APPENDIX E.8.1

INAC INSPECTOR'S DIRECTION – MILNE PORT CAMP PAD

INSPECTOR'S DIRECTION
Pursuant to Section 87(1) of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*

June 9 2017

ISSUED TO: Baffinland Iron Mines Corporation *via*
Chief Operating Officer, Sylvain Proulx
sylvain.proulx@baffinland.com

RE: ***Nunavut Waters and Nunavut Surface Rights Tribunal Act***
INSPECTOR'S DIRECTION

This is an inspector's direction to Baffinland Iron Mines Corporation (BIMC) under section 87(1) of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act,* referred to in this direction as the Act.

BELIEF ON REASONABLE GROUNDS

I, Justin Hack, an Inspector designated by the Minister under section 85(1) of the Act, have reasonable grounds to believe that:

> *waters have been and may be used in contravention of a condition of a licence; and that the adverse effects of that use of water are causing, or may cause, a danger to property and the environment.*

RELEVANT FACTS

1. On May 31, 2017, while conducting a routine water licence inspection of Baffinland Iron Mines Corporation project in the Qikiqtani Region of Nunavut, I observed that a site lay-down pad was being constructed at approximately N71° 52.529, W080° 54.379.
2. During an inspection of the perimeter, I observed that the lay-down pad was built over top a stream, and I observed that rock fill had been placed in the stream. The stream was approximately 1m in width. The stream now flows through the substrate (rock fill) used to construct the base of the site lay-down pad from the east. I observed that the stream exits the facility to the west.
3. Given that the construction of the site lay-down pad was over a stream, and that rock fill had been placed in the stream (constituting a use of waters under paragraphs (b), (c) and (d) of the definition of "use" in the Act), I asked the site's Environmental Superintendent whether BIMC had obtained the necessary Nunavut Water Board authorization.
4. In response to my question, the Site's Environmental Superintendent indicated that approval for the site lay-down pad can be found in their Amended Workplan,

which was submitted to the Nunavut Water Board on May 26, 2017 (five days before my inspection).

5. This document indicated that this site lay-down pad would be used for a "Port Construction Camp" that would accommodate a 380-person temporary camp inclusive of potable water treatment, sewage treatment, incinerator, kitchen, dining, locker, recreational and washroom facilities.
6. On review of the BIMC Water Licence 2AM-MRY1325 Amendment No. 1, this BIMC workplan does not constitute an approval, nor does it meet the requirements of the BIMC Water Licence 2AM-MRY1325 Amendment No. 1, which contains the following provision:
   a. *Part D, Item 2: The Licensee shall submit to the Board for review and acceptance, at least sixty (60) days prior to construction or in a timeframe otherwise approved by the Board in writing, final design and for-construction drawings, stamped and signed by a Professional Engineer, for all infrastructure and/or facilities designed to contain, withhold, divert or retain Water and/or Waste, as authorized under the License.*
7. This provision of the licence is applicable because the rock fill in the stream will on its own, or in combination with accumulation of sedimentation or other debris, withhold, divert or retain water.
8. I also note that the licence is intended to be protective of watercourses and drainage paths within the project footprint:
   a. *Part D, Item 20*: The Licensee shall not erect camps or store material on the surface of frozen streams or lakes including the immediate banks except what is for immediate use. Camps shall be located such that impacts on surface drainage is minimized.
   b. *Part D, Item 21*: The Licensee shall undertake necessary corrective measures to mitigate impact on surface drainage resulting from the Licensee's activities.
   c. *Part D, Item 25*: The Licensee shall prevent the deposition of debris or sediment from entering into or onto any Water body, with respect to the construction of access roads, site laydown pads and areas or other earthworks. These materials shall be disposed of at a distance of at least thirty-one (31) metres from the ordinary High Water Mark in such a manner that they do not enter the water.
9. During my inspection, and despite being asked whether BIMC had a Water Board authorization to construct a lay-down pad over the stream (and place rock fill in the stream), on-site officials did not demonstrate to me that BIMC had any such authorization, and specifically did not demonstrate that the conditions of Part D, Item 2 had been met. The Amended Workplan did not include "final design and for-construction drawings, stamped and signed by a Professional Engineer", and was submitted only five days before my inspection, while Part D, Item 2 requires submission to the Board 60 days before construction (or at a time otherwise approve by the Board in writing).
10. As of today, even if the Amended Workplan contained the required drawings, it is unlikely that the Nunavut Water Board has reviewed and accepted the required drawings according to its usual practice of posting for comment; and not enough

time has passed since submission for the Board to be deemed to have accepted the required drawings according to the terms of Part D, Item 2.

11. If the Board does not accept the proposed design, reconfiguration of the pad or other remedial steps might be required.

12. On the basis of my onsite observations and interactions and my review of the 2AM-MRY1325 water licence, I believe that there has been a use of waters in contravention of the conditions of that licence and that:

    a. the placement of fill within a stream will cause sedimentation downstream and this may cause adverse effects to the environment,

    b. the placement of fill within a stream, without proper diversion of the stream, may cause erosion and instability of the pad,

    c. the stream may pool or flood if the site lay-down pad acts as a dam-like structure during freshet, resulting in potential damage to surrounding lands and infrastructure,

    d. commissioning a camp on this structure within 31m of the watercourse may increase the risk of any spills that originate on the pad to enter water and cause adverse effects to the environment and,

    e. that additional construction of the site lay-down pad, or building the camp on top of it, would make any re-configuration of the pad or other remedial steps to address the environmental issues created by the placement of rock fill in the stream more technically challenging or otherwise onerous.

13. For those reasons, I gave an oral direction to BIMC through Sylvain Proulx on June 1, 2017 to stop work on the new site lay-down pad at Milne Port until Part D, Item 2 of the licence has been complied with.

MEASURES TO BE TAKEN

Based upon the above grounds, I hereby direct **Baffinland Iron Mines Corporation**:

1. To stop all work on the site lay-down pad at Milne Port at approximately N71° 52.529, W080° 54.379 until Part D, Item 2 of the licence has been complied with; and

2. If the Nunavut Water Board has not accepted the plans within the time indicated in Part D, Item 2 of the licence, -- to inform me of this fact, at which time I will consider the need and options for additional direction under section 87(1).

3. To post this direction prominently in appropriate locations at the site, to otherwise inform appropriate persons of this direction, and take any other appropriate steps to ensure it is complied with.

This inspector's direction does not exempt any person from compliance with other relevant legislation.

Under section 90(1) of the Act, any person that fails to comply with a direction given by an inspector under section 87(1) is guilty of an offence and is liable on summary conviction to a fine not exceeding $100,000 or to imprisonment for a term not exceeding one year, or to both.

New Information or Correction of Information

This direction is based on the information available to me at the time of making it. If you wish to bring additional information to my attention or correct any facts that might be in error, please do so in writing.

Review

Under section 87(3) of the Act, the Minister may, and if BIMC requests it the Minister must, review this direction. After review the Minster may leave the direction unchanged, alter or revoke it.

Signed this 9 day of June, 2017 at Iqaluit, Nunavut.

Justin Hack
Water Resource Officer
Field Operations, INAC
Iqaluit, Nunavut
867-975-4517
justin.hack@aandc.gc.ca

cc: Erik Allain, Sarah Forte, *Indigenous and Northern Affairs Canada*
Stephanie Autut, Sean Joseph, *Nunavut Water Board*
Laura Taylor, Bill Bowden, Wayne McPhee, Todd Burlingame – *BIMC*
Stephen Bathory - *QIA*

APPENDIX E.8.2

INAC INSPECTOR'S DIRECTION – WASTE ROCK FACILITY

INSPECTOR'S DIRECTION
Pursuant to Section 87(1) of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*

September 5 2017

ISSUED TO: Baffinland Iron Mines Corporation *via*
Chief Operating Officer, Sylvain Proulx
sylvain.proulx@baffinland.com

RE: ***Nunavut Waters and Nunavut Surface Rights Tribunal Act***
INSPECTOR'S DIRECTION

This is an inspector's direction to Baffinland Iron Mines Corporation (BIMC) under section 87(1) of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act,* referred to in this direction as the Act.

BELIEF ON REASONABLE GROUNDS

I, Justin Hack, an Inspector designated by the Minister under section 85(1) of the Act, have reasonable grounds to believe that:

> *waters have been and may be used in contravention of the Act and a condition of a licence; and that the adverse effects of that use of water are causing, or may cause, a danger to the environment.*

I) RELEVANT FACTS

1. The *waste rock water containment facility* (the facility) is a regulated facility and is considered a use of waters under paragraph (b) and (c) of the definition of "use" in the Act.
2. This facility has conditions associated with it under the water licence *2AM-MRY1325 Amendment #1* (the licence).
3. While conducting a routine water licence inspection of Baffinland Iron Mines Corporation project in the Qikiqtani Region of Nunavut, between the dates of August 22-24, 2017, I observed 3 uncontrolled discrete seepages originating from the central toe of the waste rock water containment berm at approximately N71° 20' 43", W79° 14' 18".
4. Seepages from this facility were not designed as part of the original for-construction drawings associated with this facility, and therefore, this facility is not operating as authorized. This is a requirement, as described in Part D, Item 23; whereas:

   a. The Licensee shall construct and operate all infrastructure and Facilities authorized by the Board that are designed to contain, withhold, divert or retain Water and/or Waste, in accordance with all applicable legislation and industry standards.

5. Records obtained by Baffinland and field measurements taken during the inspection have shown that the water from the seepages have not met the effluent quality limits as required by Part F, Item 25 of their licence.
6. These records also indicate that the facility has been ineffective to adequately store and treat the acid rock drainage water prior to discharge. This is required in Part D, Item 19; whereas:
   a. The Licensee shall prevent any chemicals, fuel or Wastes associated with the undertaking from entering any Water Body.
7. It is also important to note that during my inspection on August 22-24, 2017, I observed a team of BIMC employees adding soda ash through a mixing and pumping technique into the facility to raise the pH of the water to a level that is appropriate for discharge. This technique was not included in their *Waste Rock Management Plan* to treat non-compliant waters.
8. When I questioned BIMC employees about their need to increase the pH using this technique, I was informed that the facility was near capacity and could not hold any additional water if there were any precipitation events.
9. On the basis of my observations, I have reasonable grounds to believe that a contravention to both the licence and act has occurred.
10. To summarize, I believe that:
    a. the facility was not constructed to an appropriate standard as per requirement, Part D, Item 23,
    b. the licensee has not prevented wastes from entering water as per requirement, Part D, Item 19 and section 12 of the Act; and,
    c. there has been a significant controlled discharge of non-compliant waters, contrary to Part F, Item 25 of the Water Licence 2AM-MRY1325.
11. Furthermore, I believe that adverse effects of these failures have caused, are causing, or may cause a danger to the environment unless resolved.
12. For those reasons, I gave an oral direction to BIMC through Sylvain Proulx on August 25, 2017 to prevent all seepages from the facility from entering the environment.

MEASURES TO BE TAKEN

Based upon the above grounds and in addition to the oral direction given on August 25, 2017, I hereby direct **Baffinland Iron Mines Corporation**:

1. To fix the Facility to the specifications provided in the approved for-construction drawing, within 30-days of this direction or prior to freeze-up, whichever occurs first.

2. To prevent all uncontrolled discharges from leaving the facility.
3. To amend their Waste Rock Management Plan with a plan for treating non-compliant water, including contingencies, and submit this plan to the Nunavut Water Board for approval. This amendment to their plan is to be submitted to the Nunavut Water Board and an inspector by October 31, 2017.
4. To produce a report that re-assesses the hydrological data of the waste rock pile drainage to determine if the size of their current facility meets industry standards in the North, taking into consideration freshet. This report is to be submitted to the Inspector and the Water Board by September 31, 2017.
5. To stop all other uses of water from this facility for any other purpose, including road watering and water for drill use.
6. To post this direction prominently in appropriate locations at the site, to otherwise inform appropriate persons of this direction, and take any other appropriate steps to ensure it is complied with.

This inspector's direction does not exempt any person from compliance with other relevant legislation.

Under section 90(1) of the Act, any person that fails to comply with a direction given by an inspector under section 87(1) is guilty of an offence and is liable on summary conviction to a fine not exceeding $100,000 or to imprisonment for a term not exceeding one year, or to both.

New Information or Correction of Information

This direction is based on the information available to me at the time of making it. If you wish to bring additional information to my attention or correct any facts that might be in error, please do so in writing.

Review

Under section 87(3) of the Act, the Minister may, and if BIMC requests it the Minister must, review this direction. After review the Minster may leave the direction unchanged, alter or revoke it.

Signed this 5 day of September, 2017 at Iqaluit, Nunavut.

Justin Hack
Water Resource Officer

Field Operations, INAC
Iqaluit, Nunavut
867-975-4517
justin.hack@aandc.gc.ca

cc: Erik Allain, Sarah Forte, *Indigenous and Northern Affairs Canada*
Stephanie Autut, Sean Joseph, *Nunavut Water Board*
Laura Taylor, Bill Bowden, Wayne McPhee, Todd Burlingame – *BIMC*
Stephen Bathory - *QIA*

APPENDIX E.8.3

KEY REGULATORY CORRESPONDENCE – WASTE ROCK FACILITY

APPENDIX E.8.3.1

NOTIFICATION TO REGULATORS OF INTENT TO DISCHARGE

AUGUST 16, 2017

August 16, 2017

Justin Hack, Resource Management Officer
Nunavut Field Operations
Aboriginal Affairs and Northern Development Canada
Box 100
Iqaluit, NU X0A 0H0

Curtis Didham, Enforcement Officer
Iqaluit Office
Environment and Climate Change Canada
933 Mivvik Street
Iqaluit, NU X0A 0H0

RE: Notification of Potential Controlled Discharge from Waste Rock Sedimentation Pond (MS-08); Type "A" Water Licence 2AM-MRY1325 – Amend. No. 1

The purpose of this letter is to inform relevant regulators and stakeholders of Baffinland Iron Mines Corporation's proposed mitigation measures to address concerns regarding the Mary River Mine Site's Waste Rock Sedimentation Pond (the Pond), including a potential controlled discharge from the pond, through the Final Discharge Point, to the receiving environment.

During the last month, the Mary River Mine Site has experienced several large precipitation events that have resulted in significant amounts of runoff from the Mine Site waste rock stockpile being contained within the Pond. Current water levels within the Pond allow for less than <0.5m of freeboard. Due to the continuing influx of runoff into the Pond, it is possible that runoff will exceed the Pond's capacity in the near future.

Moreover, within the last two (2) weeks, the pH level in the Pond has progressively dropped and is currently fluctuating around a pH of 4. These low pH levels are suspected to be the main reason for the failure of a set of acute toxicity samples taken from the Pond on August 1, 2017. Upon becoming aware of the Pond's low pH levels, discharge of effluent from the Pond to the receiving environment ceased on August 3, 2017 and has not resumed since.

To increase the pH in the Pond to levels within the permissible range for discharge[1], Baffinland has reached out to several consultants to determine the best immediate and long term water treatment options. The best immediate water treatment option currently consists of batch treatment of the pond or in-line active discharge treatment with soda ash to increase the pH. Although this method would allow pH levels to meet the relevant discharge criteria (pH 6.0 – 9.5), internal beaker tests conducted onsite have shown that this method causes secondary chemical reactions that increase the alkalinity, conductivity and TSS of the treated water and result in TSS levels above the allowable TSS discharge criteria (15 mg/L).

However, given the limited available capacity for storing water at the Mine Site and the limited water treatment options, it is Baffinland's intention to treat the Pond as described above and conduct a controlled discharge to the environment using the MS-08 FDP commencing in the next several days, if

[1] Discharge criteria outlined in the Federal Metal Mines Effluent Regulations (MMER) and Baffinland's Type A Water Licence (2AM-MRY1325) for MS-08.

required. Daily monitoring will be conducted during the discharge to ensure pH levels remain in compliance with the relevant discharge criteria.
Because Baffinland sees this event as an ongoing risk, Baffinland is considering the following long term mitigation measures to prevent a similar event from occurring in the future:

- Establishing a permanent water treatment system at the Pond (MS-08) capable of pH adjustment and water treatment for other relevant water quality parameters (TSS, metals)
- Modifying waste rock stockpiling procedures, with a focus on potential acid generating rock (PAG) capping thickness and frequency requirements
- Expanding and increasing the capacity of the Pond associated with the Mine Site waste rock stockpile

Baffinland will continue to provide updates as immediate and long term mitigation measures are implemented and as the situation progresses. Please do not hesitate to contact the undersigned, or Laura Taylor, should you have any questions or comments.

Regards,

Bill Bowden

William Bowden
Environmental Superintendent

Cc: Stephen Williamson Bathory (Qikiqtani Inuit Association)
David Hohnstein, Sean Joseph (NWB)
Jonathan Mesher, Sarah Forté, (INAC)
Todd Burlingame, Adam Grzegorczyk, Wayne McPhee, William Bowden, Andrew Vermeer (Baffinland)

APPENDIX E.8.3.2

STATUS UPDATE OF ACTIONS TAKEN AND PLANNED

SEPTEMBER 2, 2017

Baffinland

September 2, 2017

Justin Hack, Resource Management Officer
Nunavut Field Operations
Iqaluit Office
Indigenous Affairs and Northern Development Canada
Box 100
Iqaluit, NU X0A 0H0

Curtis Didham, Enforcement Officer
David MacDonald, Enforcement Officer
Environment and Climate Change Canada
933 Mivvik Street
Iqaluit, NU X0A 0H0

RE: Update on Status, Actions Taken and Planned Corrective Actions for Waste Rock Stockpile Facility Type A Water Licence 2AM-MRY1325 – Amend. No. 1

The purpose of this letter is to provide an update on the status of Mary River Project Mine Site Waste Rock Stockpile (Waste Rock Stockpile) and associated water management infrastructure. Included is an outline of actions taken to date to address previously identified concerns regarding the Waste Rock Stockpile Sedimentation Pond (Sedimentation Pond) and additional planned actions to be taken to address outstanding concerns.

Background

On August 16, 2017, Baffinland notified regulators and stakeholders that the water quality of surface water runoff originating from the Waste Rock Stockpile is not meeting discharge requirements and there was limited remaining capacity in the Sedimentation Pond.

Update

Subsequent to the notifying regulators and stakeholders, Baffinland was able to successfully batch treat the water contained in the Sedimentation Pond using soda ash and installed sedimentation mitigation measures. Controlled discharges from the treated Sedimentation Pond to the receiving environment have occurred since the treatment and will continue, as required, up until freeze up. Available water quality monitoring data indicate discharges met all applicable discharge criteria under the Type A Water Licence and Metal Mining Effluent Regulations (MMER), with the exception of total suspended solids. Compliance with applicable discharge criteria is confirmed upon receiving all water quality monitoring data from 3rd Party laboratories.

On August 23, 2017 during an inspection of the Mine Site Waste Rock Stockpile Sedimentation Pond with Environment and Climate Change Canada (ECCC) and Indigenous and Northern Affairs Canada (INAC), seepage was observed originating from the central toe of the Sedimentation Pond in approximately four (4) discrete but closely clustered locations. It is uncertain at this time as to the exact cause of the observed flows however initial inspections indicate that surface water runoff is potentially infiltrating below the liner inlet key in. An emergency containment ditch was completed shortly after on August 25, 2017 to contain the observed seepage.

The following paragraphs outline Baffinland's action plan to evaluate and stop the seepage from the toe of the Sedimentation Pond.

Action Plan

The pond design and field engineering during construction was completed by Hatch. Baffinland has contacted Hatch for their support and expertise for addressing this serious issue. Hatch has committed to sending a field engineer team to site to determine the root cause and develop a short term action plan to stop the seepage. The field engineer team's assessment is scheduled to commence on September 1, 2017. Baffinland has scheduled personnel and equipment from Sept 6, 2017 forward to conduct the earthworks required to execute Hatch's short term action plan.

If the investigation led by the field engineer team results in a short term solution that cannot be implemented before freeze-up, an interim solution will be put in place. The interim solution will ensure seepage is conveyed to the downstream emergency collection ditch, and will include a sump(s) that will be directed back to the pond up until freeze-up, if water quality is non-compliant with applicable discharge criteria. This interim solution will collect the observed seepage from Sedimentation Pond until Hatch's short term action plan can be implemented in 2018.

The upstream area of the pond, including the east collection ditch and pond liner key in will be re-graded regardless of whether Hatch's short term action plan can be implemented before freeze up. This will prevent water from pooling on the inlet of liner. The lack of proper grading is seen by Baffinland to be a major issue and will be resolved prior to freeze up.

In parallel, a long term plan is in development that involves expanding the Waste Rock Stockpile Facility and associated surface water management infrastructure, including the sedimentation pond, in 2018. The expansion would improve the surface water management infrastructure associated with the Mine Site Waste Rock Stockpile and incorporate additional water management contingency into the design. The expansion will be submitted to the Nunavut Water Board and appropriate agencies for approval in late 2017. Implementation of the expansion would not commence until all necessary approvals are received.

Sincerely,

Sylvain Proulx
Chief Operating Officer
T: +1 416 364 8820 x6091
C: +1 416 970 6983

Cc: Stephen Williamson Bathory (Qikiqtani Inuit Association)
David Hohnstein, Sean Joseph (NWB)
Solomon Amuno (NIRB)
David MacDonald (ECCC)
Jonathan Mesher, Sarah Forté, Karen Costello (INAC)
Todd Burlingame, Adam Grzegorczyk, Wayne McPhee, William Bowden, Andrew Vermeer, Laura Taylor, Allan Knight (Baffinland)

APPENDIX E.8.3.3

BAFFINLAND RESPONSE TO MEASURES TO BE TAKEN ITEM 4

HYDROLOGY ASSESSMENT

OCTOBER 31, 2017

Baffinland

October 31, 2017

Jonathan Mesher, Water Resource Officer
Nunavut Field Operations
Indigenous and Northern Affairs Canada
P.O. Box 100
Iqaluit, NU X0A 0H0

RE: Measure to be Taken, Item 4 of INAC Inspector's Direction (Sept. 5, 2017)
Type A Water Licence (2AM-MRY1325)

The purpose of this letter to provide a report that addresses Item 4 of Measures to be Taken in the INAC Inspector's Direction (the Direction) issued to Baffinland Iron Mines Corporation (Baffinland) on September 5, 2017.

As stated in Item 4 of the Inspector's Direction, Baffinland is required:

> "To produce a report that re-assesses the hydrological data of the waste rock pile drainage to determine if the size of their current facility meets industry standards in the North, taking into consideration freshet"

Baffinland has retained Golder Associates (Golder) to complete the re-assessment and develop the report required by Item 4. A copy of the report is provided as Attachment 1 of this letter.

As confirmed in Golder's report (Attachment 1), the pond design for the Project's waste rock stockpile facility was appropriate for its intended purpose (sediment reduction).

Should you have any questions or comments, please do not hesitate to contact the undersigned.

Regards,

Sylvain Proulx,
COO, Baffinland

Attachments:

Attachment 1: INAC Inspector's Direction (dated September 5, 2017)
Attachment 2: Golder Associates – Hydrological Investigation Memo (dated October 30, 2017)

Cc: Sean Joseph, David Hohnstein (NWB)
Sara Forté (INAC)
Stephen Williamson Bathory (QIA)
Todd Burlingame, Tim Sewell, William Bowden, Allan Knight (Baffinland)

Attachment 1

INAC Inspector's Direction (dated September 5, 2017)

INSPECTOR'S DIRECTION
Pursuant to Section 87(1) of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*

September 5 2017

ISSUED TO: Baffinland Iron Mines Corporation *via*
Chief Operating Officer, Sylvain Proulx
sylvain.proulx@baffinland.com

RE: ***Nunavut Waters and Nunavut Surface Rights Tribunal Act***
INSPECTOR'S DIRECTION

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BELIEF ON REASONABLE GROUNDS

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> *waters have been and may be used in contravention of the Act and a condition of a licence; and that the adverse effects of that use of water are causing, or may cause, a danger to the environment.*

I) RELEVANT FACTS

1. The *waste rock water containment facility* (the facility) is a regulated facility and is considered a use of waters under paragraph (b) and (c) of the definition of "use" in the Act.
2. This facility has conditions associated with it under the water licence *2AM-MRY1325 Amendment #1* (the licence).
3. While conducting a routine water licence inspection of Baffinland Iron Mines Corporation project in the Qikiqtani Region of Nunavut, between the dates of August 22-24, 2017, I observed 3 uncontrolled discrete seepages originating from the central toe of the waste rock water containment berm at approximately N71° 20' 43", W79° 14' 18".
4. Seepages from this facility were not designed as part of the original for-construction drawings associated with this facility, and therefore, this facility is not operating as authorized. This is a requirement, as described in Part D, Item 23; whereas:

   a. The Licensee shall construct and operate all infrastructure and Facilities authorized by the Board that are designed to contain, withhold, divert or retain Water and/or Waste, in accordance with all applicable legislation and industry standards.

5. Records obtained by Baffinland and field measurements taken during the inspection have shown that the water from the seepages have not met the effluent quality limits as required by Part F, Item 25 of their licence.

6. These records also indicate that the facility has been ineffective to adequately store and treat the acid rock drainage water prior to discharge. This is required in Part D, Item 19; whereas:

   a. The Licensee shall prevent any chemicals, fuel or Wastes associated with the undertaking from entering any Water Body.

7. It is also important to note that during my inspection on August 22-24, 2017, I observed a team of BIMC employees adding soda ash through a mixing and pumping technique into the facility to raise the pH of the water to a level that is appropriate for discharge. This technique was not included in their *Waste Rock Management Plan* to treat non-compliant waters.

8. When I questioned BIMC employees about their need to increase the pH using this technique, I was informed that the facility was near capacity and could not hold any additional water if there were any precipitation events.

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10. To summarize, I believe that:

    a. the facility was not constructed to an appropriate standard as per requirement, Part D, Item 23,

    b. the licensee has not prevented wastes from entering water as per requirement, Part D, Item 19 and section 12 of the Act; and,

    c. there has been a significant controlled discharge of non-compliant waters, contrary to Part F, Item 25 of the Water Licence 2AM-MRY1325.

11. Furthermore, I believe that adverse effects of these failures have caused, are causing, or may cause a danger to the environment unless resolved.

12. For those reasons, I gave an oral direction to BIMC through Sylvain Proulx on August 25, 2017 to prevent all seepages from the facility from entering the environment.

MEASURES TO BE TAKEN

Based upon the above grounds and in addition to the oral direction given on August 25, 2017, I hereby direct **Baffinland Iron Mines Corporation**:

1. To fix the Facility to the specifications provided in the approved for-construction drawing, within 30-days of this direction or prior to freeze-up, whichever occurs first.

2. To prevent all uncontrolled discharges from leaving the facility.
3. To amend their Waste Rock Management Plan with a plan for treating non-compliant water, including contingencies, and submit this plan to the Nunavut Water Board for approval. This amendment to their plan is to be submitted to the Nunavut Water Board and an inspector by October 31, 2017.
4. To produce a report that re-assesses the hydrological data of the waste rock pile drainage to determine if the size of their current facility meets industry standards in the North, taking into consideration freshet. This report is to be submitted to the Inspector and the Water Board by September 31, 2017.
5. To stop all other uses of water from this facility for any other purpose, including road watering and water for drill use.
6. To post this direction prominently in appropriate locations at the site, to otherwise inform appropriate persons of this direction, and take any other appropriate steps to ensure it is complied with.

This inspector's direction does not exempt any person from compliance with other relevant legislation.

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New Information or Correction of Information

This direction is based on the information available to me at the time of making it. If you wish to bring additional information to my attention or correct any facts that might be in error, please do so in writing.

Review

Under section 87(3) of the Act, the Minister may, and if BIMC requests it the Minister must, review this direction. After review the Minster may leave the direction unchanged, alter or revoke it.

Signed this 5 day of September, 2017 at Iqaluit, Nunavut.

Justin Hack
Water Resource Officer

Field Operations, INAC
Iqaluit, Nunavut
867-975-4517
justin.hack@aandc.gc.ca

cc: Erik Allain, Sarah Forte, *Indigenous and Northern Affairs Canada*
Stephanie Autut, Sean Joseph, *Nunavut Water Board*
Laura Taylor, Bill Bowden, Wayne McPhee, Todd Burlingame – *BIMC*
Stephen Bathory - *QIA*

Attachment 2

Golder Associates – Hydrological Investigation (dated October 30, 2017)

Golder Associates

October 30, 2017 Project No. 1665556

Sylvain Proulx, Chief Operating Officer
Baffinland Iron Mines
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L6H 0C3

RESPONSE REGARDING INSPECTORS DIRECTION DATED SEPTEMBER 5, 2017, MEASURES TO BE TAKEN, ITEM 4, – HYDROLOGICAL INVESTIGATION

Dear Sylvain,

Provided herein is a letter report to address Item 4, of the measures to be taken, in response to Inspectors Direction issued to Baffinland Iron Mine Corporation (BIM), September 5, 2017. Item 4 requires that Baffinland Iron Mines produce a report that re-assesses the hydrologic data of the waste rock pile drainage.

Golder Associates Ltd. (Golder) were retained to conduct a review and assessment of the data provided related to the waste rock pile drainage, in particular:

- Construction Summary Report: Mine Site Waste Rock Sedimentation Pond and Drainage Ditch – (Report from Hatch, January 24, 2017)
- Waste Rock Geochemistry Report, Data and Status Update (Appendix D.5 of the 2016 QIA and NWB Annual Report for Operations dated March 2017)
- Appendix 1 Stormwater Management and Drainage System Design. In: Life of Mine Waste Rock Management Plan. (Report from BIM, Doc BAF-PH1-830-P16-0031. April 2014)
- Baffinland Iron Mines Corporation, Mary River Project Civil Design Criteria (Report from Hatch 2013)

Standard design criteria derived from climate data as indicated in the Section 4.2 of the Life of Mine Waste Rock Management Plan (BIM 2014) was used to plan the Waste Rock Sedimentation Pond for the anticipated catchment of the Waste Rock Stockpile. Freshet was not presented as part of the documented design criteria. Based on the information provided, sedimentation ponds were developed for the Mine Site Waste Rock Drainage area sized for a 1 in 10 year, 24 hour design storm volume, with an emergency overflow weir of sufficient capacity to safely convey a 1 in 200 year return period storm event or the Probable Maximum Flood (PMF), maximum wind-induced waves, or unexpected operational difficulties (Hatch 2013, Hatch 2017). Using a surface area of 19.88 Ha, combined with a precipitation rate of 40.8 mm (10 year, 24 hr storm) and a runoff coefficient of 0.9 yields a design volume of requirement of 7300 m^3.

The as-built volume as indicated in the 2017 Construction Summary Report (Hatch 2017) is 9,200m^3, which allows for adequate volume for a 1 in 10 year, 24 hour design storm volume and an operational excess of approximately 1900 m^3.

The design criteria assumes that water is suitable for discharge with the exception of sediment removal, and that the pond will be pumped down following every spring freshet and maintained at a low volume, thus is only required to handle storm events. The predicted water quality modelling was summarized in a report titled "Interim Waste Rock Stockpile Seepage Quality Model Report" and concluded that, with the exception of total suspended solids, the water quality of runoff and seepage would meet Metal Mining Effluent Regulations (MMER) discharge requirements, as presented in the Project's Final Environmental Impact Statement (FEIS) reviewed and approved by stakeholders and regulators.

The purpose of the pond was for sediment reduction under a maximum 1 in 10 year, 24 hour design storm, as such, the pond design appears appropriate for its intended purpose, based on the data reviewed, under the assumptions as provided in the reviewed documentation.

We trust this report meets your requirements at this time.

GOLDER ASSOCIATES LTD.

REGISTERED PROFESSIONAL GEOLOGIST
K.J. DE VOS
LICENSEE
OCT 30, 2017
NWT/NU

Ken DeVos, M.Sc., P. Geol.
Geochemist, Principal

KJD/jl

APPENDIX E.8.3.4

BAFFINLAND RESPONSE TO MEASURES TO BE TAKEN ITEM 3

UPDATED PHASE 1 WASTE ROCK MANAGEMENT PLAN

NOVEMBER 15, 2017

Baffinland Iron Mines Corporation

PHASE 1 WASTE ROCK MANAGEMENT PLAN

BAF-PH1-830-P16-0029

Rev 1

Prepared By: Cody Gagne
Department: Mine Operations
Title: Superintendent of Engineering & Geology
Date: November 15, 2017
Signature:

Approved By: Sylvain Proulx
Department: Operations
Title: Chief Operating Officer
Date: November 15, 2017
Signature:

for S. Proulx

DOCUMENT REVISION RECORD

Issue Date MM/DD/YYYY	Revision	Prepared By	Approved By	Issue Purpose
04/30/2014	0	F. Consuegra	T. Woodfine	For Permitting
11/15/2017	1	C. Gagne	S Proulx	Updating Water Treatment

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1 PURPOSE

A waste rock disposal area designed for storage of waste rock in perpetuity will be located north and west of the open pit.

A modification of the mining plan has resulted in a smaller tonnage of waste rock being produced in earlier years 1-4 of operations from 2015-2018 when ore will be mined and shipped through Milne Port at a rate of up to 3.5 Mtpa. During this Phase 1, it is estimated that about 2.5 Mt will be placed in the stockpile.

This is reflected in a smaller waste rock storage area footprint and a new run-off collection pond to be constructed. As additional geological, geotechnical and geochemical data is collected, the waste rock management plan will be updated based on the application of best management practices.

Following the planned construction of the rail line and Steensby Port, production of ore and waste rock will increase quickly with a Life of Mine total of about 600 Mt of waste rock and 30 Mt of overburden produced over the mine life of Deposit No. 1. The existing "Waste Rock Management Plan" document number H349000-1000-07-126-0009, approved under NIRB Project Certificate #005 remains in effect as the approved Life of Mine waste rock management plan.

2 SCOPE

This plan has been developed for Phase 1 of the waste rock stockpile (dump) development for Deposit 1 at the Mary River Mine Site and describes the geochemical characterization of the waste rock and how this influences the way waste rock is deposited and how the stockpile is constructed.

