			
1 (74	a man m	בייטיונאי וו	4 124 14	20100				
	All I d	N., L		بيعيم ما				
1 10	VISIBIL FULL	orion y, Neuro	ical bu	Ne WOSA	n	-		
							•	
is there any	thing unique about this crossi	ing compared to other	watercourses? (i.e. steep banks, clay	in water, etc.)			
Substrate Pa	rticles % A	treal Coverage (est.)	1	Riparian Vegation	n and Shading (describe):		_	
	% sand/silt/clay	(<2mm) 35	36	'	- 7			
	% gravel (2 - 64		50					
	% cobble (64 - 2		15					
	% boulder (> 25) % bedrock	5 mm)						
	A DEGIDOR	1						
		elete at least one measu	rement upstrea	m and downstream	of crossing)			
Meter Make	and Model:							
Location	Distance from	Turbidity	Time	Location	Distance from	Turbidity	Ti	
- 1	crossing (m)	(NTU)	1	1	crossing (m)	(NTU)	me	
Upstream	60	6.9	_	Upstream				
Crossing	0	3.0		Crossing				
Dwnstrm	75	2.5		Downstream	-		100	
FLOW ESTIM		6.3	-	Samuleem				
	And the last of th		- No.					
High Water \			_	etween points (m):				
Wetted Chan	DIT			Time (min): /				
Approx. Aver	age Depth: , 07			ocity estimate:	0.75 mls.			
			Average Ve	elocity (0.8 ⁽¹⁾ x Surf	ace Velocity) (V) =	No.		
	pends on substrate composition		rocks or coarse (gravel / 0.9 for smoot	th mud, sand, or hard pan ro	rck	3	
PHOTOS: (up	stream, crossing, downstrea	m) 192¢	1001	1204				

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3.6 TURBIDITY MONITORING DATA FORM

Air Temp: 0°C

CURRENT WEATHER: Wind:

Recent Weather Events:

SECTION	OPERATIONAL ENVIRONMENT STANDAR	RD REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	А	June 4, 2008
CROSSING ID:	CV 1/2		
Field Crew:		Juno 13,24	5 Time: 2:50
LOCATION	Datum: 1183 Zone: 17		
Easting (m): %0		ion (from mapping): 405	Other notes:

Precipitation:

Cloud Cover (%):

100

CONSTRUCTIO	אנ כ	Construction Phase (circle	one); Pre-Const	ruction During	g Construction Post-Cor	nstruction	
Type of Activi	dty:	Equipment in Use:					
Date Constru	ction Began:		100				-
	Ditch Da	is the crossing moving up				,	
o Wo	notes, remarks: (1.e. akr clar okr clar me silt f	high wher table, high turk	bidity, natural ba	nkerosion, water co	olor, char observed in stres	im, algae in water, etc.)	101
			940	*:			
					9 6		
Is there anythi	ing unique about this cri	rossing compared to other OS F DS % Areal Coverage (est.)	watercourses? (
	% sand/silt/c % gravel (2 = % cobble (64 % boulder (> % bedrock	clay (<2mm) 64 mm) 40 1 - 256 mm) 40			on and Shading (describe)		
IN SITU TURBI Meter Make a		omplete at least one meas	urement upstrea	m and downstream	of crossing)		
Location	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Ti me
Upstream	75	3.2		Upstream			
Crossing	0	4.4		Crossing			+
Dwnstrm	75	5.4		Downstream			_
FLOW ESTIMAT	TES Location :						
High Water Wi	idth (m):		Distance be	tween points (m):	21		
Wetted Channe	el Width: Zm		Time (min)				_
Approx. Averag		Annual Control	Surface vel	ocity estimate:	0.48m/s.		
			Average Va	locky (0.8 (1) y Sur	riace Velocitul (VI -		
Note (1) - deper	nds on substrate compor	sition 0.8 for rough, loose	e rocks or course r	gravel / 0.9 for smoo	th mud, sand, or hard par	rock	
PHOTOS: (upsti	ream, crossing, downstr	tream) 1851, (850, 18	52.			
NOTES:			1001	0			-5-150



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3.6 TURBIDITY MONITORING DATA FORM

Environment

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	Α	June 4, 2008

CROSSING ID: CV ZZ			(8)			
Field Crew: Mach Thing		Date: 7	10, 2015	Time: 70:24	_	
LOCATION Datum: NAO 83	Zone:	17				
Easting (m): 77.3936/" Northing (m): 7/. 3	3203	Elevation (from)	mapping): 670	Other notes:		
CURRENT WEATHER: Wind: Air Temp:	3 Precipi	itation: 💜	Cloud Cover (%):			
Recent Weather Events:		72 Dec		J - 200 178		
CONSTRUCTION Construction Phase (circle or	e): Pre-Constru	ection During C	Construction Post-Cor	istruction		
Type of Activity: Equipm	tent in Use:					
Date Construction Began:				0'=		
Is the crossing location changing? (i.e. is the crossing moving upstr						
SITE SKETCH, NOTES, REMARKS: (i.e. high water table, high turbid	ity, natural bani	k erosion, water colo	or, char observed in strea	m, algae in water, etc.)		
- natural ender - clear flow						
CITAL PRO W						
				V.		
Is there anything unique about this crossing compared to other w		e steep banks, clay	in water, etc.}			
Substrate Particles % Areal Coverage (est.) % sand/silt/clay (<2mm) 2-25 % gravel (2 - 64 mm) - 0 25 % cobble (64 - 256 mm) % boulder (> 256 mm) % hedrock Riparlan Vegation and Shading (describe): 9 (25)						
IN SITU TURBIDITY READINGS (complete at least one measure	ement upstream	and downstream of	of crossing)			
Meter Make and Model:						
Location Distance from Turbidity crossing (m) (NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Ti me	
Upstream 60 4.0	1	Upstream				
Crossing 0 3.7		Crossing		7.		
Dwnstrm 100 4.3		Downstream	1910-1972			
FLOW ESTIMATES Location :						
High Water Width [m]:	Distance bet	ween points (m):		-		
Wetted Channel Width: 3 Pm Time (min): /						
Approx, Average Depth: 0.10 m Surface velocity estimate: 1.42n/5						
Average Velocity (0.8 (1) x Surface Velocity) (V) =						
Note (1) - depends on substrate composition: 0.8 for rough, loose re	ocks or coarse gr	avel / 0.9 for smoot	h mud, sand, or hard pan	rock		
	487, 1					
		n 8 3				
NOTES:	-	4.01				

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3.6 TURBIDITY MONITORING DATA FORM

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SECTION

3.6	Turbidity (Monitoring Dat	a Form		A	June 4, 2008	;
CROSSING							
Field Crew		2-		Date: 74	4/0,200	Time: 25 28	
LOCATION	Datum: N	AD 83	Zone:	17			
Easting (m		Northing (m):		Elevation (fro	m mapping]:	Other notes:	
	/EATHER: Wind:	Air Temp:	5 Pred	ipitation: N	Cloud Cover (%): /	0.3	- 177
	ather Events: Ay	Preshet					
CONSTRUCT	TION Con:	struction Phase (circle	one): Pre-Const	ruction Durin	g Construction Post-Co	enstruction	
Type of Act	tivity:	Equip	oment in Use:			English and	
	ruction Began:						
Is the crossi	ng location changing? (i.e. is		stream or down:	stream of its origina	al location? How far? Whic	h direction?)	
for these	10 m D	>					
Stif 2KEIC	H, NOTES, REMARKS: (Le. hig	h water table, high turb	idity, natural ba	nk erosion, water o	olor, char observed in stre	am, algae in water, etc.)	
	-/		97				
	-noflow						
	1.5						
	(4)						
			200				
						- 17	
Substrate P.	thing unique about this cross articles % // % sand/silt/clay % grave! (2 - 64 % cobble (64 - 2 % boulder {> 25	Areal Coverage (est.) (<2mm) 60 mm) 2 (56 mm) 2	both	Riparlan Vegati	ion and Shading (describe):	
	% bedrock	- ·····,		"			
	BIDITY READINGS (comp and Model:	plete at least one measu	irement upstrea	m and downstream	of crossing)		
Location		Special Filter					
COLABOR	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from	Turbidity	Ti
Upstream		(410)			crossing (m)	(UTN)	me
				Upstream			
Crossing Dwnstrm	340	3.4		Crossing			
	3/A 70	3. /		Downstream			
FLOW ESTIM	ATES Location:						
High Water			Distance be	etween points (m)			
Wetted Char	nnel Width: 30	m	Time (min)	: /			
Approx. Ave.	rage Depth: 0.3	0 ~	Surface vel	locity estimate:	0	200 - 11 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	
			Average Ve	elocity (0 s (1) , c.	rface Velocity) (V) =		
Note (1) - de	pends on substrate composition	on: 0.8 for rough, loose	rocks or coarse	gravel / 0.9 for smo	oth mud, sand, or hard sa	n rock	_
	stream, crossing, downstrea		18 90	1892			
OTES:		m) /491	10.0	1010			

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TURBIDITY MONITORING DATA FORM 3.6

OPERATIONAL ENVIRONMENT STANDARD

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NOTES:

SECTI	ON OPERATION	ONAL ENVIRON	MENT ST	ANDARD	REVISION #	REVISION D	ATE
3.6	Turbidity	Monitoring Dat	a Form	_	Α	June 4, 2008	3
CROSSING	10: 8604						
Field Crew		N.n-		Date: 3145	c12, W5	Time: 20:40	1
LOCATION	Datum: 🙏	(AP 83	Zone:	17		00,70	-
Easting (m	1:079.51027-W	Northing (m): 7/.3	3228'	Elevation (from	mapping): 552	Other notes:	
CURRENT V	VEATHER: Wind:	Air Temp: 2		pitation: N	Cloud Cover (%):		
Recent We	ather Events: Da	Frsher					
CONSTRUC	TION Con	struction Phase (circle o	ne): Pre-Const	ruction During	Construction /ost-Cons	truction	
Type of Ac	tivity:	Equip	ment in Use:				
Date Const	truction Began:						
	Ing location changing? [l.e. I:						
	H, NOTES, REMARKS: (L.e. hi)				or, char observed in stream		
							,
Is there any		Areal Coverage (est.)	watercourses? (y in water, etc.) or and Shading (describe):		77:
	% sand/silt/cla % grave! (2 - 64 % cobble (64 - ; % boulder (> 25 % bedrock	mm) 30 256 mm) 30	30	sra	Lss		
Meter Make	and Model:	plete at least one measu	rement upstrea	m and downstream	of crossing)		
Location	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Ti
Upstream	60	36		Upstream			
Crossing	0	1.60		Crossing			
Dwnstrm	80	2.6		Downstream			
FLOW ESTIN	ATES Location :		T				_
High Water	Width (m):		Distance be	etween points (m):			_
Wetted Chai	nnel Width: 3m	34 44	Time (min)	All from the same of the same			_
Approx. Ave		5 m		ocity estimate:	197		_
	0.7	- /-	_	elocity (0.8 ⁽¹⁾ x Sur	0.97 m/s		
Note (1) - de	pends on substrate compositi	on: 0.8 for rough, loose i	ocks or coarse	gravel / 0.9 for smoo	race Velocity] (V) = th mud. sand, or hard name	ock	-
	ostream, crossing, downstre				ar costo peri i		
_			10				

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3.6 TURBIDITY MONITORING DATA FORM

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	ON OPERATI	ONAL ENVIRON	IMENI STA	NDARD	REVISION #	REVISION DA	TE
3.6	Turbidity	Monitoring Dat	ta Form		А	June 4, 2008	
		110					
CROSSING	ID: B6 /7	100					
Field Crew	Mach+	11.19	- 17	Date:	10/15	Time: 2/: 05	
LOCATION		1 + P 83	Zone:	17		O/ U/	
Easting (m	1:0795756°W	Northing (m): 7/.3	5551 N	Elevation (from	mapping): <- 70	Other notes:	
	VEATHER: Wind:	41.0		iltation:	Cloud Cover (%):		_
Recent We	ather Events: On	Palet			- /-	22	
CONSTRUC	TION /Co	nstruction Phase (circle	one]: Pre-Constr	uction During	Construction Post-Cons	truction	100
Type of Ac			pment in Use:				
Date Const	ruction Began:						
Is the cross	ing location changing? (i.e.	Is the crossing moving up	stream or downst	ream of its original	location? How far? Which o	lirection?)	
SITE SKETC	H, NOTES, REMARKS: (i.e. h	igh water table, high turb	idity, natural ban	k erosion, water co	or, char observed in stream	, algae in water, etc.)	
	4 80		,		.,	, again mater, etc.,	
-	natural	enosi'm					
				200			
6	low flo.				1.5		
_	LOW The.	~					
				,			
-	green / bono	2 was truck		eter-			
	9, 1, 1,	- 400		-			
- 1							
	•				3.35		
is there any	thing unique about this cro	ising compared to other	watercourses? ().	e, steep banks, clay	in water, etc.)		
6.1.1.1.0	41			- K - K			
Substrate P	articles % sand/silt/cl	Areal Coverage (est.)		Riparian Vegation	n and Shading (describe):	95 - 35-	
		· · · · · · · · · · · · · · · · · · ·	4				
	% grave[[2 = 6	* ********			1 .7 .		
	% gravel (2 - 6 % cobble (64 -	256 mm)		A A	/ 1/ -/		
	-	. /-	5	Sra	15/41/ oh		
	% cobble (64 -	. /-	45	5 ra	15/will sh		
	% cobble (64 - % boulder (> 2	. /-	45	Sta	15/vill oh		
IN SITU TUR	% cobble (64 % boulder (> 2 % bedrock	256 mm)	\		,		lo I
	% cobble (64 % boulder (> 2 % bedrock	. /-	\		,		20
	% cobble (64 % boulder (> 2 % bedrock	nplete at least one measu	arement upstream	n and downstream	of crossing)		-
Meter Make	% cobble (64 - % boulder (> 2 % bedrock Seldity READINGS (contained and Model:	256 mm)	\		of crossing) Distance from	Turbidity	Ti me
Meter Make	% cobble (64 % boulder (>2 % bedrock BIDITY READINGS (contained model): Distance from crossing (m)	nplete at least one measu Turbidity (NTU)	arement upstream	n and downstream	of crossing)		Ti me
Location Upstream	% cobble (64 % boulder (>2 % bedrock BIDITY READINGS (contained many many many many many many many many	Turbidity (NTU)	arement upstream	n and downstream Location Upstream	of crossing) Distance from	Turbidity	35.33
Location Upstream Crossing	% cobble (64 % boulder (>2 % bedrock BIDITY READINGS (core and Model: Distance from crossing (m)	Turbidity (NTU)	arement upstream	Location Upstream Crossing	of crossing) Distance from	Turbidity	35.33
Location Upstream Crossing Dwnstrm	% cobble (64 % boulder (>2 % bedrock IBIDITY READINGS (core and Model: Distance from crossing (m)	Turbidity (NTU)	arement upstream	n and downstream Location Upstream	of crossing) Distance from	Turbidity	35.33
Meter Make Location Upstream Crossing Dwnstrm FLOW ESTIM	% cobble (64 % boulder (>2 % bedrock IBIDITY READINGS (core and Model: Distance from crossing (m)	Turbidity (NTU)	arement upstream	Location Upstream Crossing	of crossing) Distance from	Turbidity	35.33
Meter Make Location Upstream Crossing Dwnstrm FLOW ESTIM High Water	% cobble (64 % boulder (>2 % bedrock IBIDITY READINGS (core and Model: Distance from crossing (m) O TO IATES Location : Width (m):	Turbidity (NTU)	Time	Location Upstream Crossing	of crossing) Distance from	Turbidity	35.33
Meter Make Location Upstream Crossing Dwnstrm FLOW ESTIM High Water Wetted Char	% cobble (64 % boulder (>2 % bedrock IBIDITY READINGS (core and Model: Distance from crossing (m) O 70 IATES Location : Width (m):	Turbidity (NTU) //. / /5.6	Time	Location Upstream Crossing Downstream	of crossing) Distance from	Turbidity	35.33
Meter Make Location Upstream Crossing Dwnstrm FLOW ESTIM High Water	% cobble (64 % boulder (>2 % bedrock IBIDITY READINGS (contained model: Distance from crossing (m) O 70 IATES Location: Width (m): nnel Width: /.	Turbidity (NTU)	Time Distance bei	Location Upstream Crossing Downstream	of crossing) Distance from crossing (m)	Turbidity (NTU)	35.33
Meter Make Location Upstream Crossing Dwnstrm FLOW ESTIM High Water Wetted Char	% cobble (64 % boulder (>2 % bedrock IBIDITY READINGS (contained model: Distance from crossing (m) O 70 IATES Location: Width (m): nnel Width: /.	Turbidity (NTU)	Time Distance bei Time (min): Surface velor	Location Upstream Crossing Downstream tween points (m):	Distance from crossing (m)	Turbidity (NTU)	35.33
Meter Make Location Upstream Crossing Dwnstrm FLOW ESTIM High Water Wetted Char Approx. Ave	% cobble (64 % boulder (>2 % bedrock IBIDITY READINGS (contained model: Distance from crossing (m) O 70 IATES Location: Width (m): nnel Width: /.	Turbidity (NTU) /// /5.6 //.9	Time Distance bei Time (min): Surface velo	Location Upstream Crossing Downstream tween points [m]: / city estimate:	Distance from crossing (m) O-33 ~(5)	Turbidity (NTU)	35.33
Meter Make Location Upstream Crossing Dwnstrm FLOW ESTIM High Water Wetted Char Approx. Ave	% cobble [64 % boulder {> 2 % bedrock IBIDITY READINGS (core and Model: Distance from crossing [m] O TO IATES Location : Width {m}: nnel Width: /.	Turbidity (NTU) //. / /5.6 /2.9 O 5	Distance bei Time (min): Surface velo Average Vel	Location Upstream Crossing Downstream tween points [m]: / celty estimate: ocity [0.8 [1] x Surfave! / 0.9 for smooth	Distance from crossing (m) O-33 ~(5)	Turbidity (NTU)	35.33

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3.6 TURBIDITY MONITORING DATA FORM

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NOTES:

3.6	Turbidity	Turbidity Monitoring Data Form			Α	June 4, 2008	3
CROSSING	ID: 36 29						
Field Crew	Hach +N	ina	- Table 1	Date:	210/15	Time: 2/:30	
LOCATION		VAO 88	Zone:	17	~/-//	61.30	
Easting (m	# 079.70472" U	Northing (m): 7/.	376277	Elevation (fro	m mapping): 562	Other notes:	
	VEATHER: Wind:			pitation: N	Cloud Cover (%): /5		
Recent We	eather Events:	Browner	-				
CONSTRUC		struction Phase (circle		ruction Durin	ng Construction Poll-Cor	struction	
Type of Ac	-		pment in Use:				
Date Cons	truction Began:				10000		
Is the cross	ing location changing? (i.e. is	the crossing moving up	stream or downs	tream of its origin	al location? How far? Which	direction?)	
		IVIA					
SITE SKETC	H, NOTES, REMARKS: (i.e. hig	gh water table, high turb	oldity, natural ba	nk erosion, water o	color, char observed in strea	m, algae in water, etc.)	0.5
A	th, notes, remarks: (i.e. his flow even grossy bank	loner the	on prev	المراهاب	68 T		
			4 1	· · · · · ·			
Ų.,							
_	grossy bond	0					
	•						
5							
•	8						
la abass a	dhimt		12	100			
is there any	thing unique about this cross	ung compared to other	watercourses? (le steep banks, c	lay in water, etc.)		
Substrate F	Partirles %	Areal Coverage (est.)	-	Biography March			
3003114(0)	% sand/silt/cfay			ruparian vegat	Ion and Shading (describe)		
	% gravel {2 - 64						
	% cobble (64 - 2			19/0	15		
	% boulder (> 25	i6 mm)		'			
	% bedrock						
// —							
		plete at least one measi	urement upstrea	m and downstream	n of crossing)		
Meter Make	e and Model:						
Location	Distance from	Turbidity	Time	Location	Distance from	Turbidity	TI
	crossing (m)	(NTU)			crossing (m)	(NTU)	me
Upstream	60	223		Upstream			
Crossing	0	18.0		Crossing			
Dwnstrm	60	14.0		Downstream			
FLOW ESTIN	MATES Location :	The state of the s					_
High Water	Width (m):		Distance be	etween points (m)):		
	Wetted Channel Width:			: /			
	weel Astatu:						
			Surface vel	ocity estimate:	0.79/6	and the state of t	
Wetted Cha					1 2011 2		
Wetted Cha Approx. Ava		on: 0.8 for raugh, loose	Average Ve	elocity (0.8 ⁽¹⁾ x Se	urface Velocity) (VI =	rack	

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3.6 TURBIDITY MONITORING DATA FORM

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3.6	Turbidity Monitoring Data Form	Α	June 4, 2008

CROSSING ID: CV078					
Field Crew: Macke + Nina		Date: To-	e 10 2015	Time: 73'3	
LOCATION Datum: NA083	Zone:	Jun	E MEN TO	1 Z3.35	
	31711	Elevation (from	manningly (***)	Other notes:	
CHRISTIAN STATE OF TAKE A. A. T. A.		pitation:	Claud Cours (N.)		
Recent Weather Events O	ricuj	літатівні.	Cloud Cover (34):	00	
My mac	1. 200 Ca-00-				
		uction During	Construction Post-Cor	istruction	
Type of Activity: Equipme	ent in Use:				
Is the crossing location changing? (i.e. is the crossing moving upstre	iem or downs:	tream of its original	l location? How far? Which	direction?)	
NIA					
SITE SKETCH, NOTES, REMARKS: (i.e. high water table, high turbidit	y, natural bar	ak erosion, water co	olor, char observed in strea	m, algae in water, etc.)	
I DI . I I			•		
- low Flow, natural crossion					
-lowflow, natural crossion -rocky bud, loose banks					
- (ocky mo, look sinks	9				
			55		
is there anything unique about this crossing compared to other wa	tercourses? (i	e steep banks, cla	v in water etc.)		
	DS	,			
Substrate Particles % Areal Coverage (est.)		Riparian Vegation	on and Shading (describe)	:	-
% sand/silt/clay (<2mm) = 15)		-,		
% gravel {2 - 64 mm} - 90) K	1 0 0.5	<		
% cobble (64 - 256 mm) - 5 % boulder (> 256 mm)		9 22			
% bedrock		0			
1					
IN SITU TURBIDITY READINGS (complete at least one measure)			,		
IN SITU TURBIDITY READINGS (complete at least one measure: Meter Make and Model:	ment upstrea	m and downstream	of crossing)		
Location Distance from Turbidity crossing (m) (NTU)	Time	Location	Distance from	Turbidity	l n
			crossing (m)	(NTU)	me
Upstream QO 1,0		Upstream			
Crossing 6		Crossing			
Dwnstrm 60 1.2	10.3	Downstream			
FLOW ESTIMATES Location :					
High Water Width (m):	Distance be	tween points (m):			
Wetted Channel Width:	Time (min)				
Approx. Average Depth:	Surface vel	ocity estimate:	0.04 mb.		
O.4W			rface Velocity) (V) =		
Note (1) - depends on substrate composition: 0.8 for rough, loose roo	ks or coarse a	reavel / 0.9 for smooth	make Velocity) [V] =	rock	
PHOTOS: (upstream, crossing, downstream)			man, anna, or mana per	11995	
		-			
NOTES					

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3.6 TURBIDITY MONITORING DATA FORM

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3.6	Turbidity	Monitoring Dat	ta Form		A	June 4, 2008	3
		-					
CROSSING	C						
Field Crew	MINCK 7	Nina			L 10 2015	Time: 22!15	
LOCATION		A083	Zone:	17			
Easting (m		Northing (m): 71		Elevation (from	mapping):	Other notes:	
	VEATHER: Wind:	Air Temp: 70	Preci	pitation:	Cloud Cover (%):	00	F
	ather Events:						
CONSTRUC		nstruction Phase (circle	one): Pre-Const	ruction During	Construction Post-Cor	nstruction	-
Type of Ac		Equi	pment in Use:			tymu — a	57
-	ruction Began:						
	Ing location changing? (i.e. by NOTES, REMARKS: (i.e. h						
SITE SKETC	H, NOTES, REMARKS: (le. h	igh water table, high turb	oldity, natural ba	nk erosion, water co	lor, char observed in strea	im, algae in water, etc.)	
- Sun	Jy bonks	w/ Son	n the	Crosion	•		
- 51	ghtly Lister				Jo Flon	J	
				¥			
			8		0		
Is there any	thing unique about this cro	ising compared to other	watercourses?	i e steep banks, cla-	in water, etc.)		
		US + D	2		El		
Substrate P	articles 9	US + D Areal Coverage (est.)		Riparlan Vegatio	n and Shading [describe]		-
	% sand/silt/cl	ay (<2mm) 9 5					
	% gravet (2 - 6				4.4		
	% cabble (64 - % boulder (> 2			-	N/A		
	% bedrock	.20 11111)		-	10/11		
IN SITH THE	REIDITY READINGS (cor	nplete at least one meas	INCOMES ADDITION	and downstream	of		
	and Model:	inproce at reast one thesis	arement apstrea	mi and nowntriest	or crossing)		
Location	Sister of Con-	T 1146					
Location	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from	Turbidity	TI
					crossing (m)	(NTU)	me
Upstream	15	11.2	-	Upstream			
Crossing	0	43.5	-	Crossing			
Dwnstrm	15	29.6		Downstream			
FLOW ESTIN	AATES Location :	And the state of t		5 107 15 F 1074			
High Water	Width (m):		Distance b	etween points (m):		- /	
Wetted Cha	nnel Width:	m	Time (min				
Approx. Ave	rage Depth:	15	Surface ve	locity estimate:	dark		
9		i sm		elocity (0.8 ⁽¹⁾ x Sur	AITH IS		
Note {1} - de	pends on substrate composi	tion: 0.8 for rough, loose	rocks or coarse	gravel / 0.9 for smooth	tace Velocity] [V] =	n rock	
	pstream, crossing, downstre						
	erroom, wassing, namustre	eam) 187	5 , 18	72 . 187	4		

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TURBIDITY MONITORING DATA FORM

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	А	June 4, 2008

CROSSING	ID: (VOUS						_
Field Crew	Moself & A	I.L.		Date: 110	L 10 7015	Time: 22:40	
LOCATION	Datum: 14	083	Zone:	7	210 101	22,40	
Easting (m	80,16604 W	Northing (m): 71.	426011	Elevation (from	mapping): SZ	Other notes:	
CURRENT W	EATHER: Wind:	Air Temp: 70		pitation:	Cloud Cover (%): 100		
Recent We	ather Events: OCV	melt			100		
CONSTRUCT	714/	nstruction Phase (circle	onel: Pre-Const	rection During	Construction Post-Con	thrust on	
Type of Act			pment in Use:	outer contra	CONSTRUCTION CONTROL	struction	
	ruction Began:		princial til O'ac.				
-	ng location changing? (i.e.	Is the crossing moving up	itream or downs	tream of its original	location? How far? Which	direction?)	(C) 40
· · · · · ·	of flaving						
•							
				9			
is there any	thing unique about this cros	ssing compared to other	watercourses? (ie steep banks, clay	y in water, etc.)		
		USFOS.					
Substrate P		4 Areal Coverage (est.)		Riparian Vegation	n and Shading (describe):		
	% sand/silt/cl	ay (<2mm)					
		4 mm - 30 -256 mm) - 70		1			
	% boulder (> 2			i a	17.05		
	% bedrock				90085		
IN SITH THE	RBIDITY READINGS (cor	mplete at least one meas	Uramant unetra	m and downstream	of crossing)		
	and Model:	ilbiere ar iest one mess	orement opsirea	an and bownstream	or crossing		
Location	Distance form	To ablatta		Land			
Cocation	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Ti
Upstream	70	Aq	_	Upstream	and the	(1.1.0)	-
Crossing	<i>t</i> >	13	-	Crossing			-
Dwnstrm	25	113	-				1
	73	LOIT		Downstream		l	1
FLOW ESTIN		× -					
High Water			Distance b	etween points (m):			
Wetted Cha	nnel Width:	3m	Time (min)	- /		102 22	
Approx. Ave	rage Depth:	azm	Surface ve	locity estimate:	1015m/s.		
	27 × 77 2	The state of the s	Average V	elocity (0.8 ⁽¹⁾ x Sur	face Velocity) (V) =		
Note (1) - de	pends on substrate composi	tion: 0.8 for rough, loose	rocks or coarse	gravel / 0.9 for smoo	th mud, sand, or hard pan	rock	
PHOTOS: (u)	stream, crossing, downstr	eam) 1875	1874, 18	77			
NOTES:		10.0	101-) 13	-			
			-				

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3.6 TURBIDITY MONITORING DATA FORM