Closure considerations are included as well as environmental monitoring and reporting.

Updates to this plan will be developed as new information is available and is included in ongoing optimization of the waste rock storage area (dump) design.

2.1 Relationship with Standard Operating Procedures

This Phase 1 Waste Rock Management Plan should be reviewed with other Baffinland Standard Operating Procedures:

- BAF-PH1-340-PRO-0006 r0 - Haul Truck Operation Procedure
- BAF-PH1-340-PRO-0012 r0 - Dozer Operation Procedure

3 RESPONSIBILITES

3.1 Mine Operations Supervisor Responsibilities

The Mine Operations supervisor is responsible for the following:

- The safety and health of all persons while managing and directing activities associated with the hauling and placement of waste rock. Nothing relieves the mine operations supervisor for ensuring a safe work place and compliance with federal and provincial regulations and those of Baffinland
- Preparation and execution of the waste rock stockpile deposition plan

3.2 Haul Truck Operator Responsibilities

Haul truck operators are responsible for the safe operation of their haul truck as follows:

- Carry out all pre-start up and shut down inspections as specified in the Baffinland regulations
- Observe all speed limits and adjust driving for the conditions during bad weather
- Follow closely all directional signs when proceeding loaded to the waste rock stockpile
- When approaching, dumping and leaving the stockpile area follow closely the instructions of the spotter

3.3 Dozer Operator and Spotter Responsibilities

The dozer operator and spotter have the following responsibilities:

- Maintain safe conditions for haul truck dumping at the edges of the stockpile lift and at the dumping location
- Give clear communication and signals to the haul truck operator
- On bottom lift, avoid pushing large boulders down at the edge of the stockpile footprint to prevent damage to run off pond liner at the north end of the stockpile

3.4 Safety

- PPE is essential and is required to be worn at all times
- Appropriate speed limit and direction signs will be posted
- A daily safety huddle and review of Job Safety Assessments will be made

3.5 ENVIRONMENT

Haul truck, Dozer Operators and the Spotter must take every precaution to protect the environment and wildlife as follows:

- Haul truck, Dozer Operators and the Spotter must have completed WHMIS training
- Haul truck, Dozer Operators and the Spotter must have completed training in oil spill reporting, containment and cleanup
- Return all waste and empty containers to the Mary River Waste Management facility for appropriate disposal

The Environmental Department will be responsible for:

- Regular inspections of the waste rock stockpile and run off pond and dam
- Monitoring of the water quality of the run off pond before controlled release into the environment
- All required reporting to the regulators

4 REGULATORY REQUIREMENTS

All mining operations are carried out under the Mines Act and the requirements will be reflected in Baffinland procedures which must be followed.

The Mary River Operation is permitted under Nunavut Impact Review Board Project Certificate #005 and Nunavut Water Board Type A Water Licence, 2AM-MRY1325. The specific environmental requirement related to the waste rock stockpile is for run-off to be collected in a downstream pond with capacity sized to reduce suspended solids in the discharge to meet discharge requirements of <30 mg/L (Maximum concentration of any grab sample) and 15 mg/L maximum average concentration.

In addition, the discharge from the pond is established as a monitoring and discharge point under the Metal Mining Effluent Regulations (MMER) SOR/2002-222.

5 WASTE ROCK CHARACTERIZATION

5.1 Deposit Geology

Deposit No.1 occurs at the nose of a syncline plunging steeply to the north-east (Aker Kvaerner, 2008). The iron formation occupies the nose and two limbs of this feature with a ~1,300 m long northern portion and a ~700 m long southern portion. The footwall to the iron formation mainly consists of gneiss with minor schist, psammitic gneiss (psammite) and amphibolite. The hanging wall is primarily composed of schist and volcanic tuff with lesser amphibolite and metasediment.

The hanging wall primarily encompasses chlorite–actinolite schist and garnetiferous amphibolites. Meta-volcanic tuff is also a significant lithology identified in the hanging wall. The footwall mainly consists of quartz-feldspar-mica gneiss with lesser meta-sediment (greywacke) and quartz-mica schist. Microcline and albite are the predominant feldspars within the gneiss and biotite is generally more abundant than muscovite.

The iron ore deposits at the Mary River project represent high-grade examples of Algoma-type iron formation and are composed of hematite, magnetite and mixed hematite-magnetite-specular hematite varieties of ore (Aker Kvaerner, 2008). The iron deposits consist of a number of lensoidal bodies that vary in their proportions of the main iron oxide minerals and impurity content of sulphur and silica in the ore. The massive hematite ore is the highest grade ore and also has the fewest impurities, which may indicate it was derived from relatively pure magnetite or that chert, quartzite and sulphides were leached and oxidized during alteration of the iron formation.

Intense deformation and lack of outcrop limit the ability to subdivide by lithology on the basis of future mined tonnages.

5.2 Summary of Geotechnical Considerations

The existence of the ridge north of Deposit No. 1 and outcrop appearing along the ridge support existing evidence from geotechnical drilling of the geotechnical stability of the area and make it a suitable location to start construction of the waste rock stockpile. Ongoing geotechnical drilling to complement existing data will be used to optimize the stockpile design.

5.3 Summary of Geochemical Sampling and Test Work

Metal leaching and acid rock drainage (ML/ARD) characterization studies in support of the Life of Mine pit waste rock are provided in the report entitled “Mine Rock ML/ARD Characterization Report Deposit 1, Mary River Project”, March 2014 as appended to the Life-of-Mine Waste Rock Management Plan. A further analysis of the available ML/ARD results related to the five year pit is provided in Appendix A.

The waste rock was subdivided based on broad geo-structural categories about the iron ore zone, mainly by hanging wall and footwall zones. A total of 776 waste rock samples were selected as representing the waste rock categories and broad spatial coverage of non-ore mine rock in the vicinity of the Life of Mine open pit development. All 776 waste rock samples were analyzed for modified Sobek acid base accounting (ABA), NAG pH and elemental content. Subsets of drillcore samples were also analyzed for downhole variability, NAG leachate, short-term metal leaching, whole rock elemental content, detailed mineralogical analysis, and long-term kinetic testing.

Results of ABA testing determined that waste rock is generally characterized as having low neutralization potentials (NP) and low acid potentials (AP). Data suggests that the waste rock is dominated by non-carbonate sources of NP (e.g. silicates) with lesser NP derived from carbonate sources. Sulphide was the primary form of sulphur. Approximately 85% of waste rock samples had neutralization potential ratios (NPR) greater than 2 and are classified as non-potentially acid generating (Non-PAG) and are unlikely to generate acidic drainage. Approximately 10% of the samples had NPR values of less than 1, and 5% of the samples were classified as having uncertain acid generating potential (1<NPR<2). Extrapolating these results to the project waste rock model, indicates that approximately 11% of the Life of Mine in-pit waste rock is expected to have NPR <2 and is considered potentially acid generating (PAG). Proximity to ore appears to correlate to increased PAG quantities (defined as NPR <2) with the hanging wall schist (HWS) and footwall schist (FWS) zones identified with the greatest proportion of PAG of the major waste units.

Analysis of a set of samples proximal to the proposed five year pit indicates a lower sulphur and sulphide content is likely to be encountered in the shallower HWS and FWS rock of early development than at depth during later production. This lower sulphide content is expected to result in a lower percentage of PAG rock being encountered during early operations than would be predicted by extrapolating the overall (including deeper) HWS and FWS waste rock data to near surface.

For planning related to the Phase 1 Waste Rock Management Plan, 10% PAG rock plus allowances for expansion due to field screening limitations and dilution has been assumed.

Ten waste rock samples were run in humidity cells for 53 weeks in 2008 and 2009. A further 17 waste rock samples were initiated in humidity cell tests in May 2011 for between 109 and 120 weeks of reported data. Nine of these samples were standard humidity cells and eight were NP depleted humidity cells designed to assess drainage quality in the absence of carbonate NP. The pH of most cells was in the range of 5.5 to 7 throughout testing. Of the 17 cells in operation since 2011, three cells exhibited slowly declining pH throughout testing reaching a minimum measured weakly acidic pH between 4.5 and 5 after approximately two (2) years of operation (under laboratory conditions). Metal release rates from humidity cells were generally low.

Kinetic testing results and cold climate conditions at site suggest the lag time to acid on-set in PAG rock with potentially increased metal release rates would be on the order of five years or longer.

Work is continuing to confirm the feasibility of developing field test pads at the site using selected waste rock material generated during early mine development. Operation and monitoring of such test piles (if feasible) would better inform the project about projected drainage quality and water quality modeling assumptions under site-specific cold climate conditions.

6 CONSTRUCTION OF THE WASTE ROCK STOCKPILE

6.1 DEPOSITION STRATEGY

Waste rock will be deposited in lifts using the guidelines presented in Section 6.4. The primary objective is safety of personnel and stability of the waste rock stockpile. However, these deposition methods will also enhance permafrost aggradations into the Waste Rock Stockpile

The design of the waste rock storage area is based on the conservative results from drilling and laboratory test work.

Phase 1 of the WRD will be built oriented along the ridge extending Northwards from the top of Deposit 1 as shown in Figure 6.1. Stockpile construction will start at the northern perimeter of the stockpile footprint. The stockpile will be bounded on the east and west by WRD roads which join to form the downstream wall of the run off pond. Berms constructed along the upstream edge of the WRD roads will divert run off towards the run off pond. A plan of the northern section of the WRD, the WRD roads and the run off pond is included in Appendix B.

It is important that the bottom layer of the waste rock is placed while the ground is frozen allowing the freezing level to rise in elevation by conduction. In addition, the first lift of material to be placed will be non-PAG material. It expected that a permanently frozen impermeable core will form in the waste rock storage area within the first few years after placement. A technical memorandum with recommendations on the development of permafrost in waste rock stockpiles has been completed by Thurber (refer to Appendix B, Life-of-Mine Waste Rock Management Plan) Temperature modeling of the waste rock regime including climate change included in the technical memorandum will be carried out as part of the ongoing waste rock characterization program.

It is expected that the interior of the waste rock stockpile material will become permanently frozen, and that only the outer layer of material will be subject to seasonal freezing and thawing. The frozen condition will increase both the physical and chemical stability of the structure. The final surficial "active" layer, which will be subject to seasonal freeze-thaw, will be constructed of non acid generating rock as the waste rock stockpile develops.

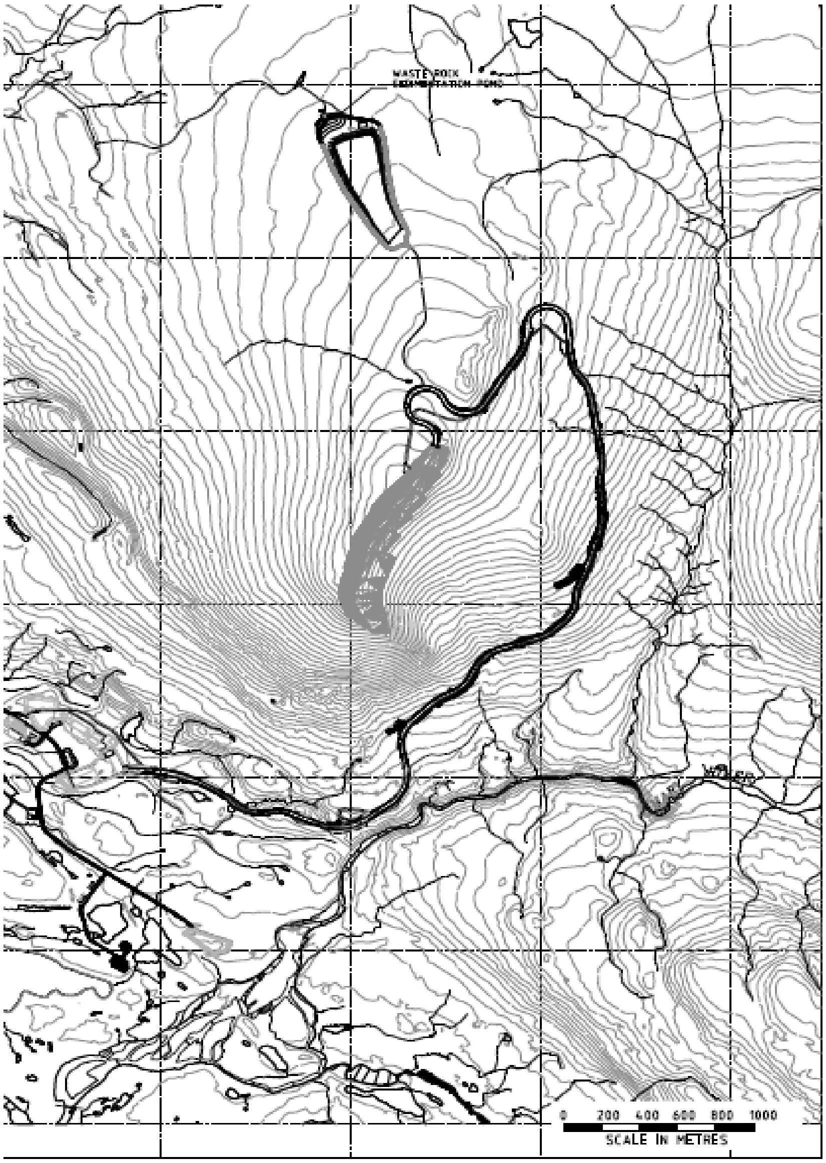


FIGURE 6-1: PHASE 1 OF THE WASTE ROCK STOCKPILE AND RUN OFF POND

6.2 Phasing of Waste Rock Deposition Over Time

A modification of the mining plan has resulted in a smaller tonnage of waste rock being produced in the earlier years of operation.

The initial, Phase 1, waste rock storage layout for the first five years of mining is illustrated in Figure 6-1. As additional geological, geotechnical and geochemical data is collected, the waste rock deposition plan will be updated based on the application of best management practices. A geotechnical investigation will be carried out in areas where there are potential instabilities. These results will be incorporated into the ongoing waste rock stockpile design. Specifically a stability analysis of the waste rock stockpile and the open pit will be carried out to show that the combined structures are stable.

Following the planned construction of the rail line and Steensby Port, production of ore and waste rock will increase quickly with a Life of Mine for Deposit 1 total of about 600 Mt of waste rock and 30 Mt of overburden produced over the mine life.

The volume of waste rock delivered to the waste rock storage area will be recorded and will be reported as required by the NWB Type A Water Licence, 2AM-MRY1325 and the Commercial Lease, Q13C301.

6.3 Management of Potentially Acid Generating (PAG) Waste Rock

The low percentage of PAG material identified in waste rock and an estimated lag time of more than five years support the management of PAG by encapsulation of the PAG material in the ultimately frozen core of the waste rock stockpile.

PAG waste rock will be identified by processing on-site analytical data from blast hole drill cuttings samples. Laboratory determination of PAG waste materials will be completed using total sulphur analysis by Leco sulphur analyser and guidance provided in Appendix A. Materials identified with a total sulphur content greater than 0.20% will be considered PAG rock or subjected to standard ABA testing for confirmation as either PAG or non-PAG rock. NAG pH testing may also be used as a screening tool for this purpose. The on-site processing of blast hole samples in the environmental laboratory will allow timely development of the waste rock deposition plan.

All material within a specified 3D radius from a sample determined to be PAG will be assigned as PAG and incorporated into the mine scheduling. When that material is loaded into the haul truck it will be directed according to the mine scheduling plan to a specific section of the waste stockpile where all the PAG rock will be encapsulated together within non-PAG waste rock.

The permanently frozen core of the stockpile will limit sulphide oxidation and prevent seepage of PAG drainage to the environment.

The outer “active” layer of the WRD which freezes and thaws seasonally will be constructed of non-PAG rock.

6.4 General Guidelines Used to Develop the Waste Rock Stockpile

The design of the waste rock storage area is based on the conservative results from laboratory test work. The design guidelines which follow will develop over time as the results of the ongoing studies and field piles become available:

- The stockpile will be constructed in lifts from the bottom up with lift and bench characteristics appropriate for the geotechnical conditions and waste handling equipment. These characteristics will be approved by the Mine Manager
- A 2-3 m thermal barrier of non-PAG waste rock will be placed during the winter months to protect the permafrost layer during the summer months and allow development of the permafrost through conduction
- PAG waste rock should be segregated from non-PAG rock and encapsulated within the pile
- At closure, the active layer of the waste rock stockpile should consist of non-PAG rock
- PAG rock should all be placed in the section of the WRD which drains to the Mary River watershed
- The perimeter of the WRD will be a minimum of 31 m from any water body

7 WASTE ROCK RUNOFF MANAGEMENT

The first phase of runoff management for years 1-4 for the waste rock stockpile area will consist of channels formed by berms around the stockpile perimeter produced by two roads, one on each side of the waste rock stockpile. These will channel the run off downstream of the waste rock stockpile where a sedimentation pond is formed by construction of a berm about 3 m high. The watershed, including the waste rock stockpile, contributing to this pond has an area of 20ha. The sedimentation pond will be lined and is sized to contain the 1:10 year 24 hr storm event falling on the waste rock stockpile area. The sedimentation pond will have an overflow weir capable of passing the 1:200 year storm event. Clean, non contact water from upstream of the waste rock stockpile will be diverted around the waste rock stockpile by upstream diversion berms.

Further phased drainage management berms and ponds will be designed as mining progresses. All phases of the run off management system are designed such that the discharge from sedimentation ponds flows directly into existing water courses such that surface erosion is minimized and no additional impacts are created.

Figure 6-1 shows that the initial footprint of the waste rock storage area is partially in the western watershed of the two watersheds that drain the area to the north of the open pit and which drain into Camp Lake. In order to divert the discharge from the run off pond to the Mary River watershed a berm/channel will be constructed to convey the water to an existing water course draining into a tributary of Mary River. A drawing of the waste rock drainage diversion ditch plan and profile is included as Appendix C.

Snow will accumulate on the waste rock stockpile during the winter and during the summer the melted snow along with any rainfall will seep through the active zone and run off the sides of the stockpile or drain from the foot of the perimeter of the stockpile.

Stockpile drainage water quality is expected to meet MMER discharge limits. Specifically, the existing water quality model developed in support of the larger Life-of-Mine Waste Rock Management Plan predicts that after sedimentation, drainage water quality from the non-acidic mine rock exposed during operations will meet MMER discharge requirements. Kinetic testing results and cold climate conditions at site suggest the lag time to acid on-set in PAG rock would be on the order of five years or longer providing adequate time to isolate PAG materials within the waste rock stockpile. This supports the key modeling assumption of non-acidic drainage from PAG rock during waste rock stockpile construction.

7.1 Ore Storage

Ore mined in the pit will be dumped on a small run-of-mine (ROM) stockpile located near the mobile crusher in the Crushing and Screening area located on the South side of the pit east of the Site Services Pad.

Following crushing, the ore is loaded directly into ore transport trucks for transportation to Milne Port. Since ore will be stored in these locations only temporarily and the drainage during operations is controlled, there is no concern about long-term potential effects of PAG material stored at these locations.

7.2 Runoff Water Treatment Alternatives

Recent results from seepages and impounded water at the Waste Rock Pile indicate that some treatment of the Waste Rock Pond may be required during specific periods of the year to meet discharge requirements. During fall sampling events, it was found that the impounded water in the Waste Rock Pond had a depressed pH, and that Nickel was elevated in concentrations approaching the discharge limits set forth in the Metal Mining Effluent Regulations (MMER) and 2AM-1325 Amendment No.1 Water Licence (Water Licence) applicable guidelines.

7.2.1 pH Adjustment

Monitoring results from the Waste Rock Pond have periodically exhibited pH below MMER and Water Licence Guidelines, which is expected to be caused by runoff from areas of stored PAG material in the Waste Rock Stockpile. This runoff is captured in the Waste Rock Pond and affects the overall pH of the pond. The degree to which this runoff affects the water quality in the pond is dependent on the quality of the impounded water and the quantity of runoff.

To adjust the pH of the pond, a basic chemical would be dosed under constant mixing, until samples confirmed that the pH of the pond had increased sufficiently to be compliant with applicable guidelines. Monitoring would then be necessary during discharge to ensure that further runoff does not drop the pH back below MMER and Water Licence discharge guidelines. Chemicals that could be used to raise the pH include:

- Sodium Bicarbonate, NaHCO3 (Baking soda)
- Sodium Hydroxide, NaOH (Caustic soda)
- Calcium Hydroxide, Ca(OH)2 (Hydrated lime)
- Magnesium Hydroxide, Mg(OH)2
- Calcium Carbonate, CaCO3 (Limestone)
- Sodium Carbonate, NasCO3 (Soda ash)

Sampling of the water chemistry will be required to ensure that the proposed method of treatment will pass discharge requirements including Acute Toxicity testing.

To ensure adequate mixing, the pond will need to be mixed during dosing. This can be achieved using pumps and hoses placed on the top of the berm, drawing suction from one side of the pond and discharging to the opposite end. Doing this provides complete mixing for chemical dosing, and ensures that any samples taken will be representative of the pond water quality.

The pH adjustment chemicals noted above are available as both solids and liquids, in a variety of different shipping containers. If a liquid chemical is selected, the chemical can be dosed directly in-line through the mixing pumps, using a small dosing pump and an in-line mixer. Solid chemicals will need to be prepared as a solution first, to allow them to be injected in a similar manner.

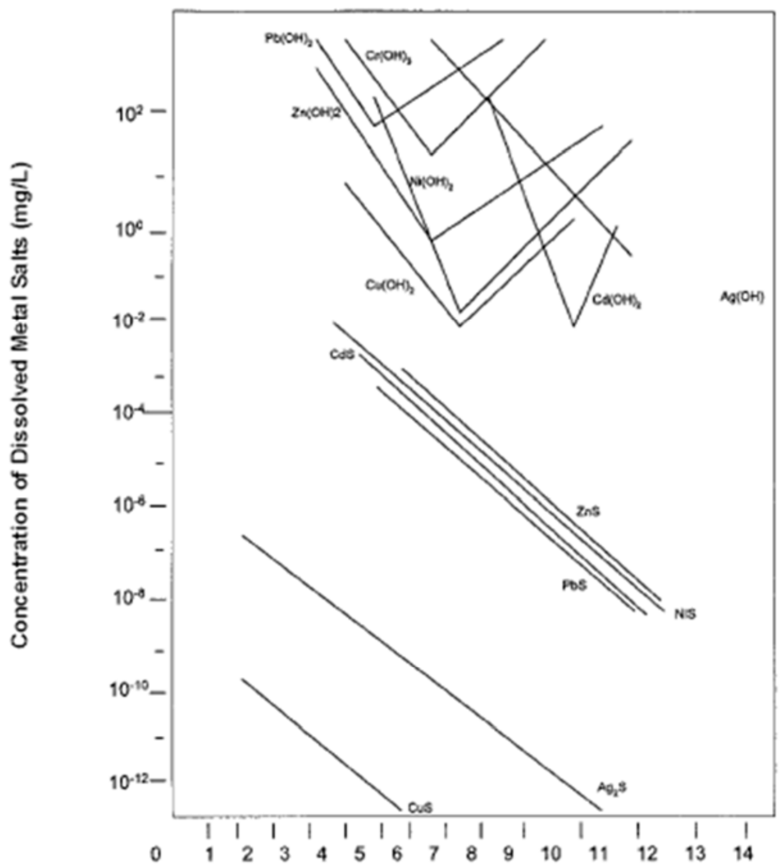
An estimate of chemical requirements should be completed beforehand to provide a target dosage for the volume of water in the pond. This is most effectively done through bench-scale titration of samples of the pond water, with the proposed chemistry being used for treatment.

As the actual dose approaches the theoretical dose, care should be taken to avoid overdosing and surpassing the upper pH limit. It is important to take into consideration the reaction time of the specific chemistry being used when evaluating performance and measuring pond water quality. Adequate time should be given for the reactions to run to completion, before pond samples are taken.

7.2.2 Metals Precipitation

Monitoring of the Waste Rock Pond and inflow into the pond have shown elevated levels of Nickel. If, during discharge, the water impounded in the Waste Rock Pond is found to have metals concentrations over the limits, further treatment will be required.

Precipitation is a reliable method of removing metal species from a water body. To precipitate metals, the pH of the water must be adjusted to the point that the target metals become insoluble in water, and form a precipitate. This precipitate is then allowed to settle to the bottom of the pond as a solid, which later may need to be removed and disposed of as a sludge depending on accumulation rates. Figure 7-1 below shows a typical solubility chart for metal hydroxides and sulphides, showing the relationship between solubility and pH of the solution. Similar established relationships can be found for most metal compounds. Figure 7-1. Displays a pH of approximately 8 is optimal to precipitate out Nickel concentrations in Waste Rock Sedimentation Pond waters.



Solubility of metal hydroxides and sulfides as a function of pH (*x*-axis) (source: EPA 625/8-80-003).

Figure 7-1: Solubility of metal hydroxides and sulphides

Once the water has been pH adjusted, the pond would be allowed to settle for a period of time. This gives time for the reactions to take place, and for precipitates to form and settle out to the bottom of the pond. Once analysis shows that metals concentrations are within applicable discharge guidelines, further pH adjustment may be necessary prior to discharge to ensure compliance with MMER and Water Licence Regulations. This pH adjustment should be done in-line if possible, to prevent any precipitated metals in the pond from going back into solution.

Chemicals that could be used to increase pH for precipitation include:

- Sodium Bicarbonate, NaHCO3 (Bicarb, baking soda)

- Sodium Hydroxide, NaOH (Caustic soda)
- Calcium Hydroxide, Ca(OH)2 (Hydrated lime)
- Magnesium Hydroxide, Mg(OH)2
- Calcium Carbonate, CaCO3 (Limestone)
- Sodium Carbonate, NasCO3 (Soda ash)

Chemicals that could be used to decrease pH to meet regulatory requirements during discharge include:

- Sulphuric acid, H2SO4
- Hydrochloric acid, HCl
- Nitric acid, HNO3
- Phosphoric acid, H3PO4

As noted in the previous section, these chemicals are available as both solids and liquids, which have different equipment requirements for dosing. Liquid chemistry can be dosed directly in-line, while solid products must be made-down into a solution prior to dosing.

Solids Removal

At present, solids concentration and turbidity in the pond are variable, likely due to the depth of the pond and solids characteristics. If solids concentrations are elevated prior to discharge, it may become necessary to utilize a coagulant to assist with settling. Using a coagulant, in conjunction with the chemistry noted above, will cause the solids in the water to bind together, forming heavier particles that sink more readily. This will create more sludge, but will result in clearer water.

As with the other chemicals, the coagulant must be added and mixed into the pond, but may be added in-line during mixing. The coagulant chemical addition should follow the pH chemical addition program if required. A theoretical dose should be established through bench scale testing first, to act as a target during dosing. An effective dose of coagulant will yield a clear supernatant and form a layer of thick solids, which is not easily disturbed. The lighter the solids layer, the more affected by wind it will be, and the greater the possibility the solids will go back into suspension.

Chemicals that may be used for coagulation of solids in the pond include:

- Ferric Chloride, FeCl3
- Ferrous Sulphate, FeSO4
- Aluminium Chloride AlCl3
- Polyaluminium Chloride
- Aluminium Sulphate Al(SO4)3

As noted in the previous section, these chemicals are available as both solids and liquids, which have different handling and dosing requirements. Liquid chemistry can be dosed directly in-line, while solid products must be made-down into a solution prior to dosing.

Solids Polishing

If solids concentrations in the pond continue to be elevated beyond the limits set out in the Regulations, a further polishing step will be required to meet discharge criteria. Solids concentrations in the pond could be elevated due to ineffective settling, or environmental conditions such as wind, precipitation, or additional runoff.

A polishing filter is a physical barrier designed to capture and retain solids in a stream of water. These systems are typically installed in-line, and in this case, would be installed after the discharge pumps, in-line with the discharge line. A system suitable for use at the site would be compact and skidded, and would either be housed inside a structure or left outside.

Technologies that could be employed to provide tertiary solids removal include:

- Microfiltration (MF)
- Ultrafiltration (UF)
- Nanofiltration (NF)
- Cartridge filter
- Disk filter
- Sand filter
- Filter bags

These systems would be installed in-line with the discharge pumps, and would be initially arranged to recirculate into the runoff pond. Once the effluent from the filtration system has been tested and shown to be compliant, the filters can be connected to the discharge line. It is important to note that filtration systems require monitoring and periodic cleaning to perform optimally. This should be done in accordance with the manufacturer's instructions.

7.2.3 Potential System Arrangement

A temporary treatment system established along the top of the lined berm could be constructed and modified as necessary to achieve treatment. The components required for mixing and dosing the chemistry are placed on top of the berm and connected using flexible tank hose. Suction and discharge piping is laid down the berm and into the pond, with floats ensuring the lines don't damage the liner or disturb any settled solids. Components of the system could be placed into housing where necessary, to protect equipment and chemicals from the elements.

A typical potential arrangement for a pond-side mixing and dosing system is shown in Figure 7-2.

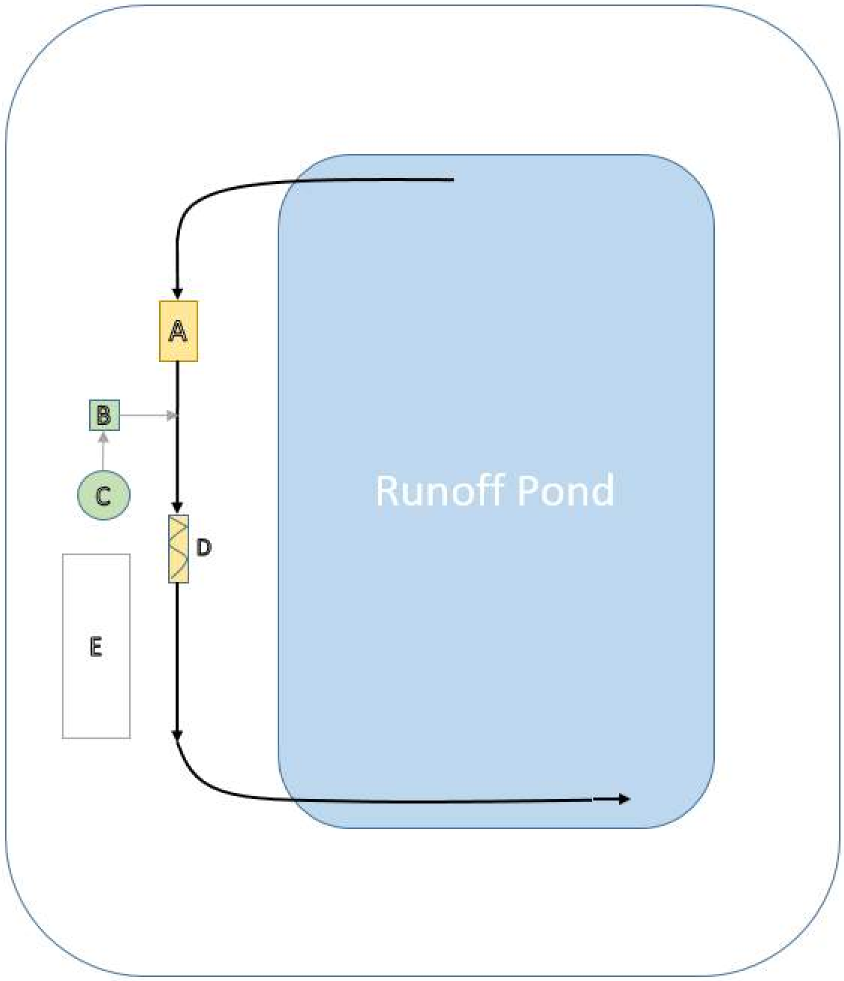


Figure 7-2: Layout of Typical Mixing/Dosing System

Potential Components of the system are as follows:

A. Self-priming pump
B. Chemical dosing pump
C. Make-down tank (if required)
D. In-line mixer
E. Chemical storage

During discharge of the pond, it may be necessary to arrange equipment on the discharge end of the pump to provide pH adjustment or final solids removal before the water enters the environment. A typical discharge arrangement is shown in Figure 7-3.

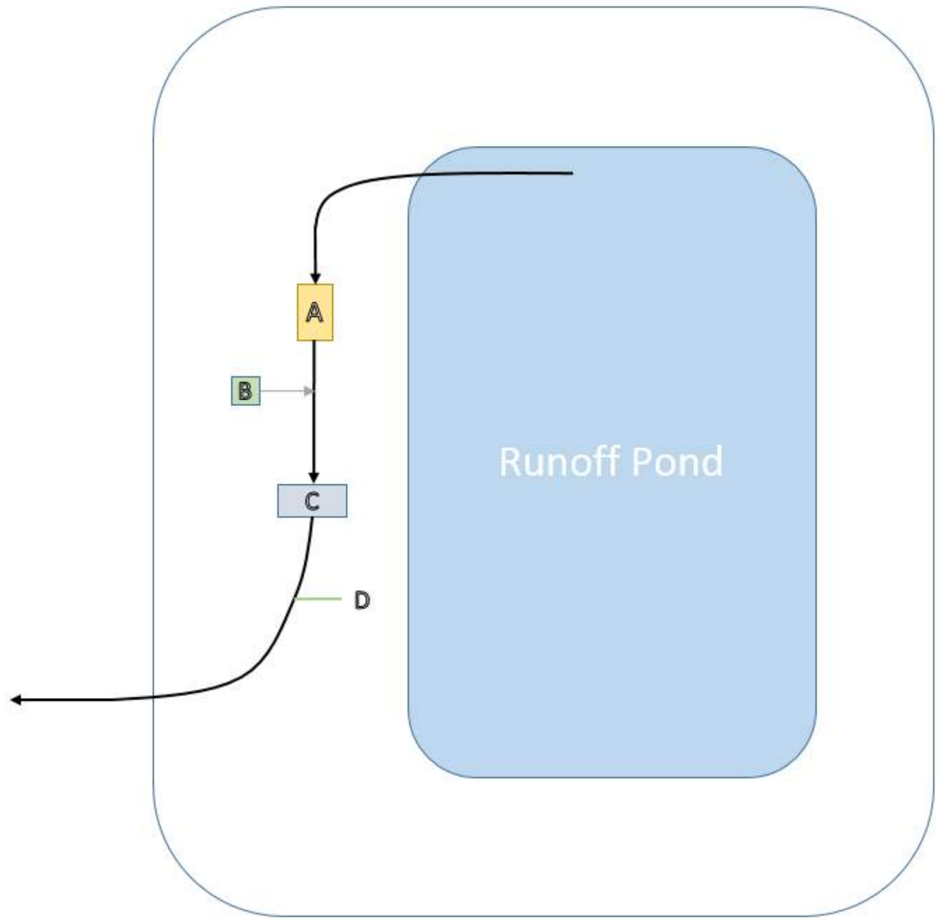


Figure 7-3: Typical Discharge Equipment Layout

Potential Components of the system are as follows:

A. Self-priming discharge pump
B. Chemical dosing pump for final pH adjustment
C. Tertiary solids removal
D. Final Discharge Point

7.2.4 Sludge Management

The use of in-pond treatment techniques will generate a certain amount of sludge, which will settle to the bottom of the pond and accumulate over time. As this sludge layer builds up, the sludge may require removal and disposal dependent on affects to water quality and capacity in the pond. Sludge levels in the pond should be inventoried on a yearly basis. This can be done by taking sludge depth measurements at different points throughout the pond, then calculating a total volume of sludge based on pond geometry.