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3.6	Turbidity Monitoring Data Form	Α	June 4, 2008

CROSSING	ID: CVIII	Tr.		***			
Field Crew	" Mack + N	lina		Date: Jur	e 11, 2015	Time: /140	
LOCATION	Datum:		Zone:				
Easting (m	1:80.39077-W	Northing (m): 7/. 6	9071'N	Elevation (fro	m mapping): 407	Other notes:	
CURRENT V	VEATHER: Wind:	Air Temp: /-	C Preci	pitation:	Cloud Cover (%): /	00%	
Recent We	eather Events: Day	zreshet				~	
CONSTRUC	TION / Cor	struction Phase (circle on	e): Pre Constr	uction Durin	g Construction Post-Cor	struction	
Type of Ac	tivity:	Equipm	sent in Use:				
Date Cons	truction Began:						
is the cross	ing location changing? (i.e. 1	s the crossing moving upstr	eam or downs	tream of its origin	al location? How far? Which	direction?)	
SITE SKETC	H, NOTES, REMARKS: (e. fi	gh water table, high turbid	ity, natural bai	nk erosion, water o	olor, char observed in strea	m, algae in water, etc.)	
*					4		
ا	clearwo	ater					
1							
-	natural	bank ero	sion				
-							
is there any	thing unique about this cros	sing compared to other wa	itercourses? (le steep banks, ci	ay in water, etc.)		
			0.5				
Substrate P	articles %	Areal Coverage (est.)		Riparian Vegat	ion and Shading (describe)	;	-
	% gravet (2 - 64		32				
	% cobble (64 -		15	}			
	% boulder (> 2:	56 mm)					
	% bedrack						
		plete at least one measure	ment upstrea	m and downstream	af crossing)		
Meter Maki	e and Model:						
Location	Distance from	Turbidity	Time	Location	Distance from	Turbidity	Ti
	crossing (m)	(NTU)		<u> </u>	crossing (m)	(ניזא)	me
Upstream	60	3,4		Upstream			
Crossing	0	5.0		Crossing			
Dwnstrm	60	2.7		Downstream			
FLOW ESTIN	MATES Location :						
High Water	Width (m):		Distance be	tween points (m)	:		
Wetted Cha	nnel Width: 1 m		Time (min)			· · · · · · · · · · · · · · · · · · ·	
Approx. Ave	rage Depth: O.		Surface vel	ocity estimate:	0.50 m/s		
			Average Va	locity (0 x (1) v c.	urface Velocity) (V) =		
Note (1) - de	pends on substrate composit	ion 0.8 for rough, loose ro	cks or coarse a	gravel / 0.9 for smo	oth mud, sand, or hard par	rock	
	pstream, crossing, downstre			1088 35	10.0 (8.09)		
NOTES:	<u>-</u>				- 1		

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3.6 TURBIDITY MONITORING DATA FORM

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	Α	June 4, 2008
	V112		
Field Crew: M	ach + Nino Date: Jun	e 11, 2015	Time: 2:25
LOCATION	Datum: N A-O 83 Zone: 1.7		

Easting (m): 80.40078 W Northing (m): 71, 69437° N Elevation (from mapping): 405 Other notes: CURRENT WEATHER: Wind: Air Temp: Cloud Cover (%): /00 Precipitation: Recent Weather Events: CONSTRUCTION Construction Phase (circle one): Pre-Construction During Construction Post-Construction Type of Activity: Equipment in Use: Date Construction Began: is the crossing location changing? (i.e. is the crossing moving upstream or downstream of its original location? How far? Which direction?) SITE SKETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream, algae in water, etc.) -water fairly clear slightly silty in stream bed Is there anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water; etc.) Substrate Particles % Areal Coverage (est.) Riparlan Vegation and Shading (describe): % sand/silt/clay (<2mm) 4 40 grass fuillow % gravel (2 - 64 mm) 10 % cobble (64 - 256 mm) % boulder (> 256 mm) % bedrock IN SITU TURBIDITY READINGS (complete at least one measurement upstream and downstream of crossing) Meter Make and Model: Location Distance from Turbidity Location Distance from Turbidity Τì crossing (m) (NTU) crossing (m) (NTU) me 75 2.3 Upstream Upstream 0 Crossing Crossing Dwnstrm 3-5 Downstream FLOW ESTIMATES Location : High Water Width (m): Distance between points (m): Wetted Channel Width: Time (min): In Approx. Average Depth: Surface velocity estimate: 054 m/s 0,20 Average Velocity (0.8 (1) x Surface Velocity) (V) =

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Note (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock

PHOTOS: [upstream, crossing, downstream]

NOTES:

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3.6 TURBIDITY MONITORING DATA FORM

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3.6 Turbidity Monitoring Data Form A June 4, 2008	
CROSSING ID: 1/4/2	
por.	
Nav 3	
Cities unites:	
trespitation civel (a): 40	
Recent Weather Events: Vry, melt	50.7
CONSTRUCTION Construction Phase (circle one): Pre-Construction During Construction Post-Construction	
Type of Activity: Equipment in Use:	
Date Construction Began:	
Is the crossing location changing? (i.e. is the crossing moving upstream or downstream of its original location? How far? Which direction?)	
SITE SKETCH, NOTES, REMARKS: e high water table, high turbidity, natural bank erosion, water color, char observed in stream, algae in water, etc.)	
Frake lanks forther North U/S.	
State	
Testing to see if will but a material or	
auged by row.	
· Green bean tolder color. Picurios: us Go III. s there anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) Stream Floring in Q cultust s there anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.)	
PREJECT OF GO IST	
tain in the color	
is there anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.)	
Substrate Particles	
% sand/silt/clay (<2mm) 70 50	
% gravel (2 - 64 mm) 20 5	
* cobble (64 - 255 mm) 10 F Gross Willow	
% boulder (* 256 mm) 40	
V SITU TURBIDITY READINGS (complete at least one measurement upstream and downstream of crossing) Reter Make and Model:	
Location Distance from Turbidity Time Location Distance from Turbidity	Ti
crossing (m) (NTU) crossing (m) (NTU)	m
pstream 60 14.4 Upstream	
70.0	
WASTIM 60 8.6 Downstream	
	51.5**
igh Water Width (m): Distance between points (m):	
/etted Channel Width: Zm Time (min): /	
pprox. Average Depth: Surface velocity estimate: 0.3 m/S.	
Average Velocity (0.8 (1) x Surface Velocity) (V) =	
ote (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock	
HOTOS: (upstream, crossing, downstream) 1897, [896, 1898]	
OTES:	

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SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	А	June 4, 2008
CROSSING ID. C.			

Field Crew							
LOCATION	MILL F NIA			Date: Ju	e 117014	Time: 22: 10	
	N		Zone:	7	200		
Easting (m	DOI -1 DOIN	Northing [m]: 7(38236N	Elevation (from	mapping):	Other notes:	
	WEATHER: Wind:	Air Temp:	Precir	itation:	Cloud Cover (%):	100	
	eather Events: Orv	out.				-	
CONSTRUC	TION Con	struction Phase (circle	one): Pre-Constr	uction During	Construction Post-Co	onstruction	
Type of Ac	ctivity:	Equi	pment in Use:				
Date Cons	truction Began						
Is the cross	ing location changing? (i.e. is	the crossing moving up	stream or downst	ream of its original	location? How far? Which	th direction?)	
	New read Mu		_ .				
SITE SKETC	H. NOTES, REMARKS: (i.e. bij	gh water table, high turb	idity, natural bar	k erosion, water co	lor, char observed in stre	am, algae in water, etc.)	
· Ha	we silt is what des butting com substitute build	flowing ?	bred Dicell.)/S.	ā		
. с	Luking com	J.Kon.					
	1 E E b. 1	Continu.					
, Y	July rul man	, 30,411					
					55		
Substrate F	Particles % % sand/silt/cla % gravel {2 - 64 % cobble {64 - 2 % boulder {> 25 % bedrock	(mm) 40 256 mm) (0		Riparian Vegatio	n and Shading (describe	·):	
	RBIDITY READINGS (com	plete at least one measu	rement upstream	n and downstream	of crossing)		
	e and Model: Distance from	plete at least one meast Turbidity	Jrement upstrear	n and downstream	of crossing) Distance from	Turbidity	T I
Meter Make	e and Model:					Turbidity (NTU)	Ti me
Meter Make Location	e and Model: Distance from	Turbidity			Distance from	· · · · · · · · · · · · · · · · · · ·	
Meter Make	e and Model: Distance from crossing (m)	Turbidity (NTU)		Location	Distance from	· · · · · · · · · · · · · · · · · · ·	
Location Upstream Crossing	Distance from crossing (m)	Turbidity (NTU)		Location Upstream	Distance from	· · · · · · · · · · · · · · · · · · ·	
Meter Make Location Upstream Crossing Dwnstrm	Distance from crossing (m)	Turbidity (NTU) 9.2 /0.3		Location Upstream Crossing	Distance from	· · · · · · · · · · · · · · · · · · ·	
Meter Make Location Upstream Crossing Dwnstrm	Distance from crossing (m) 0 0 75 MATES Location :	Turbidity (NTU) 9.2 /0.3	Time	Location Upstream Crossing Downstream	Distance from	· · · · · · · · · · · · · · · · · · ·	
Meter Make Location Upstream Crossing Dwnstrm FLOW ESTIN	Distance from crossing (m) 0 0 75 MATES Location :	Turbidity (NTU) 9.2 /0.3	Time Distance be	Location Upstream Crossing Downstream tween points (m):	Distance from	· · · · · · · · · · · · · · · · · · ·	
Meter Make Location Upstream Crossing Dwnstrm FLOW ESTIN High Water Wetted Cha	Distance from crossing (m) 100 75 MATES Location : Width (m):	Turbidity (NTU) 9.2 /0.3 9.7	Distance be	Location Upstream Crossing Downstream tween points (m):	Distance from crossing (m)	· · · · · · · · · · · · · · · · · · ·	
Meter Make Location Upstream Crossing Dwnstrm FLOW ESTIN High Water Wetted Cha	Distance from crossing (m) O O O TS AATES Location : Width (m):	Turbidity (NTU) 9.2 /0.3 9.7	Distance be Time (min): Surface velo	Upstream Crossing Downstream tween points (m): /	Distance from crossing (m)	· · · · · · · · · · · · · · · · · · ·	
Meter Make Location Upstream Crossing Dwnstrm FLOW ESTIN High Water Wetted Cha	Distance from crossing (m) O O TS MATES Location : Width (m): unnel Width: 4 crage Depth: 0.2	Turbidity (NTU) 9.2 /0.3 9.7	Distance be Time (min): Surface velo	Upstream Crossing Downstream tween points (m): / pocity estimate: locity (0.8 (1) x Sun	Distance from crossing (m) O:43 m/s.	(NTU)	
Meter Make Location Upstream Crossing Dwnstrm FLOW ESTIN High Water Wetted Cha Approx. Ave	Distance from crossing (m) O O TS MATES Location : Width (m): winnel Width: 4 M erage Depth: 0.2 A	Turbidity (NTU) 9.7 /0.3 9.7	Distance be Time (min): Surface velo Average Verocks or coarse g	Upstream Crossing Downstream tween points (m): // ocity estimate: locity (0.8 [1] x Surrayel / 0.9 for smoo	Distance from crossing (m) O:43 m/s.	(NTU)	
Meter Make Location Upstream Crossing Dwnstrm FLOW ESTIN High Water Wetted Cha Approx. Ave	Distance from crossing (m) O O TS MATES Location : Width (m): unnel Width: 4 crage Depth: 0.2	Turbidity (NTU) 9.2 /0.3 9.7	Distance be Time (min): Surface velo	Upstream Crossing Downstream tween points (m): / pocity estimate: locity (0.8 (1) x Sun	Distance from crossing (m) O:43 m/s.	(NTU)	

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3.6 Turbidity Monitoring Data Form A June 4, 2008	SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
	3.6	Turbidity Monitoring Data Form	А	June 4, 2008

CROSSING ID: U046
Field Crew: Muck + Wines Date: June 11 2017 Time: ZZ'88.
LOCATION Datum: NAD 85 Zone: 17
Easting (m): 80. 11060 W Northing (m): 71,41930 W Elevation (from mapping): 7981 Other notes:
CURRENT WEATHER: Wind: / Air Temp: 7 C Precipitation: / Cloud Cover (%): (00
Recent Weather Events:
CONSTRUCTION Construction Phase (circle one): Pre-Construction During Construction Post-Construction
Type of Activity: Equipment in Use:
Date Construction Began:
Is the crossing location changing? (i.e. is the crossing moving upstream of downstream of its original location? How far? Which direction?) SITE SKETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream, algae in water, etc.)
** Tusto; Dean water table, high turbidity, natural bank erosion, water color, char observed in stream, algae in water, etc.) ***Tusto; Dean water ***Wateral acos.on, famy 5:11 land
a buse of 4:11?
Flow award collect uncks road iputing 216.6 NTO Waks into Streem. Results in 57.2 NTO DIS. ~ 3km = 13.7 Is there anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.)
Substrate Particles % Areal Coverage (est.) Riparlan Vegation and Shading (describe):
% sand/silt/clay (<2mm) % gravel (2 - 64 mm) 10 % cobble (64 - 256 mm) 40
% cobble (64 - 256 mm) 40 % boulder (> 256 mm) 30 % bedrock
IN SITU TURBIDITY READINGS (complete at least one measurement upstream and downstream of crossing)
IN SITU TURBIDITY READINGS (complete at least one measurement upstream and downstream of crossing) Meter Make and Model:
Location Distance from Turbidity Time Location Distance from Turbidity
conting ind
and the state of t
Upstream 100 10.0 Upstream Crossing 2.7.416 Crossing
7 7 2 10.0
Dwnstrm 150 Downstream
FLOW ESTIMATES Location :
High Water Width (m): Distance between points (m):
Wetted Channel Width: / Time (min): /
Approx, Average Depth: 0, 2 m Surface velocity estimate: 0, 5 m/S.
Average Velocity (0.8 (1) x Surface Velocity) (V) =
Note (1) -depends on substrate composition: 0.8 for rough, loose rocks or coarse grave! / 0.9 for smooth mud, sand, or hard pan rock
PHOTOS: (upstream, crossing, downstream) 1907, 1908, 1909
NOTES:
/

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3.6 TURBIDITY MONITORING DATA FORM

	SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE				
	3.6	Turbidity Monitoring Data Form	А	June 4, 2008				
-1	CROSSING ID: CV7774							