When sludge needs to be removed, care should be taken to ensure it can be removed and stored without damaging the pond or the causing harm to the environment. Sludge is typically removed by first draining the pond, a pump dredge system or other methods to remove the solids. A dewatering process may then be employed to reduce sludge volume and make storage and disposal easier. This can be passive, using a gravity drain system, or active, using a centrifuge or other similar piece of technology. Dewatered sludge could be stored in a landfill, buried in the Waste Rock Stockpile or backhauled, depending on its composition.

7.2.5 High Density Sludge (HDS) Process- Inline Treatment option

As an alternative to in-pond treatment, the High-Density Sludge Process uses a series of tanks, chemical dosing systems, mixing systems and clarifiers to achieve the same metals removal, while making more effective use of the chemistry and allowing for easier management and removal of sludge. Various arrangements of the HDS process are used through the mining industry.

The HDS process uses the same principles of treatment discussed above, while allowing treatment to occur outside the pond. This reduces the impact of adverse weather on effluent quality, and can eliminate some of the risk posed by influent runoff changing pond conditions following treatment. The process also makes more efficient use of the chemistry, through improved mixing and sludge recycling.

Runoff/pond water is first collected and pumped into a mixing chamber, where it is mixed with one of the neutralizing chemicals noted above and return sludge from the end of the process. Chemical dosing is metered to achieve a target pH in the mixing chamber. From there, the mixture is fed to a main reaction tank, where it is subjected to aggressive aeration and mixing to maximize the effectiveness of the chemistry. It is then fed into a flocculation tank, where a flocculent is added to aid in settling. Finally, the process water is fed into a clarifier unit, where the solids are separated and collected as a sludge, and final clarified effluent overflows from this unit into a holding structure (either an above ground tank or a lined pond). The treated effluent can then be tested for compliance and discharged. A portion of the sludge collected in the clarifier is recycled to the front of the system to improve performance, and any additional sludge can be pumped off the bottom of the clarifier, dewatered and disposed of.

A typical system flow diagram is presented in Figure 7-4. The process equipment can simply be placed on the side of the pond, or housed in structure or container.

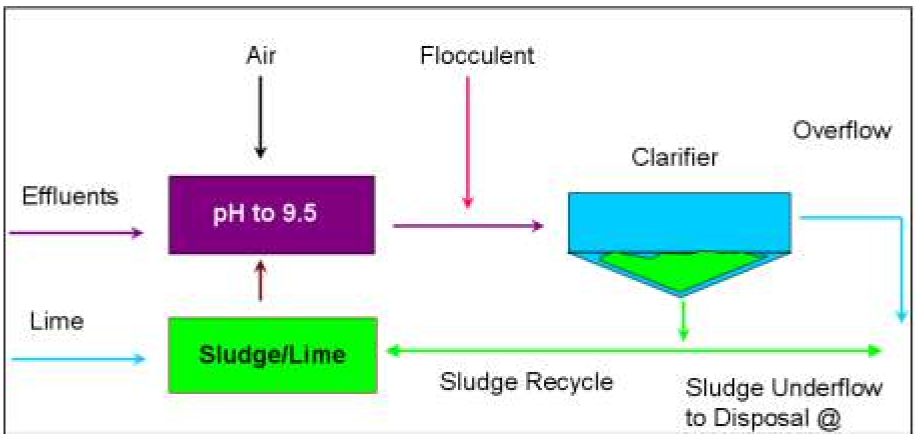


Figure 7-4: Typical layout of HDS Process

Runoff Water Treatment Contingency

The majority of the water that is captured by the waste rock sedimentation pond occurs during a 2-4-week period in the months of June – July. As a result of the intensity of the occurrence it is possible that may not be adequate time to develop the treatment chemistry requirements and receive analytical results from the laboratory for pre-discharge samples prior to the ponds reaching capacity.

There are two contingency potentials available at this time:

A. Transfer and Storage to other permitted MMER storage ponds
B. Emergency PH adjustment and discharge

Transfer and Storage

During the spring melt season (Freshet) the intensity of the storm water flow is typically higher than other times of the year. During this period if the Waste Rock Sedimentation Pond water quality does not meet MMER and Water Licence requirements, and the level were to increase at a rate greater than manageable, it is possible that impounded water could be moved using tanker trucks to alternate Storm Water Management and Sedimentation Ponds located onsite to prevent an uncontrolled discharge.

Emergency pH Adjustment

In the event that there is not adequate capacity in the Waste Rock Sedimentation Pond and the pond contained non-compliant runoff; the target parameter of concern is expected to be PH.

Baffinland will keep the necessary chemistry required to increase the PH of the entire pond volume to compliant levels onsite. In the event of an uncontrolled discharge efforts will be made to maintain compliance with applicable discharge criteria The Waste Rock Sedimentation Pond emergency spill response plan will be implemented.

8 CLOSURE

At closure the principal objectives are the safety of the public and maintaining the physical and chemical stability of the permanent structures to ensure that there is no long-term safety or environmental impact.

Mine planning will ensure that at closure the exterior of the final stockpile consists of an active layer of non-PAG material up to 50 m thick so that the interior of the stockpile remains frozen year round in the long term. The thickness of this active layer will be determined after some years of mining experience and taking climate change into account. To minimize active layer thickness a stockpile of overburden will be retained to spread a layer of less porous material over the top of the waste rock stockpile.

When monitoring shows that runoff meets water quality objectives for closure the runoff ponds will be decommissioned and runoff will be discharged directly to the environment.

8.1 CLIMATE CHANGE CONSIDERATIONS

Studies of waste rock in permafrost demonstrate that permafrost forms an effective long-term barrier to water and oxygen, thereby preventing significant oxidation of sulphidic waste rock located below the surficial active zone. The surficial “active” zone, which will be subject to seasonal freeze-thaw, will not reach the 50 m thickness of non-PAG material in the long-term (within 200 years) under the influence of current climate change criteria (Intergovernmental Panel on Climate Change, 2007).

Therefore, over the long term, runoff water quality which is influenced by contact water that flows through the active layer in the waste rock stockpile will not be affected.

9 ENVIRONMENTAL PERFORMANCE INDICATORS AND THRESHOLDS

Runoff quality from the waste rock and ore storage runoff management ponds is the most relevant environmental performance indicator. Discharge from these ponds shall not exceed the effluent quality limits of Part F, Item 25 in Type A Water Licence 2AM-MRY1325 and site-specific indicators shown in Table 9-1.

TABLE 9-1: DISCHARGE PERFORMANCE INDICATORS AND THRESHOLDS

Indicator	Units	Maximum Concentration of Any Grab Sample
pH		6.0 < pH < 9.5
Ammonia	mg/L	Monitored but not regulated
Nitrate	mg/L	Monitored but not regulated
Sulphate	mg/L	To be established
Arsenic	mg/L	0.5
Copper	mg/L	0.30
Lead	mg/L	0.20
Nickel	mg/L	0.50
Zinc	mg/L	0.5
TSS	mg/L	15
Oil and Grease		No visible sheen
Toxicity		Non-Acutely Toxic

In addition, Environmental Effects Monitoring or biological monitoring will be carried out as required by MMER.

Conductivity, pH and sulphate will be used as early-warning indicators to identify potential acid generation in the waste rock storage area. Ammonia and Nitrate will be monitored in run-off to ensure that no explosive material remaining on the blasted waste rock has been dissolved by water infiltrating the active layer.

Any contaminants of potential concern identified from on-going testing will be measured to provide temporal data on effluent quality that could potentially affect the receiving water quality.

The Aquatic Effects Monitoring Plan (AEMP) will be implemented to monitor environmental effects of effluent discharge from the SWM ponds at Mary River. Results of the AEMP can trigger additional adaptive management actions such as further treatment of pond effluent, if required.

10 MONITORING AND REPORTING REQUIREMENTS

All monitoring and reporting of runoff water quality will be carried out by the Environmental Department.

This includes the annual reporting to NIRB, NWB, QIA and others.

10.1 Ground Temperature Monitoring

Following consultation with experts from NRCan, the appropriate instrumentation will be installed in the waste rock stockpile to monitor ground temperatures and confirm the aggradation of permafrost within the waste rock stockpile and the thickness of the active layer.

Data from temperature sensors installed to monitor the ground temperatures will be collected on a regular basis and used to ensure that frozen conditions are maintained below the waste rock stockpile. In addition, the data will be used to calibrate the waste rock stockpile thermal model.

Baffinland will carry out thermal modeling of the waste rock stockpile when suitable data is available to demonstrate the robustness of the proposed waste rock stockpile deposition design and confirm that frozen conditions are maintained in the waste rock stockpile. This will take long-term climate change into account (200 years).

11 REFERENCES

NWT Mine Health and Safety Act and Regulations

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Appendix A:
AMEC ML/ARD Characterization for Five Year Pit

TECHNICAL MEMORANDUM

To	**Jim Millard, Baffinland**	File no	**TC123908**
From	**Steve Walker, AMEC**	cc	**Steve Sibbick, AMEC**
Tel	**(905) 568-2929**		
Date	**April 28, 2014**		

Subject **Mary River Deposit 1, 5-Year Pit ML/ARD Characterization**
Rev. 1 – Issued for Phase 1, WRMP

1.0 INTRODUCTION

AMEC was retained by Baffinland Iron Mines Corporation to investigate the metal leaching and acid rock drainage (ML/ARD) potential of mine rock from the Mary River project. The current Deposit 1 mine plan includes a reduced production schedule in the first five years of operation in comparison to that originally envisioned for the project. This memo provides an updated evaluation of the available geochemical characterization results related to this revised five year mine plan. The basis for this evaluation is the data-base and report developed for the Mary River life of mine plan (AMEC 2014). This evaluation also includes recommended guidance to assist in developing appropriate waste rock management planning for the proposed five year mine plan.

1.1 Background

ML/ARD characterization of Mary River Deposit 1 waste rock within the life of mine pit has been reported (AMEC 2014). In summary, the waste rock was subdivided based on broad geo-structural categories about the iron ore zone, mainly by hanging wall and footwall zones. A total of 776 waste rock samples were selected as representing the waste rock categories and broad spatial coverage of non-ore mine rock in the vicinity of the life of mine open pit development. All 776 waste rock samples were analyzed for modified Sobek acid base accounting (ABA), NAG pH and elemental content. Subsets of drillcore samples were also analyzed for downhole variability, NAG leachate, short-term metal leaching, whole rock elemental content, detailed mineralogical analysis, and long-term kinetic testing.

Results of ABA testing determined that waste rock is generally characterized as having low neutralization potentials (NP) and low acid potentials (AP). Data suggests that the waste rock is dominated by non-carbonate sources of NP (e.g. silicates) with lesser NP derived from carbonate sources. Sulphide was the primary form of sulphur. Approximately 85% of waste rock samples had neutralization potential ratios (NPR) greater than 2 and are classified as non potentially acid generating (Non-PAG) and are unlikely to generate acidic drainage. Approximately 10% of the samples had NPR values of less than 1, and 5% of the samples were classified as having uncertain acid generating potential (1<NPR<2). Extrapolating these results to the project waste rock model, indicates that approximately 11% of the life of mine in-pit waste rock is expected to have NPR <2 and is considered potentially acid generating (PAG). Proximity to ore appears to correlate to increased PAG quantities (defined as NPR <2) with the hanging wall schist (HWS) and footwall schist (FWS) zones identified with the greatest proportion of PAG of the major waste units.

The revised five year mine plan is projected to produce approximately 2.5 Mt of waste rock primarily from the HWS and FWS defined waste rock regions.

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1.2 Objective and Scope of Work

The objective of this analysis is to support development of the Phase 1 waste rock management plan for the project. The content of this analysis includes:

- reinterpretation of the available geochemical data to develop an understanding of early mine life waste rock in terms of ML/ARD, and
- identification of analytical options that will be effective for determination of PAG rock during mining to support the planned segregation of PAG rock during operations.

2.0 SAMPLE SELECTION RELATIVE TO FIVE YEAR PIT

Analysis of geochemical data across the life of mine pit provides reduced resolution of the much more localized waste rock units adjacent to ore within the five year pit (Figures 1 to 3). Therefore, to aid in planning for rock encountered during early mine development, a subgrouping of samples were selected from within and adjacent to the five year pit limit. Essentially only the HWS and FWS waste rock units are intersected within the volume of the five year pit. Small regions of FW material are identified along the upper-most regions on the west side of the five year pit; however, for the purposes of this analysis treating this limited region as FWS is reasonable and conservative (FWS contains proportionally more PAG rock than FW). Therefore, the subsample list was populated by extracting all HWS and FWS samples from within approximately 150m adjacent to and below the five year pit (Figures 4 and 5). The extension of the sample area laterally and below the pit was necessary due to the paucity of samples within the actual five year pit envelope which is located at high elevations above the majority of existing exploratory drilling.

3.0 COMPARISON OF FIVE YEAR AND LIFE OF MINE DATA SETS

The following sections describe the ABA and elemental content results of HWS and FWS samples within and just below the five year pit limit as described in Section 2 and compare these results to overall results for the life of mine data (AMEC 2014).

3.1 ABA

The subset of ABA data extracted from the life of mine data set in support of the five year pit development is provided in Appendix A, Tables A-1 and A-2. A statistical summary of this data in comparison to the life of mine data is provided in Table A-3 with selected parameters provided as side by side comparison in Table 1. Analysis and discussion of this comparative analysis for both the HWS and FWS zones is provided in the following sections.

3.1.1 Hanging Wall Schist

ABA results for the HWS five year data set are generally comparable to the life of mine data with the exception of distinctly lower overall sulphide content leading to a lower proportion of PAG samples in the five year data. Results for the five year data are summarized as follows.

- Paste pH values for footwall schist samples were circum-neutral to alkaline with values that ranged from 7.4 to 9.7 and a median of 8.5.
- Total sulphur contents ranged from the minimum detection limit (MDL) of 0.005 to 1.2% with a median and average of 0.11 and 0.14% respectively.
- The majority of the sulphur is in the form of sulphide (Figure 6) with concentrations that ranged from the MDL of 0.01 to 0.97% with a median and average of 0.02 and 0.08% respectively.

- The sulphide content for the five year data is distinctly less than the life of mine data with a median sulphide content of 0.02% in comparison to 0.06% and a 90th percentile sulphide content of 0.15% in comparison to 0.72%.
- The NP ranged from 7.0 to 104 kg $CaCO_3$/t with median and mean values of 16 and 23 kg $CaCO_3$/t respectively.
- In general the carbonate NP (CarbNP) was lower than the NP (Figure 7) indicating a predominance of non-carbonate NP (silicates).
- One of 53 samples had CarbNP higher than the corresponding NP, which was interpreted to be due to the presence of iron or manganese carbonates that do not provide effective neutralization potential.
- NPR ranged from 0.41 to 268 with median and mean values of 26 and 9.5 respectively.
- Based on the NPR distribution where values less than 2 are considered PAG, one of 53 samples (2%) would be classified as PAG (Table 2; Figure 8).

3.1.2 Footwall Schist

ABA results for the FWS five year data set are generally comparable to the life of mine data with the exception of slightly lower sulphide content resulting in a lower proportion of PAG samples in the five year data. Results for the five year data are summarized as follows.

- Paste pH values for footwall schist samples were circum-neutral to alkaline with values that ranged from 6.4 to 10 and a median of 9.1.
- Total sulphur contents ranged from the MDL of 0.005 to 5.6% with a median and average of 0.01 and 0.32% respectively.
- The majority of the sulphur is in the form of sulphide (Figure 9) with concentrations that ranged from the MDL of 0.01 to 4.2% with a median and average of 0.01 and 0.23% respectively.
- At the 90th percentile, the sulphide content for the five year data is less than half that of the life of mine data (0.31% in comparison to 0.72%).
- The NP ranged from 5.3 to 59 kg $CaCO_3$/t with median and mean values of 13 and 17 kg $CaCO_3$/t respectively.
- The NP at the 90th percentile for the five year data was slightly higher than that of the life of mine data (29 kg $CaCO_3$/t in comparison to 26 kg $CaCO_3$/t).
- In general the CarbNP was lower than the NP (Figure 10) indicating a predominance of non-carbonate NP (silicates).
- Five of 40 samples had CarbNP higher than the corresponding NP, which was interpreted to be due to the presence of iron or manganese carbonates that do not provide effective neutralization potential.
- NPR ranged from 0.21 to 176 with median and mean values of 36 and 2.4 respectively.
- Based on the NPR distribution where values less than 2 are considered PAG, 5 of 40 samples (8%) would be classified as PAG (Table 2; Figure 11).

3.1.3 Analysis of Decreased PAG Proportion in Five Year Pit

From the analysis above it is observed that the proportion of PAG on the basis of NPR <2 is lower in the HWS and FWS units projected to surface in the vicinity of the five year pit than the overall life of mine pit. In order to further support this observation, the life of mine ABA data was evaluated in comparison to elevation.

Plots of total sulphur, sulphide, NP and NPR variation by elevation are provided in Figures 12 through 15. A distinct decrease in total sulphur and sulphide is observed in both the HWS and FWS sample sets above an elevation of 420 masl. The majority of HWS and FWS samples above the lowest elevation of the five year pit (~570 masl) are less than 0.5% total sulphur and less than 0.3% sulphide (Figures 12 and 13). The variation of NP with depth (Figure 14) is observed to decrease in the highest range and increase in lowest range with little change in average NP. The net result of the sulphide (and AP) and NP responses with decreasing depth are an overall shift toward higher NPR at shallower depths (Figure 15) and especially for those samples above the base of the five year pit.

3.2 Elemental Content

The subset of elemental content data extracted from the life of mine data set in support of the five year pit development is provided in Appendix A, Table A-4. A statistical summary of this data in comparison to the life of mine data is provided in Table 3. For screening purposes, elemental content of the mine rock samples were compared to 10 times average continental crust values (Price, 1997). The number of enriched samples are summarized in Table 4 and compared to results for the life of mine data set.

The list of elements exceeding the 10 times screening criteria are similar between the five year data set and the life of mine data set. Some infrequently observed enriched elements in the larger life of mine data set are not observed in the five year data set.

Concentrations of Bi exceeded the screening value of 0.25 µg/g for 14% of the samples (13 of 93 samples). Bi exceedances of the 10 times criteria for the various waste types on a percentage basis are lowest in the hanging wall schist.

A total of 8 of the 93 samples were greater than the MDL for selenium which also exceeded the screening value. It is noted that the MDL for selenium (0.7 µg/g) is greater than the 10 times crustal abundance value of 0.5 µg/g.

Three elements (arsenic, silver and molybdenum) had 3-8% of their concentrations above their respective screening values. Chromium, gold, iron, lithium, manganese and antimony had 1-2% of their samples concentrations above the applicable screening values.

4.0 GUIDANCE ON PAG ROCK MANAGEMENT

Total sulphur, sulphide and NAG pH can be interpreted as predictors of PAG materials on the basis of NPR <2 (Figures 16 through 18). Specifically, a total sulphur content of >0.2% and NAG pH of <4.5 are predictors of PAG material (NPR <2).

An analysis of the effectiveness and errors associated with the use of the above thresholds for categorization of PAG and Non-PAG samples in relation to the life of mine ABA data set is provided in Table 5 and Figures 19 through 21. Use of sulphur content in excess of 0.2% results in a small percent of PAG samples (0.1%) being incorrectly categorized as Non-PAG. A higher percentage (10%) of Non-PAG samples were incorrectly categorized as PAG. The use of NAG pH <4.5 resulted in 3% of PAG samples incorrectly categorized as Non-PAG and 2% of Non-PAG samples incorrectly categorized as PAG.

For the critical segregation factor which is to prevent PAG being identified as Non-PAG the sulphur cut-off of >0.2% is the most effective approach. PAG quantity estimates using the sulphur cut-off (>0.2%) in comparison to the original ABA data (NPR <2) are provided in Table 6. Using the sulphur cut-off results in an increase in the life of mine projected PAG quantity (without considering increased volumes due to dilution effects) from 63 Mt to 110 Mt.

Applying the sulphur cut-off followed by NAG pH check increased the reliability of PAG classification with the combined analyses resulting in a decrease in misclassification of Non-PAG as PAG from 10% to 1% (Table 5, Figure 21). However, there is a subset of 23 PAG samples (3%) that are misclassified as Non-PAG using NAG pH <4.5 . The reason for the misclassifications is presently unknown; however, it was noted that a high proportion of these samples (12) are iron formation samples. For comparison, the misclassified samples that aren't iron formation represent 1.6% of all non-iron formation samples.

5.0 SUMMARY AND CONCLUSIONS

Analysis of a set of samples proximal to the proposed five year pit has been completed that indicates a lower sulphur and sulphide content is likely to be encountered in the shallower rock of early development than at depth during later production. This lower sulphide content is expected to result in a lower percentage of PAG rock being encountered during early operations than would be predicted by extrapolating waste rock data in similar proximity to the ore to near surface. A comparison of the overall percentages and quantities of PAG materials for the HWS and FWS for the life of mine pit as well as the five year pit are provided in Table 7.

A sulphur content of >0.2% has been determined to be indicative of PAG material (NPR <2) and would be a suitable screening test to segregate PAG and Non-PAG using sulphur by Leco S analyser. The addition of the NAG pH test to those PAG samples identified by sulphur >0.2% can substantially reduce the potential for incorrect classification of Non-PAG samples as PAG. However, the data presently suggests use of the NAG pH test could result in a misclassification of PAG samples as Non-PAG in 1 to 3% of samples (for available data).

The NAG pH test should be explored further as a potential means of refining PAG and Non-PAG segregation through the Phase 1 development. The additional test if proven in the operational setting may provide a relatively efficient means to allow a significant reduction in the amount of Non-PAG material managed as PAG for the Life of Mine project.

It is noted that due to ore body geometry and availability of exploration drilling intersects there is an inherent limitation in sample coverage of the waste rock within the five year pit envelope. Therefore, for planning purposes and the Phase 1 waste rock management plan, AMEC recommends that a minimum of 10% PAG rock be assumed for HWS and FWS waste rock (Table 7). The above 10% PAG allowance excludes any increases due to field screening and dilution.

6.0 REFERENCES

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TABLES

Table 1: Summary and Comparison of ABA Results (Five Year and End of Mine Sample Sets)

		Total Sulphur %		Sulphide* %		AP kg $CaCO_3$/t		NP kg $CaCO_3$/t		CarbNP kg $CaCO_3$/t		NPR		CarbNPR	
		5 Year Pit	LOM Pit	5 Year Pit	LOM Pit	5 Year Pit	LOM Pit	5 Year Pit	LOM Pit	5 Year Pit	LOM Pit	5 Year Pit	LOM Pit	5 Year Pit	LOM Pit
Footwall Schist	Count	40	143	40	143	40	143	40	143	40	143	40	143	40	143
	Min	0.0050	0.0050	0.010	0.010	0.31	0.31	5.3	4.6	0.083	0.083	0.21	0.21	0.019	0.0034
	Max	5.6	5.6	4.2	4.2	130	130	59	71	129	178	176	176	345	345
	Median	0.011	0.044	0.010	0.010	0.31	0.31	13	13	0.54	0.50	36	23	1.6	1.0
	Average	0.32	0.29	0.23	0.23	7.1	7.0	17	16	11	8.5	2.4	2.3	1.5	1.2
	Standard Deviation	1.00	0.70	0.74	0.58	23	18	12	11	30	27	35	27	55	30
	10th Percentile	0.0050	0.0050	0.010	0.010	0.31	0.31	7.2	7.4	0.083	0.083	1.4	0.90	0.19	0.039
	90th Percentile	0.53	0.74	0.31	0.72	9.5	22	29	26	17	14	78	62	17	6.8
Hanging Wall Schist	Count	53	270	53	270	53	270	53	270	53	270	53	270	53	270
	Min	0.0050	0.0050	0.010	0.010	0.31	0.31	7.0	-6.5	0.083	0.083	0.41	0.000033	0.019	0.00035
	Max	1.2	22	0.97	22	30	693	104	487	79	514	268	621	232	571
	Median	0.11	0.12	0.019	0.057	0.59	1.8	16	18	1.0	0.62	26	13	1.3	0.37
	Average	0.14	0.60	0.076	0.48	2.4	15	23	26	8.0	17	9.5	1.7	3.4	1.1
	Standard Deviation	0.19	2.0	0.14	1.8	4.5	56	20	46	19	56	42	50	39	41
	10th Percentile	0.0050	0.0080	0.010	0.010	0.31	0.31	11	7.7	0.090	0.083	4.1	0.41	0.069	0.0095
	90th Percentile	0.26	0.91	0.15	0.72	4.7	22	31	33	18	21	55	73	20	19

*As total sulphur - sulphate

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Table 2: Five Year Pit NPR Distribution

Waste Classification	Number of Samples	NPR Distribution				
		NPR < 1	1 < NPR < 2	2 < NPR < 3	3 < NPR < 4	NPR > 4
All	93	3	3	3	2	82
Footwall Schist	40	2	3	0	1	34
Hanging Wall Schist	53	1	0	3	1	48
Waste Classification	**Number of Samples**	**Carbonate NPR Distribution**				
		NPR < 1	**1 < NPR < 2**	**2 < NPR < 3**	**3 < NPR < 4**	**NPR > 4**
All	93	42	12	7	7	25
Footwall Schist	40	16	8	4	4	8
Hanging Wall Schist	53	26	4	3	3	17

Table 3: Summary of Elemental Content for the 5 Year Pit

		Hg	Au	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	K	Li	Mg
		µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
Footwall Schist	Count	40	13	13	40	40	40	40	40	40	40	40	40	40	40	40	40	40
	Min	0.10	0.020	0.010	1,700	0.50	0.90	0.21	0.090	110	0.020	4.4	12	1.8	20,000	40	2.0	8,600
	Max	0.10	0.15	1.3	100,000	147	1,600	5.0	2.3	19,000	0.38	52	600	380	470,000	39,000	244	91,000
	Median	0.10	0.020	0.060	34,000	0.60	180	0.71	0.095	1,500	0.040	12	72	10	70,000	9,050	17	21,500
	Average	0.10	0.030	0.22	42,860	7.0	234	1.0	0.26	3,157	0.096	15	114	33	118,125	10,414	24	31,970
	Standard Deviation	4.2E-17	0.036	0.36	24,634	26	307	0.88	0.40	4,519	0.096	10	119	68	114,764	10,130	38	23,918
	10th Percentile	0.10	0.020	0.014	17,700	0.50	3.1	0.37	0.090	368	0.020	6.3	27	3.1	29,000	177	3.8	10,840
	90th Percentile	0.10	0.020	0.47	80,100	4.7	534	2.0	0.52	8,290	0.20	25	240	70	234,000	20,800	36	70,000
Hanging Wall Schist	Count	53	33	33	53	53	53	53	53	53	53	53	53	53	53	53	53	53
	Min	0.10	0.020	0.010	10	0.50	0.010	0.020	0.090	25	0.020	0.25	0.50	0.10	33	1.0	2.0	19
	Max	0.10	0.040	1.3	116,000	59	660	3.5	28	43,000	0.60	67	1,260	180	600,000	31,000	370	110,000
	Median	0.10	0.020	0.05	39,000	0.50	31	0.32	0.090	1,700	0.080	26	150	73	63,000	2,500	19	25,000
	Average	0.10	0.021	0.12	40,885	2.6	123	0.62	0.65	7,233	0.12	27	215	71	82,548	7,239	32	30,238
	Standard Deviation	5.6E-17	0.0035	0.29	22,623	8.4	185	0.78	3.8	9,994	0.11	15	213	53	89,986	8,500	51	21,715
	10th Percentile	0.10	0.020	0.010	16,200	0.50	2.2	0.070	0.090	312	0.020	9.9	61	5.1	15,000	114	7.2	7,920
	90th Percentile	0.10	0.020	0.12	71,000	3.5	472	1.6	0.22	24,000	0.20	48	500	140	159,000	20,000	56	54,800

		Mn	Mo	Na	Ni	P	Pb	S	Sb	Se	Sn	Sr	Ti	Tl	U	V	Y	Zn
		µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
Footwall Schist	Count	40	40	40	40	13	40	20	40	40	40	40	40	40	40	40	13	40
	Min	83	0.30	28	5.3	32	1.3	41	0.80	0.70	0.50	0.8	72	0.020	0.42	2.0	1.1	3.9
	Max	11,000	360	1,100	260	5,400	32	1,200	1.4	6.2	4.6	28	3,100	1.6	8.4	170	14	110
	Median	530	2.1	275	27	390	4.1	89	0.80	0.70	0.80	3.4	745	0.23	1.8	32	3.7	32
	Average	1,430	18	306	46	1,030	5.9	260	0.82	0.95	1.2	5.5	1,000	0.31	2.2	45	5.7	40
	Standard Deviation	2,770	62	248	51	1,587	5.8	362	0.09	0.95	1.02	5.3	803	0.34	1.7	41	4.3	26
	10th Percentile	170	0.30	55	8.1	56	1.8	54	0.80	0.70	0.50	1.8	238	0.030	0.68	7.9	1.6	14
	90th Percentile	2,210	13	570	101	2,960	13	911	0.80	0.76	2.9	12	2,310	0.64	4.1	101	12	77
Hanging Wall Schist	Count	53	53	53	53	33	53	0	53	53	53	53	53	53	53	53	33	53
	Min	2.3	0.30	9.0	0.10	7.0	0.40	-	0.80	0.70	0.50	0.22	0.10	0.020	0.0080	1.0	0.63	0.70
	Max	2,600	39	2,000	430	2,200	113	-	14	1.4	4.6	35	3,000	1.6	7.3	210	6.5	145
	Median	370	0.90	350	93	280	2.2	-	0.80	0.70	0.50	9.7	1,000	0.10	0.22	65	2.7	37
	Average	502	2.3	527	109	348	5.2	-	1.1	0.74	0.90	11	1,060	0.23	0.83	87	2.8	41
	Standard Deviation	440	5.7	522	93	402	15	-	1.8	0.14	0.79	7.5	789	0.33	1.3	58	1.4	29
	10th Percentile	152	0.42	86	30	42	0.85	-	0.80	0.70	0.50	2.8	180	0.020	0.012	22	1.2	14
	90th Percentile	850	3.0	1,378	200	612	6.0	-	0.80	0.70	1.7	21	2,000	0.49	1.8	170	4.5	71

Table 4: Summary of Enriched Elements (> 10x Crustal Abundance)

	Waste Classification	Au	Ag	As	Bi	Cd	Cr	Fe	Li	Mn	Mo	Ni	S	Sb	Se*	Zn
5 Year Pit		µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
	Number of Samples	**46**	**46**	**93**	**93**	**93**	**93**	**93**	**93**	**93**	**93**	**93**	**93**	**93**	**93**	**93**
	Avg Crustal	**0.004**	**0.075**	**1.8**	**0.025**	**0.15**	**102**	**56300**	**20**	**950**	**1.2**	**84**	**350**	**0.2**	**0.05**	**70**
	10x Avg Crustal	**0.04**	**0.75**	**18**	**0.25**	**1.5**	**1020**	**563000**	**200**	**9500**	**12**	**840**	**3500**	**2**	**0.5**	**700**
	All	1	3	3	13	-	1	1	2	2	7	-	-	1	8	-
	Footwall Schist	1	1	2	9	-	-	-	1	2	5	-	-	-	4	-
	Hanging Wall Schist	-	2	1	4	-	1	1	1	-	2	-	-	1	4	-

	Waste Classification	Au	Ag	As	Bi	Cd	Cr	Fe	Li	Mn	Mo	Ni	S	Sb	Se*	Zn
LOM Pit		µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
	Number of Samples	**261**	**261**	**413**	**413**	**413**	**413**	**413**	**413**	**413**	**413**	**413**	**413**	**413**	**413**	**413**
	Avg Crustal	**0.004**	**0.075**	**1.8**	**0.025**	**0.15**	**102**	**56300**	**20**	**950**	**1.2**	**84**	**350**	**0.2**	**0.05**	**70**
	10x Avg Crustal	**0.04**	**0.75**	**18**	**0.25**	**1.5**	**1020**	**563000**	**200**	**9500**	**12**	**840**	**3500**	**2**	**0.5**	**700**
	All	11	4	28	81	2	5	18	3	9	32	3	10	3	62	1
	Footwall Schist	5	2	4	32	1	-	10	3	5	15	1	2	2	18	1
	Hanging Wall Schist	6	2	24	49	1	5	8	-	4	17	2	8	1	44	-

*Only values above detection are included

Table 5: Assessment of Sulphur and NAG pH to Define PAG Material

Description		Correctly Categorized		Incorrectly Categorized	
		Non-PAG as Non-PAG	PAG as PAG	Non-PAG as PAG	PAG as Non-PAG
		776	**776**	**776**	**776**
Sulphur >0.2% as PAG	**Number of Samples**	584	114	77	1
	Percent	75%	15%	10%	0.1%
NAG pH <4.5 as PAG	**Number of Samples**	648	92	13	23**
	Percent	84%	12%	2%	3%
Sulphur >0.2% followed by NAG pH check*	**Number of Samples**	652	92	9	23**
	Percent	84%	12%	1%	3%

* NAG pH check on apparent PAG samples from sulphur >0.2%.