CROSSING ID: CUZZZ					-
Field Crew:		Date: Tun	L 12 7015	Time: 20 1 Z	O
LOCATION Datum: JAD 93	Zone:	17			
Easting (m): 74 43777 Northing (m): 76.3	2894N	Elevation (from	n mapping):	Other notes:	
CURRENT WEATHER: Wind: Air Temp: < **	Precip	pitation: Light	Cloud Cover (%):	00	
Recent Weather Events: Dry me If					
CONSTRUCTION Construction Phase (circle on	e): Pre Constr	ruction Durin	g Construction Post-Co	instruction	
Type of Activity: Equipm	ent in Use:				
Date Construction Began:					
is the crossing focation changing? (i.e. is the crossing moving upstr					
SITE SKETCH, NOTES, REMARKS: (i.e. high water table, high turbide	ty, natural bar	nk erosion, water c	olor, char observed in stre	am, algae in water, etc.)	
"Brown turbed waked DK	, no	it al a	osion pus	1+	
old soud.					
	9		E1		
deal de les					
is there anything unique about this crossing compared to other wi		i.e steep banks, cli	By in Water, etc.)		
Substrate Particles % Areal Coverage (est.)	DS. 1	Discolar Massel	and the state of t		
	70	Ripartan Vegati	on and Shading (describe	2.)1	
	Ю				
% coopie (64 - 256 mm)	0				1
% boulder (> 256 mm)		ì			
% bedrock					
					8
IN SITU TURBIDITY READINGS (complete at least one measure Meter Make and Model)	ement upstrea	m and downstream	of crossing)		
Location Distance from Turbidity	Time	Location	Distance from	Turbidity	Ti
crossing (m) (NTU)		100	crossing (m)	(NTU)	me
Upstream 85 m 37.5	1	Upstream			
Crossing 8 39.2		Crossing	3		
Dwnstrm 23.0		Downstream		10	
FLOW ESTIMATES Location :	1				
High Water Width (m):	Distance be	etween points (m)	:		
Wetted Channel Width:	Time (min)	: /			
Approx. Average Depth: 100 mg	Surface vel	locity estimate:	O. lmk	3450	
IVEN	-		rrface Velocity) (V) =	9	
Note (1) - depends on substrate composition: 0.8 for rough, loose ro	ocks or coarse	gravel / 0.9 for smo	oth mud, sand, or hard or		\rightarrow
PHOTOS: (upstream, crossing, downstream) 14/2					
NOTES:	1917	1914			
			symile		

Recent Weather Events:

CONSTRUCTION

Type of Activity:

Location

NOTES:

Distance from

Environmental Protection Plan

Environment

Issue Date: July 15, 2014

Post-Construction

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1/19

Turbidity

3.6 TURBIDITY MONITORING DATA FORM

SECTION	OPERATIONAL ENVIRONMENT STA	NDARD REVIS	SION # REVISION DATE
3.6	Turbidity Monitoring Data Form	А	June 4, 2008
	21 4		
CROSSING ID:	ALLE I NING	Date: Time 17	2015 Time: 20! 50
LOCATION	Datum: Nitv 83 Zone: 1	7	201, 20.30
Easting (m): 74	. 633140 W Northing (m): 71,36707 N	Elevation (from mapping):	Other notes
CURRENTWEATHE		tation: Cloud Cove	er (%): 100

During Construction

Date Construction Began is the crossing location changing? (i.e. lighte crossing moving upstream or downstream of its original location? How far? Which direction?)

Equipment in Use:

Henry bink asson Checking.

SITE SKETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank eroslon, water color, char observed in stream, algae in water, etc.)

· Havy bank wosion, checking thels.

Is there anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.)

Construction Phase (circle one): Pre-Construction

Substrate Particles	% Areat Coverage (est.)	Riparian	vegation and Snai
	% sand/slit/clay (<2mm) % Parties (2 - 64 mm)		
	% gravel (2 - 64 mm)		
	% cobble (64 - 256 mm) (9		
	% boulder (> 256 mm)	1	
	% hadenek	31	

IN SITU TURBIDITY READINGS (complete at least one measurement upstream and downstream of crossing) Meter Make and Model:

Turbidity

	crossing (m)	{NIU}		crossing (m)	נאזטן	me
Upstream	100	5.1	Upstream			
Crossing	Ø	6.8	Crossing			
Dwnstrm	100	7.4	Downstream		C	
FLOW ESTIMAT	ES Location :	e para transit e a				
High Water Wi	dth (m):	780.00	Distance between points (m):			
Wetted Channe	l Width: Zm		Time (min): /			
Approx. Averag		M	Surface velocity estimate:	1.3 m/s.		
			Average Velocity (0.8 (1) x Su		100 - 000 000	
Note (1) - deper	nds on substrate compositi	on: 0.8 for rough, loose	rocks or coarse gravel / 0.9 for smooth	oth mud, sand, or hard pan o	rock	
PHOTOS: {upstr	ream, crossing, downstre	am) 10	1017 1916			

Location

Distance from

Environmental Protection Plan

Environment

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TURBIDITY MONITORING DATA FORM 3.6

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	А	June 4, 2008

CROSSING ID: AGE	-						
Field Crew: Mark +N:16 Date: June 12 7015 Time: 21:08							
LOCATION Datum: NAO 82 Zone: 17							
Easting (m): 44, 70332 W Northing (m): 71, 376364 Elevation (from mapping): Other notes:							
CURRENT WEATHER: Wind: Air Temp: 41 Precipitation Cloud Cover (%):							
Recent Weather Events: Div , melt							
CONSTRUCTION Construction Phase (circle one): Pre-Construction During Construction Part Construction							
Type of Activity: Equipment in Use:							
Date Construction Began:	_						
Is the crossing location changing? (i.e. is the crossing moving upstream of downstream of its original location? How far? Which direction?)							
SITE SKETCH, NOTES, REMARKS: i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream, algae in water, etc.)	_						
· Recherting hubidity.							
in the second se							
Y a second of the second of th							
is there anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.)							
Substrate Particles % Areal Coverage (est.) % sand/silt/clay {<2mm} 70 % gravel {2 - 64 mm} 20 % cobble (64 - 256 mm) % boulder (> 256 mm) % bedrock Riparian Vegation and Shading (describe): Guess							
	- 3						
IN SITU TURBIDITY READINGS (complete at least one measurement upstream and downstream of crossing) Meter Make and Model:							
Location Distance from Turbidity Time Location Distance from Turbidity crossing (m) (NTU) crossing (m) (NTU)	Ti me						
Upstream Upstream							
Crossing Crossing							
Dwnstrm 75 15.4 Downstream							
FLOW ESTIMATES Location :							
	-						
High Water Width (m): Wetted Channel Width: Time (min): /							
Approx. Average Depth: O (Surface velocity estimate: O 7-15	_						
0.00							
I A D. I. D. A.							
Average Velocity (0.8 (1) a Surface Velocity) (V) =	_						
Note (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock							
Note (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock PHOTOS: [upstream, crossing, downstream]							

NOTES:

Environmental Protection Plan

Environment

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TURBIDITY MONITORING DATA FORM 3.6

CROSSING ID: REAL T VA COUNTY AND CONTROL TO THE COUNTY AND COUNTY AND CONTROL TO THE COUNTY AND COUNTY	SECTIO	N OPERAT	IONAL ENVIRON	MENT ST	ANDARD	REVISION #	REVISION DATE
Date: July 13 23/5 Time: V:	3.6	Turbidity	/ Monitoring Dat	a Form		А	
Date: July 13 23/5 Time: V:	CROSSING II	0.5.1=				7,5-2	
SCALUM: (N.P.) 7.5 TS 47 * K Morthing (m.) 71.35 5/4 * M. Etevation (from mapping) 574 Other notes: CURRENT WEATHER Winds: Air Temp: Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Recent (M): 22/6 70// Recent Weather Cvents: Recent (M): 23/6 70// Recent Weather Weather (M): 23/6 70// Recent Weather (M): 23/		0011				The state of the s	
SCALUM: (N.P.) 7.5 TS 47 * K Morthing (m.) 71.35 5/4 * M. Etevation (from mapping) 574 Other notes: CURRENT WEATHER Winds: Air Temp: Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Precipitation: M. Cloud Cover (K): 22/6 70// Recent Weather Cvents: Recent (M): 22/6 70// Recent Weather Cvents: Recent (M): 23/6 70// Recent Weather Weather (M): 23/6 70// Recent Weather (M): 23/		Mach + 1	Vina		Date: Ju-	= 13, 2-15	Time: 2/://
CURRENT WEATHER. While: A tremp: Precipitation: Construction Constru		Datum: //	/4D 83		/7		
Recent Weather Events: Prescription over views day CONSTRUCTION Construction Phase (Ende one): Pre-Construction Use: Gentruction Phase (Ende one): Pre-Construction Use: Gentruction Segan: In the crossing location changing? (i.e. is the crossing moving upstream or downstream of its original location? How far? Which direction?) Wife SKETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream. Sigas in water. etc.) - North and Construction - Second by Out About - Second by Out About				5546 N	Elevation (from	m mapping): 574	Other notes:
CONSTRUCTION Construction Phase lefted easi; Feconstruction During Construction Type of Activity: Equipment in Use: Date Construction Eagan: In the crossing location changing? (i.e. is the crossing mowing upstream or downstream of its original location? How far? Which direction?) All ESKECH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream. algae in water, etc.) - Notice Activity: - Second brown Associate - Low Adout - green brown Associate - there anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) - which is the constant of t				Prec	ipitation: 🖊	Cloud Cover (%):	8 70%
Type of Activity: Equipment in Use: Date Construction Began: At the crossing foration changing? (i.e. is the crossing moving upstream or downstream of its original location? How far? Which direction?) Attended the crossing foration changing? (i.e. is the crossing moving upstream or downstream of its original location? How far? Which direction?) Attended the crossing compared to other watercourses? There anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) There anything unique about this crossing compared to other watercourses? There anything unique about this crossing compared to other watercourses? There anything unique about this crossing compared to other watercourses? There anything unique about this crossing compared to other watercourses? There anything unique about this crossing compared to other watercourses? There anything unique about this crossing compared to other watercourses? There anything unique about this crossing compared to other watercourses? There anything unique about this crossing compared to other watercourses? There anything unique about this crossing compared to other watercourses? There anything unique about this crossing compared to other watercourses? There anything unique about this crossing compared to other watercourses? There anything unique about this crossing compared to other watercourses? There anything unique about this crossing compared to other watercourses? There anything unique about this crossing length unitered. There anything unique about this crossing compared to other watercourses? There anything unique about this crossing parel to a steep banks, clay in water, clc.] There anything unique about this crossing parel to a steep banks, clay in water, clc.] There anything unique about this crossing parel to a steep banks, clay in water, clc.] There anything unique about this crossing parel to a steep banks, clay in water, clc.] There anything unique about this crossing parel to a steep bank		Preci	pitation pre	views 0	lay		
Date Construction Began: In the crossing focation changing? (i.e. is the crossing moving upstream or downstream of its original location? How far? Which direction?) SITE SKETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream. algae in water, etc.] - Notice of the control of the control of the control of the color, char observed in stream. algae in water, etc.] - Notice of the control of the color of the color of the color, char observed in stream. algae in water, etc.] - Notice of the color of the color of the color of the color of the color, char observed in stream. algae in water, etc.] - Notice of the color of			instruction Phase (Circle)	one): Pre-Const	ruction Durin	g Construction dist-Const	mino.
A the crossing location changing? (i.e. is the crossing moving upstream or downstream of its original location? How far? Which direction?) WASHESKETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream. algae in water, etc.) - Note of our first of the constant of the color, char observed in stream. algae in water, etc.) - Note of our first our fi			Equip	ment in Use:			
SITE SKETCH, NOTES, REMARKS: (i.e. high water table, high turbidity, natural bank erosion, water color, char observed in stream. Bigae in water, etc.) - notional ensign - low flow - green brown flow - water board - green brown flow - water board - water color, char observed in stream. Bigae in water, etc.) - how flow - green brown flow - water board - water color, char observed in stream. Bigae in water, etc.) - water board - water board - water color, char observed in stream. Bigae in water, etc.) - water anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) - water anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) - water anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) - water anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) - water anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) - water anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) - water anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) - water anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) - water anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) - water anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water etc.) - water anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water etc.) - water anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water etc.) - water an							
- Northwalers in the service of the service of the steep banks, clay in water, etc.) there anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) ubstrate Particles **Areal Coverage (est.) **Sand/silt/clay (<2mm) 7 b **Sgravel (2 - 64 mm) 20 **Scobile (6 - 256 mm) 10 **Sboulder (> 256 mm) 10 **Story of the service of the se		NIA					
- Northwalers in the service of the service of the steep banks, clay in water, etc.) there anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) ubstrate Particles **Areal Coverage (est.) **Sand/silt/clay (<2mm) 7 b **Sgravel (2 - 64 mm) 20 **Scobile (6 - 256 mm) 10 **Sboulder (> 256 mm) 10 **Story of the service of the se	SITE SKETCH,	NOTES, REMARKS: (i.e.)	nigh water table, high turb	dity, natural ba	nk erosion, water c	olor, char observed in stream.	algat in water, etc.)
there anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) white anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) white particles							
there anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) white anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) white particles	- 126	Llan			1.00		
there anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) Wareal Coverage (est.) Sand/silt/clay (<2mm) 70 Sand/silt/clay (<2mm) 70 Scabble (64 - 256 mm) 70 Subulder (> 256 mm) 70 Subul							
there anything unique about this crossing compared to other watercourses? (i.e. steep banks, clay in water, etc.) Wareal Coverage (est.) Sand/silt/clay (<2mm) 70 Sand/silt/clay (<2mm) 70 Scabble (64 - 256 mm) 70 Subulder (> 256 mm) 70 Subul	- aree	1/2000	Luchard	-ater			
### Areal Coverage (est.) ### Areal Coverage (est.) ### Sand/silt/clay (<2mm) 75	0100	TOYOLES.	1001014	co cop and			
### Areal Coverage (est.) ### Areal Coverage (est.) ### Sand/silt/clay (<2mm) 75					5.0		
### Areal Coverage (est.) ### Areal Coverage (est.) ### Sand/silt/clay (<2mm) 75				.81.			
*** sand/silt/clay (<2mm) 73	is there anyth	ing unique about this cro	ssing compared to other v	vatercourses? (i.e. steep banks, cla	iy in water, etc.)	
*** sand/silt/clay (<2mm) 73							
**gravel (2 - 64 mm)	Substrate Par				Riparlan Vegation	on and Shading (describe):	
**Scobble (64 - 256 mm)			d much	1			
** boulder (> 256 mm)							
STTU TURBIDITY READINGS (complete at least one measurement upstream and downstream of crossing)				40	1.90	ass Lilla	
eter Make and Model: Location		% bedrock				75/11/123	
eter Make and Model: Location							
Distance from crossing (m) Continue Co			npiete at least one measu	ement upstrea	m and downstream	of crossing)	
crossing (m) (NTU) Distance from crossing (m) (NTU) Distance from crossing (m) (NTU) me Distance from crossing (m) (NTU) Distance from crossing (m) (NTU) me Distance from crossing (m) (NTU) me Distance from crossing (m) (NTU) me Distance from crossing (m) (NTU) Distance from crossing (m) (NTU) Topoxing (m) (NTU) Distance between points (m):	deter Make a	nd Model					
postream 19.8 Upstream	Location			Time	Location		4
ossing 32.7 Crossing wastrm 76 21.9 Downstream OW ESTIMATES Location : gh Water Width (m): Distance between points (m): titled Channel Width: /.5 m Time (min): / prox. Average Depth: 0.64 Surface velocity estimate: 0.33~/5 Average Velocity (0.8 (1) x Surface Velocity) (v) = te (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock	pstream	50	19.8		Upstream		
DOW ESTIMATES Location: Sh Water Width (m): Distance between points (m): Itted Channel Width: / 5 \cdots Time (min): Surface velocity estimate: 0.33 \(\)/5 Average Velocity (0.8 \(\)/1 \(\) Surface Velocity (V) = te (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock	rassing						
Distance between points [m]: petted Channel Width:	wnstrm	78					
chted Channel Width: /.5 \cdot Time [min]: / prox. Average Depth: 0.6 \cdot Surface velocity estimate: 0.33 \cdot/5 Average Velocity [0.8 (1) x Surface Velocity] (V) = te (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock	LOW ESTIMAT			+			
teted Channel Width: /.5 \sim Time [min]: / prox. Average Depth: 0.6 \sim Surface velocity estimate: 0.33 \sim /5 Average Velocity [0.8 (1) x Surface Velocity] (V) = te (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock				Dian			
prox. Average Depth: 0.64. Surface velocity estimate: 0.33~/5 Average Velocity [0.8 (1) x Surface Velocity] (V) = te (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock							
Average Velocity (0.8 (1) x Surface Velocity) (V) = te (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock		1. 3					
te (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock	Phina MACIS	е оерин	04	_	70	0.33215	
	te (1) adone	ndi na substante se	Non- 0.8 for small 1	Average Ve	locity (0.8 (1) x Sui	rface Velocity) (V) =	
OTOS: (upstream, crossing, downstream)				ocks of costse f	ravel / 0.9 for smoo	oth mud, sand, or hard pan roo	ik