**Includes 12 iron formation samples which is proportionally high for the data set (see text).

Table 6: Tonnage Distribution for Life of Mine Pit (Comparison of PAG by NPR <2 and S >0.2%)

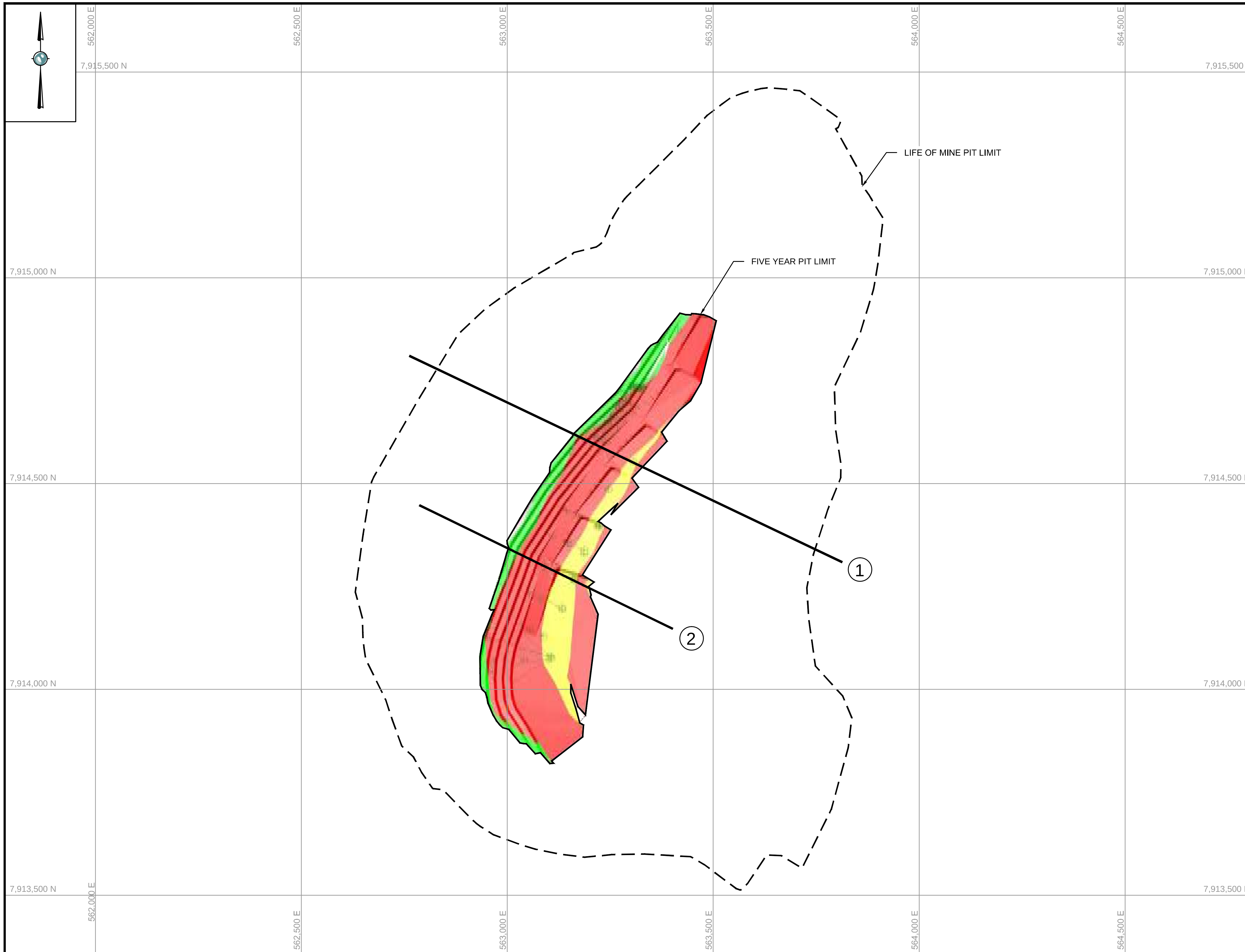
Waste Rock Domain	Tonnage (Mt)	No. Samples	Mean Sulphur %	Mean NPR*	% Samples NPR <2	PAG tonnage (Mt)	% Samples Sulphur >0.2%	PAG tonnage (Mt)
Footwall Schist	74.1	143	0.29	2.3	20%	15.0	28%	20.7
Footwall Waste	263	271	0.070	12	4%	9.7	8%	21.4
Hanging Wall Schist	139.6	270	0.60	1.7	24%	33.1	40%	56.4
Hanging Wall Waste	77.5	62	0.074	20	0%	0	5%	3.8
Internal Waste	2.1	12	0.61	1.0	42%	0.9	42%	0.9
Mineralized Waste	9.7	18	0.81	1.7	41%	4.0	67%	6.5
Total	566	776				62.7		109.5

Table 7: HWS and FWS PAG Tonnage Estimates

Waste Classification	Number of Samples		Tonnage (Mt)		% PAG*		Tonnage (Mt) PAG*		For Planning (5 year pit)	
	LOM Pit	5 Year Pit	LOM Pit	5 Year Pit	LOM Pit	5 Year Pit	LOM Pit	5 Year Pit	% PAG	Tonnage (Mt) PAG
Footwall Schist	143	40	74.1	0.81	20%	8%	14.8	0.07	10%	0.08
Hanging Wall Schist	270	53	140	1.70	24%	2%	33.5	0.03	10%	0.17

*Based on NPR<2

FIGURES



NOTES:

1. THE GRID COORDINATES SHOWN ON THIS DRAWING ARE IN METRES. THE COORDINATES ARE REFERENCED TO UTM NAD 83 ZONE 17N DATUM.
2. DRAWING PRODUCED FROM DIGITAL FILES PROVIDED BY BAFFINLAND IRON MINES CORPORATION.
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE ACCOMPANYING REPORT.

LEGEND:

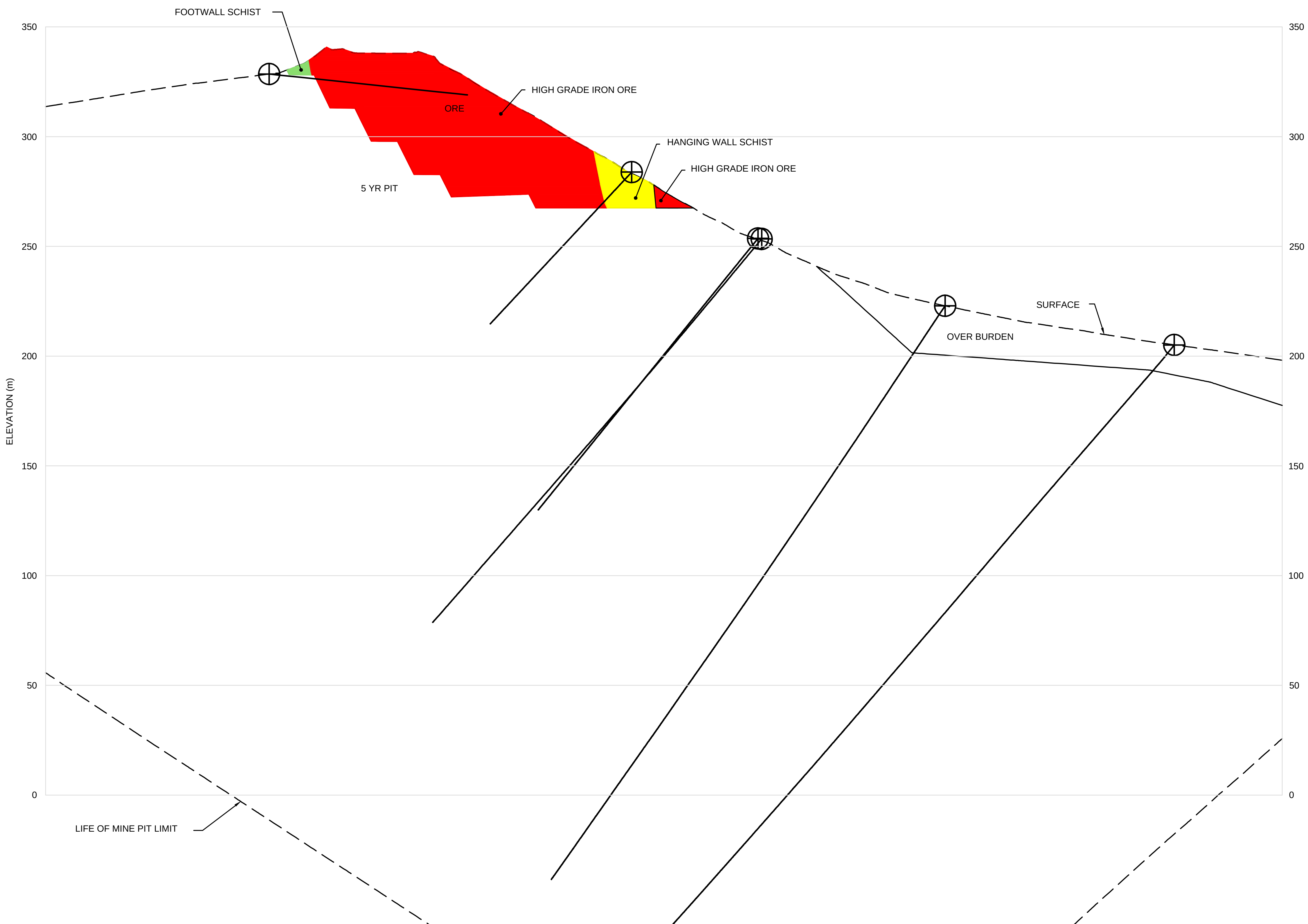
- HIGH GRADE IRON ORE
- FOOTWALL SCHIST
- HANGING WALL SCHIST
- FOOTWALL WASTE
- CROSS SECTION

0 100 200 500m

1:10 000 SCALE

CLIENT LOGO: Baffinland Iron Mines Corporation	CLIENT: BAFFINLAND IRON MINES CORPORATION	DWN BY: NR	PROJECT: MARY RIVER PROJECT DEPOSIT 1
	AMEC Environment & Infrastructure 160 Traders Boulevard East Mississauga, Ontario, Canada L4Z 3K7	CHK'D BY: SW	DATE: APRIL 2014
	amec	DATUM: NAD 83	PROJECT NO: TC123908
		PROJECTION: UTM ZONE 17N	TITLE: FIVE YEAR PIT LIMIT PLAN VIEW
		SCALE: AS SHOWN	REV. NO.: A
			FIGURE No. 1

P:\Geo\1 - PROJECTS\2012\TC123908-Baffinland Iron Mines Corp\08. CAD\WRK\FIGURE 1a.DWG - 1 - Apr. 23, 2014 11:35am - nadine.rondon



NOTES:

1. DRAWING PRODUCED FROM DIGITAL FILES PROVIDED BY BAFFINLAND IRON MINES CORPORATION.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE ACCOMPANYING REPORT.

LEGEND:

- HIGH GRADE IRON ORE
- FOOTWALL SCHIST
- HANGING WALL SCHIST
- FOOTWALL WASTE
- EXISTING BOREHOLE

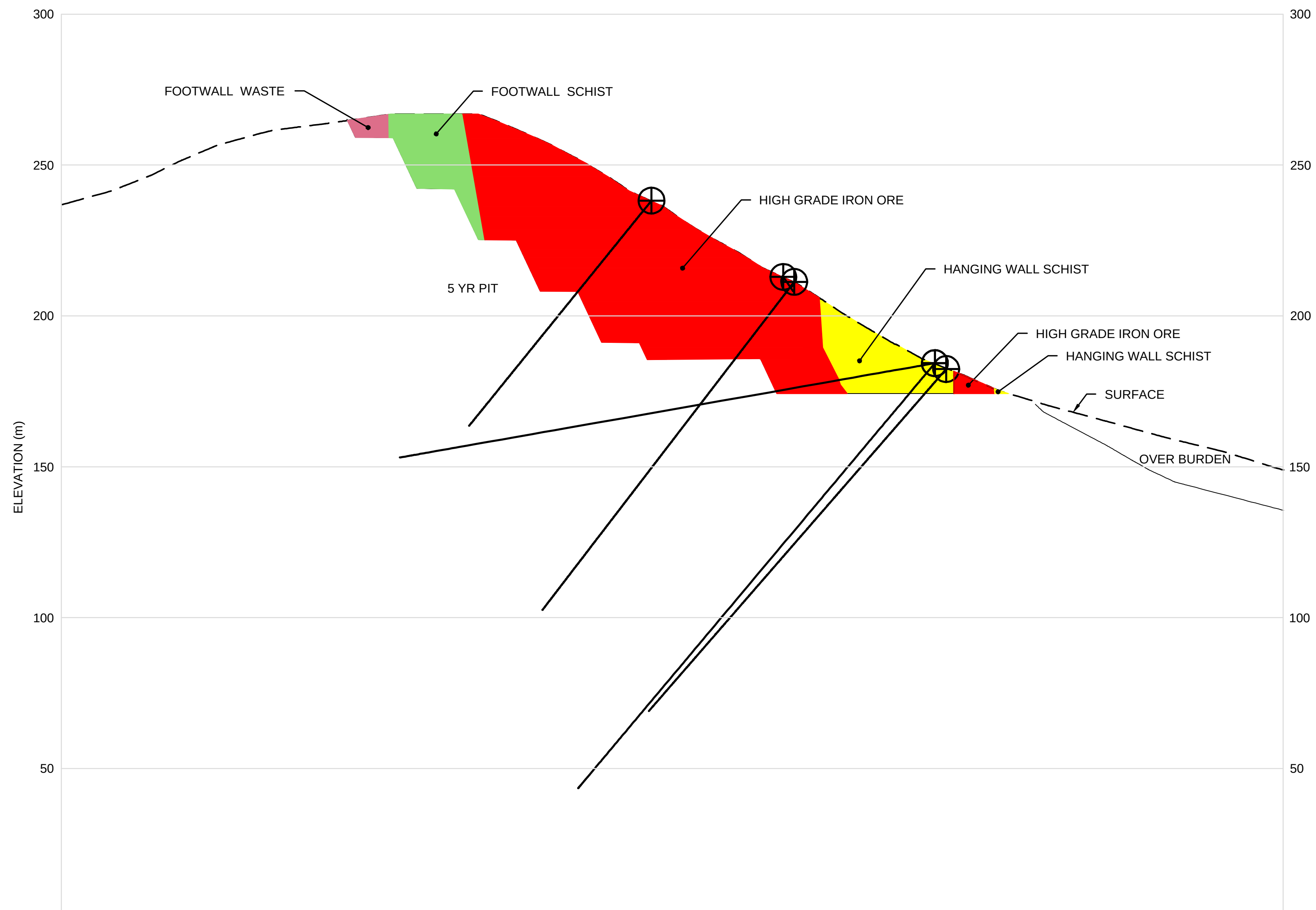
0 50 100m

1:2000 SCALE

CLIENT LOGO: Baffinland Iron Mines Corporation	CLIENT: BAFFINLAND IRON MINES CORPORATION	DWN BY: NR	PROJECT: MARY RIVER PROJECT DEPOSIT 1
	AMEC Environment & Infrastructure, 160 Traders Boulevard East, Mississauga, Ontario, Canada L4Z 3K7 — amec	CHK'D BY: SW	DATE: APRIL 2014
		DATUM: NAD 83	PROJECT NO: TC123908
		PROJECTION: UTM ZONE 17N	TITLE: FIVE YEAR PIT CROSS SECTION #1
		SCALE: AS SHOWN	REV. NO.: A
			FIGURE No. 2

NOTES:

1. DRAWING PRODUCED FROM DIGITAL FILES PROVIDED BY BAFFINLAND IRON MINES CORPORATION.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE ACCOMPANYING REPORT.



LEGEND:

- HIGH GRADE IRON ORE
- FOOTWALL SCHIST
- HANGING WALL SCHIST
- FOOTWALL WASTE
- EXISTING BOREHOLE

0 50 100m

1:2000 SCALE

CLIENT LOGO

Baffinland Iron Mines Corporation

CLIENT:

BAFFINLAND IRON MINES CORPORATION

AMEC Environment & Infrastructure

160 Traders Boulevard East
Mississauga, Ontario, Canada L4Z 3K7

amec

DWN BY:	NR
CHK'D BY:	SW
DATUM:	NAD 83
PROJECTION:	UTM ZONE 17N
SCALE:	AS SHOWN

PROJECT

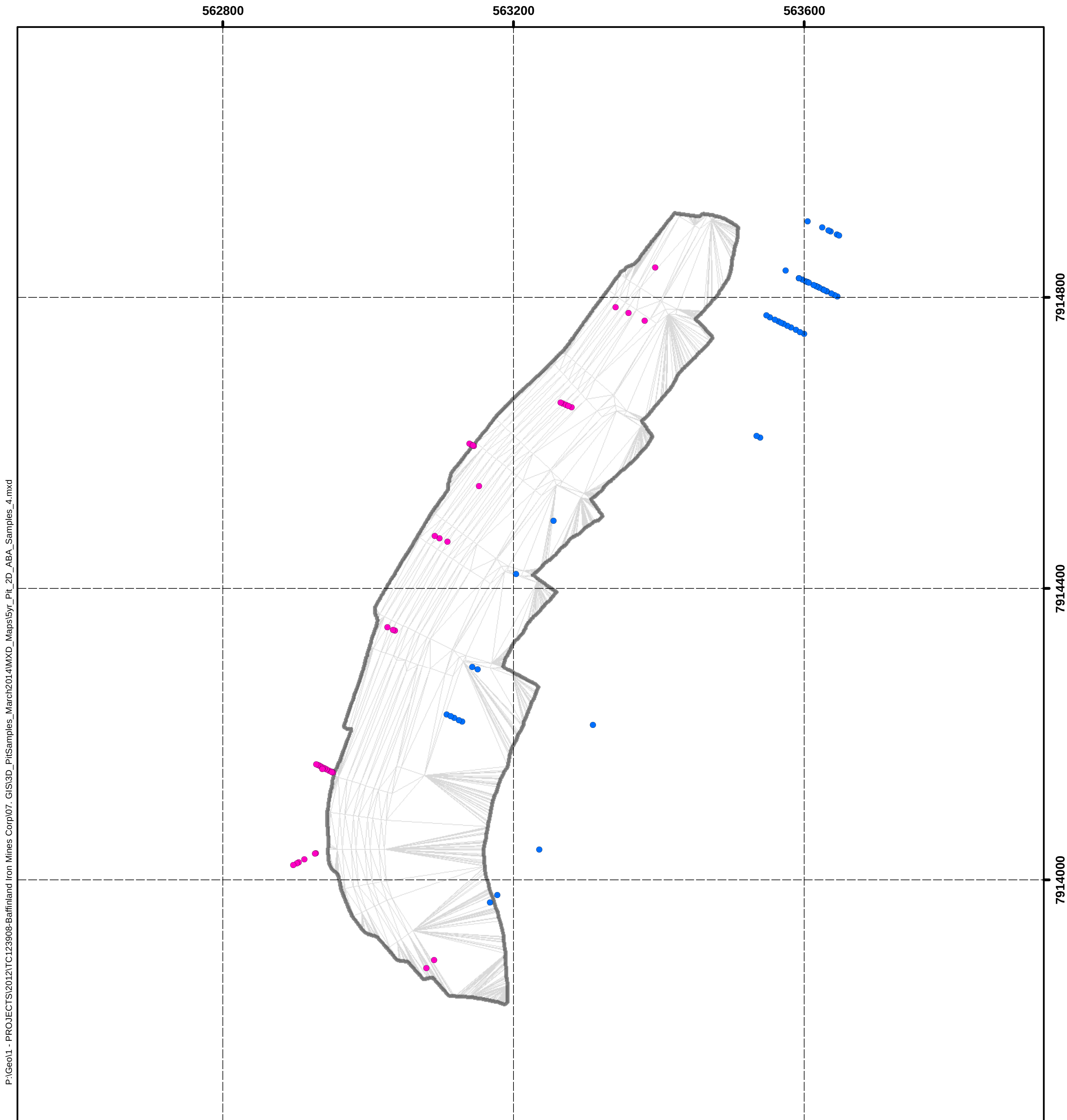
MARY RIVER PROJECT
DEPOSIT 1

TITLE

FIVE YEAR PIT
CROSS SECTION #2

DATE:	APRIL 2014
PROJECT NO:	TC123908
REV. NO.:	A
FIGURE No.	3

P:\Geo\1 - PROJECTS\2012\TC123908-Baffinland Iron Mines Corp\08. CAD\WRK\FIGURE 1a.DWG - 3 - Apr. 23, 2014 11:56am - nadine.rondon



LEGEND

Proposed 5 Year Open Pit Boundary

Footwall Schist ARD Sample Locations

Hanging Wall Schist ARD Sample Locations

0 75 150 300 450 600 Metres

NOTES:
-

Datum: NAD83
Projection: UTM Zone 17N

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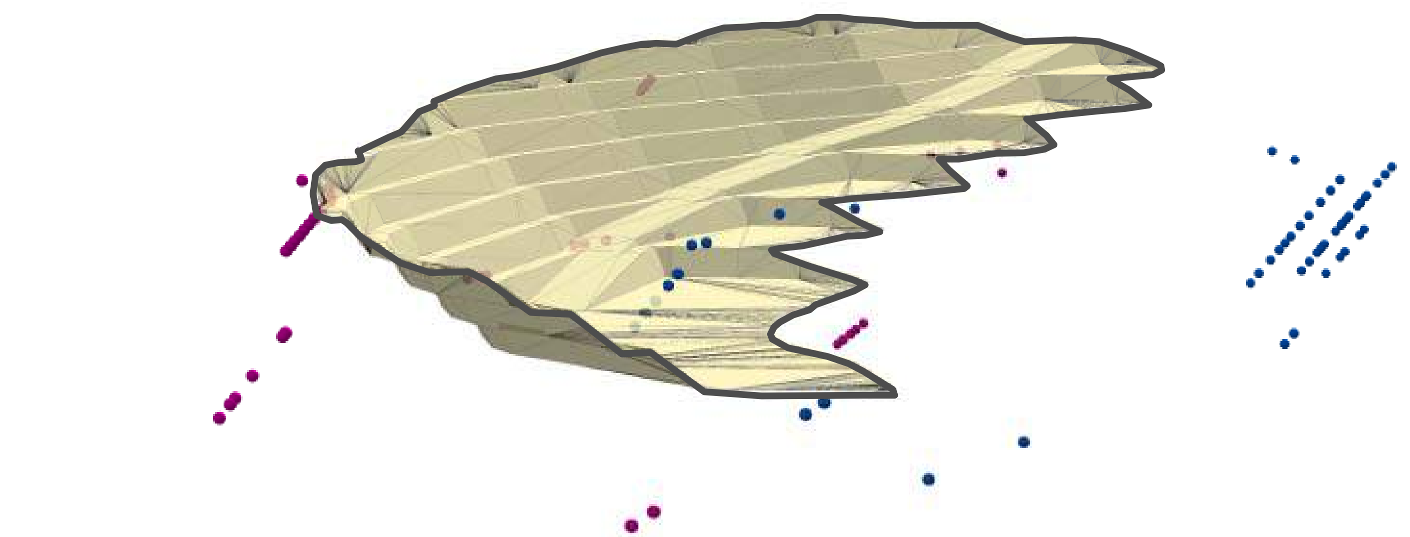
MARY RIVER PROJECT

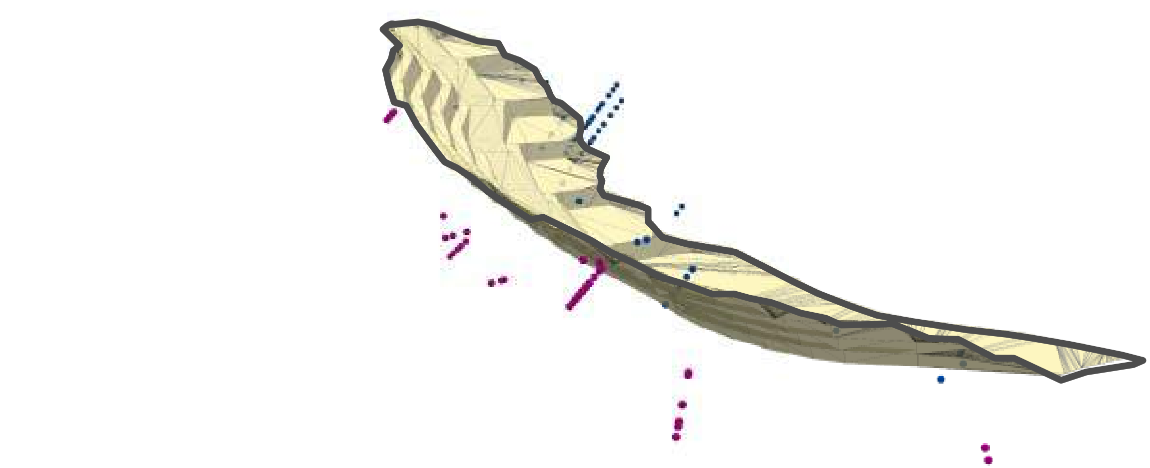
Plan View of ARD Sample Distribution Adjacent to the 5 Year Deposit 1 Pit Shell

PROJECT N^{o}: TC123908	**FIGURE: 4**
SCALE: 1:7,000	DATE: April 2014

Three-Dimensional Looking North
(linear scale varies in this perspective)



Three-Dimensional Looking Northeast
(linear scale varies in this perspective)



LEGEND

- Proposed 5 Year Open Pit Boundary
- Footwall Schist ARD Sample Locations
- Hanging Wall Schist ARD Sample Locations

NOTES:
-

Baffinland Iron Mines Corporation

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MARY RIVER PROJECT

Oblique View of ARD Sample Distribution Adjacent to the 5 Year Deposit 1 Pit Shell

Datum: NAD83
Projection: UTM Zone 17N

N W E S

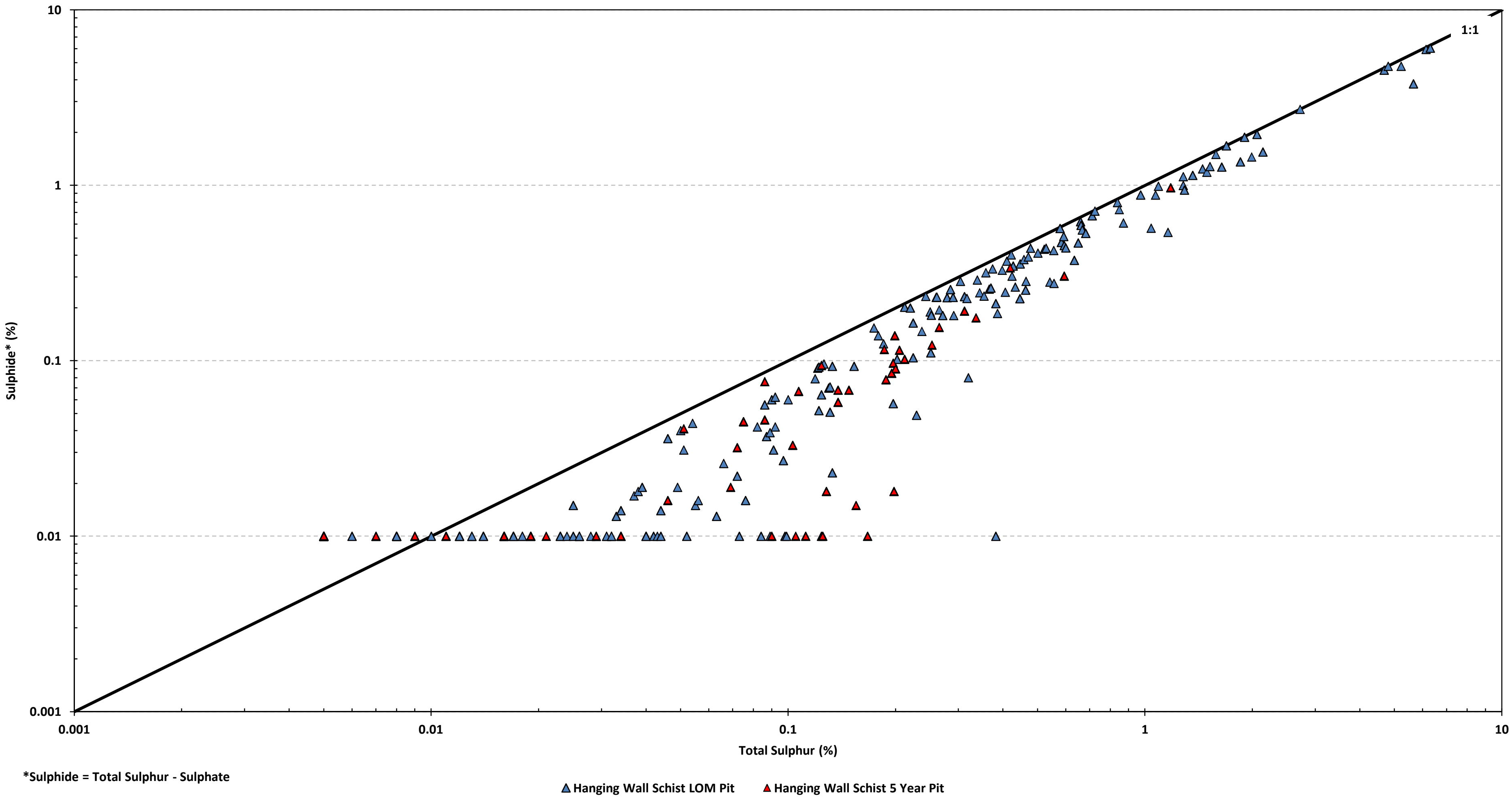
PROJECT N°: TC123908

FIGURE: 5

SCALE:

DATE: April 2014

P:\Geo\1 - PROJECTS\2012\TC123908-Baffinland Iron Mines Corp\07. GIS\3D_PitSamples_March2014\MXD_Maps\5yr_Pit_3D_ABA_Samples_4.mxd



*Sulphide = Total Sulphur - Sulphate

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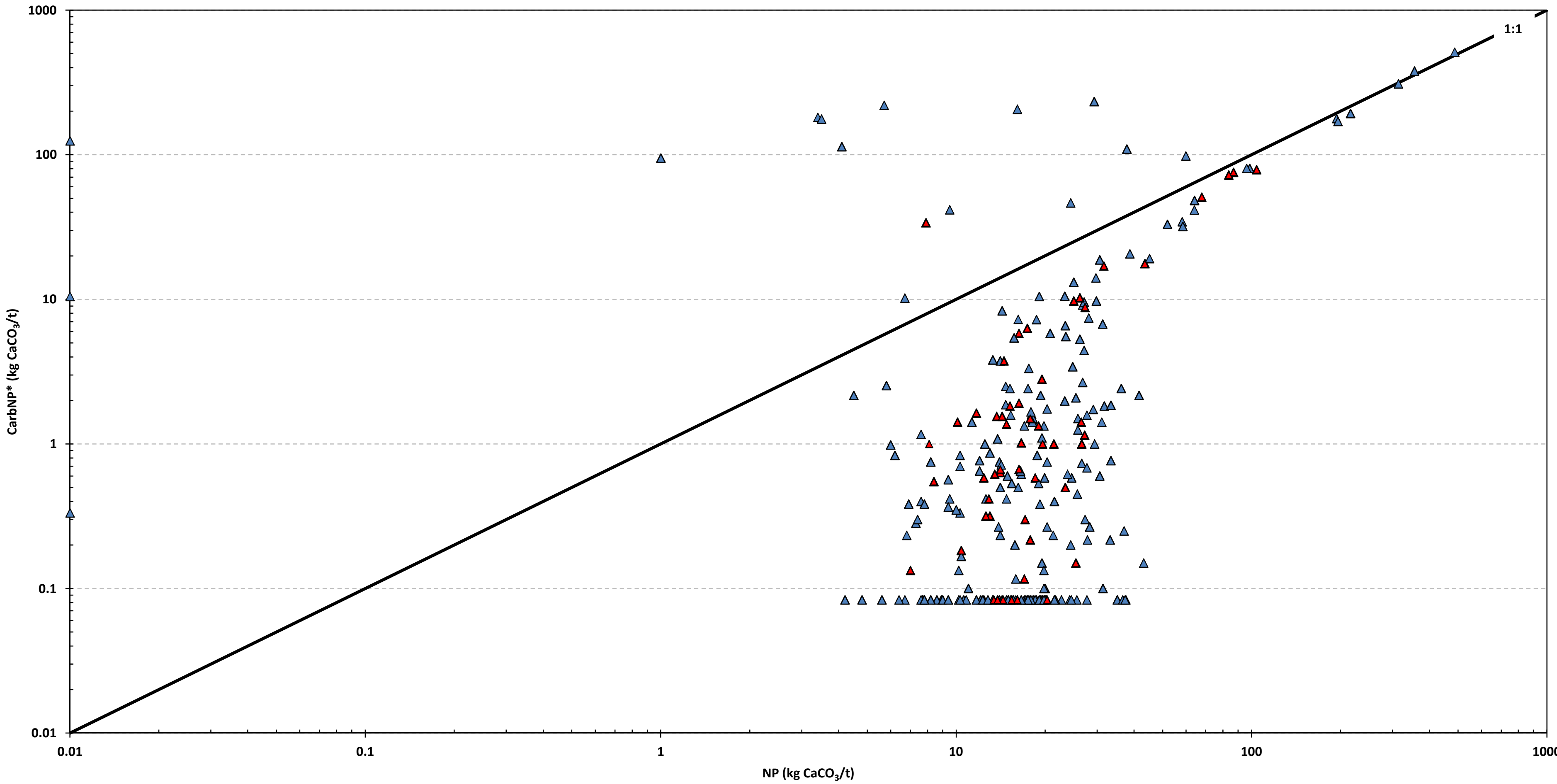
Mary River Project