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Environment

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3.6 TURBIDITY MONITORING DATA FORM

SECTION	ON OPERATION	ONAL ENVIRON	MENT STA	ANDARD	REVISION #	REVISION DA	ATE
3.6	Turbidity	Monitoring Dat	a Form		А	June 4, 2008	
CROSSING							
Field Crew	Hack +N:	10		Date: June	13,205	Time: 28:40	
LOCATION	Datum: N	4083	Zone:	17			
Easting (m)	10876 W	Northing (m): 7/	HIRLP N	Elevation (from	mapping): 796	Other notes:	
CURRENT W	EATHER: Wind:	Air Temp: 3	Preci	pitation: //	Cloud Cover (%): 7/	8	- 2
Recent We	ther Events: Preci	2. Previou	· day				
CONSTRUCT	ION Con	struction Phase (circle	one}: Pre Const.	ruction During	Construction Cost Constr	niction	
Type of Act	ivity:	Equi	pment in Use:				
Date Consti	uction Began:						
Is the crossi	ng location changing? ()	the crossing moving up	stream or downs	tream of its original	location? How far? Which di	rection?)	
- c	ilty flow	Areal Coverage (est.) y (<2mm) amm) 256 mm)	atively notes a	clear oad m	or, char observed in stream, issuing with in water, etc.) n and Shading (describe):		
IN SITU TUR Meter Make		iplete at least one meas	urement upstrea	m and downstream	of crossing)		
Location	Distance from	Turbidity	Time	Location	Distance from	Turbidity	Ti
	crossing (m)	(NTU)	1,,,,,,		crossing (m)	(NTU)	me
Upstream	100	10.9	-	Upstream			
Crossing	0	53 3	+	Crossing			-
Dwastrm	70	33. 8	+	Downstream			
FLOW ESTIM		22, 5	_	Jennin Call			
High Water			Distance h	etween points (m).			
Wetted Char			Time (min)				
Approx. Ave.			_	locity estimate:			
ubluny was	apr schrut		I spurace Ag	outy examate:			

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Average Velocity (0.8 ^{1} x Surface Velocity) (V) =

Note (1) - depends on substrate composition: 0.8 for rough, loose rocks or coarse gravel / 0.9 for smooth mud, sand, or hard pan rock

PHOTOS: (upstream, crossing, downstream)

SECTION

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Environment

PHOTOS: (upstream, crossing, downstream)

NOTES:

3.6 TURBIDITY MONITORING DATA FORM

OPERATIONAL ENVIRONMENT STANDARD

3.6	Turbidity N	ionitoring Data	Form		Α	June 4, 2008	
CROSSING ID:	CV273					7523012 8	
Field Crew:	Mark & N.	10		Date: Tune	14/2015	Time: 20:14	1000
LOCATION	Datum: A/A	0 83	Zone: /	7			
Easting (m): ()	79 43612 H	Northing (m): 7/. 3	2003 N	Elevation (from	mapping): 543	Other notes:	
CURRENT WEAT		Air Temp:		itation: N	Cloud Cover (%): /C	7.	
Recent Weather	r Events: Precip	. 2 days	090	000000			
CONSTRUCTION		ruction Phase (circle or	ne): Pre-Constru	uction During	Construction Cost-Con	struction	
Type of Activity	ri .	Equipr	nent in Use				
Date Constructi	on Began						
Is the crossing !	ocation changing? (s.e. is t	he crossing moving upst	ream or downst	tream of its original	l location? How far? Which	direction?}	
					0.10	100	5.55
SITE SKETCH, N	OTES, REMARKS: (i.e. high	water table, high turbic	lity, natural ban	ik erosion, water co	olor, char observed in strea	m, algae in water, etc.)	
3		Δ.			٠.		
- 110.	In low	Upin					
		/	- 1	38			7
- 1	bid (bro	un/areu	wate	~)			
2.	March Clouds	7 11 11 7		100			
				-			
			9		8.5		
le there another	g unique about this crossi	ng compared to other s	vatercourses? (i	i.e. steep banks, cla	y in water, etc.)		
is bleic mithing	P ouder apper aus areas.		,		** **		
Substrate Parti	cles %#	real Coverage (est.)		Riparian Vegati	on and Shading (describe)	li .	
	% sand/silt/clay	(<2mm) 63					
	% gravet (2 - 64	2 - 1		ے د			
	% cobble {64 - 2 % boulder (> 25)			1 00 K	e grass		
	% bedrock	nm)					
		1 "					
IN SITU TURBIC	NEW DEADUNCE (com-	lete at least one measu	rement unstrea	m and downstream	o of crossing)		
Meter Make an		and the same of th					
	Distance from	Turbidity	Time	Location	Distance from	Turbidity	T Ti
Location	crossing (m)	(NTU)	73070		crossing (m)	(NTU)	me
- 1	9	. 7		Upstream			-
	100	18-1	-			-	-
Upstream			1	Crossing		I	
Crassing	Ü	22.5	_	Daventena			-
	100	32.2		Downstream			
Crassing	100	32.2					
Crassing Dwnstrm	/00 ES Location : dth (m):		Distance b	Downstream Detween points (m):		
Crossing Dwnstrm FLOW ESTIMAT	/00 ES Location : dth (m):		Distance b	setween points (m			
Crossing Dwnstrm FLOW ESTIMAT High Water Wi	ES location : dth (m): el Width: 7.5		Time (min	setween points (m	2 very /ou	0.01 ms?	

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	A	June 4, 2008

	Hack + Nin	۵		Date:	143,2015	Time: 0	
LOCATION	Datum: NAC		Zone: 17h		14 3 7315	9:150	m
Easting (m)	361° K	Northlag (m):		Elevation (from	n mappinel:	Other notes:	
CURRENT W	736/ 4 EATHER: Wind:		Precipitation:		570	3000 110003	
	1	Air Temp: 37°C	1/es	MA	Cover (X): 196 %		
N.	Light	prezipitati	ion				
CONSTRUCTE	ON Constru	sction Phase (circle one): P	re-Construction	During Construct	Pust Construction		7
Type of Acth	vity:	Equipment	n Use:				
Date Constru	uction Began;						
the crossin	ig location changing? (i.e. is the	crossing moving upstream	or downstream of	its original focation?	How far? Which direction?)		
	150 m						
ITE SKETCH,	, NOTES, REMARKS: (i.e. high w	vater table, high turbidity, na	tural bank erosior	, water color, char o	observed in stream, algae in wate	er, etc.)	
		<i>.</i>	54	430			٠.
	les +	low, no	usible	tochi	dity		
5	43-			*	. 2		
		78			85		
		-	g**	0.80	80.		1
ubstrate Par	rticles % Arnal Coverage ((est.) US	D3	Riparian Vernto	tion and Shading (describe):		
	% sand/slit/day (<	2mm) 7-0%	75%				
	% gravei (2 - 64 mn % cobble (64 - 256	num) 70 %	25% 55%	Wille	m/gass.		
	% boulder (> 256 m % bedrock		300	10.110	W/ 9 H3 Z		
					. A .	*0	
STU TURB		e at least one measurement	upstream and do		•	•	
oter Maka :	NOTTY READINGS (complete and Model:	e at least one measurement	upstream and do		•	•2	
oter Maka :	IDITY READINGS (complete	e at least one measurement Turbidity {NTU}	upstream and do		g) Distance from	Turbidity	Time
loter Make a	IDITY READINGS (complete and Model: Distance from crossing (m)	Turbidity (NTU)		ownstream of crossing	g)	Turbidity (NTU)	Time
loter Make a Location patream	Distance from cressing (m)	Turbidity (NTU)		Location Upstream	g) Distance from		Yime
loter Make s Location pstream rossing	IDITY READINGS (complete and Model: Distance from crossing (m)	Turbidity (NTU)		wnstream of crossing	g) Distance from		Time
oter Maka s Location Estream	Distance from crossing (m)	Turbidity (NTU)		Location Upstream	g) Distance from		Time
Location pstream rossing	Distance from crossing (m)	Turbidity (NTU) 10, 4		Location Upstream Crossing	g) Distance from		Yime
oter Make a Location patream ossing wastrm	Distance from crossing (m) 70 80 TES Location:	Turbidity (NTU) 10, 4	Time	Location Upstream Crossing Downstream	g) Distance from		Time
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oter Make a Location pstream ossing wastrm OW ESTIMA	Distance from crossing (m) 70 80 TES Location:	Turbidity (NTU) 10, 4	Distance be Time (min):	Location Upstream Crossing Downstream tween points (m):	Distance from crossing (m)		Time
oter Make a Location pstream ossing wastrm OW ESTIMA	Distance from crossing (m) 70 80 TES Location:	Turbidity (NTU) 10, 4	Distance be Time (min):	Location Upstream Crossing Downstream	Distance from crossing (m)		Time
oter Make a Location patream ossing wastrm DW ESTIMA* the Water Wa	Distance from crossing (m) 70 80 TES Location: Idth (m): Socm 30cm	Turbidity (NTU) 10, 4 4.7 9, 4	Distance be Time (min): Surface velo	Location Upstream Crossing Downstream tween points (m):	Distance from crossing (m) S.4 M/S co Velocity) (v) =		Time
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ocation stream stream stream string mistrm we estima h Water W tted Channe rox. Average (1) - deper	Distance from crossing (m) 70 80 TES Location: Idth (m): Socm 30cm	Turbidity (NTU) 10, 4 4.7 9, 4	Distance be Time (min): Surface velo	Location Upstream Crossing Downstream tween points (m):	Distance from crossing (m) S.4 M/S co Velocity) (v) =		Time

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SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	Α	June 4, 2008