Total Sulphur vs Sulphide for Hanging Wall Schist

Drawn by: LC	Checked by: SW	Date: April 2014
Project: TC123908		FIGURE 6



*Samples from 2010 CarbNP calculated off total carbon, samples from 2011 onwards CarbNP calculated off carbonate carbon

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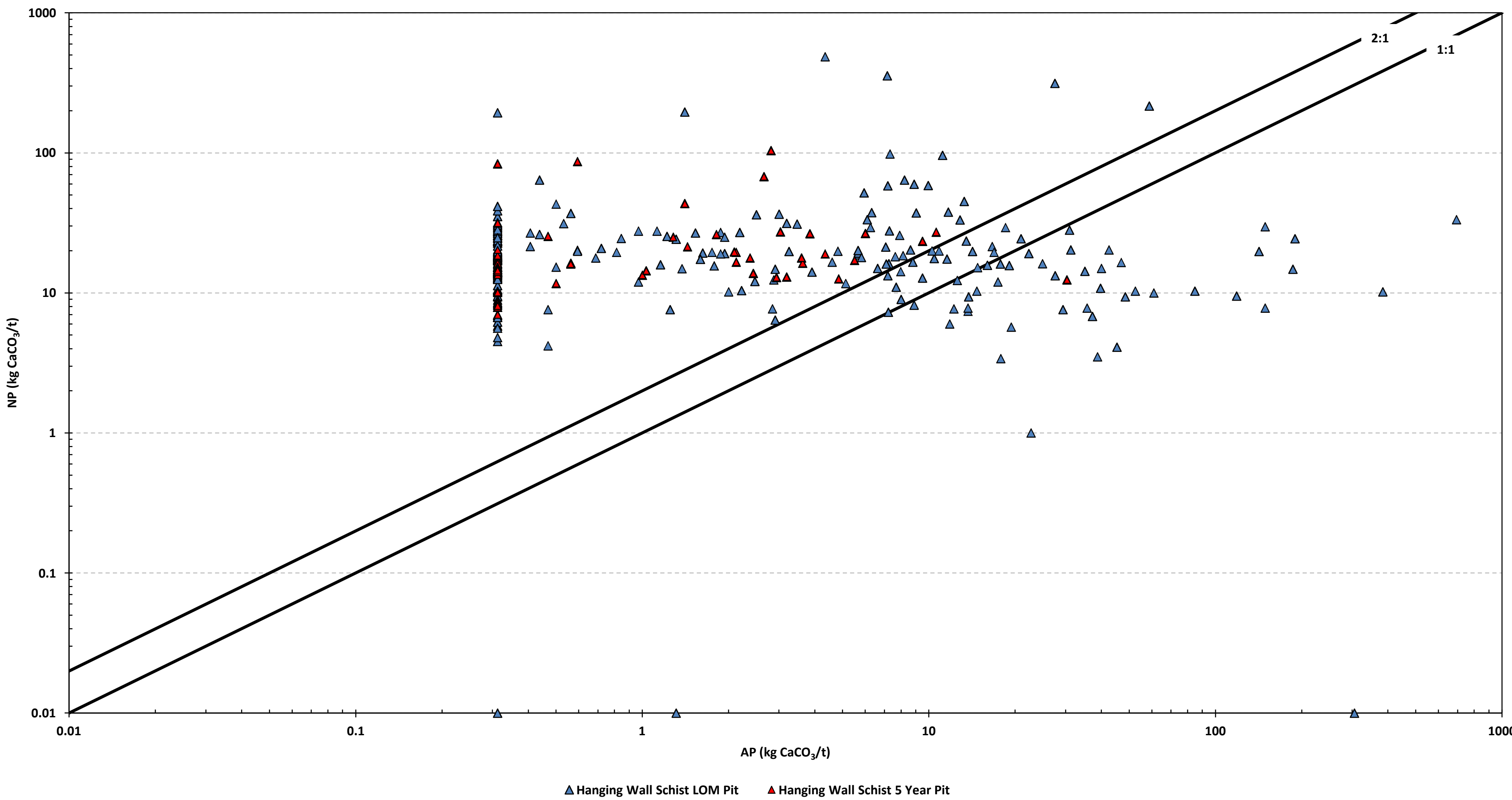
Mary River Project	
NP vs. CarbNP for Hanging Wall Schist	
Drawn by: LC / Checked by: SW	Date: April 2014
Project: TC123908	FIGURE 7



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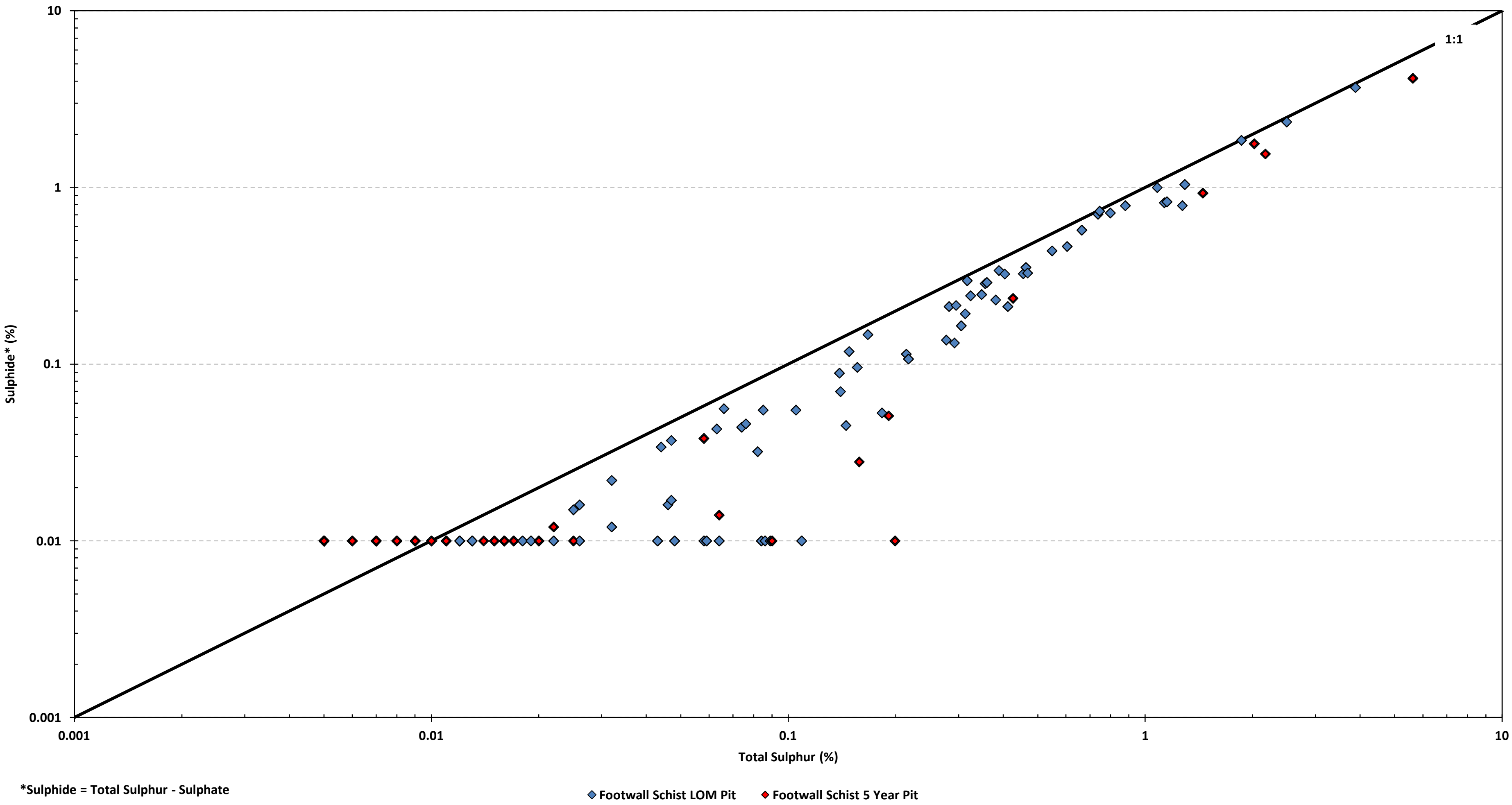
Mary River Project

NP vs. AP for Hanging Wall Schist

Drawn by: LC	Checked by: SW	Date: April 2014
Project: TC123908		FIGURE 8



*Sulphide = Total Sulphur - Sulphate

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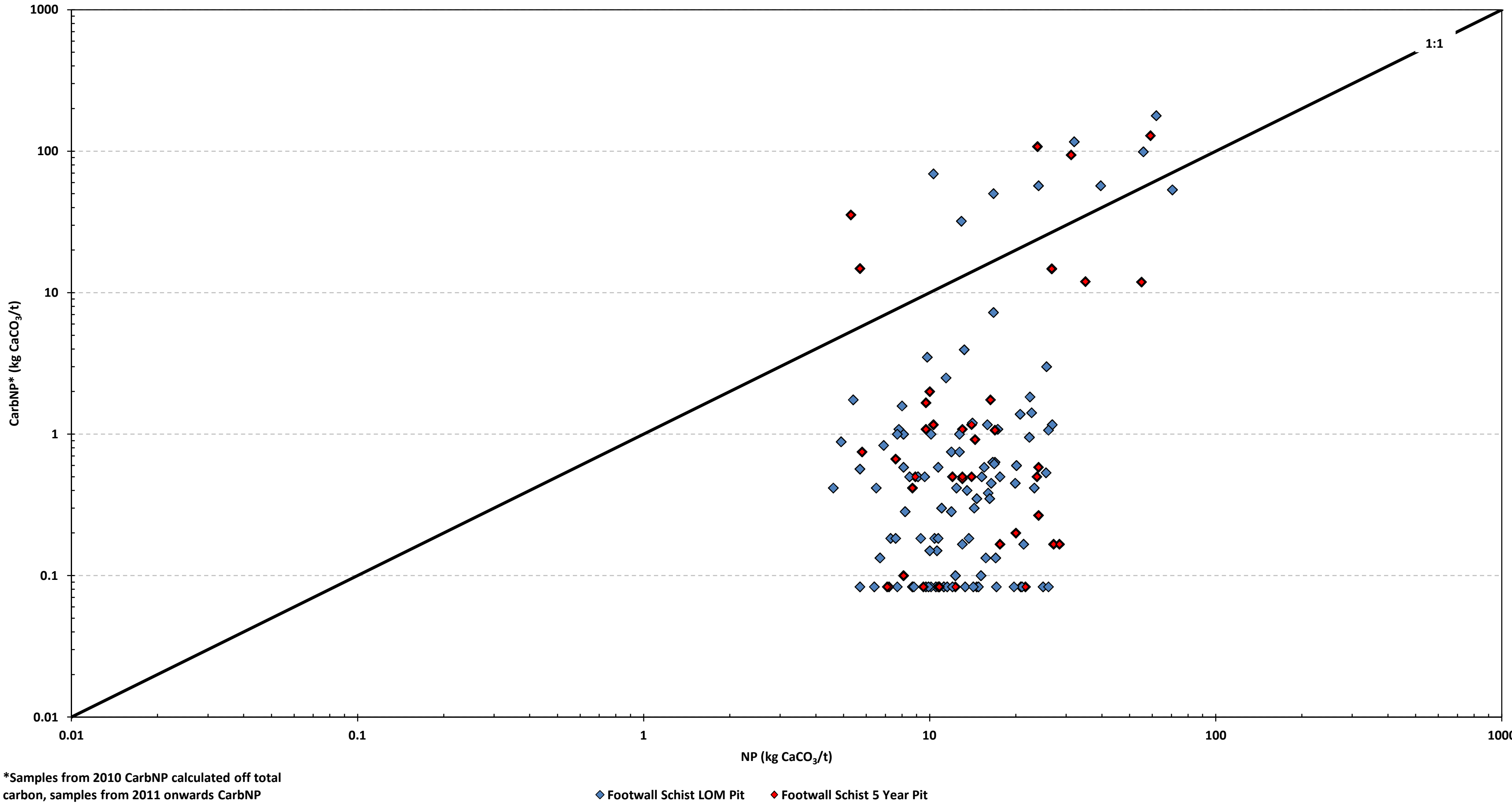
Mary River Project

Total Sulphur vs Sulphide for Footwall Schist

Drawn by: LC	Checked by: SW	Date: April 2014
Project: TC123908		FIGURE 9



*Samples from 2010 CarbNP calculated off total carbon, samples from 2011 onwards CarbNP calculated off carbonate carbon

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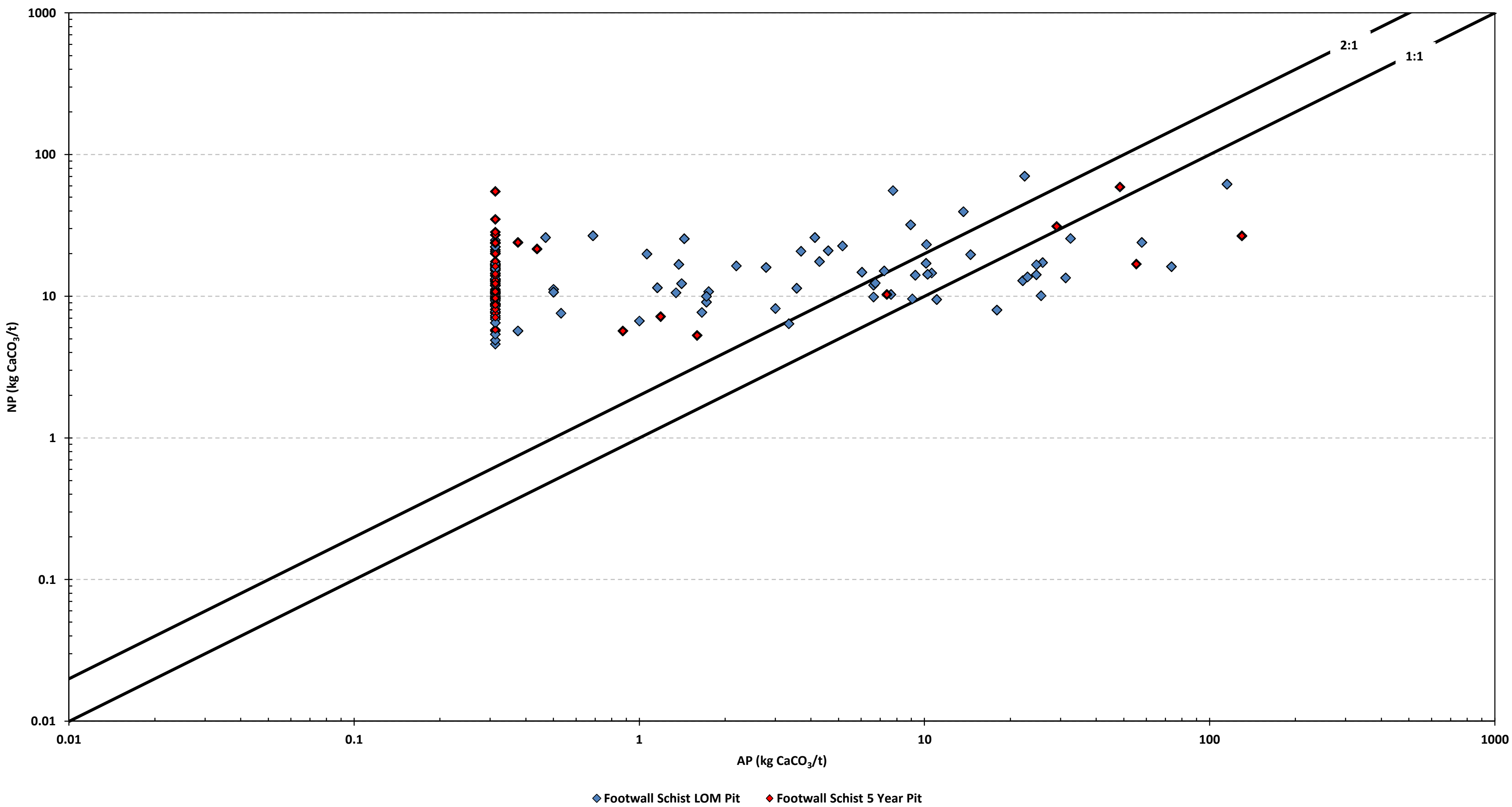
Mary River Project

NP vs. CarbNP for Footwall Schist

Drawn by: LC	Checked by: SW	Date: April 2014
Project: TC123908		FIGURE 10



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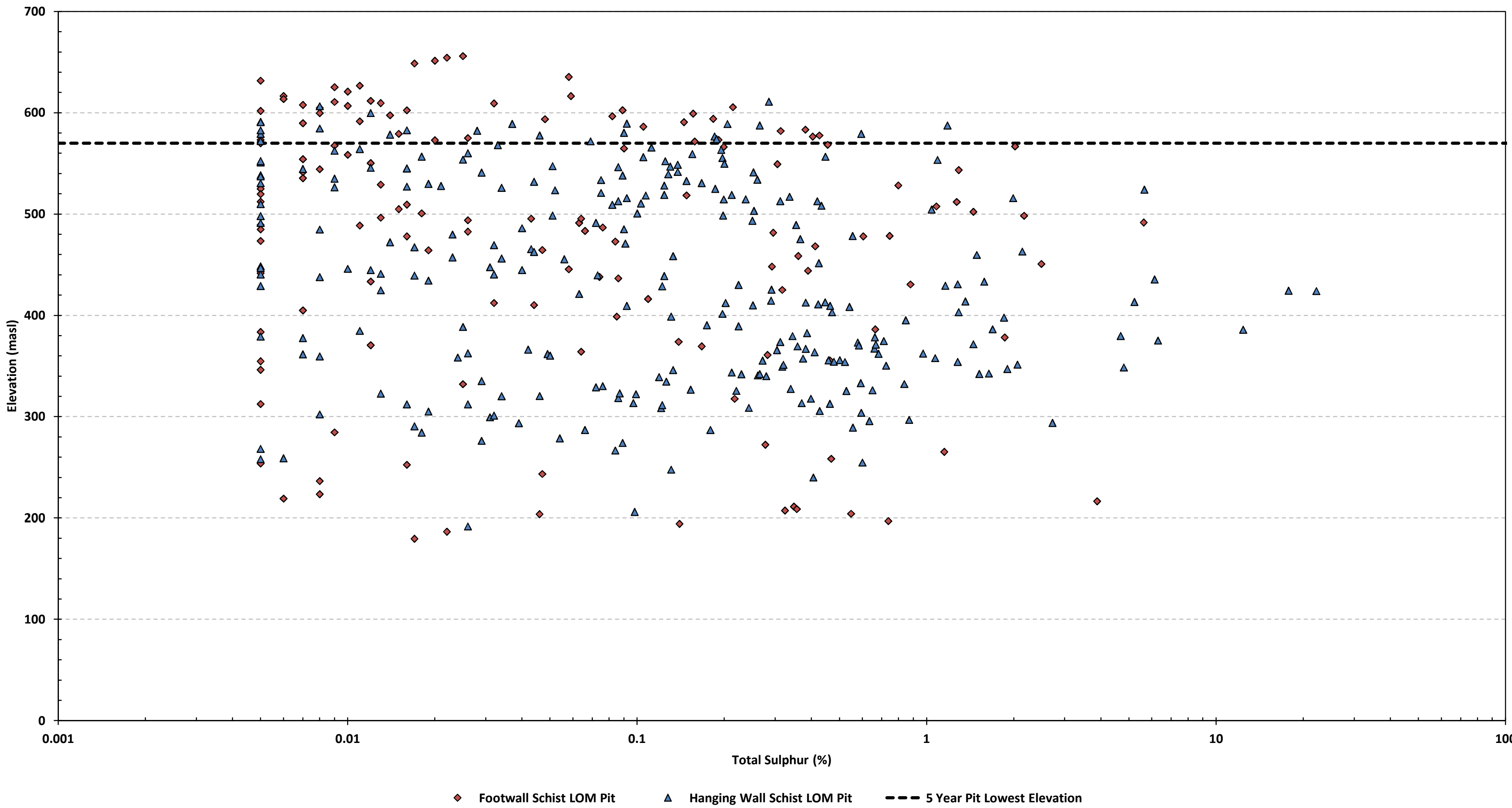
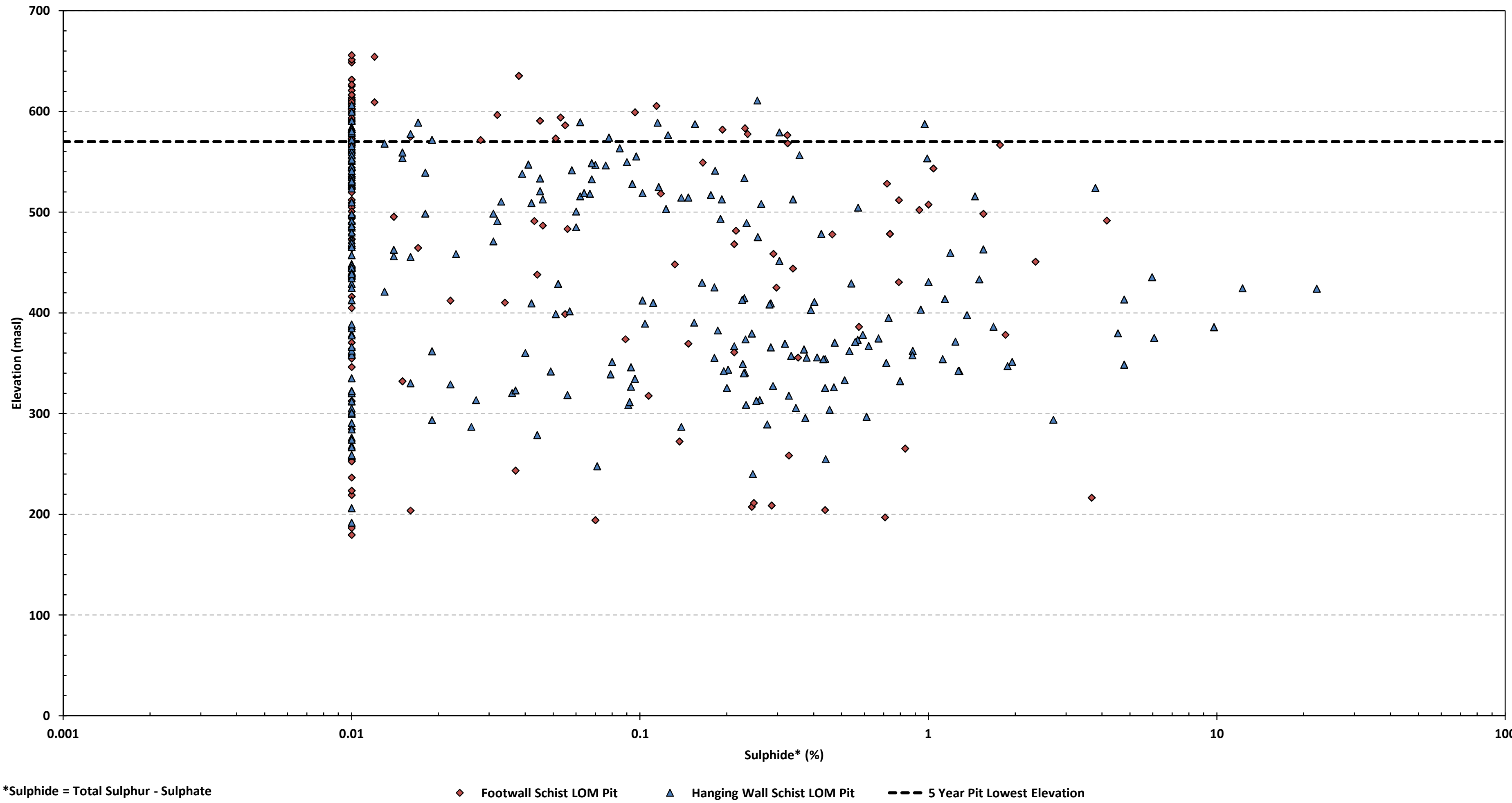
Mary River Project

NP vs. AP for Footwall Schist

Drawn by: LC	Checked by: SW	Date: April 2014
Project: TC123908		FIGURE 11



Mary River Project	
Total Sulphur vs. Elevation for Footwall Schist and Hanging Wall Schist	
Drawn by: LC / Checked by: SW	Date: April 2014
Project: TC123908	FIGURE 12



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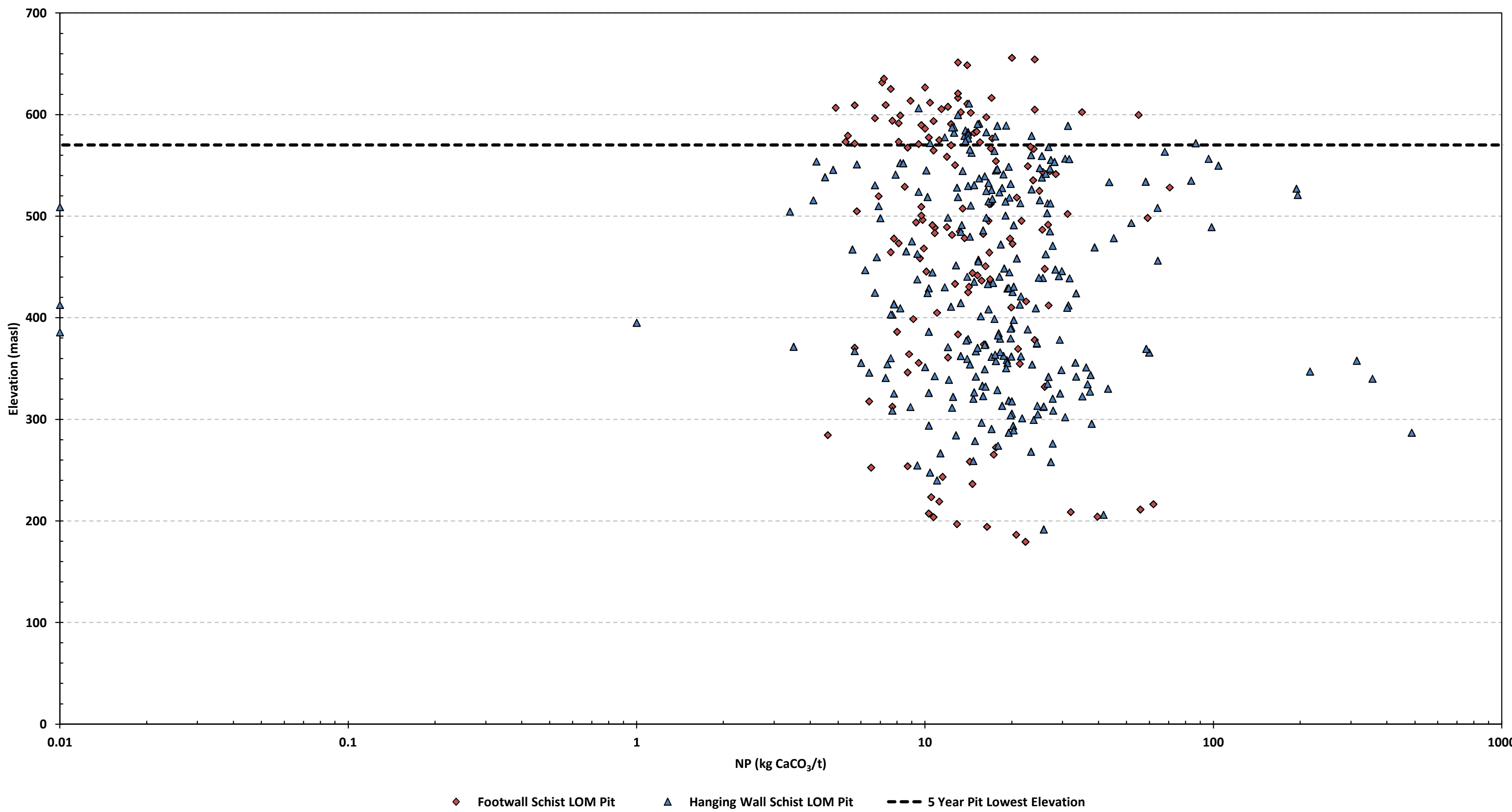
Mary River Project

Sulphide vs. Elevation for Footwall Schist and Hanging Wall Schist

Drawn by: LC	Checked by: SW	Date: April 2014
Project: TC123908		FIGURE 13



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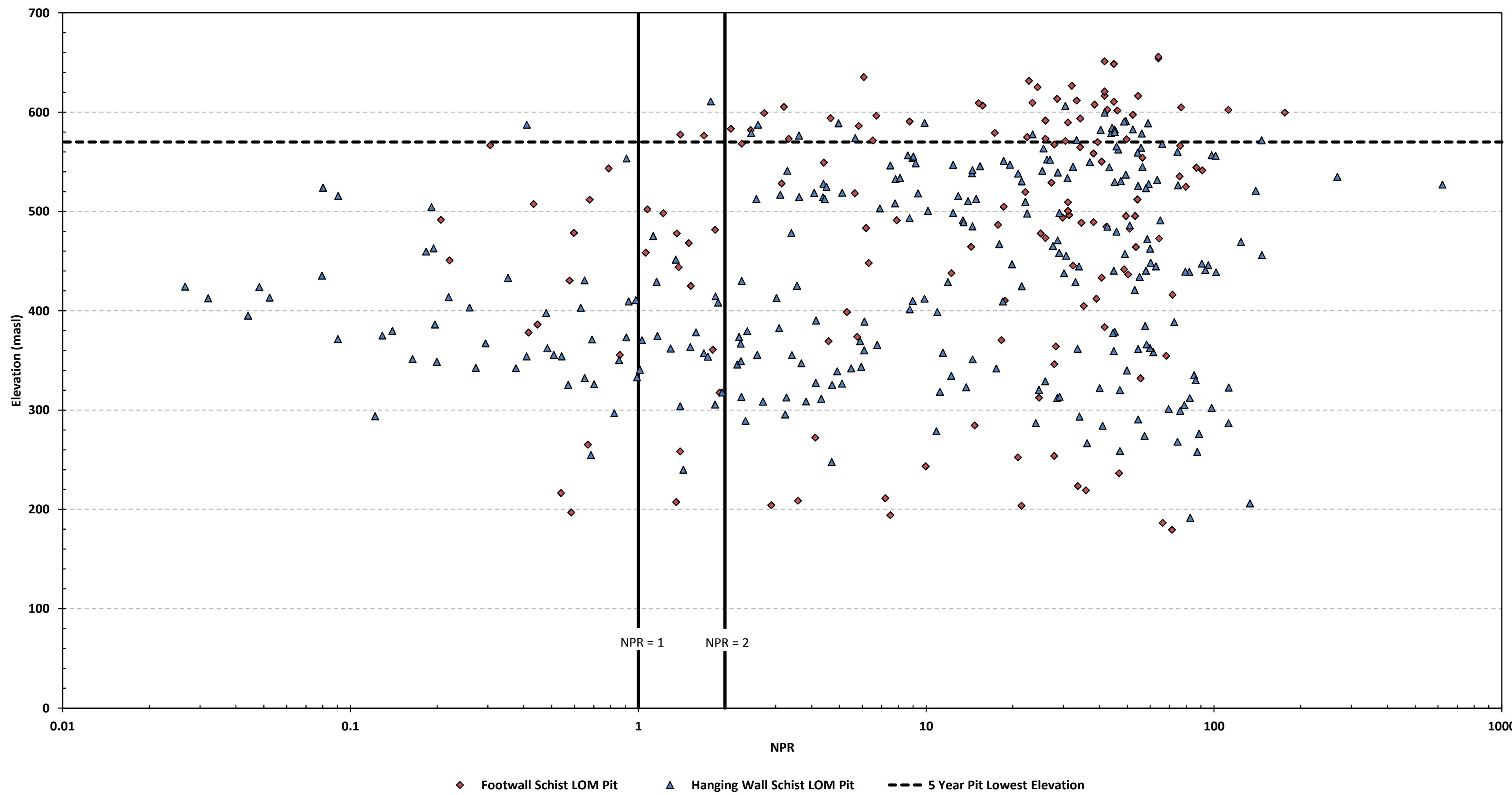
Mary River Project

NP vs. Elevation for Footwall Schist and Hanging Wall Schist

Drawn by: LC	Checked by: SW	Date: April 2014
Project: TC123908		FIGURE 14



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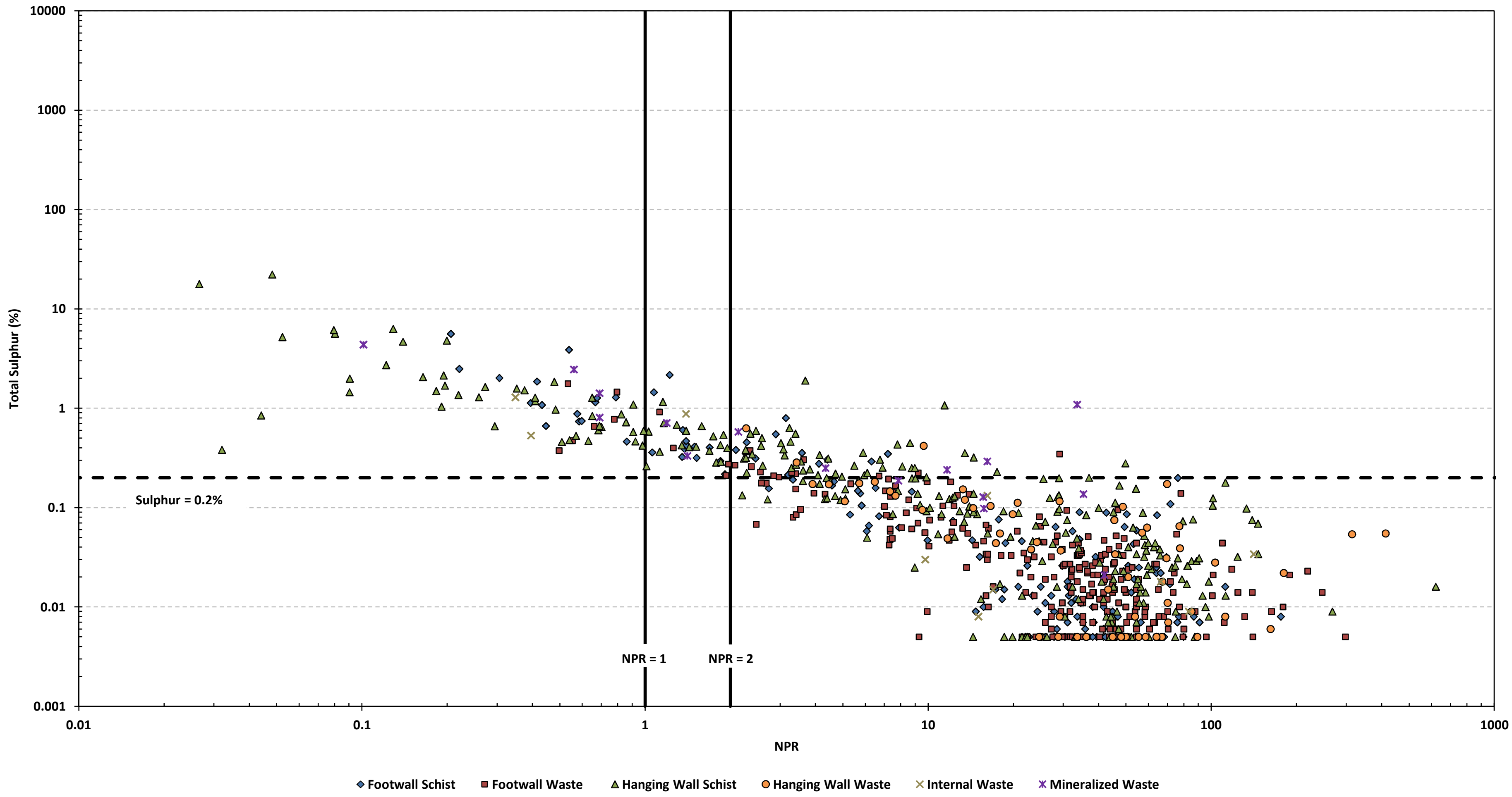
Mary River Project

NPR vs. Elevation for Footwall Schist and Hanging Wall Schist

Drawn by: LC	Checked by: SW	Date: April 2014
Project: TC123908		FIGURE 15



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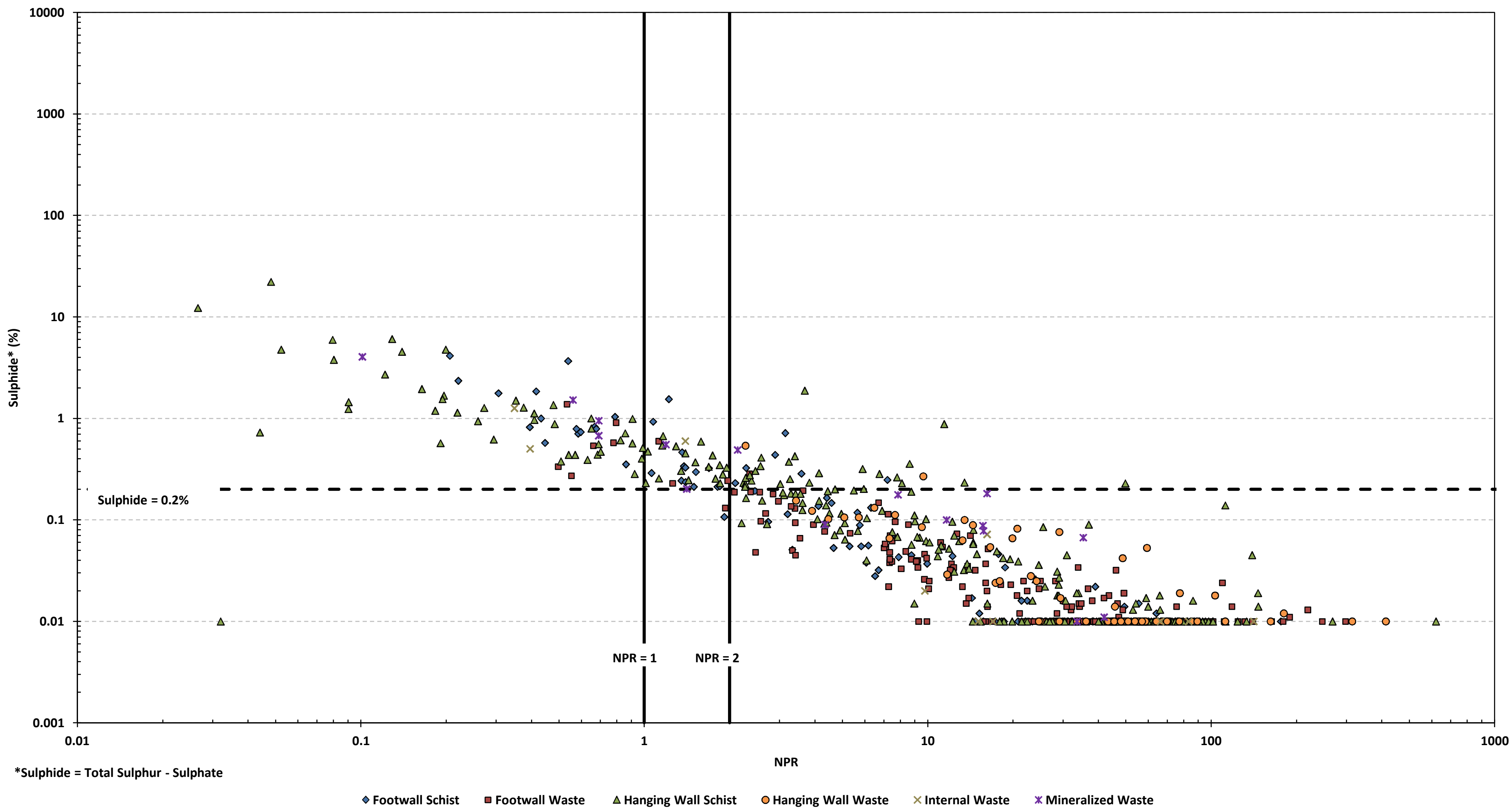
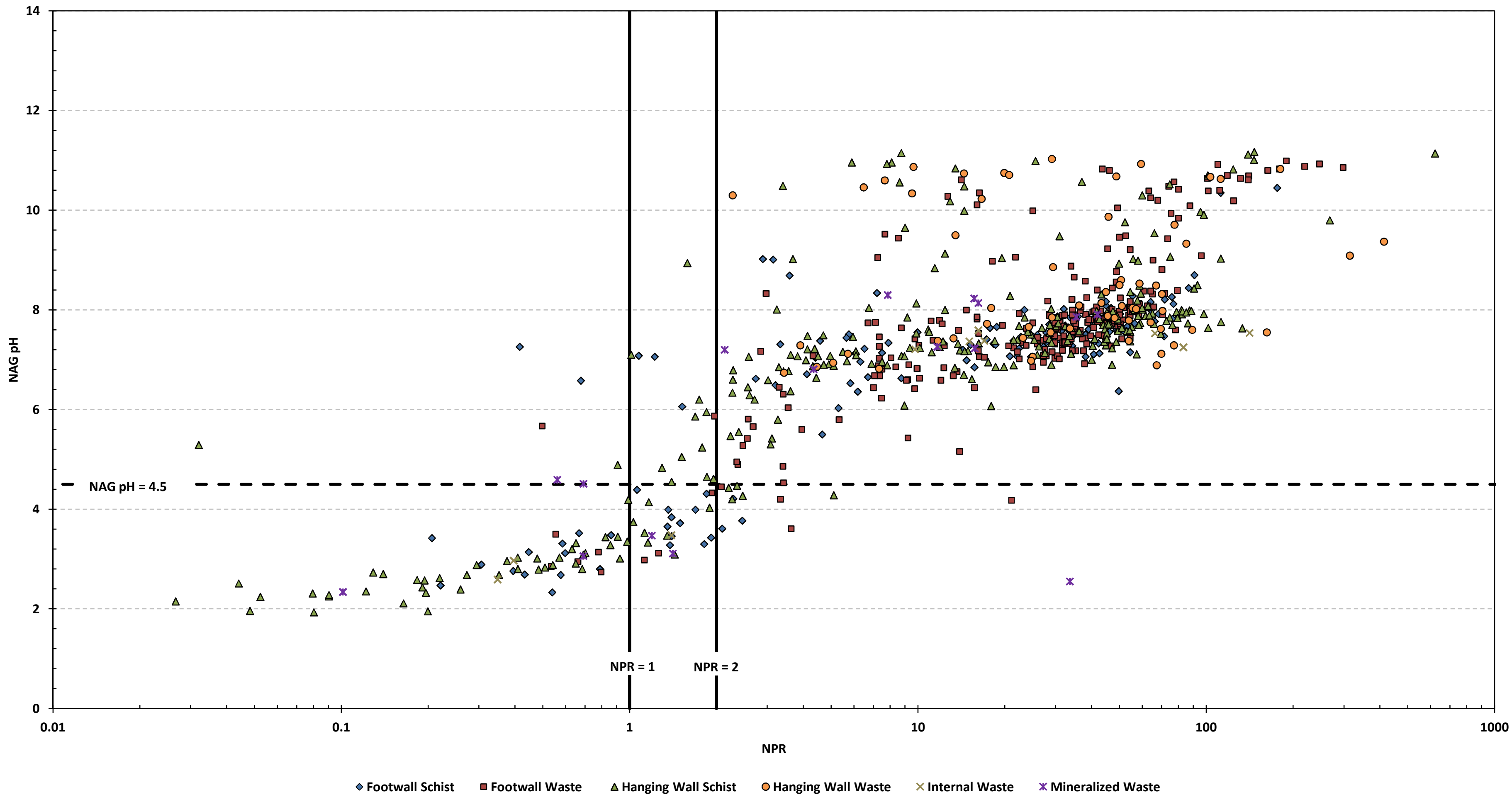
Mary River Project

Total Sulphur vs. NPR for the LOM Pit

Drawn by: LC	Checked by: SW	Date: April 2014
Project: TC123908		FIGURE 16



Mary River Project	
Sulphide vs. NPR for the LOM Pit	
Drawn by: LC / Checked by: SW	Date: April 2014
Project: TC123908	FIGURE 17



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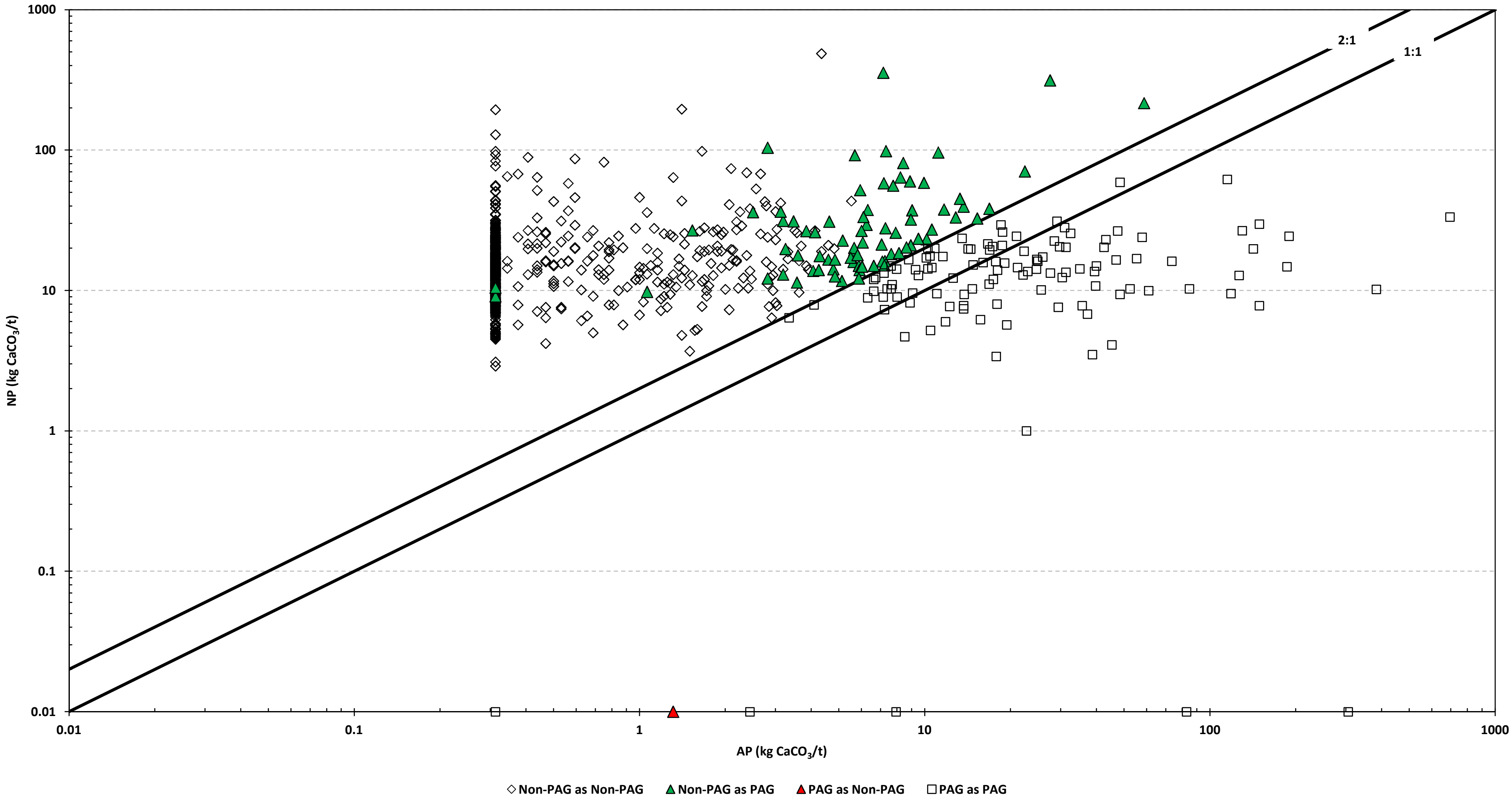
Mary River Project

NAG pH vs. NPR for the LOM Pit

Drawn by: LC	Checked by: SW	Date: April 2014
Project: TC123908		FIGURE 18



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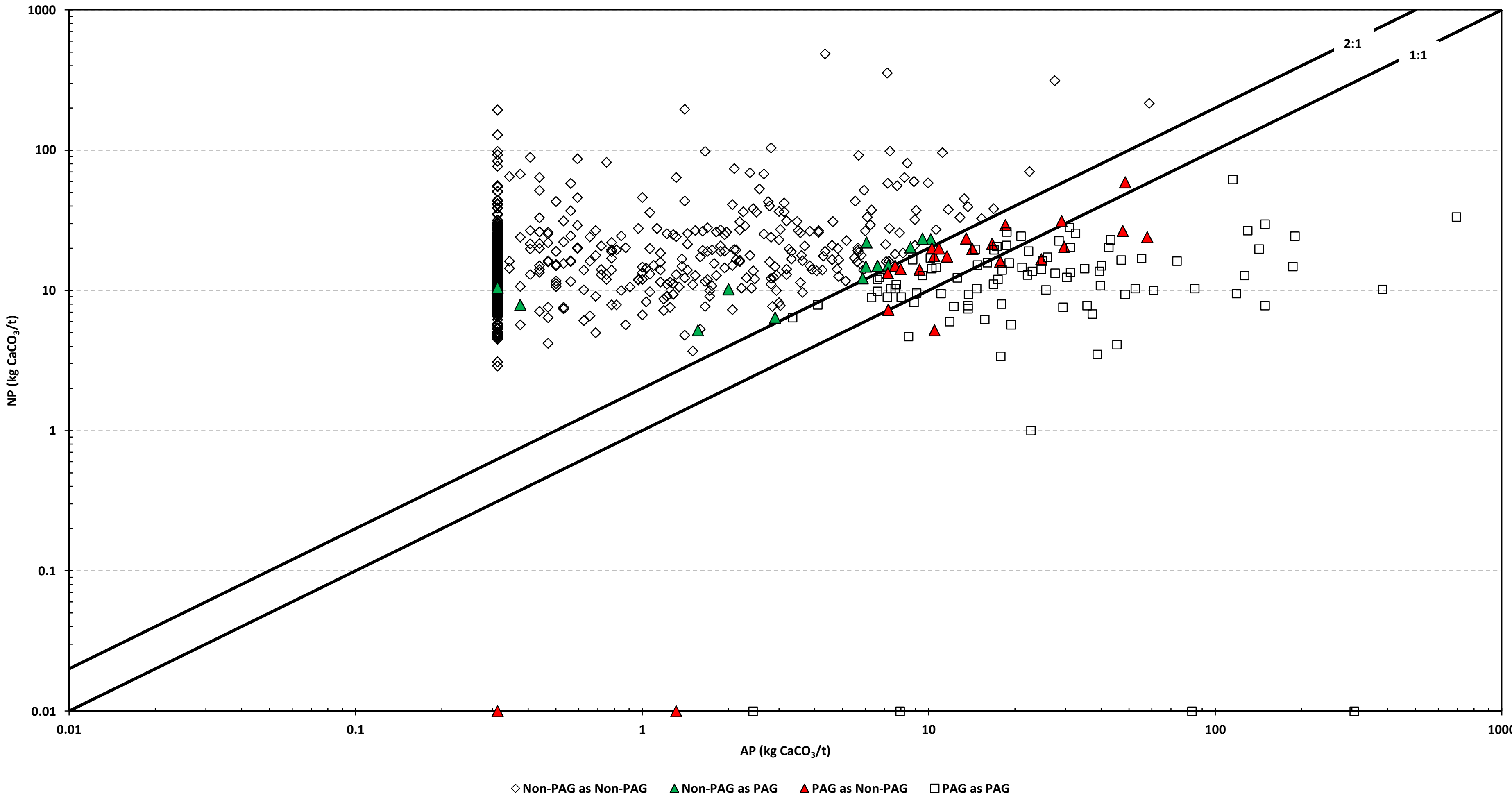
Mary River Project

Misclassification Using a Total Sulphur Content >0.2% to Determine PAG

Drawn by: LC	Checked by: SW	Date: April 2014
Project: TC123908		FIGURE 19



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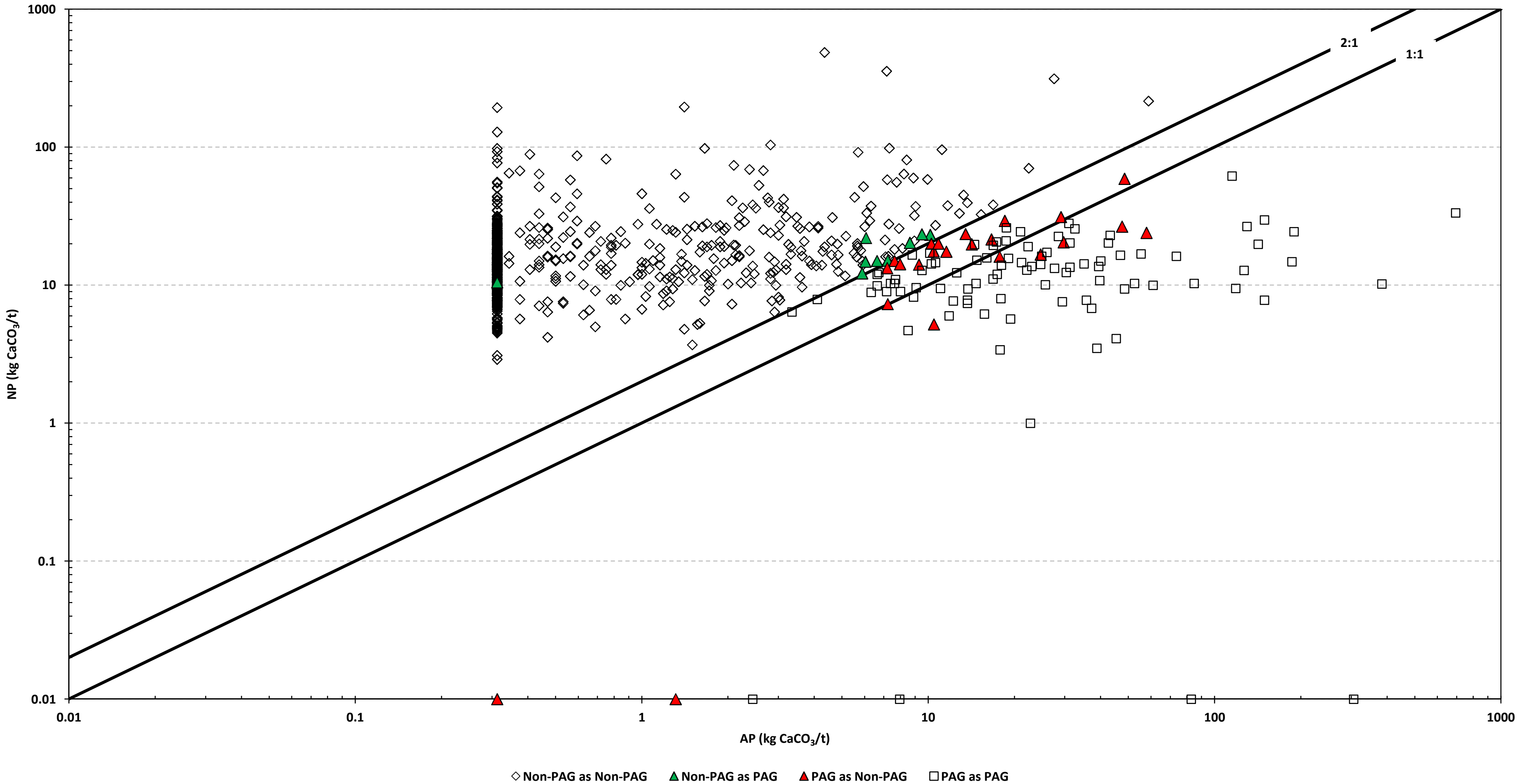
Mary River Project

Misclassification Using a NAG pH < 4.5 to Determine PAG

Drawn by: LC	Checked by: SW	Date: April 2014
Project: TC123908		FIGURE 20



Note: NAGpH test applied to samples identified as PAG by sulphur >0.2%.