CROSSING ID							_
CV	223						
Field Craw;	Mach + Nine	ı.		Date: Jul	14 3, 2015	11me: 9: 35	
LOCATION	Datum: NA	D 83	Zone: 17W		72	1 7. 53	
Easting (m):	079.48921	Northing (m): 71. 3	3285/ *	Elevation (from	m mapping):	Other notes:	
CURRENT WE	ATHER: Wind:	Air Temp:	Precipitation:	Lain Cloud	Cover (%):		
Recent Weath	ier Events:	precip.		PGI /1	100		-
CONSTRUCTION		uction Phase (circle one): P	re-Construction	During Construct	tion Post Construction		-1017
Type of Activi	ty:	Equipment	n Use:			- 270.92-	
Date Construc	tion Began:						
	location changing? (i.e. is th	e crossing moving upstream	or downstream of	its original location?	How far? Which direction?)		
SITE SKETCH,	NOTES, REMARKS: (i.e. high v	water table, high turbidity, na	tural bank erosion	, water color, char o	diserved in stream, algae in wa	iter, etc.)	-
71	5 11 797		.)	15 04	-1 8.02		
٧١	5 p4 7.97 Cond 30.	2/2	0		-1 8.02 5 12 9.4 4	skua '	
	30,	3 MS/CM		Con	129,9 4	s/cm	
	('oro			COP			
Substrata Parti	ides & Armil Courses	(art) Us 1	05	I mt. 1 Ad 1			-
Substrate Parti	% sand/slit/clay (< % gravel (2 - 64 m % cobble (64 - 256	(est.) V 8 -2mm) 6-7, m) 207.	05		ition and Studing (describe): wss + Willow	٧	
	% sand/slit/clay (< % gravel (2 - 64 m; % cobble (64 - 256 ; % boulder (> 256 ; % bedrock	(ert.) US (2mm) 6-7, m) 207, mm) 207, mm) 20%	,	0	tion and Studing (describe): (USS + Willow	√	
	% sand/slit/clay (< % gravel (2 - 64 m) % cobble (64 - 256 g) % boulder (> 256 g) % bedrock Offy READINGS (comple	(est.) V 8 -2mm) 6-7, m) 207.	,	0	tion and Studing (describe): (USS + Willow	٠	
N SITU TURBIC	% sand/sit/clay (< % gravel (2 - 64 m) % coloble (64 + 256 m) % boulder (> 256 m) % bedrock Offy READINGS (completed Model: Distance from	(est.) US (2mm) 6-73 m) 207. mm) 207. mm) to at least one measurement Turbidity	,	0	ition and Shading (describe): (USS + Willow B) Distance from	Turbidity	Tim
N SITU TURBIC Neter Make en Location	% sand/sit/clay (< % gravel (2 - 64 m) % coloble (64 + 256 % boulder (> 256 r) % bedrock Offy READINGS (completed Model:	(est.) US (2mm) 6-7, m) 20.7, mm) 20.7, nm) te at least one measurement Turbidity (NTU)	upstream and do	wnstream of crossin	ntion and Studing (describe): www.tillou		Tim
N SITU TURBIC Meter Make an Location Jostream	% sand/sit/clay (< % gravel (2 - 64 m) % coloble (64 + 256 m) % boulder (> 256 m) % bedrock Offy READINGS (completed Model: Distance from	(est) US (2mm) 6-7, m) 207. mm) 207. nm) te at least one measurement Turbidity (NTU)	upstream and do	wnstream of crossin Location Upstream	ition and Shading (describe): (USS + Willow B) Distance from	Turbidity	Tim
N SITU TURBIC Meter Make an Location	% sand/slit/clay (< % gravel (2 - 64 m) % cobble (64 - 256 m) % boulder (> 256 m) % bedrock Offy READINGS (completed Model: Distance from crossing (m)	(est.) US (2mm) 6-7, m) 20.7, mm) 20.7, nm) te at least one measurement Turbidity (NTU)	upstream and do	wnstream of crossin	ition and Shading (describe): (USS + Willow B) Distance from	Turbidity	Tim
N SITU TURBIC Make an Location pstream	% sand/sit/clay (< % gravel (2 - 64 m) % coloble (64 + 256 m) % boulder (> 256 m) % bedrock OHY READINGS (completed by the same from crossing (m)	(est) US (2mm) 6-7, m) 207. mm) 207. nm) te at least one measurement Turbidity (NTU)	upstream and do	wnstream of crossin Location Upstream	ition and Shading (describe): (USS + Willow B) Distance from	Turbidity	Tim
N SITU TURBIC Make an Location	% sand/sit/clay (< % gravel (2 - 64 m) % cobble (64 - 256 m) % beutder (> 256 m) % bedrock OHY SEADINGS (completed Model: Distance from crossing (m)	(est) US (2mm) 6-7. m) 207. mm) 70% nm) to at least one measurement (NTU) 1, 4	upstream and do	Upstream Crossing	ition and Shading (describe): (USS + Willow B) Distance from	Turbidity	Tim
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W SITU TURBIC Meter Make an Location	% sand/sit/clay (< % gravel (2 - 64 m) % colobia (64 - 256 m) % colobia (64 - 256 m) % bedrock Offy READUNGS (completed by the color of the color o	(est) US (2mm) 6-7. mm) 207. mm) 207. mm) to at least one measurement Turbidity (NTU) 1, 4 0 0	upstream and do	Location Location Upstream Crossing Downstream	ition and Shading (describe): (USS + Willow B) Distance from	Turbidity	Tim
V SITU TURBIC leter Make an Location	% sand/sit/clay (< % gravel (2 - 64 m) % coloble (64 + 256 m) % boulder (> 256 m) % bedrock OHY SEADINGS (completed Model: Distance from crossing (m) Oo O C C ES Location :	(est) US (2mm) 6-7. mm) 207. mm) 207. mm) to at least one measurement Turbidity (NTU) 1, 4 0 0	upstream and do	Location Location Upstream Crossing Downstream	ition and Shading (describe): (USS + Willow B) Distance from	Turbidity	Tim
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V STU TURBIC letter Makes an Location	% sand/sit/clay (< % gravel (2 - 64 m) % coloble (64 + 256 m) % boulder (> 256 m) % bedrock Distance from crossing (m) Oo	(est) US (2mm) 6-7. mm) 207. mm) 207. mm) to at least one measurement Turbidity (NTU) 1, 4 0 0 G	Upstream and do	Location Upstream Crossing Downstream	Distance from crossing (m)	Turbidity	Tim
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3.6		IONAL ENVIRONM	EINI DIWA	JAKU	REVISION #	IVEAL	SION DATE
5.0	Turbidity	Monitoring Data F	orm		A	June	4, 2008
							·
CROSSING ID	B G 17						
Field Crew;				Date:		Maria	
LOCATION	Mach +	-3.53		3	uly 3, 2015	Time: 10	:35 am
-0.5		MD 8 5	Zone: 171	~			
	57890.	Northing (m): 7/-35 5 5	9.	Elevation (from mapping):	Other not	es:
	ATHER: Wind:	Air Temp:	Precipitation:	Clo	ud Cover (%): 00		
ecent Weati	her Events: Ligh	rt precip	-				
DNSTRUCTIO	Consi	truction Phase (circle one): Pr	re-Construction	During Constr	ruction Post-Construction		
rpe of Activi	ity:	Equipment is	n Use:				
rte Construc	tion Began:						
		the crossing moving upstream o					
III Gifteren	Ocyin	water table, high turbidity, na	our iny				
- 1				, water color, cha	ar observed in stream, algae in	water, etc.)	
Was	a dicev	brown tinge	۶,	۸	cer werker		
	0	•		Ch	cer with		
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	5				1 8 88		
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bstrata Parti	icios % Arnal Coverno	(est)	DS		. 4 . 20		
butrate Parti	% sand/slit/clay	(dmm) 70	50	Siparian Veg	station and Shading (describe	k	
butrata Parti	% sand/slit/clay % gravel (2 - 64 n % cobble (64 - 25	(<2mm) 70 nm) 20 66 mm) 10	50		station and Shading (describe	je	;
butrata Parti	% sand/slit/clay (% gravel (2 - 64 n	(<2mm) 70 nm) 20 66 mm) 10	30	Siparian Veg	station and Shading (describe	k	
bstrata Parti	% sand/slit/clay % gravel (2 - 64 n % cobble (64 - 25 % boulder (> 256 % bedrock	(<2mm) 70 nm) 20 66 mm) 10	50	Sipartan Vag	station and Shading (describe	je	
STU TURBIC	% sand/slit/clay % gravel (2 - 64 n % cobble (64 - 25 % boulder (> 256 % bedrock	(<1mm) 70 nm) 20 66 mm) 10 mm)	50	Sipartan Vag	estation and Shading (describe		l dife.
SITU TÜRBIÇ der Make an ocation	% sand/slit/clay % gravel (2 - 64 n % cobble (64 - 25 % boulder (> 256 % bedrock OTY READINGS {complete Model: Distance from crossing {m}	(<2mm) 70 nm) 20 is mm) 10 mm) etc at least one measurement Turbidity (NTU)	S S 40 upstream and do	Ripartan Veg	station and Shading (describe	Turb (NI	ru)
SITU TÜRBIÇ ter Make an ocation	% sand/slit/clay % gravel (2 - 64 n % cobble (64 - 25 % boulder (> 256 % bedrock OTY READINGS {complete Complete Distance from	(<1mm) 70 mm) 20 6 mm) 19 mm) etc at least one measurement Turbidity	S S 40 upstream and do	Ripartan Veg	station and Shading (describe) Sing) Distance from	Turb (NI	ru)
STU TURBIC for Make an	% sand/slit/clay % gravel (2 - 64 n % cobble (64 - 25 % boulder (> 256 % bedrock OTY READINGS {complete Model: Distance from crossing {m}	(<2mm) 70 nm) 20 is mm) 10 mm) etc at least one measurement Turbidity (NTU) 4.2	S S 40 upstream and do	Ripartan Veg	Station and Shading (describe) Sing) Distance from crossing (m) PU 7.66	Turb (NI	ru)
SITU YURBIC ter Make an exation	% sand/slit/clay % gravel (2 - 64 n % colable (64 - 25 % boulder (> 256 % bedrock OUTY READINGS (complete Model: Distance from crossing (m)	(<2mm) 70 nm) 20 66 mm) 10 mm) ete at least one measurement Turbidity (NTU) 4.2 13.5	S S 40 upstream and do	Ripartan Veg American of cross Location Upstream	Distance from creating (m)	Turb (NI	ru)
SITU TURBIC for Make an ocation stream	% sand/slit/clay % gravel (2 - 64 n % cobbie (64 - 25 % boulder (> 256 % bedrock OTY READINGS (complete of the complete of th	(<2mm) 70 nm) 20 is mm) 10 mm) etc at least one measurement Turbidity (NTU) 4.2	S S 40 upstream and do	Ripartan Veg Avastream of cross Location Upstream Crossing	Station and Shading (describe) Sing) Distance from crossing (m) PU 7.66	Turb (NI	
SITU TURBIC for Make an ocation stream saling histrin	% sand/slit/clay % gravel (2 - 64 m % cobble (64 - 25 % boulder (> 256 % bedrock OUTY READINGS (complete of the complete of t	(<2mm) 70 nm) 20 66 mm) 10 mm) ete at least one measurement Turbidity (NTU) 4.2 13.5	S S 40 epstream and do	Ripartan Veg G Westream of cross Location Upstream Crossing	Distance from crossing (m) PH 7.66 PH 7.68 PH 7.70	Turb (NI	ru)
SITU TURBIC for Make an ocation stream saling histrin	% sand/slit/clay % gravel (2 - 64 m % cobble (64 - 25 % boulder (> 256 % bedrock OUTY READINGS (complete of the complete of t	(<2mm) 70 nm) 20 66 mm) 10 mm) ete at least one measurement Turbidity (NTU) 4.2 13.5	S S 40 epstream and do	Ripartan Veg Avastream of cross Location Upstream Crossing	Distance from crossing (m) PH 7.66 PH 7.68 PH 7.70	Turb (NI	ru)
SITU TURBIC ber Make an ecation stream saing astrin	% sand/slit/clay % gravel (2 - 64 m % cobble (64 - 25 % boulder (> 256 % bedrock OUTY READINGS (complete of the complete of t	(<2mm) 70 nm) 20 66 mm) 10 mm) ete at least one measurement Turbidity (NTU) 4.2 13.5	S S 40 epstream and do	Ripartan Veg Ripartan Veg Costream of cross Location Location Crossing Downstream	Distance from crossing (m) PH 7.66 PH 7.68 PH 7.70	Turb (NI	ru)
STIV TURBIC ther Make an existion stream stream saling instrin	% sand/slit/clay % gravel (2 - 64 n % cobble (64 - 25 % boulder (> 256 % bedrock OTY READINGS (complete of the complete of th	(<2mm) 70 mm) 20 66 mm) 10 etc at least one measurement Turbidity (NTU) 4.2 13.5 6.5	Upstream and do	Ripartan Veg Ripartan Veg Costream of cross Location Location Crossing Downstream	Station and Shading (describe assets) Distance from crussing (m) P4 7.66 P1 7.68 P1 7.70	Turb (NI	ru)
STU TURBIC for Make an ocation stream saling instrin	% sand/slit/clay % gravel (2 - 64 n % cobble (64 - 25 % boulder (> 256 % bedrock OTY READINGS (complete of the complete of th	(<2mm) 70 mm) 20 66 mm) 10 etc at least one measurement Turbidity (NTU) 4.2 13.5 6.5	Upstream and do Time Distance hel Time (min):	Ripartan Veg Ripartan Veg Westream of cross Location Updweem Crossing Downstream beween points (m)	Distance from crossing (m) PH 7.68 PH 7.70	Turb (NI	ru)
STU TURBIC for Make an ocation stream saling instrin westimated Channel ted Channel for. Average	* sand/slit/clay	(<2mm) 70 mm) 20 s6 mm) 10 mm) etc at least one measurement Turbidity (NTU) 4.2 13.5 6.5	Upstream and do Time Distance hell Time (min): Surface velo	Ripartan Veg Avastream of cross Location Upstvenn Crossing Downstream ween points (m)	Distance from crossing (m) PH 7.66 PH 7.70 PH 7.70 O.8 M/S. Trace Velocity) (V) =	Turb (NI	ru)
STU TURBIC for Make an ocation stream saling instring westimated Channel tool Channel for. Average	* sand/slit/clay	(<2mm) 70 mm) 20 s6 mm) 10 ete at least one measurement Turbidity (NTU) 4.2 13.5 6.5	Upstream and do Time Distance hell Time (min): Surface velo	Ripartan Veg Avastream of cross Location Upstvenn Crossing Downstream ween points (m)	Distance from crossing (m) PH 7.66 PH 7.70 PH 7.70 O.8 M/S. Trace Velocity) (V) =	Turb (NI	ru)