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Mary River Project

Misclassification Using a Total Sulphur Content >0.2% and NAG pH < 4.5

Drawn by: LC	Checked by: SW	Date: April 2014
Project: TC123908		FIGURE 21

APPENDIX A

Table A-1: ABA Results for the 5 Year Pit

Easting	Northing	Elevation	Hole ID	Sample ID	Program	From	To	Waste Classification	Lithology	Paste pH	Fizz Rate	Total Sulphur	Sulphate	Sulphide*	Total Carbon	Carbonate	AP**	NP	CarbNP	NPR	CarbNPR
												%					kg $CaCO_3$/t				
7914597.909	563141.566	651.436	MR1-12-224	15482	Baff2012	27.5	29.5	Footwall Schist	Gniess	9.16	1	0.02	0.01	0.01	0.027	0.029	0.3	13	0.5	41.6	1.5
7914599.171	563139.381	648.73	MR1-12-224	15484	Baff2012	31.3	33.1	Footwall Schist	Gniess	10	1	0.017	0.01	0.01	0.019	0.07	0.3	14	1.2	44.8	3.7
7914147.995	562951.331	626.809	MR1-12-225	15702	Baff2012	14	16	Footwall Schist	Gniess	9.09	1	0.011	0.01	0.01	0.063	0.12	0.3	10	2.0	32.0	6.4
7914148.592	562950.105	625.346	MR1-12-225	15703	Baff2012	16	18	Footwall Schist	Gniess	9.46	1	0.009	0.01	0.01	0.024	0.04	0.3	7.6	0.7	24.3	2.1
7914150.386	562946.428	620.958	MR1-12-225	15706	Baff2012	22	24	Footwall Schist	Gniess	9.15	1	0.01	0.01	0.01	0.018	0.065	0.3	13	1.1	41.6	3.5
7914152.18	562942.75	616.57	MR1-12-225	15709	Baff2012	28	30	Footwall Schist	Gniess	9.46	1	0.006	0.01	0.01	0.013	0.03	0.3	13	0.5	41.6	1.6
7914153.376	562940.298	613.644	MR1-12-225	15711	Baff2012	32	34	Footwall Schist	Gniess	9.51	1	0.006	0.01	0.01	0.013	0.03	0.3	8.9	0.5	28.5	1.6
7914154.572	562937.846	610.719	MR1-12-225	15713	Baff2012	36	38	Footwall Schist	Gniess	9.57	1	0.009	0.01	0.01	0.013	0.03	0.3	14	0.5	44.8	1.6
7914155.768	562935.394	607.793	MR1-12-225	15715	Baff2012	40	42	Footwall Schist	Gniess	9.78	1	0.007	0.01	0.01	0.016	0.03	0.3	12	0.5	38.4	1.6
7914156.919	562933.034	604.978	MR1-12-225	15717	Baff2012	44	45.7	Footwall Schist	Gniess	9.37	1	0.008	0.01	0.01	0.019	0.035	0.3	24	0.6	76.8	1.9
7914464.386	563109.225	573.328	MR1-08-145	16310	Baff2011	132.5	133.65	Footwall Schist	Gniess	8.53	1	0.005	0.01	0.01	0.023	0.006	0.3	8.1	0.1	25.9	0.3
7914469.619	563098.002	571.144	MR1-08-145	16312	Baff2011	145.2	146.1	Footwall Schist	Gniess	8.63	1	0.005	0.01	0.01	0.034	0.005	0.3	9.5	0.1	30.4	0.3
7914472.537	563091.745	569.927	MR1-08-145	16314	Baff2011	152.16	153.16	Footwall Schist	Gniess	9.3	1	0.005	0.01	0.01	0.016	0.005	0.3	12.3	0.1	39.4	0.3
7914152.497	562936.858	635.446	MR1-07-118	16518	Baff2011	14.61	15.56	Footwall Schist	Gniess	9.15	1	0.058	0.02	0.038	0.024	0.005	1.2	7.2	0.1	6.1	0.1
7914148.235	562949.976	631.75	MR1-07-118	16520	Baff2011	28.9	29.83	Footwall Schist	Gniess	9.39	1	0.005	0.01	0.01	0.012	0.005	0.3	7.1	0.1	22.7	0.3
7914347.059	563026.427	564.832	MR1-06-90	16726	Baff2011	153.4	154.38	Footwall Schist	Gniess	9.05	1	0.09	0.09	0.01	0.015	0.005	0.3	10.7	0.1	34.2	0.3
7913890.018	563090.826	509.355	MR1-09-179	MRARD10 004	AMEC_2010	160	161	Footwall Schist	Gniess	9.5	1	0.016	0.02	0.01	0.013	0.026	0.3	9.7	1.1	31.0	3.5
7913878.955	563080.142	504.945	MR1-09-179	MRARD10 005	AMEC_2010	176	177	Footwall Schist	Gniess	9.4	1	0.015	0.02	0.01	0.009	0.011	0.3	5.8	0.8	18.6	2.4
7914840.815	563394.858	577.665	MR1-08-161	MRARD10 057	AMEC_2010	160	161	Footwall Schist	Gniess	9.49	1	0.426	0.19	0.236	0.014	0.042	7.4	10.3	1.2	1.4	0.2
7914540.881	563152.285	567.574	MR1-08-140	MRARD10 104	AMEC_2010	165	166	Footwall Schist	Gniess	8.41	1	0.009	0.01	0.01	0.005	0.005	0.3	8.7	0.4	27.8	1.3
7914654.151	563267.972	491.753	MR1-06-105	16076	Baff2011	182.01	182.96	Footwall Schist	High Grade Iron Formation	7.66	1	5.62	1.47	4.15	1.25	0.885	129.7	26.7	14.8	0.2	0.1
7914649.263	563279.902	502.306	MR1-06-105	16070	Baff2011	165.6	166.05	Footwall Schist	High Grade Iron Formation	7.2	1	1.45	0.52	0.93	3.29	5.65	29.1	31.2	94.2	1.1	3.2
7914651.088	563275.469	498.382	MR1-06-105	16072	Baff2011	171.52	172.52	Footwall Schist	High Grade Iron Formation	7.92	2	2.17	0.62	1.55	3.34	7.73	48.4	59.1	128.9	1.2	2.7
7914595.8	563145.219	655.96	MR1-12-224	15479	Baff2012	21.23	23.4	Footwall Schist	Schist	8.06	4	0.025	0.02	0.01	0.026	0.012	0.3	20	0.2	64.0	0.6
7914596.528	563143.958	654.398	MR1-12-224	15480	Baff2012	23.4	25.5	Footwall Schist	Schist	8.34	1	0.022	0.01	0.012	0.021	0.016	0.4	24	0.3	64.0	0.7
7914037.25	562928.144	573.304	MR1-12-226	15631	Baff2012	75.27	77.37	Footwall Schist	Schist	6.44	1	0.191	0.14	0.051	0.427	2.13	1.6	5.3	35.5	3.3	22.3
7914036.549	562926.826	571.702	MR1-12-226	15632	Baff2012	77.37	79.65	Footwall Schist	Schist	6.4	1	0.158	0.13	0.028	0.202	0.889	0.9	5.7	14.8	6.5	16.9
7914028.919	562912.476	554.274	MR1-12-226	15644	Baff2012	101.34	103.34	Footwall Schist	Schist	8.21	1	0.007	0.01	0.01	0.027	0.01	0.3	17.6	0.2	56.3	0.5
7914024.568	562904.293	544.335	MR1-12-226	15651	Baff2012	114.93	116.93	Footwall Schist	Schist	8.4	1	0.008	0.01	0.01	0.022	0.01	0.3	27.1	0.2	86.7	0.5
7914023.321	562901.947	541.487	MR1-12-226	15653	Baff2012	118.93	120.72	Footwall Schist	Schist	8.64	1	0.007	0.01	0.01	0.02	0.01	0.3	28.4	0.2	90.9	0.5
7914157.935	562930.95	602.491	MR1-12-225	15719	Baff2012	47.4	49.1	Footwall Schist	Schist	9.66	1	0.016	0.01	0.01	0.194	0.719	0.3	35	12.0	112.0	38.4
7914159.056	562928.651	599.749	MR1-12-225	15721	Baff2012	51	53	Footwall Schist	Schist	9.9	4	0.008	0.01	0.01	0.222	0.714	0.3	55	11.9	176.0	38.1
7914020.687	562896.994	535.471	MR1-12-226	15658	Baff2012	127.05	129.05	Footwall Schist	Schist	9.62	1	0.007	0.01	0.01	0.022	0.03	0.3	23.7	0.5	75.8	1.6
7914655.524	563264.597	488.761	MR1-06-105	16078	Baff2011	186.7	187.7	Footwall Schist	Schist	9.05	1	0.011	0.01	0.01	0.009	0.005	0.3	10.8	0.1	34.6	0.3
7914342.277	563036.682	566.827	MR1-06-90	16722	Baff2011	141.9	142.9	Footwall Schist	Schist	7.62	1	2.02	0.25	1.77	0.014	0.064	55.3	16.9	1.1	0.3	0.02
7914343.44	563034.188	566.342	MR1-06-90	16724	Baff2011	144.7	145.69	Footwall Schist	Schist	8.07	1	0.199	0.2	0.01	1.45	6.47	0.3	23.8	107.9	76.2	345.3
7914786.719	563340.21	594.098	MR1-08-163	MRARD10 035	AMEC_2010	155	156	Footwall Schist	Schist	7.89	1	0.007	0.01	0.01	0.02	0.207	0.3	9.7	1.7	31.0	5.3
7914767.99	563380.374	601.912	MR1-08-163	MRARD10 047	AMEC_2010	110	111	Footwall Schist	Schist	8.5	1	0.005	0.01	0.01	0.011	0.005	0.3	14.4	0.9	46.1	2.9
7914778.395	563358.061	597.571	MR1-08-163	MRARD10 049	AMEC_2010	135	136	Footwall Schist	Schist	8.15	1	0.014	0.01	0.01	0.021	0.005	0.3	16.3	1.8	52.2	5.6
7914652.408	563272.251	495.535	MR1-06-105	16074	Baff2011	176	177.03	Footwall Schist	Ultramafic	8.31	1	0.064	0.05	0.014	0.028	0.005	0.4	21.6	0.1	49.4	0.2
7914607.255	563539.17	498.078	MR1-05-72	16022	Baff2011	92.7	93.65	Hanging Wall Schist	Amphibolite	7.77	1	0.005	0.01	0.01	0.014	0.008	0.3	7	0.1	22.4	0.4
7914609.72	563534.114	491.375	MR1-05-72	16024	Baff2011	101.4	102.45	Hanging Wall Schist	Amphibolite	8.16	1	0.072	0.04	0.032	0.008	0.005	1.0	13.4	0.1	13.4	0.1
7914755.246	563588.198	564.313	MR1-05-77	16590	Baff2011	41.13	42.1	Hanging Wall Schist	Amphibolite	9.27	2	0.011	0.01	0.01	0.114	0.378	0.3	17.4	6.3	55.7	20.2
7914758.512	563581.502	555.435	MR1-05-77	16592	Baff2011	52.71	53.7	Hanging Wall Schist	Amphibolite	9.45	2	0.197	0.1	0.097	0.158	0.529	3.0	27.3	8.8	9.0	2.9
7914760.988	563576.426	548.705	MR1-05-77	16594	Baff2011	61.5	62.48	Hanging Wall Schist	Amphibolite	9.26	1	0.138	0.07	0.068	0.07	0.168	2.1	19.5	2.8	9.2	1.3
7914763.569	563571.134	541.688	MR1-05-77	16596	Baff2011	70.65	71.65	Hanging Wall Schist	Amphibolite	9.2	2	0.138	0.08	0.058	0.184	0.616	1.8	26.2	10.3	14.5	5.7
7914772.622	563552.572	517.075	MR1-05-77	16604	Baff2011	102.8	103.76	Hanging Wall Schist	Amphibolite	8.86	1	0.336	0.16	0.176	0.018	0.018	5.5	17.1	0.3	3.1	0.1
7914775.024	563547.646	510.544	MR1-05-77	16606	Baff2011	111.32	112.29	Hanging Wall Schist	Amphibolite	8.84	1	0.103	0.07	0.033	0.023	0.005	1.0	14.4	0.1	14.0	0.1
7914766.867	563564.372	532.721	MR1-05-77	16600	Baff2011	82.35	83.36	Hanging Wall Schist	Gniess	9.01	1	0.148	0.08	0.068	0.031	0.061	2.1	16.6	1.0	7.8	0.5
7914769.349	563559.282	525.973	MR1-05-77	16602	Baff2011	91.15	92.18	Hanging Wall Schist	Gniess	9.65	1	0.034	0.03	0.01	0.013	0.007	0.3	17	0.1	54.4	0.4
7914749.753	563599.461	579.247	MR1-05-77	16586	Baff2011	21.62	22.62	Hanging Wall Schist	Metasediment	9.22	1	0.005	0.01	0.01	0.061	0.093	0.3	13.7	1.6	43.8	5.0
7914752.385	563594.064	572.092	MR1-05-77	16588	Baff2011	30.96	31.96	Hanging Wall Schist	Metasediment	9.16	1	0.005	0.01	0.01	0.018	0.011	0.3	10.4	0.2	33.3	0.6
7914801.516	563645.605	582.739	MR1-08-156	16694	Baff2011	8.73	9.79	Hanging Wall Schist	Metasediment	8.93	2	0.005	0.01	0.01	0.107	0.35	0.3	16.3	5.8	52.2	18.7
7914803.299	563641.781	577.71	MR1-08-156	16696	Baff2011	15.34	16.31	Hanging Wall Schist	Metasediment	9.46	1	0.046	0.03	0.016	0.035	0.098	0.5	11.7	1.6	23.4	3.3
7914765.211	563567.766	537.222	MR1-05-77	16598	Baff2011	76.5	77.46	Hanging Wall Schist	Schist	9.33	1	0.005	0.01	0.01	0.015	0.005	0.3	15.4	0.1	49.3	0.3
7914821.987	563601.703	525.01	MR1-08-156	16712	Baff2011	84.07	85.17	Hanging Wall Schist	Schist	8.64	1	0.186	0.07	0.116	0.013	0.04	3.6	16.3	0.7	4.5	0.2
7914824.14	563597.087	518.939	MR1-08-156	16714	Baff2011	92.03	93.06	Hanging Wall Schist	Schist	7.96	1	0.212	0.11	0.102	0.015	0.019	3.2	13	0.3	4.1	0.1
7914826.342	563592.365	512.731	MR1-08-156	16716	Baff2011	100.18	101.12	Hanging Wall Schist	Schist	8.29	1	0.419	0.08	0.339	0.022	0.069	10.6	27.2	1.2	2.6	0.1
7914217.513	563129.414	580.306	MR1-06-84	16740	Baff2011	16.55	17.63	Hanging Wall Schist	Schist	8.42	1	0.09	0.09	0.01	0.023	0.038	0.3	14.1	0.6	45.1	2.0
7914219.703	563124.716	574.128	MR1-06-84	16742	Baff2011	24.68	25.63	Hanging Wall Schist	Schist	8.38	1	0.188	0.11	0.078	0.019	0.005	2.4	13.8	0.1	5.7	0.03
7914222.7	563118.29	565.679	MR1-06-84	16744	Baff2011	35.7	36.67	Hanging Wall Schist	Schist	8.25	1	0.112	0.11	0.01	0.027	0.093	0.3	14.3	1.6	45.8	5.0
7914227.474	563108.051	552.215	MR1-06-84	16748	Baff2011	53.21	54.31	Hanging Wall Schist	Schist	7.83	1	0.125	0.13	0.01	0.02	0.033	0.3	8.4	0.6	26.9	1.8
7913979.772	563177.5	545.133	MR1-09-179	MRARD10 002	AMEC_2010	30.2	31.2	Hanging Wall Schist	Schist	8.37	1	0.016	0.02	0.01	0.017	0.037	0.3	10.1	1.4	32.3	4.5
7913969.538	563167.617	541.054	MR1-09-179	MRARD10 003	AMEC_2010	45	46	Hanging Wall Schist	Schist	7.74	1	0.029	0.03	0.01	0.407	1.57	0.3	7.9	33.9	25.3	108.5
7914042.297	563235.419	498.607	MR1-09-177	MRARD10 007	AMEC_2010	55	56	Hanging Wall Schist	Schist	8.5	1	0.198	0.18	0.018	0.023	0.053	0.6	16.3	1.9	29.0	3.4
7914493.018	563254.927	587.544	MR1-08-140	MRARD10 068	AMEC_2010	50	51	Hanging Wall Schist	Schist	7.58	1	1.18	0.21	0.97	0.007	0.144	30.3	12.4	0.6	0.4	0.0
7914820.868	563604.104	528.166	MR1-08-153	MRARD10 078	AMEC_2010	80	81	Hanging Wall Schist	Schist	8.33	1	0.124	0.03	0.094	0.005	0.005	2.9	12.9	0.4	4.4	0.1
7914890.585	563636.278	518.342	MR1-08-147	MRARD10 086	AMEC_2010	90	91	Hanging Wall Schist	Schist	8.43	1	0.107	0.04	0.067	0.012	0.005	2.1	19.6	1.0	9.4	0.5
7914904.285	563604.232	579.229	MR1-08-142	MRARD10 092	AMEC_2010	30	31	Hanging Wall Schist	Schist	7.67	1	0.594	0.29	0.304	0.006	0.005	9.5	23.4	0.5	2.5	0.1
7914895.95	563624.772	503.213	MR1-08-147	MRARD10 094	AMEC_2010	110	110.5	Hanging Wall Schist	Schist	8.17	1	0.253	0.13	0.123	0.017	0.012	3.8	26.5	1.4	6.9	0.4
7914826.301	563592.452	512.846	MR1-08-153	MRARD10 101	AMEC_2010	100	101	Hanging Wall Schist	Schist	8.16	1	0.086	0.04	0.046	0.012	0.005	1.4	21.4	1.0	14.9	0.7
7914815.435	563615.755	543.487	MR1-08-156	MRARD10 117	AMEC_2010	60	61	Hanging Wall Schist	Schist	8.86	1	0.086	0.01	0.076	0.018	0.033	2.4	17.8	1.5	7.5	0.6
7914820.977	563603.871	527.86	MR1-08-156	MRARD10 119	AMEC_2010	80.8	81	Hanging Wall Schist	Schist	8.04	1	0.021	0.02	0.01	0.007	0.005	0.3	18.5	0.6	59.2	1.9
7914826.301	563592.452	512.846	MR1-08-156	MRARD10 122	AMEC_2010	100	101	Hanging Wall Schist	Schist	8.46	1	0.312	0.12	0.192	0.012	0.005	6.0	26.6	1.0	4.4	0.2
7914420.445	563203.455	591.661	MR1-08-145	MRARD10 126	AMEC_2010	27	28	Hanging Wall Schist	Schist	7.44	1	0.011	0.01	0.01	0.012	0.005	0.3	8.1	1.0	25.9	3.2
7914836.569	563574.057	590.725	MR1-08-143	MRARD10 127	AMEC_2010	20	21	Hanging Wall Schist	Schist	8.1	1	0.005	0.01	0.01	0.022	0.005	0.3	15.2	1.8	48.6	5.9
7914814.05	563618.726	547.394	MR1-08-153	MRARD10 130	AMEC_2010	54.9	55.9	Hanging Wall Schist	Schist	8.74	1	0.051	0.01	0.041	0.117	0.381	1.3	25	9.8	19.5	7.6
7914212.854	563309.016	491.231	MR1-05-46	16470	Baff2011	55.72	56.72	Hanging Wall Schist	Volcanic Tuff	8.32	1	0.005	0.01	0.01	0.043	0.005	0.3	20.3	0.1	65.0	0.3
7914805.377	563637.324	571.85	MR1-08-156	16698	Baff2011	23	23.95	Hanging Wall Schist	Volcanic Tuff	9.25	3	0.069	0.05	0.019	0.998	4.54	0.6	86.8	75.7	146.2	127.5
7914808.323	563631.006	563.542	MR1-08-156	16700	Baff2011	33.82	34.82	Hanging Wall Schist	Volcanic Tuff	9.17	3	0.195	0.11	0.085	0.724	3.06	2.7	67.8	51.0	25.5	19.2
7914810.885	563625.513	556.319	MR1-08-156	16702	Baff2011	43.25	44.25	Hanging Wall Schist	Volcanic Tuff	9.48	3	0.105	0.1	0.01	0.223	1.02	0.3	31.6	17.0	101.1	54.4
7914813.19	563620.57	549.819	MR1-08-156	16704	Baff2011	51.73	52.74	Hanging Wall Schist	Volcanic Tuff	8.96	3	0.2	0.11	0.09	1.09	4.74	2.8	104	79.1	37.0	28.1
7914815.036	563616.611	544.613	MR1-08-156	16706	Baff2011	58.53	59.53	Hanging Wall Schist	Volcanic Tuff	9.64	1	0.007	0.01	0.01	0.014	0.037	0.3	13.5	0.6	43.2	2.0
7914816.895	563612.624	539.37	MR1-08-156	16708	Baff2011	65.37	66.38	Hanging Wall Schist	Volcanic Tuff	9.49	1	0.128	0.11	0.018	0.023	0.005	0.6	16.1	0.1	28.6	0.1
7914819.97	563606.029	530.698	MR1-08-156	16710	Baff2011	76.7	77.69	Hanging Wall Schist	Volcanic Tuff	8.48	1	0.167	0.17	0.01	0.025	0.082	0.3	14.8	1.4	47.4	4.4
7914289.124	563150.669	589.004	MR1-06-90	16718	Baff2011	14.21	15.17	Hanging Wall Schist	Volcanic Tuff	8.41	1	0.205	0.09	0.115	0.017	0.013	3.6	17.8	0.2	5.0	0.1
7914292.595	563143.225	587.556	MR1-06-90	16720	Baff2011	22.5	23.56	Hanging Wall Schist	Volcanic Tuff	8.31	1	0.265	0.11	0.155	0.013	0.019	4.8	12.6	0.3	2.6	0.1
7914224.949	563113.466	559.336	MR1-06-84	16746	Baff2011	44	44.93	Hanging Wall Schist	Volcanic Tuff	8.32	1	0.155	0.14	0.015	0.021	0.009	0.5	25.4	0.2	54.2	0.3
7914891.943	563633.365	514.512	MR1-08-150	MRARD10 066	AMEC_2010	95	96	Hanging Wall Schist	Volcanic Tuff	8.31	1	0.199	0.06	0.139	0.016	0.026	4.3	19	1.3	4.4	0.3
7914886.496	563645.046	529.871	MR1-08-150	MRARD10 067	AMEC_2010	75	75.9	Hanging Wall Schist	Volcanic Tuff	8.63	1	0.019	0.02	0.01	0.008	0.181	0.3	14.1	0.7	45.1	2.1
7914885.152	563647.929	533.663	MR1-08-147	MRARD10 089	AMEC_2010	70	71	Hanging Wall Schist	Volcanic Tuff	8.72	1	0.075	0.03	0.045	0.212	0.78	1.4	43.5	17.7	30.9	12.6
7914808.644	563630.319	562.638	MR1-08-153	MRARD10 098	AMEC_2010	35	36	Hanging Wall Schist	Volcanic Tuff	9.53	1	0.009	0.01	0.01	0.045	0.086	0.3	14.5	3.8	46.4	12.0
7914810.083	563627.231	558.578	MR1-08-156	MRARD10 112	AMEC_2010	40.3	41.3	Hanging Wall Schist	Volcanic Tuff	9.02	3	0.009	0.01	0.01	0.871	4.03	0.3	83.7	72.6	267.8	232.3

Table A-2: NAG pH Results for the 5 Year Pit

Easting	Northing	Elevation	Hole ID	Sample ID	Program	From	To	Waste Classification	Lithology	NAG pH after Reaction	Volume of 0.1 N NaOH (mL)		NAG (kg H_2SO_4/tonne)	
											to pH 4.5	to pH 7	to pH 4.5	to pH 7
7914597.909	563141.566	651.436	MR1-12-224	15482	Baff2012	27.5	29.5	Footwall Schist	Gniess	7.89	0	0	0	0
7914599.171	563139.381	648.73	MR1-12-224	15484	Baff2012	31.3	33.1	Footwall Schist	Gniess	8.17	0	0	0	0
7914147.995	562951.331	626.809	MR1-12-225	15702	Baff2012	14	16	Footwall Schist	Gniess	8.02	0	0	0	0
7914148.592	562950.105	625.346	MR1-12-225	15703	Baff2012	16	18	Footwall Schist	Gniess	7.67	0	0	0	0
7914150.386	562946.428	620.958	MR1-12-225	15706	Baff2012	22	24	Footwall Schist	Gniess	7.97	0	0	0	0
7914152.18	562942.75	616.57	MR1-12-225	15709	Baff2012	28	30	Footwall Schist	Gniess	7.83	0	0	0	0
7914153.376	562940.298	613.644	MR1-12-225	15711	Baff2012	32	34	Footwall Schist	Gniess	7.71	0	0	0	0
7914154.572	562937.846	610.719	MR1-12-225	15713	Baff2012	36	38	Footwall Schist	Gniess	8.09	0	0	0	0
7914155.768	562935.394	607.793	MR1-12-225	15715	Baff2012	40	42	Footwall Schist	Gniess	7.9	0	0	0	0
7914156.919	562933.034	604.978	MR1-12-225	15717	Baff2012	44	45.7	Footwall Schist	Gniess	8.12	0	0	0	0
7914464.386	563109.225	573.328	MR1-08-145	16310	Baff2011	132.5	133.65	Footwall Schist	Gniess	7.49	0	0	0	0
7914469.619	563098.002	571.144	MR1-08-145	16312	Baff2011	145.2	146.1	Footwall Schist	Gniess	7.87	0	0	0	0
7914472.537	563091.745	569.927	MR1-08-145	16314	Baff2011	152.16	153.16	Footwall Schist	Gniess	7.75	0	0	0	0
7914152.497	562936.858	635.446	MR1-07-118	16518	Baff2011	14.61	15.56	Footwall Schist	Gniess	7.13	0	0	0	0
7914148.235	562949.976	631.75	MR1-07-118	16520	Baff2011	28.9	29.83	Footwall Schist	Gniess	7.46	0	0	0	0
7914347.059	563026.427	564.832	MR1-06-90	16726	Baff2011	153.4	154.38	Footwall Schist	Gniess	7.46	0	0	0	0
7913890.018	563090.826	509.355	MR1-09-179	MRARD10 004	AMEC_2010	160	161	Footwall Schist	Gniess	7.72	0	0	0	0
7913878.955	563080.142	504.945	MR1-09-179	MRARD10 005	AMEC_2010	176	177	Footwall Schist	Gniess	7.3	0	0	0	0
7914840.815	563394.858	577.665	MR1-08-161	MRARD10 057	AMEC_2010	160	161	Footwall Schist	Gniess	3.46	0.7	1.6	2.3	5.2
7914540.881	563152.285	567.574	MR1-08-140	MRARD10 104	AMEC_2010	165	166	Footwall Schist	Gniess	7.35	0	0	0	0
7914654.151	563267.972	491.753	MR1-06-105	16076	Baff2011	182.01	182.96	Footwall Schist	High Grade Iron Formation	3.42	1.24	10.76	4	35
7914649.263	563279.902	502.306	MR1-06-105	16070	Baff2011	165.6	166.05	Footwall Schist	High Grade Iron Formation	7.08	0	0	0	0
7914651.088	563275.469	498.382	MR1-06-105	16072	Baff2011	171.52	172.52	Footwall Schist	High Grade Iron Formation	7.06	0	0	0	0
7914595.8	563145.219	655.96	MR1-12-224	15479	Baff2012	21.23	23.4	Footwall Schist	Schist	7.88	0	0	0	0
7914596.528	563143.958	654.398	MR1-12-224	15480	Baff2012	23.4	25.5	Footwall Schist	Schist	8.16	0	0	0	0
7914037.25	562928.144	573.304	MR1-12-226	15631	Baff2012	75.27	77.37	Footwall Schist	Schist	7.31	0	0	0	0
7914036.549	562926.826	571.702	MR1-12-226	15632	Baff2012	77.37	79.65	Footwall Schist	Schist	7.22	0	0	0	0
7914028.919	562912.476	554.274	MR1-12-226	15644	Baff2012	101.34	103.34	Footwall Schist	Schist	7.73	0	0	0	0
7914024.568	562904.293	544.335	MR1-12-226	15651	Baff2012	114.93	116.93	Footwall Schist	Schist	8.44	0	0	0	0
7914023.321	562901.947	541.487	MR1-12-226	15653	Baff2012	118.93	120.72	Footwall Schist	Schist	8.7	0	0	0	0
7914157.935	562930.95	602.491	MR1-12-225	15719	Baff2012	47.4	49.1	Footwall Schist	Schist	10.35	0	0	0	0
7914159.056	562928.651	599.749	MR1-12-225	15721	Baff2012	51	53	Footwall Schist	Schist	10.45	0	0	0	0
7914020.687	562896.994	535.471	MR1-12-226	15658	Baff2012	127.05	129.05	Footwall Schist	Schist	8.26	0	0	0	0
7914655.524	563264.597	488.761	MR1-06-105	16078	Baff2011	186.7	187.7	Footwall Schist	Schist	7.62	0	0	0	0
7914342.277	563036.682	566.827	MR1-06-90	16722	Baff2011	141.9	142.9	Footwall Schist	Schist	2.89	5.21	9.28	17.1	30
7914343.44	563034.188	566.342	MR1-06-90	16724	Baff2011	144.7	145.69	Footwall Schist	Schist	7.82	0	0	0	0
7914786.719	563340.21	594.098	MR1-08-163	MRARD10 035	AMEC_2010	155	156	Footwall Schist	Schist	7.64	0	0	0	0
7914767.99	563380.374	601.912	MR1-08-163	MRARD10 047	AMEC_2010	110	111	Footwall Schist	Schist	7.56	0	0	0	0
7914778.395	563358.061	597.571	MR1-08-163	MRARD10 049	AMEC_2010	135	136	Footwall Schist	Schist	7.55	0	0	0	0
7914652.408	563272.251	495.535	MR1-06-105	16074	Baff2011	176	177.03	Footwall Schist	Ultramafic	7.58	0	0	0	0
7914607.255	563539.17	498.078	MR1-05-72	16022	Baff2011	92.7	93.65	Hanging Wall Schist	Amphibolite	7.68	0	0	0	0
7914609.72	563534.114	491.375	MR1-05-72	16024	Baff2011	101.4	102.45	Hanging Wall Schist	Amphibolite	6.84	0	0.05	0	0.2
7914755.246	563588.198	564.313	MR1-05-77	16590	Baff2011	41.13	42.1	Hanging Wall Schist	Amphibolite	9.02	0	0	0	0
7914758.512	563581.502	555.435	MR1-05-77	16592	Baff2011	52.71	53.7	Hanging Wall Schist	Amphibolite	9.65	0	0	0	0
7914760.988	563576.426	548.705	MR1-05-77	16594	Baff2011	61.5	62.48	Hanging Wall Schist	Amphibolite	7.85	0	0	0	0
7914763.569	563571.134	541.688	MR1-05-77	16596	Baff2011	70.65	71.65	Hanging Wall Schist	Amphibolite	9.99	0	0	0	0
7914772.622	563552.572	517.075	MR1-05-77	16604	Baff2011	102.8	103.76	Hanging Wall Schist	Amphibolite	5.42	0	0.36	0	1.2
7914775.024	563547.646	510.544	MR1-05-77	16606	Baff2011	111.32	112.29	Hanging Wall Schist	Amphibolite	7.19	0	0	0	0
7914766.867	563564.372	532.721	MR1-05-77	16600	Baff2011	82.35	83.36	Hanging Wall Schist	Gniess	6.89	0	0.6	0	1.9
7914769.349	563559.282	525.973	MR1-05-77	16602	Baff2011	91.15	92.18	Hanging Wall Schist	Gniess	7.56	0	0	0	0
7914749.753	563599.461	579.247	MR1-05-77	16586	Baff2011	21.62	22.62	Hanging Wall Schist	Metasediment	7.7	0	0	0	0
7914752.385	563594.064	572.092	MR1-05-77	16588	Baff2011	30.96	31.96	Hanging Wall Schist	Metasediment	7.65	0	0	0	0
7914801.516	563645.605	582.739	MR1-08-156	16694	Baff2011	8.73	9.79	Hanging Wall Schist	Metasediment	9.76	0	0	0	0
7914803.299	563641.781	577.71	MR1-08-156	16696	Baff2011	15.34	16.31	Hanging Wall Schist	Metasediment	7.85	0	0	0	0
7914765.211	563567.766	537.222	MR1-05-77	16598	Baff2011	76.5	77.46	Hanging Wall Schist	Schist	7.58	0	0	0	0
7914821.987	563601.703	525.01	MR1-08-156	16712	Baff2011	84.07	85.17	Hanging Wall Schist	Schist	7.07	0	0	0	0
7914824.14	563597.087	518.939	MR1-08-156	16714	Baff2011	92.03	93.06	Hanging Wall Schist	Schist	6.99	0	0.07	0	0.2
7914826.342	563592.365	512.731	MR1-08-156	16716	Baff2011	100.18	101.12	Hanging Wall Schist	Schist	6.45	0	0.11	0	0.4
7914217.513	563129.414	580.306	MR1-06-84	16740	Baff2011	16.55	17.63	Hanging Wall Schist	Schist	7.42	0	0	0	0
7914219.703	563124.716	574.128	MR1-06-84	16742	Baff2011	24.68	25.63	Hanging Wall Schist	Schist	6.97	0	0.05	0	0.2
7914222.7	563118.29	565.679	MR1-06-84	16744	Baff2011	35.7	36.67	Hanging Wall Schist	Schist	7.71	0	0	0	0
7914227.474	563108.051	552.215	MR1-06-84	16748	Baff2011	53.21	54.31	Hanging Wall Schist	Schist	7.64	0	0	0	0
7913979.772	563177.5	545.133	MR1-09-179	MRARD10 002	AMEC_2010	30.2	31.2	Hanging Wall Schist	Schist	7.67	0	0	0	0
7913969.538	563167.617	541.054	MR1-09-179	MRARD10 003	AMEC_2010	45	46	Hanging Wall Schist	Schist	7.4	0	0	0	0
7914042.297	563235.419	498.607	MR1-09-177	MRARD10 007	AMEC_2010	55	56	Hanging Wall Schist	Schist	6.9	0	0.1	0	0.3
7914493.018	563254.927	587.544	MR1-08-140	MRARD10 068	AMEC_2010	50	51	Hanging Wall Schist	Schist	2.8	4.5	7.3	15	24
7914820.868	563604.104	528.166	MR1-08-153	MRARD10 078	AMEC_2010	80	81	Hanging Wall Schist	Schist	6.86	0	0.1	0	0.3
7914890.585	563636.278	518.342	MR1-08-147	MRARD10 086	AMEC_2010	90	91	Hanging Wall Schist	Schist	7.24	0	0	0	0
7914904.285	563604.232	579.229	MR1-08-142	MRARD10 092	AMEC_2010	30	31	Hanging Wall Schist	Schist	4.27	0.1	1	0.3	3.3
7914895.95	563624.772	503.213	MR1-08-147	MRARD10 094	AMEC_2010	110	110.5	Hanging Wall Schist	Schist	6.92	0	0.1	0	0.3
7914826.301	563592.452	512.846	MR1-08-153	MRARD10 101	AMEC_2010	100	101	Hanging Wall Schist	Schist	7.18	0	0	0	0
7914815.435	563615.755	543.487	MR1-08-156	MRARD10 117	AMEC_2010	60	61	Hanging Wall Schist	Schist	6.96	0	0.1	0	0.3
7914820.977	563603.871	527.86	MR1-08-156	MRARD10 119	AMEC_2010	80.8	81	Hanging Wall Schist	Schist	8.33	0	0	0	0
7914826.301	563592.452	512.846	MR1-08-156	MRARD10 122	AMEC_2010	100	101	Hanging Wall Schist	Schist	6.64	0	0.4	0	1.3
7914420.445	563203.455	591.661	MR1-08-145	MRARD10 126	AMEC_2010	27	28	Hanging Wall Schist	Schist	7.5	0	0	0	0
7914836.569	563574.057	590.725	MR1-08-143	MRARD10 127	AMEC_2010	20	21	Hanging Wall Schist	Schist	7.36	0	0	0	0
7914814.05	563618.726	547.394	MR1-08-153	MRARD10 130	AMEC_2010	54.9	55.9	Hanging Wall Schist	Schist	9.04	0	0	0	0
7914212.854	563309.016	491.231	MR1-05-46	16470	Baff2011	55.72	56.72	Hanging Wall Schist	Volcanic Tuff	7.93	0	0	0	0
7914805.377	563637.324	571.85	MR1-08-156	16698	Baff2011	23	23.95	Hanging Wall Schist	Volcanic Tuff	11.01	0	0	0	0
7914808.323	563631.006	563.542	MR1-08-156	16700	Baff2011	33.82	34.82	Hanging Wall Schist	Volcanic Tuff	10.99	0	0	0	0
7914810.885	563625.513	556.319	MR1-08-156	16702	Baff2011	43.25	44.25	Hanging Wall Schist	Volcanic Tuff	10.7	0	0	0	0
7914813.19	563620.57	549.819	MR1-08-156	16704	Baff2011	51.73	52.74	Hanging Wall Schist	Volcanic Tuff	10.57	0	0	0	0
7914815.036	563616.611	544.613	MR1-08-156	16706	Baff2011	58.53	59.53	Hanging Wall Schist	Volcanic Tuff	8.31	0	0	0	0
7914816.895	563612.624	539.37	MR1-08-156	16708	Baff2011	65.37	66.38	Hanging Wall Schist	Volcanic Tuff	7.7	0	0	0	0
7914819.97	563606.029	530.698	MR1-08-156	16710	Baff2011	76.7	77.69	Hanging Wall Schist	Volcanic Tuff	7.97	0	0	0	0
7914289.124	563150.669	589.004	MR1-06-90	16718	Baff2011	14.21	15.17	Hanging Wall Schist	Volcanic Tuff	7.08	0	0	0	0
7914292.595	563143.225	587.556	MR1-06-90	16720	Baff2011	22.5	23.56	Hanging Wall Schist	Volcanic Tuff	6.29	0	0.13	0	0.4
7914224.949	563113.466	559.336	MR1-06-84	16746	Baff2011	44	44.93	Hanging Wall Schist	Volcanic Tuff	7.59	0	0	0	0
7914891.943	563633.365	514.512	MR1-08-150	MRARD10 066	AMEC_2010	95	96	Hanging Wall Schist	Volcanic Tuff	7.22	0	0	0	0
7914886.496	563645.046	529.871	MR1-08-150	MRARD10 067	AMEC_2010	75	75.9	Hanging Wall Schist	Volcanic Tuff	7.71	0	0	0	0
7914885.152	563647.929	533.663	MR1-08-147	MRARD10 089	AMEC_2010	70	71	Hanging Wall Schist	Volcanic Tuff	9.48	0	0	0	0
7914808.644	563630.319	562.638	MR1-08-153	MRARD10 098	AMEC_2010	35	36	Hanging Wall Schist	Volcanic Tuff	7.7	0	0	0	0
7914810.083	563627.231	558.578	MR1-08-156	MRARD10 112	AMEC_2010	40.3	41.3	Hanging Wall Schist	Volcanic Tuff	9.8	0	0	0	0

Table A-3: Summary of ABA Results

		Paste pH	Total Sulphur	Sulphate	Sulphide*	Total Carbon	Carbonate	AP	NP	CarbNP	NPR	CarbNPR
			%					kg CaCO3/t				
Footwall Schist (5 Year Pit)	Count	40	40	40	40	40	40	40	40	40	40	40
	Min	6.4	0.005	0.010	0.010	0.0050	0.0050	0.31	5.3	0.083	0.21	0.019
	Max	10	5.6	1.5	4.2	3.3	7.7	130	59	129	176	345
	Median	9.1	0.011	0.010	0.010	0.021	0.030	0.31	13	0.54	36	1.6
	Average		0.32	0.100	0.23	0.28	0.65	7.1	17	11.0	2.4	1.5
	Standard Deviation	0.89	1.0	0.26	0.74	0.77	1.8	23	12.0	30	35	55
	10th Percentile	7.7	0.005	0.010	0.010	0.012	0.0050	0.31	7.2	0.083	1.4	0.19
	90th Percentile	9.6	0.53	0.21	0.31	0.51	1.01	9.5	29	17	78	17
Footwall Schist (LOM Pit)	Count	143	143	143	143	143	143	143	143	143	143	143
	Min	4.8	0.005	0.010	0.010	0.005	0.0050	0.3125	4.6000	0.08	0.2	0.003
	Max	10	5.6	1.5	4.15	3.3	10.7	129.7	70.5	178	176	345
	Median	8.9	0.044	0.020	0.010	0.015	0.011	0.313	13.000	0.50	23	0.99
	Average		0.29	0.07	0.225	0.20	0.50	7.04	15.94	8.5	2	1.2
	Standard Deviation	0.86	0.70	0.15	0.58	0.62	1.61	18.0	10.86	27	27	30
	10th Percentile	7.7	0.005	0.010	0.010	0.006	0.005	0.313	7.3600	0.08	1	0.04
	90th Percentile	10	0.74	0.14	0.716	0.218	0.85	22.4	25.92	14.2	62	7
Hanging Wall Schist (5 Year Pit)	Count	53	53	53	53	53	53	53	53	53	53	53
	Min	7.4	0.005	0.010	0.010	0.0050	0.0050	0.31	7.0	0.083	0.41	0.019
	Max	9.7	1.2	0.29	0.97	1.1	4.7	30	104	79	268	232
	Median	8.5	0.11	0.060	0.019	0.021	0.037	0.59	16	1.0	26	1.3
	Average		0.14	0.070	0.076	0.11	0.44	2.4	23	8.0	9.5	3.4
	Standard Deviation	0.58	0.19	0.061	0.14	0.25	1.1	4.5	20	19	42	39
	10th Percentile	7.9	0.005	0.010	0.010	0.0088	0.0050	0.31	11	0.090	4.1	0.069
	90th Percentile	9.5	0.26	0.14	0.15	0.22	0.97	4.7	31	18	55	20
Hanging Wall Schist (LOM Pit)	Count	270	270	270	270	270	270	270	270	270	270	270
	Min	4.3	0.005	0.010	0.010	0.005	0.0050	0.3125	-6.5000	0.08	0.0	0.000
	Max	9.8	22.2	5.5	22.19	6.69	30.8	693.4	487.00	514	621	571
	Median	8.4	0.12	0.04	0.057	0.022	0.022	1.766	17.5500	0.62	13	0.4
	Average		0.60	0.12	0.485	0.259	0.97	15.14	26.450	16.7	2	1.1
	Standard Deviation	0.68	2.04	0.39	1.807	0.83	3.35	56.5	45.84	56.1	50	41
	10th Percentile	7.7	0.008	0.010	0.010	0.010	0.0050	0.3125	7.7000	0.08	0	0.009
	90th Percentile	9.6	0.90	0.18	0.72	0.37	1.26	22.43	33.40	21.0	73	19