2.5	THE RESERVE OF THE PARTY OF THE	IONAL ENVIRONM		DAKD	- Ki	VISION	1 #	REVISIO	N DATE
3.6	Turbidity	Monitoring Data	Form		A			June 4,	2008
CROSSING ID:	0 6 6								5
	B G 29			2077 1912					
	1ach +	Nina		Date:	July 3.	. 2-	15	Time: 0:5	
OCATION	Datum: NA	HD83	Zone: /7	W					0
79.707		Northing (m): 71-3763	7:	Elevation	(from mapping):	535		Other notes:	
URRENT WEATHER		Air Temp: 60 C	Procipitation:		Cloud Cover (%):	1009			
ecent Weather Eve	nts: Lis h	+ preup.	1011			1001			
ONSTRUCTION	Const	ruction Phase (circle one): I	re Construction	During Con	struction Fast-	onstruction	5		
rpe of Activity:		Equipment	In Use:						
rte Construction Be	egan;								
the crossing location	n changing? (Le. 1s th	ne crossing moving upstream	or downstream of	f its original loca	tion? How far? Wh	ch direction	n?)		
	Construct	water table, high turbidity, n	4				,		
E SKETCH, NOTES,	REMARKS: (i.e. high	water table, high turbidity, n	grad bank erosio	n, water color, c	har observed in str	cam, algae	in water, e	tc.)	
0 1-15h	lusics a	nulyses.							92
	-1111111111.	12			15				
strato Particles	% Areal Coverage % sand/silt/clay (<	(est.) 2mm) 9		Hiparian Ve	gotation and Shad	ing (descrit	на):		
strats Particles	% sand/silt/clay (< % gravel (2 - 64 m)	2mm) - 900 1/2		Hiparian Ve	4 .	ing (descrit	He):		
strato Particles	% sand/sit/clay (< % gravel {2 + 64 mi % cobbie {64 - 256 % boulder (> 256 n	2mm) - 700 //		Siparian Ve	egatation and Shad	ing (descril	e):	-	
	% sand/slit/clay (< % gravel (2 - 64 m; % cobble (64 - 256 % boulder (> 256 n; % bedrock	2mm) 700 //2 m) 10 800 //2 mm)			grass	ing (descrit	ee):	-	
WTO TURBIDITY REA	% sand/sit/clay (< % gravel (2 - 64 m) % cobble (64 - 256 % boulder (> 256 n) % bedrock LDINGS (comple)	2mm) - 700 //			grass	ing {descrit	14):	-	
TTU TURSIDITY REA or Make end Mode cation Dis	% sand/slit/clay (< % gravel (2 + 64 m) % cobble (64 - 256 % boulder (> 256 n) % bedrock DINGS (complet 4:	2mm) mm) mm) e at least one measurement Turbidity			g (uss	a from	He};	Turbidity	Til
OTO TURBIDITY REASON Make and Mode cation Dis-	% sand/slit/clay (< % gravel (2 - 64 m) % cobble (64 - 256 n) % boulder (> 256 n) % bedrock DINGS (complet t: tance from passing (m)	2mm) ml mm) mm) ie at least one measurement Turbidity (NTU)	upstream and do	Location	g (uss	a from	10):	Turbidity (NTU)	Tie
TO TURBIDITY REA or Make end Mode cation Dis cream	% sand/slit/clay (< % gravel (2 + 64 m) % cobble (64 - 256 % boulder (> 256 n) % bedrock DINGS (complet 4:	2mm) mm) mm) e at least one measurement Turbidity	upstream and do	Location Upstrain	g (USS) Distance crossic	a from	(0,3	(NTU)	
or Tursibity REA or Make end Mode cation Dis cre tream	% sand/slit/clay (< % gravel (2 - 64 m) % cobble (64 - 256 n) % boulder (> 256 n) % bedrock DINGS (complet t: tance from passing (m)	2mm) ml mm) mm) ie at least one measurement Turbidity (NTU)	upstream and do	Location	grassing) Distancerossis	s from g (m)	Cos	135.6	u /cm
or Make and Mode cation Dis- cream	% sand/slit/clay (< % gravel (2 + 64 m) % cobble (64 - 256 n) % boulder (> 256 n) % bedrock DINGS (complet 4: tance from pasing (m)	2mm) mm) e at least one measurement Turbidity (NTU) 8 -1 /5-8	upstream and do	Location Upstrain	grassing) Distancerossin PH 7.	s from 8 (m) 5 <i>b</i>	(0.8	135.6 124.1	u Van
or Make and Mode cation Dis cream	% sand/slit/clay (< % gravel (2 - 64 m) % cobble (64 - 256 m) % boulder (> 256 m) % bedrock DINGS (complet 4: tance from passing (m)	mm) mm) e at least one measurement Turbidity (NTU)	upstream and do	Location Upstrain	grassing) Distance crossic PH 7.	s from 8 (m) 5 <i>b</i>	(0.8	135.6	u Van
TO TURBIDITY READING MAKE and Mode cation Discretion Critical Crit	% sand/slit/clay (< % gravel (2 - 64 m) % cobble (64 - 256 m) % boulder (> 256 m) % bedrock ADINGS (complet 4: tance from casing (m) 60	2mm) mm) e at least one measurement Turbidity (NTU) 8 -1 /5-8	upstream and do	Location Upstream Consing Downstream	Distance crossing PH 7.	s from s (m) Sb	(0.8	135.6 124.1	-
or Make and Mode cation Discretion Discretion Discretion Cream Sing Strm VESTIMATES	% sand/slit/clay (< % gravel (2 - 64 m) % cobble (64 - 256 m) % boulder (> 256 m) % bedrock ADINGS (complet 4: tance from casing (m) 60	2mm) mm) e at least one measurement Turbidity (NTU) 8 -1 /5-8	upstream and do	Location Upstrain	Distance crossing PH 7.	s from s (m) Sb	(0.8	135.6 124.1	u Van
or Make and Mode cation Discretion Discretion Discretion Cream Sing Strm VESTIMATES	% sand/slit/clay (< % gravel (2 - 64 m) % cobble (64 - 256 m) % boulder (> 256 m) % bedrock ADINGS (complet 4: tance from casing (m) 60	2mm) mm) e at least one measurement Turbidity (NTU) 8 -1 /5-8	upstream and do	Location Upstream Consing Downstream	Distance crossing PH 7.	s from s (m) Sb	(0.8	135.6 124.1	u Van
or Turniony REA or Make end Mode cation Dis cre tream sing strm V ESTIMATES Water Width (m):	% sand/slit/clay (< % gravel (2 + 64 m) % cobble (64 - 256 m) % boulder (> 256 m) % bedrock NDINGS (complete) tance from cassing (m) GO O Location :	2mm) mm) e at least one measurement Turbidity (NTU) 8 -1 /5-8	upstream and do Time Distance better Time (min);	Location Location Upstrain Consing Downstream	Distance crossic PH 7.	o from g (m) Sb	(0.8	135.6 124.1	u Van
TURBIDITY READITY MAKE End Mode cation Discretized Channel Width:	% sand/slit/clay (< % gravel (2 + 64 m) % cobble (64 - 256 m) % boulder (> 256 m) % bedrock NDINGS (complete) tance from cassing (m) GO O Location :	2mm) mm) e at least one measurement Turbidity (NTU) 8 -1 /5-8	Upstream and do Time Distance better Time (min):	Location Upstream Consing Downstream	9 (USS) Distance crossing PH 7. PH 7. PH 7. PH 7.9	s from g (m) Sb 83	(0.8	135.6 124.1	u Van
sing sitre Sing Sitre Water Width (m): and Channel Width: Ox. Average Depth:	% sand/slit/clay (< % gravel (2 + 64 m) % cobble (64 - 256 m) % boulder (> 256 m) % bedrock Location (m) Location :	2mm) n) mm) e at least one measurement Turbidity (NTU) 8 -1 15 -8 34 -4	Upstream and do Time Distance bet Time (min): Surface valoc Average Valo	Location Upstream Consing Downstream Consing Downstream	Distance crossing) Distance crossing PH 7. PH 7.	s from g (m) 5 b 8 3	(0.8	135.6 124.1	u Van
TU TURBIDITY READITY MEAN MINISTER MAIN PROPERTY CONTROL OF CONTRO	% sand/slit/clay (< % gravel (2 - 64 m) % cobble (64 - 256 m) % boulder (> 256 m) % bedrock DINGS (completel transform cossing (m) CO D Location :	2mm) mm) e at least one measurement Turbidity (NTU) 8 -1 /5-8	Upstream and do Time Distance bet Time (min): Surface valoc Average Valo	Location Upstream Consing Downstream Consing Downstream	Distance crossing) Distance crossing PH 7. PH 7.	s from g (m) 5 b 8 3	(0.8	135.6 124.1	witch

	OPERATIO	NAL ENVIRONMEN	VT STAND	ARD	REVISION #	REVISION DATE	
3.6	_Turbidity /	Monitoring Data Fo	rm		A	June 4, 2008	
		= -					
CROSSING ID:	CV 217						
-114	CV 217		0.000				
Field Crew:	Mach +	Nih a		Date:	14 2 2015	Time: 11: Zoam	
LOCATION	Datum: NA	D &3	17 W				
0 79-81		Northing (m): 7/. 39848		Elevation (fro	m mapping):	Other notes:	_
	HER: Wind:	Air Temp: 50C	Precipitation:	Cloud	Cover (%):		
Recent Weather	Events: Light	precip.	Lett.	0	1009	7,41	
CONSTRUCTION	Constru	ction Phase (circle one): Pre-	Construction	During Construc	tion Cost-Construction		
Type of Activity:		Equipment in U	Jse:				_
Date Construction	n Began:						
ls the crossing lo	cation changing? (i.e. is the	crossing moving upstream or d	lownstream of	Its original location?	How far? Which direction?)	2	_
	U/5 10m				101 (3)2		
SITE SKETCH, NO	TTES, REMARKS: (i.e. high w	ater table, high turbidity, natur	al bank erosion	, water color, char	observed in stream, algae in water	er, etc.)	
		+				19	
	30.00				¥:		
					2.5		
,							
Substrate Particle			D5_	Alparian Vegets	ation and Shading (describe);		
Substrate Particle	% sand/silt/day (<2 % gravel (2 - 64 mm	mm) 75	D5 76		1		
substrato Particle	% sand/silt/day (<2 % gravel {2 - 64 mm % cobble (64 - 256 r	mm) 75 i) 5 nm)	D5 76 5		tion and Shading (describe);	4. 4	
	% sand/slit/clay (<2 % gravel (2 - 64 mm % cobble (64 - 256 r % boulder (> 256 m % bedrock	mm) 75) 5 nm)	75	12	/A		
N <i>SITU</i> TURBIDIT	% sand/silt/day (<2 % gravel {2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock Y READINGS {complete	mm) 75 i) 5 nm)	75	12	/A		
V <i>SITU</i> TURBIDIT Astor Make and	% sand/silt/day (<2 % gravel {2 - 64 mm % cobble {64 - 256 m % boulder { > 256 m % bedrock Y READINGS {complete Model: Distance from	mm) 35 nm) mm) at least one measurement up	75	12	g) Distance from	Turbidity	Ti
V <i>SITU</i> TURBIDIT Notor Make and Location	% sand/silt/day (<2 % gravel {2 - 64 mm % cobble (64 - 256 m % boulder {> 256 m % bedrock Y READINGS {complete Model: Distance from crossing (m)	mm) 35 mm) 35 mm) at least one measurement up Turbidity (NTU)	stream and do	westream of crossin	Distance from crossing (m)	(ити)	_
V SITU TURBIDIT Actor Make and Location	% sand/sitt/day (<2 % gravel {2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock Y READINGS {complete Model: Distance from crossing (m)	mm) 35 nm) mm) at least one measurement up	stream and do	Location Upstream	g) Distance from	62.6 uskn	_
V SITU TURBIDIT Actor Make and Location Spstream	% sand/silt/day (<2 % gravel {2 - 64 mm % cobble (64 - 256 m % boulder {> 256 m % bedrock Y READINGS {complete Model: Distance from crossing (m)	mm) 35 mm) 35 mm) at least one measurement up Turbidity (NTU)	stream and do	wastream of crossin	Distance from crossing (m)	(ити)	_
V SITU TURBIDIT Actor Make and Location Spstream	% sand/sitt/day (<2 % gravel {2 - 64 mm % cobble (64 - 256 m % boulder {> 256 m % bedrock Y READINGS {complete Model: Distance from crossing (m)	Turbidity (NTU)	stream and do	Location Upstream	Distance from crossing (m)	62.6 uskn	_
V SITU TURBIDIT Actor Make and Location	% sand/sitt/day (<2 % gravel {2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock Y READINGS {complete Model: Distance from crossing (m)	mm) 35 mm) 35 mm) 4 least one measurement up Turbidity (NTU)	stream and do	Location Upstream Crossing	Distance from crossing (m)	62.6 uskn	_
V SITU TURBIDIT Notor Make and Location Spatream rossing western	% sand/sitt/day (<2 % gravel {2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock Y READINGS {complete Model: Distance from crossing (m) Distance from crossing (m)	Turbidity (NTU)	stream and do	Location Location Upstream Crossing Downstream	Distance from crossing (m)	62.6 uskn	_
V SITU TURBIDIT Retor Make and Location pstream rossing western OW ESTIMATES	% sand/sitt/day (<2 % gravel {2 - 64 mm % cobble {64 - 256 m % boulder {> 256 m % bedrock Y READINGS {complete Model: Distance from crossing (m) Distance from crossing (m)	Turbidity (NTU)	Time Distance bet	Location Upstream Crossing	Distance from crossing (m)	62.6 uskn	_
V SITU TURBIDIT Retor Make and Location pstream rossing western OW ESTIMATES	% sand/sitt/day (<2 % gravel {2 - 64 mm % cobble {64 - 256 m % boulder {> 256 m % bedrock Y READINGS {complete Model: Distance from crossing (m) Distance from crossing (m)	Turbidity (NTU)	stream and do	Location Location Upstream Crossing Downstream	Distance from crossing (m)	62.6 uskn	_
V SITU TURBIDIT Notor Make and Location Spatneam	% sand/sitt/day (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % boulder (> 256 m % bedrock Y READINGS (complete Model: Distance from crossing (m) O (b) Location : (m):	Turbidity (NTU)	Time Distance bet	Location Upstream Crossing Downstream	Distance from crossing (m) PH 1.62 9.05 7.92	62.6 uskn	_
V SITU TURBIDIT Notor Make and Location pstream rossing wissim OW ESTIMATES gh Water Width	** sand/sitt/day (<2	Turbidity (NTU)	Time (min):	Location Upstream Crossing Downstream	Distance from crossing (m) PH 1.62 9.05 7.92	62.6 uskn	_
ossing Westim DW ESTIMATES The Water Width Street Channel V Drox. Average C	% sand/silt/day (<2 % gravel (2 - 64 mm % cobble (64 - 256 m % bedrock	Turbidity (NTU)	Time Distance bet Time (min): Surface valor	Location Upstream Crossing Downstream ween points (m):	Distance from crossing (m) pH 1.62 9.05 7.92 0.2m(3.	62.6 uskn	_

NOTES:

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	A	June 4, 2008
#_ U_ 22			

CROSSING	ID:						
	CV046		os	316944	J 79242881	7	
Field Crew:	Made + N	ina		Date:	Jul 7 2015	13:15 pm	
LOCATION	Datum: NAO		Zone:)"7			1 19.73 PM	1
Easting (m)		Northing (m):		Elevation (fr	om mapping):	Other notes:	
CURRENT W	M	Air Temp:	Precipitation:	/ Clou	(17)		70 -
Recent Wes	ither Events:	3		RAIN	00	<u></u>	-
CONSTRUCT	ION Constru	cion Phase (dirde one): P	re-Construction	During Constru	ction Post-Construction		
Type of Acti		Equipment 1					
Date Constr	uction Began:						
Is the crossir	ng location changing? (i.e., is the	crossing moving upstream	or downstream of	Its original Jocation	7 How far? Which direction?\		
		u/S			The state of the s		
SITE SKETCH	, NOTES, REMARKS: (i.e. high w	eter table, high turbidity, na	tural bank erosion	n, water color, char	observed in stream, algae in wat	er, etc.)	
4 1 1/	ites Flowin	الاسمادة	cular	entr:	u through	mode.	
a ~~•	9	•	,	• •	J w J		
00/M2	mul benk was	on.		-122	Gow From U	now coul.	
	2 X			חי ליקוער			
	527		us 17/5				
Substrate Pa	rticles % Areal Coverage (refer and etc. in a fig. 1		4
-T- J	% sand/silt/clay (<2	mm) 5 7	30 60	rapanan Vega	tation and Shading (describe):	15 X	
	% gravel (2 - 64 mm % cobble (64 - 256 r		40 20		. / A		
	% boulder (> 256 m	. (X - 1) H	10 20	2	N/A		
IN SITU TURE	% bedrock	at least one measurement	undersian and de-				
Motor Make	A CONTRACTOR OF THE PARTY.	and the street s	aparent end do	WIND OF THE PROPERTY OF THE PR	ng)		
Location	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from crossing (m)	Turbidity (NTU)	Time
Upstream	70	0.1		Upstream	Committee (m)	(410)	
Crossing	10	0.1		Crossing		- 6	
Dunet -	Ó	28.8					8
Dwnstrm	70	15.5		Downstream			100
LOW ESTIMA	TES Location :						-11
High Water W	fidth (m):		Distance bet	twoen points (m):			
Natted Chann	al matel.						10
	m		Time (min):	/			-0
ipprox. Avera	ge Depth: 30c	m #	Surface velo	city estimate:	0.4 m/s.		Į.
	***		Average Vel	ocity (0.8 ⁽¹⁾ x Suri	face Velocity) (V) =		- 1
	nds on substrate composition; 0	8 for rough, loose racks or	coarse gravel / 0.9	for smooth mud, s	and, or hard pan rock		
HOTOS: (uput	ream, crossing, downstream)			70			
IOTES:							100

3.6	V OPERATIO	DNAL ENVIRONME	TIAL DIWIND	XKD	REVISION #	REVISION DA	TF.
5.0	Turbidity !	Monitoring Data F	orm		Α	June 4, 2008	, _
		****				34112 1, 2000	
CROSSING ID:							
100	CV049						
Field Crew:	Mack Datum: NAI	<i>t</i> Nim		Date: Dry	- 3 2015	1 3:35	
LOCATION	Datum: NA-L) 83 z	inne: 17-				
Easting (m):	052966 4W	Narthing (m): 9	2655IN	Elevation (from	mapping):	Other notes:	
CURRENT WE A		Air Temp: 29 C	Pracioitationa	Cloud C	over (%):		
Recent Weathe	Pruip:	<u> </u>			1006.		
CONSTRUCTION		ction Phase (circle one): Pr	e-Construction	During Construction	n Post-Construction		
Type of Activity	γ:	Equipment In	ı Use:				
Date Constructi	ion Began:	~ 3					
Is the crossing [location changing? (i.e., is the	crossing moving upstream o	r downstream of it	s priginal location? H	low far? Which direction?)		
17	10m D/5				and the second and control		
SITE SKETCH, N	OTES, REMARKS: (I.e. high w		ural bank erosion,	water color, char ob	served in stream, algae in water	, etc.)	
	Gass +	willows.				51	
					•		i.
					101	59	
			DS.		• 8	\$ D	
Substrate Partic	fes % Areal Coverage (% sand/slit/clay (<2	ert.) Imm) 5		Riparlan Vegetati	on and Shading (describe):	20.5%	
	% gravel (2 - 64 mer % cobble (64 - 256 r						
	% boulder (> 256 m % bedrock	m) 5					
N SITU TURBIDI							
Actor Make and		at least one measurement	upstream and down	nstream of crossing)			
- 23	i Model:	at least one measurement	nbaceau and dow	nstream of crossing)			
Location	Distance from crossing (m)	Turbidity	Time	Location	Distance from	Turbidity	Time
/	Distance from crossing (m)	Turbidity (NTU)				Turbidity (NTU)	Tim
pstream	Distance from	Turbidity (NTU)		Location Upstream	Distance from	THE PERSON NAMED IN COLUMN 1	Tim
pstream	Distance from crossing (m)	Turbidity (NTU)		Location	Distance from	THE PERSON NAMED IN COLUMN 1	Tim
pstream	Distance from crossing (m)	Turbidity (NTU)		Location Upstream	Distance from	THE PERSON NAMED IN COLUMN 1	Tim
pstream	Distance from crossing (m) 70 0	Turbidity (NTU)		Location Upstream Crossing	Distance from	THE PERSON NAMED IN COLUMN 1	Tim
pstream rossing wistim	Distance from crossing (m) 70 0 100 Location:	Turbidity (NTU)	Time	Upstream Crossing Downstream	Distance from	THE PERSON NAMED IN COLUMN 1	Tim
ipstream rossing westre	Distance from crossing (m) 70 0 100 Location:	Turbidity (NTU)	Time	Location Upstream Crossing	Distance from	THE PERSON NAMED IN COLUMN 1	Tim
pstream rossing wistim OW ESTIMATES	Distance from crossing (m) 70 0 100 Location :	Turbidity (NTU)	Time	Upstream Crossing Downstream	Distance from	THE PERSON NAMED IN COLUMN 1	Tim
pstream rossing wirstrm OW ESTIMATES gh Water Widtl	Distance from crossing (m) 70 0 100 Location : th (m):	Turbidity (NTU) 1.1 13.5 0.5	Time	Location Upstream Crossing Downstream peen points (m):	Distance from crossing (m)	THE PERSON NAMED IN COLUMN 1	Tim
pstream rossing wristrm OW ESTIMATES gh Water Wide	Distance from crossing (m) 70 0 100 Location : th (m):	Turbidity (NTU) 1.1 13.5 0.5	Distance between Time (min):	Location Upstream Crossing Downstream een points (m):	Distance from crossing (m)	THE PERSON NAMED IN COLUMN 1	Tim
pstream rossing wistim OW ESTIMATES gh Water Width etted Channel	Distance from crossing (m) 70 0 100 Location : h [m]: Width: Depth: QCW	Turbidity (NTU) 13.5 0.5	Distance betw Time (min): Surface velocit	Location Upstream Crossing Downstream een points (m):	Distance from crossing (m)	THE PERSON NAMED IN COLUMN 1	Tim
pstream rossing westrm OW ESTIMATES gh Water Widtl etted Channel i	Distance from crossing (m) 70 0 100 Location : h [m]: Width: Depth: Que	Turbidity (NTU) 13.5 0.5	Distance betw Time (min): Surface velocit	Location Upstream Crossing Downstream een points (m):	Distance from crossing (m)	THE PERSON NAMED IN COLUMN 1	Tim
pstream rossing westrm OW ESTIMATES gh Water Widtl etted Channel i	Distance from crossing (m) 70 0 100 Location : h [m]: Width: Depth: QCW	Turbidity (NTU) 13.5 0.5	Distance betw Time (min): Surface velocit	Location Upstream Crossing Downstream een points (m):	Distance from crossing (m)	THE PERSON NAMED IN COLUMN 1	Tien

3.6	Turbidity	Monitoring Data F	orm		A	June 4, 2008	
			=-				
CROSSING II	CVO 99			11-11-11			
Field Crew:		. 1:		Date:		Time:	
LOCATION	Mack t	Nina	Zone:	Ju	11 3 15	15:10	
Easting (m);	NA	Northing (m)	13	Shoutten 16	om mapping):		
7	10,37654W	Northing (m): 71.63	163 N		425	Other notes:	
Recent West		Ан типар: 6	Prodpitation:	N/A	d Cover (%): /OD		
	cithi	Precip.					
CONSTRUCTIO	-	ction Phase (circle one): P	re-Construction	During Constru	etion Post-Construction	>	****
Type of Activ		Equipment 1	n Use:		20 20 20 20	70	
	ction Began:					- 100	
is the crossing	location changing? (i.e. is the		or downstream of	its original focation	7 How far? Which direction?)		
STIE SKETCH.		Cater table high turbidity na	tient bank more	. weeter males also	observed in stream, algae in w		
	The state of the s	the contract of	MINI DONK CICACO	, water color, chai	ouserved in stream, algae in w	ster, etc.)	
	1.0						×
						*	
	- F					12	
	to N						
		US	DS				
Substrate Pari	ides % Areal Coverage (- % sand/slit/clay (<		10	Riparian Vego	tation and Shading (describe):		- 0
	% gravel (2 - 64 mm % cobble (64 - 256	1 50	50 10	1	/A 0		
	% boulder (> 256 m % bedrock		10	1	/Δ		
IN SITU TURBI Meter Make a		e at least one measurement	upstream and do	winstream of cross	ing)		
Location	Distance from crossing (m)	Turbidity (NTU)	Time	Location	Distance from crossing (m)	[NTU]	Time
Upstream .	101	0.5		Upstraken	eH	0 (E
Crossing	U	0		Crossing		Cond.	
Dwnstrm	1.1		-	Downstream	pH	God	
	160	0.7		_/_	pri	Coul.	
FLOW ESTIMAT	ES Location :						6000
ligh Water Wi	dth (m):		Distance bei	ween points (m):		y	77.790
Wetted Channe	Width: 6 m		Time (min):	1			ACCU
Approx. Averag			Surface valo	city estimate:	1.5 m/s	The same of the sa	400
13-3-	100		Approximately 17=1	ton (1)	face Valocity) (V) =	7 (C)	0.61
foto (1) - day		N. f					
HOTOS: (upstr	ds on substrate composition: (AS for rough, loose rocks or	coarse gravel / 0.9	for smooth mud, :	rand, or hard pan rock		
ютез:							

REVISION#

REVISION DATE

SECTION

OPERATIONAL ENVIRONMENT STANDARD

SECTION	OPERATIONAL ENVIRONMENT STANDARD	REVISION #	REVISION DATE
3.6	Turbidity Monitoring Data Form	A	June 4, 2008

LOCATION	Mack + A	95	Zone: 17	<u> </u>	1 3 701	7	_/_
Easting (m):	80. 17438'W		1114° N	Elevation (from	n mapping): 5/4) Other/	notes:
CURRENT WE	ATHER: Wind:	Air Tomp:	Precipitation:	Cloud	Cover (%):		
Recent West	her Events: Light P	CC, P			<u> </u>		45
CONSTRUCTIO	N Construc	tion Phase (circle one):	Pre-Construction	During Construct	lon Post-Construct	ion	
Type of Activi	ty:	Equipment	in Use:		/		
Dete Construc							
is the crossing	location changing? (i.e. is the	crossing moving upstream	or downstream of	its original focation?	How far? Which direc	tion?)	
SITE SKETCH,	NOTES, REMARKS: (i.e. high wa	•	atural bank erosion	, water color, char o	bsgived in stream, alg	ac in water, etc.)	
			T.		2.		•
						25	•
		9 2	104			34.2	,
		US DS	. /				
Substrate Parti		est.)	· /	Riparlan Vegnta	tion and Shading (des	cribe):	
			/				
	% sand/silt/clay (<2 % gravel (2 - 64 mm	1 - 30 /					
		nm) 70			*		
IN STIL TURBI	% gravel (2 - 64 mm % cobble (64 - 256 m % bouldar (> 256 mi % bedrock) - 30 nm} 70 m)					
	% gravel (2 - 64 mm % cobble (64 - 256 m % bouldar (> 256 m % bedrock DITY READINGS (complete	nm) 70	t upstream and do	wnstream of crossin	z)		2
IN SITU TURBII Motor Make as Location	% gravel (2 - 64 mm % cobble (64 - 256 m % bouldar (> 256 m % bedrock DITY READINGS (complete) - 30 nm} 70 m)	t upstream and do	wnstream of crossin	Distance from		Furbidity
Motor Make as	% gravel (2 - 64 mm % cobble (64 - 256 m % bouldar (> 256 m % bedrock DITY READINGS (complete and Model:	nm) 70 m) at least one measurement		15_II =	. 6		Furbidity {NTU}
Motor Make as	% gravel (2 - 64 mm % cobble (64 - 256 m % bouldar (> 256 m % bedrock DITY READINGS (complete and Model:	nm) 70 m) at least one measurement		Location	Distance from	1	
Motor Make as Location Upstream Crossing	% gravel (2 - 64 mm % cobble (64 - 256 m % bouldar (> 256 m % bedrock DITY READINGS (complete and Model:	nm) 70 m) at least one measurement		Location Upstream Crossing	Distance from	7	
Motor Make as Location Upstream Crossing Dwnstrm	% gravel (2 - 64 mm % cobble (64 - 256 m % bouldar (> 256 m % bedrock DITY READINGS (complete and Model: Distance from crossing (m)	nm) 70 m) at least one measurement		Location	Distance from		
Motor Make as Location Upstream Crossing Dwnstrm	% gravel (2 - 64 mm % cobble (64 - 256 m % bouldar (> 256 m % bedrock DITY READINGS (complete ad Model: Distance from crossing (m)	nm) 70 m) at least one measurement		Location Upstream Crossing	Distance from		
Motor Make as Location Upstream Crossing Dwistrin FLOW ESTIMATI	% gravel (2 - 64 mm % cobble (64 - 256 m % bouldar (> 256 mi % bedrock DITY READINGS (complete and Model: Distance from crossing (m)	nm) 70 m) at least one measurement	Time	Location Upstream Crossing	Distance from		
Motor Make as Location Upstream Crossing Dwinstrin FLOW ESTIMATI	% gravel (2 - 64 mm % cobble (64 - 256 m % bouldar (> 256 m) % bedrock DITY READINGS (complete and Model: Distance from crossing (m) ES Location :	nm) 70 m) at least one measurement	Time	Location Upstream Crossing Downstream	Distance from		
Motor Make as Location Upstream Crossing Dwnstrm FLOW ESTIMATI	% gravel (2 - 64 mm % cobble (64 - 256 m % bouldar (> 256 m) % bedrock DITY READINGS (complete and Model: Distance from crossing (m) ES Location :	nm) 70 m) at least one measurement	Distance bet	Location Upstream Crossing Downstream	Distance from		
Motor Make as Location Upstream Crossing Dwnstrm FLOW ESTIMATI	% gravel (2 - 64 mm % cobble (64 - 256 m % bouldar (> 256 m) % bedrock DITY READINGS (complete and Model: Distance from crossing (m) ES Location :	nm) 70 m) at least one measurement	Distance bet Time (min): Surface velo	Location Upstream Crossing Downstream wwen points (m):	Distance from crossing (m)		
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