*As total sulphur - sulphate

Table A-4: Elemental Content Results for the 5 Year Pit

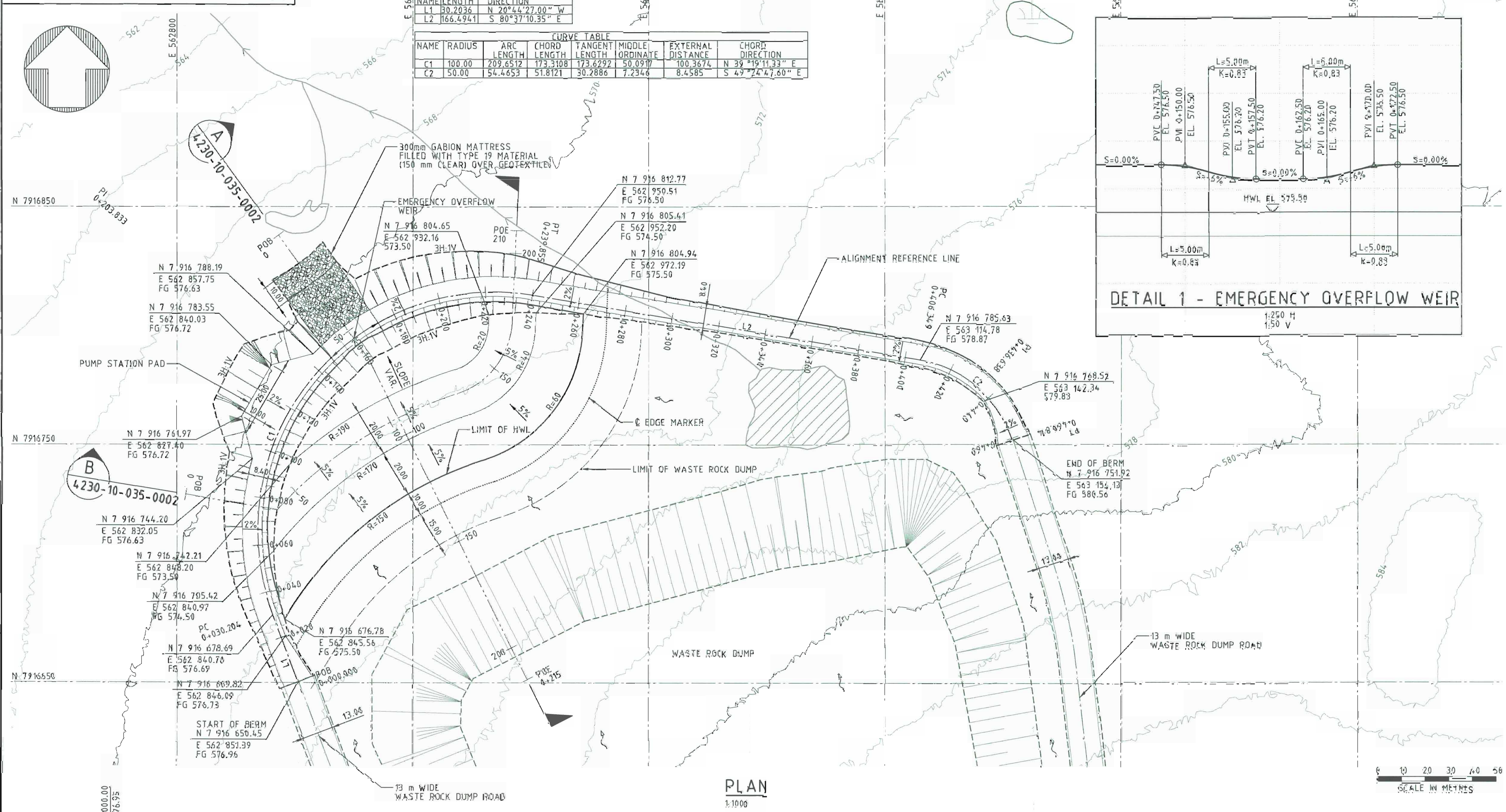
Easting	Northing	Elevation	Hole ID	Sample ID	Program	From	To	Waste Classification	Lithology	Hg	Au	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Se	Sn	Sr	Ti	Tl	U	V	Y	Zn
										µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
									Avg Crustal	0.085	0.004	0.075	82300	1.8	425	3	0.025	41500	0.15	25	102	60	56300	20850	20	23300	950	1.2	23550	84	1050	14	350	0.2	0.05	2.3	370	5650	0.85	2.7	120	33	70
									10x Avg Crustal	0.85	0.04	0.75	823000	18	4250	30	0.25	415000	1.5	250	1020	600	563000	208500	200	233000	9500	12	235500	840	10500	140	3500	2	0.5	23	3700	56500	8.5	27	1200	330	700
7914597.909	563141.566	651.436	MR1-12-224	15482	Baff2012	27.5	29.5	Footwall Schist	Gniess	0.1			33000	0.7	530	0.63	0.16	250	0.03	16	210	33	52000	19000	20	16000	240	8.2	440	68		10	170	0.8	0.7	1.3	2.6	1200	0.55	4.9	23		26
7914599.171	563139.381	648.73	MR1-12-224	15484	Baff2012	31.3	33.1	Footwall Schist	Gniess	0.1			30000	0.5	300	0.37	0.09	500	0.02	6.7	100	12	42000	20000	11	14000	120	6.6	550	14		5.1	160	0.8	0.7	1.2	2.6	980	0.39	6.8	12		3.9
7914147.995	562951.331	626.809	MR1-12-225	15702	Baff2012	14	16	Footwall Schist	Gniess	0.1			25000	4	200	0.78	0.13	1700	0.04	23	73	25	44000	7900	32	14000	320	0.5	240	29		3.2	69	0.8	0.7	0.5	3.8	670	0.25	2.4	8		27
7914148.592	562950.105	625.346	MR1-12-225	15703	Baff2012	16	18	Footwall Schist	Gniess	0.1			18000	1.8	190	0.46	0.09	1200	0.05	9.5	71	17	29000	6100	11	9100	220	0.4	300	11		4.8	60	0.8	0.7	0.5	3.3	520	0.18	1.3	7		22
7914150.386	562946.428	620.958	MR1-12-225	15706	Baff2012	22	24	Footwall Schist	Gniess	0.1			33000	0.5	210	0.56	0.09	1600	0.04	11	190	2.8	42000	11000	19	21000	530	0.3	310	48		2.9	61	0.8	0.7	0.5	3.2	810	0.29	1.5	26		38
7914152.18	562942.75	616.57	MR1-12-225	15709	Baff2012	28	30	Footwall Schist	Gniess	0.1			36000	0.5	320	0.69	0.09	1100	0.02	7.2	72	4.5	43000	17000	19	20000	550	0.3	390	8.1		3.3	52	0.8	0.7	0.5	2.6	1100	0.45	1.8	10		26
7914153.376	562940.298	613.644	MR1-12-225	15711	Baff2012	32	34	Footwall Schist	Gniess	0.1			18000	0.5	200	0.38	0.09	370	0.02	6.4	110	4.5	20000	9200	9	8700	200	0.3	350	19		2.1	41	0.8	0.7	0.5	3	490	0.22	1.6	10		14
7914154.572	562937.846	610.719	MR1-12-225	15713	Baff2012	36	38	Footwall Schist	Gniess	0.1			32000	0.5	190	0.52	0.09	1400	0.02	12	59	2.8	48000	15000	16	18000	530	0.3	400	25		2.1	61	0.8	0.7	0.5	2.6	1200	0.49	1.3	34		18
7914155.768	562935.394	607.793	MR1-12-225	15715	Baff2012	40	42	Footwall Schist	Gniess	0.1			24000	0.8	250	0.59	0.09	870	0.02	4.9	62	4.1	32000	13000	13	12000	370	0.3	370	5.9		2.2	54	0.8	0.7	0.5	2.8	860	0.37	1.9	6		23
7914156.919	562933.034	604.978	MR1-12-225	15717	Baff2012	44	45.7	Footwall Schist	Gniess	0.1			34000	0.5	390	0.64	0.38	6500	0.27	5.2	63	17	41000	18000	42	27000	1100	0.3	320	5.4		4.8	160	0.8	0.7	1.6	9.8	1500	0.51	2.5	12		74
7914464.386	563109.225	573.328	MR1-08-145	16310	Baff2011	132.5	133.65	Footwall Schist	Gniess	0.1	0.02	0.03	20000	0.7	85	0.76	0.09	1400	0.02	7.1	110	3.7	35000	6900	12	11000	170	2.2	140	9	570	1.7		0.8	0.7	0.5	4	640	0.13	2.1	14	5.4	12
7914469.619	563098.002	571.144	MR1-08-145	16312	Baff2011	145.2	146.1	Footwall Schist	Gniess	0.1	0.02	0.07	29000	0.6	86	0.69	0.09	860	0.02	13	88	8.7	49000	11000	19	19000	560	1.7	240	34	210	1.6		0.8	0.7	0.5	3.9	550	0.23	2	20	2.2	27
7914472.537	563091.745	569.927	MR1-08-145	16314	Baff2011	152.16	153.16	Footwall Schist	Gniess	0.1	0.02	0.06	26000	0.5	260	0.42	0.21	3000	0.03	12	130	32	41000	18000	22	17000	580	1.7	470	30	1200	1.9		0.8	0.7	0.6	5.4	2400	0.33	2.6	31	12	47
7914152.497	562936.858	635.446	MR1-07-118	16518	Baff2011	14.61	15.56	Footwall Schist	Gniess	0.1	0.02	0.03	19000	1.4	140	0.31	0.09	1000	0.03	4.4	120	31	38000	8900	13	8600	230	2.8	220	5.3	320	4.3		0.8	0.7	0.5	1.7	1000	0.28	1.5	2	2.3	36
7914148.235	562949.976	631.75	MR1-07-118	16520	Baff2011	28.9	29.83	Footwall Schist	Gniess	0.1	0.02	0.04	15000	1.2	180	0.29	0.09	1200	0.03	7.9	76	4.5	24000	4200	8	9400	180	0.8	240	17	530	2.8		0.8	0.7	0.5	2.8	370	0.09	1.8	7	3.4	23
7914347.059	563026.427	564.832	MR1-06-90	16726	Baff2011	153.4	154.38	Footwall Schist	Gniess	0.1	0.02	0.01	34000	0.5	360	1.2	0.1	830	0.02	10	91	28	46000	17000	20	22000	170	3.8	430	12	390	3.5		0.8	0.7	1.4	5.7	2300	0.33	2.2	32	3.7	26
7913890.018	563090.826	509.355	MR1-09-179	MRARD10 004	AMEC_2010	160	161	Footwall Schist	Gniess	0.1			83000	0.6	230	2.5	0.09	1800	0.2	18	28	1.8	130000	10000	36	82000	310	15	280	85		2.3		0.8	0.7	3.3	6.3	1100	0.21	1.8	46		22
7913878.955	563080.142	504.945	MR1-09-179	MRARD10 005	AMEC_2010	176	177	Footwall Schist	Gniess	0.1			77000	0.6	39	2.8	0.09	1700	0.2	14	91	15	130000	4800	38	70000	1800	8	160	55		4.6		0.8	0.7	4.6	6.8	420	0.12	1.3	53		53
7914840.815	563394.858	577.665	MR1-08-161	MRARD10 057	AMEC_2010	160	161	Footwall Schist	Gniess	0.1			59000	0.5	0.9	2.2	0.19	4900	0.2	24	390	6.4	150000	180	29	59000	490	0.3	97	140		4		1.4	0.7	2.9	6.4	650	0.05	3.4	78		36
7914540.881	563152.285	567.574	MR1-08-140	MRARD10 104	AMEC_2010	165	166	Footwall Schist	Gniess	0.1			47000	0.5	960	0.35	0.11	1900	0.2	18	59	70	63000	29000	5	21000	170	1	750	17		32		0.8	0.7	3	8.4	2600	0.71	1.4	140		9.3
7914654.151	563267.972	491.753	MR1-06-105	16076	Baff2011	182.01	182.96	Footwall Schist	High Grade Iron Formation	0.1	0.15	1.3	11000	0.5	0.98	0.79	0.93	15000	0.1	19	36	380	400000	41	2	15000	9300	3.2	28	56	5400	4.7		0.8	2.6	0.5	16	300	0.02	0.69	42	14	18
7914649.263	563279.902	502.306	MR1-06-105	16070	Baff2011	165.6	166.05	Footwall Schist	High Grade Iron Formation	0.1	0.02	0.36	3700	2.2	3.1	0.21	0.25	3600	0.38	17	21	31	470000	150	2	17000	11000	13	31	43	32	8.8		0.8	0.7	1	0.82	220	0.02	0.42	22	3	33
7914651.088	563275.469	498.382	MR1-06-105	16072	Baff2011	171.52	172.52	Footwall Schist	High Grade Iron Formation	0.1	0.02	0.41	1700	14	1.4	0.43	0.24	10000	0.14	23	29	72	470000	40	2	13000	11000	2.7	56	40	99	4.6		0.8	1.3	0.7	2.6	72	0.07	0.66	15	6.1	21
7914595.8	563145.219	655.96	MR1-12-224	15479	Baff2012	21.23	23.4	Footwall Schist	Schist	0.1			67000	1	45	2	0.97	350	0.06	31	64	16	220000	1100	244	39000	1600	8.9	110	100		2.5	140	0.8	0.7	0.6	3	380	0.03	5.8	62		110
7914596.528	563143.958	654.398	MR1-12-224	15480	Baff2012	23.4	25.5	Footwall Schist	Schist	0.1			68000	0.5	570	1.3	0.32	1100	0.04	24	230	5.1	160000	20000	32	43000	660	3	360	97		8.8	180	0.8	0.7	1.4	3.6	1800	0.63	4	70		41
7914037.25	562928.144	573.304	MR1-12-226	15631	Baff2012	75.27	77.37	Footwall Schist	Schist	0.1			45000	77	34	0.81	2.3	130	0.17	12	100	180	230000	340	5	27000	1300	158	56	34		6	1100	0.8	6.2	2.1	1.2	210	0.04	0.84	110		100
7914036.549	562926.826	571.702	MR1-12-226	15632	Baff2012	77.37	79.65	Footwall Schist	Schist	0.1			48000	147	9.5	0.64	0.84	110	0.13	11	150	170	170000	180	7	29000	1300	89	71	44		7.2	1200	0.8	2.6	0.8	1.8	190	0.03	0.89	130		78
7914028.919	562912.476	554.274	MR1-12-226	15644	Baff2012	101.34	103.34	Footwall Schist	Schist	0.1			80000	2.2	2.9	0.93	0.09	801	0.02	40	600	7.9	180000	130	2	68000	360	3	50	260		1.8	79	0.8	0.7	0.6	1.3	270	0.02	1.2	100		71
7914024.568	562904.293	544.335	MR1-12-226	15651	Baff2012	114.93	116.93	Footwall Schist	Schist	0.1			81000	0.6	140	0.84	0.1	2100	0.04	13	22	6.5	130000	4200	9	66000	420	2.7	120	15		2.7	79	0.8	0.7	0.7	6.5	680	0.11	3	48		81
7914023.321	562901.947	541.487	MR1-12-226	15653	Baff2012	118.93	120.72	Footwall Schist	Schist	0.1			84000	0.6	290	1.2	0.09	2700	0.03	18	16	6.6	110000	11000	23	70000	560	0.3	270	17		4.1	70	0.8	0.7	1.8	8.2	960	0.23	3.4	48		71
7914157.935	562930.95	602.491	MR1-12-225	15719	Baff2012	47.4	49.1	Footwall Schist	Schist	0.1			28000	0.5	160	0.71	0.36	17000	0.07	6.6	51	9.6	29000	14000	28	19000	1200	1.4	520	13		7.9	890	0.8	0.7	0.8	16	1400	0.45	1.7	23		41
7914159.056	562928.651	599.749	MR1-12-225	15721	Baff2012	51	53	Footwall Schist	Schist	0.1			29000	0.5	180	0.72	0.09	19000	0.05	5.5	56	7.1	29000	15000	24	14000	1000	0.9	820	7.8		6.6	470	0.8	0.7	0.7	28	1500	0.43	2.2	16		31
7914020.687	562896.994	535.471	MR1-12-226	15658	Baff2012	127.05	129.05	Footwall Schist	Schist	0.1			63000	0.5	1600	1.1	0.12	2700	0.02	12	68	6.2	91000	39000	35	36000	83	1	1100	20		13	99	0.8	0.7	3.8	12	3100	1.1	2.1	59		13
7914655.524	563264.597	488.761	MR1-06-105	16078	Baff2011	186.7	187.7	Footwall Schist	Schist	0.1	0.02	0.03	50000	0.5	700	0.91	0.09	2100	0.04	11	12	15	92000	28000	19	23000	630	1.4	430	17	950	15		0.8	0.7	1.3	3.1	2900	1.1	8.4	40	9	18
7914342.277	563036.682	566.827	MR1-06-90	16722	Baff2011	141.9	142.9	Footwall Schist	Schist	0.1	0.02	0.48	71000	0.8	6.3	1.5	0.48	390	0.33	52	35	13	180000	880	66	91000	410	360	360	140	45	16		0.8	0.7	1.3	1.9	380	0.08	0.68	60	1.1	77
7914343.44	563034.188	566.342	MR1-06-90	16724	Baff2011	144.7	145.69	Footwall Schist	Schist	0.1	0.02	0.08	31000	2	3.1	0.41	0.39	1400	0.03	7	63	6.2	270000	330	7	28000	540	7.7	86	19	250	1.3		0.8	0.7	0.9	1.8	270	0.06	0.49	14	1.4	55
7914786.719	563340.21	594.098	MR1-08-163	MRARD10 035	AMEC_2010	155	156	Footwall Schist	Schist	0.1			61000	11	28	0.69	0.09	2700	0.2	29	350	33	130000	350	9	47000	580	2	93	110		3.7		0.8	0.7	1.2	7.8	240	0.03	0.5	170		51
7914767.99	563380.374	601.912	MR1-08-163	MRARD10 047	AMEC_2010	110	111	Footwall Schist	Schist	0.1			59000	0.5	450	0.71	0.09	1000	0.2	8.6	55	11	77000	34000	17	25000	320	4.4	860	18		16		0.8	0.7	1.1	2.9	2100	1.6	2.5	21		15
7914778.395	563358.061	597.571	MR1-08-163	MRARD10 049	AMEC_2010	135	136	Footwall Schist	Schist	0.1			100000	0.7	15	5	0.09	1900	0.2	15	68	1.9	130000	1200	13	89000	5900	2.5	110	49		1.7		0.8	0.7	2.5	3.4	1400	0.04	1.5	77		72
7914652.408	563272.251	495.535	MR1-06-105	16074	Baff2011	176	177.03	Footwall Schist	Ultramafic	0.1	0.02	0.01	41000	0.5	15	1	0.1	8100	0.11	17	330	3.1	58000	450	4	41000	200	1.7	31	95	3400	2.7		0.8	0.7	0.5	12	250	0.03	2.7	92	10	49
7914607.255	563539.17	498.078	MR1-05-72	16022	Baff2011	92.7	93.65	Hanging Wall Schist	Amphibolite	0.1	0.02	0.01	44000	0.5	320	1.2	0.09	410	0.03	26	110	34	60000	20000	98	21000	230	0.6	350	100	34	6.1		0.8	0.7	1.3	9.7	1800	0.78	1.2	110	2.2	14
7914609.72	563534.114	491.375	MR1-05-72	16024	Baff2011	101.4	102.45	Hanging Wall Schist	Amphibolite	0.1	0.02	0.03	47000	0.5	180	0.39	0.09	310	0.02	27	160	82	82000	14000	40	30000	300	0.4	230	120	7	2.3		0.8	0.7	0.5	5.1	1400	0.41	0.066	150	0.9244	
7914755.246	563588.198	564.313	MR1-05-77	16590	Baff2011	41.13	42.1	Hanging Wall Schist	Amphibolite	0.1	0.02	0.07	21000	0.5	15	0.07	0.09	17000	0.06	11	59	110	19000	1700	15	11000	310	0.5	1100	30	220	1.4		0.8	0.7	0.5	13	930	0.02	0.02	41	3.5	32
7914758.512	563581.502	555.435	MR1-05-77	16592	Baff2011	52.71	53.7	Hanging Wall Schist	Amphibolite	0.1	0.02	0.06	26000	0.5	53	0.06	0.09	22000	0.03	27	130	130	22000	5800	22	10000	300	0.5	1900	110	300	1.8		0.8	0.7	0.5	23	2200	0.21	0.021	91	3.832	
7914760.988	563576.426	548.705	MR1-05-77	16594	Baff2011	61.5	62.48	Hanging Wall Schist	Amphibolite	0.1	0.02	0.04	31000	0.5	31	0.08	0.09	24000	0.05	25	89	92	25000	2300	23	12000	430	0.4	1400	84	440	2.2		0.8	0.7	0.5	25	1300	0.08	0.043	72	5.3	38
7914763.569	563571.134	541.688	MR1-05-77	16596	Baff2011	70.65	71.65	Hanging Wall Schist	Amphibolite	0.1	0.02	0.09	23000	0.5	33	0.07	0.09	25000	0.08	19	65	110	21000	2400	10	7900	550	0.5	1400	69	240	2		0.8	0.7	0.5	18	1400	0.07	0.024	52	3.6	38
7914772.622	563552.572	517.075	MR1-05-77	16604	Baff2011	102.8	103.76	Hanging Wall Schist	Amphibolite	0.1	0.02	0.08	42000	1.3	260	0.16	0.09	1200	0.05	41	210	150	58000	17000	28	27000	230	0.5	460	110	440	3.3		0.8	0.7	0.5	8.4	2000	0.27	0.012	180	1.1	46
7914775.024	563547.646	510.544	MR1-05-77	16606	Baff2011	111.32	112.29	Hanging Wall Schist	Amphibolite	0.1	0.02	0.12	50000	1.1	640	0.12	0.09	320	0.22	50	250	120	69000	25000	56	32000	330	1.5	650	140	43	18		0.8	0.7	0.5	10	2800	0.26	0.012	170	0.63	59
7914766.867	563564.372	532.721	MR1-05-77	16600	Baff2011	82.35	83.36	Hanging Wall Schist	Gniess	0.1	0.02	0.03	43000	0.5	200	0.02	0.09	1200	0.02	45	150	120	63000	13000	19	29000	260	0.8	570	100	280	0.84		0.8	0.7	0.5	6	2000	0.2	0.01	190	1.4	52
7914769.349	563559.282	525.973	MR1-05-77	16602	Baff2011	91.15	92.18	Hanging Wall Schist	Gniess	0.1	0.02	0.03	38000	0.5	240	0.24	0.09	2600	0.02	45	150	73	54000	21000	9	21000	390	1.5	640	120	1100	1.3		0.8	0.7	0.7	18	2900	0.44	0.018	190	2.7	42
7914749.753	563599.461	579.247	MR1-05-77	16586	Baff2011	21.62	22.62	Hanging Wall Schist	Metasediment	0.1	0.02	0.05	18000	0.5	17	0.07	0.09	14000	0.04	11	78	110	11000	1500	16	7000	190	0.6	1700	31	300	0.64		0.8	0.7	0.5	18	980	0.03	0.06	49	2.6	16
7914752.385	563594.064	572.092	MR1-05-77	16588	Baff2011	30.96	31.96	Hanging Wall Schist	Metasediment	0.1	0.02	0.05	23000	0.5	16	0.07	0.09	11000	0.06	13	80	110	20000	1300	22	13000	190	0.3	1200	36	160	1.4		0.8	0.7	0.5	12	620	0.02	0.016	67	2.1	36
7914801.516	563645.605	582.739	MR1-08-156	16694	Baff2011	8.73	9.79	Hanging Wall Schist	Metasediment	0.1	0.02	0.07	20000	0.5	34	0.07	0.09	13000	0.02	25	170	100	13000	3300	39	11000	240	0.7	2000	68	340	0.62		0.8	0.7	0.5	21	1420	0.06	0.022	120	2.7	31
7914803.299	563641.781	577.71	MR1-08-156	16696	Baff2011	15.34	16.31	Hanging Wall Schist	Metasediment	0.1	0.02	0.08	14000	0.5	10	0.07	0.09	10000	0.04	12	77	94	13000	1700	24	7600	240	0.6	1600	38	280	2.2		0.8	0.7	0.5	15	1050	0.04	0.038	43	2.4	20
7914765.211	563567.766	537.222	MR1-05-77	16598	Baff2011	76.5	77.46	Hanging Wall Schist	Schist	0.1	0.02	0.03	26000	0.5	17	0.07	0.09	24000	0.06	13	60	72	14000	1700	8	6400	370	0.5	950	37	290	0.93		0.8	0.7	0.5	21	1300	0.03	0.02	55	3.2	23
7914821.987	563601.703	525.01	MR1-08-156	16712	Baff2011	84.07	85.17	Hanging Wall Schist	Schist	0.1	0.02	0.01	58000	0.5	600	0.44	0.09	1000	0.02	48	240	91	88000	26000	48	40000	330	1.4	510	150	240	4.5		0.8	1.3	0.5	7.9	2260	0.32	0.011	170	2.2	40
7914824.14	563597.087	518.939	MR1-08-156	16714	Baff2011	92.03	93.06	Hanging Wall Schist	Schist	0.1	0.02	0.01	53000	0.5	190	0.54	0.09	1100	0.02	53	230	60	98000	16000	55	37000	390	0.9	280	140	320	3.1		0.8	0.7	0.5	5.6	1430	0.17	0.008	160	2.8	25
7914826.342	563592.365	512.731	MR1-08-156	16716	Baff2011	100.18	101.12	Hanging Wall Schist	Schist	0.1	0.04	0.03	46000	0.5	2.1	0.38	0.09	5000	0.07	28	290	50	86000	160	9	54000	550	1	76	78	2200	2.2		0.8	0.7	0.5	10	410	0.02	1.6	60	2.8	47
7914217.513	563129.414	580.306	MR1-06-84	16740	Baff2011	16.55	17.63	Hanging Wall Schist	Schist	0.1	0.02	0.01	39000	2.1	2.6	0.23	0.09	710	0.14	12	230	9.2	82000	130	12	31000	150	2.6	86	110	340	5.3		0.8	0.7	0.5	7.2	180	0.02	1	35	2.8	145
7914219.703	563124.716	574.128	MR1-06-84	16742	Baff2011	24.68	25.63	Hanging Wall Schist	Schist	0.1	0.02	0.04	35000	1.5	13	0.12	0.09	110	0.12	13	250	22	68000	200	8	25000	77	1.9	86	110	58	4.5		0.8	0.7	0.5	0.85	310	0.02	1.4	40	2.1	42
7914222.7	563118.29	565.679	MR1-06-84	16744	Baff2011	35.7	36.67	Hanging Wall Schist	Schist	0.1	0.02	0.01	58000	0.6	1	0.3	0.09	250	0.02	29	640	6.2	120000	82	10	55000	750	1.6	97	290	57	0.63		0.8	0.7	0.7	1.2	200	0.02	0.77	57	1.8	46
7914227.474	563108.051	552.215	MR1-06-84	16748	Baff2011	53.21	54.31	Hanging Wall Schist	Schist	0.1	0.02	0.02	37000	3.8	6.1	0.91	0.09	140	0.04	49	380	11	140000	2400	14	31000	160	1.9	120	390	53	0.93		0.8	0.7	0.5	1.5	250	0.02	1	64	1.5	65
7913979.772	563177.5	545.133	MR1-09-179	MRARD10 002	AMEC_2010	30.2	31.2	Hanging Wall Schist	Schist	0.1			34000	0.6	520	0.32	0.09	1700	0.2	7.7	100	9.3	53000	18000	8	17000	130	4.4	430	14		3.7		0.8	0.7	3.7	7.5	2000	0.6	1.5	32		5.7
7913969.538	563167.617	541.054	MR1-09-179	MRARD10 003	AMEC_2010	45	46	Hanging Wall Schist	Schist	0.1			17000	0.7	99	0.62	0.09	480	0.2	5.3	120	79	23000	8600	7	8300	100	2.4	240	8.4		4.9		0.8	0.7	0.6	3.2	440	0.36	7.3	5		7.5
7914042.297	563235.419	498.607	MR1-09-177	MRARD10 007	AMEC_2010	55	56	Hanging Wall Schist	Schist	0.1			7900	16	3	0.58	0.09	1600	0.2	6.8	19	3.9	600000	130	3	8000	2600	1.7	120	18		1.9		0.8	0.7	0.7	3	180	0.02	0.35	11		7
7914493.018	563254.927	587.544	MR1-08-140	MRARD10 068	AMEC_2010	50	51	Hanging Wall Schist	Schist	0.1			60000	1.1	160	2.5	28	1700	0.2	48	150	169	160000	11000	36	33000	530	1.9	270	92		113		1.2	0.7	1.2	2.8	930	0.89	0.88	130		26
7914820.868	563604.104	528.166	MR1-08-153	MRARD10 078	AMEC_2010	80	81	Hanging Wall Schist	Schist	0.1			28000	0.5	160	1.2	0.09	640	0.2	9.9	74	1.6	35000	11000	11	15000	320	2	300	14		2.8		0.8	0.7	0.8	3.7	700	0.42	1.7	21		22
7914890.585	563636.278	518.342	MR1-08-147	MRARD10 086	AMEC_2010	90	91	Hanging Wall Schist	Schist	0.1			71000	0.5	0.01	2.4	0.09	1400	0.2	37	1260	15	170000	82	47	82000	1500	1	150	430		1.4		0.8	0.7	1.3	4.7	68	0.02	1.8	64		50
7914904.285	563604.232	579.229	MR1-08-142	MRARD10 092	AMEC_2010	30	31	Hanging Wall Schist	Schist	0.1			87000	0.7	2.9	0.69	0.11	6500	0.2	25	530	4.8	135000	47	6	58000	570	0.3	71	93		2.4		0.8	0.7	0.5	15	200	0.08	1.2	140		37
7914895.95	563624.772	503.213	MR1-08-147	MRARD10 094	AMEC_2010	110	110.5	Hanging Wall Schist	Schist	0.1			78000	0.5	5.8	1.2	0.24	1500	0.2	31	170	7.4	150000	490	39	63000	310	3.8	87	130		2.1		0.8	0.7	1.4	15	76	1.5	1	62		99
7914826.301	563592.452	512.846	MR1-08-153	MRARD10 101	AMEC_2010	100	101	Hanging Wall Schist	Schist	0.1			18000	0.5	25	0.06	0.12	10000	0.4	27	110	92	31000	1600	13	8800	960	0.9	1290	88		3.3		0.8	0.7	1	11	870	0.27	0.29	79		80
7914815.435	563615.755	543.487	MR1-08-156	MRARD10 117	AMEC_2010	60	61	Hanging Wall Schist	Schist	0.1			73000	0.5	510	1.1	0.19	12000	0.2	55	74	33	155000	31000	17	19000	140	18	550	70		15		0.8	0.7	1.9	35	1700	1.6	2.6	28		26
7914820.977	563603.871	527.86	MR1-08-156	MRARD10 119	AMEC_2010	80.8	81	Hanging Wall Schist	Schist	0.1			10	1.7	0.51	0.08	0.13	25	0.2	0.25	0.5	0.1	33	1	2	19	2.3	0.5	9	0.1		0.4		0.8	0.7	0.5	0.22	0.1	0.27	0.22	1		0.7
7914826.301	563592.452	512.846	MR1-08-156	MRARD10 122	AMEC_2010	100	101	Hanging Wall Schist	Schist	0.1			45000	0.5	100	0.12	0.09	1200	0.2	40	230	141	56000	15000	35	25000	220	0.6	390	120		0.91		0.8	0.7	0.7	11	1200	0.2	0.047	210		23
7914420.445	563203.455	591.661	MR1-08-145	MRARD10 126	AMEC_2010	27	28	Hanging Wall Schist	Schist	0.1			84000	6.9	31	3.5	0.17	810	0.2	44	130	29	216000	600	370	46000	630	0.8	170	200		5.7		0.8	0.7	1.5	7.9	750	0.04	3.9	55		143
7914836.569	563574.057	590.725	MR1-08-143	MRARD10 127	AMEC_2010	20	21	Hanging Wall Schist	Schist	0.1			116000	0.5	560	1.3	0.09	2500	0.2	67	580	94	145000	10000	32	110000	850	0.8	350	310		3.6		0.8	0.7	1	3.6	1000	0.19	0.89	150		73
7914814.05	563618.726	547.394	MR1-08-153	MRARD10 130	AMEC_2010	54.9	55.9	Hanging Wall Schist	Schist	0.1			25000	1.2	56	0.12	0.09	7400	0.2	21	120	165	33000	5000	39	24000	590	1.7	250	59		1		0.8	0.7	2	12	1200	0.09	0.031	140		16
7914212.854	563309.016	491.231	MR1-05-46	16470	Baff2011	55.72	56.72	Hanging Wall Schist	Volcanic Tuff	0.1	0.02	1.3	48000	0.6	7.5	2.7	0.09	750	0.08	6.9	170	3.9	78000	3800	20	69000	1100	0.6	190	48	42	2.1		0.8	0.7	2.1	9.4	350	0.1	3.4	1	6.4	46
7914805.377	563637.324	571.85	MR1-08-156	16698	Baff2011	23	23.95	Hanging Wall Schist	Volcanic Tuff	0.1	0.02	0.08	13000	0.5	6.1	0.05	0.09	43000	0.06	10	51	130	12000	2000	16	7600	600	2.7	1200	38	280	1.4		0.8	0.7	0.5	27	1030	0.05	0.013	31	4.3	15
7914808.323	563631.006	563.542	MR1-08-156	16700	Baff2011	33.82	34.82	Hanging Wall Schist	Volcanic Tuff	0.1	0.02	0.07	16000	0.5	21	0.08	0.09	33000	0.16	13	68	42	23000	2500	24	12000	730	0.7	1000	35	280	6.5		0.8	0.7	0.5	20	1070	0.03	0.024	57	4.5	45
7914810.885	563625.513	556.319	MR1-08-156	16702	Baff2011	43.25	44.25	Hanging Wall Schist	Volcanic Tuff	0.1	0.02	0.11	25000	0.5	45	0.07	0.09	27000	0.09	18	73	140	22000	4100	35	14000	770	0.5	390	47	330	0.84		0.8	0.7	0.5	17	1640	0.06	0.019	71	3.7	40
7914813.19	563620.57	549.819	MR1-08-156	16704	Baff2011	51.73	52.74	Hanging Wall Schist	Volcanic Tuff	0.1	0.02	0.06	21000	0.5	64	0.08	0.09	25000	0.02	18	80	120	30000	3100	61	40000	1600	0.4	270	52	240	1.6		0.8	0.7	0.5	17	870	0.03	0.014	78	6.5	17
7914815.036	563616.611	544.613	MR1-08-156	16706	Baff2011	58.53	59.53	Hanging Wall Schist	Volcanic Tuff	0.1	0.02	1.2	41000	0.5	240	0.17	0.09	1100	0.02	39	210	180	54000	25000	17	25000	420	1.2	520	120	370	1.2		0.8	0.9	0.7	15	3000	0.22	0.011	170	1.4	17
7914816.895	563612.624	539.37	MR1-08-156	16708	Baff2011	65.37	66.38	Hanging Wall Schist	Volcanic Tuff	0.1	0.02	0.17	37000	0.5	140	0.17	0.09	790	0.03	35	370	140	54000	15000	17	24000	250	2.2	380	190	240	0.9		0.8	0.7	0.5	6.4	1840	0.17	0.041	160	1.2	30
7914819.97	563606.029	530.698	MR1-08-156	16710	Baff2011	76.7	77.69	Hanging Wall Schist	Volcanic Tuff	0.1	0.02	0.01	51000	0.5	660	0.37	0.09	2200	0.03	47	260	93	68000	20000	70	31000	360	0.8	390	150	740	1.9		0.8	1.1	0.6	14	1550	0.24	0.012	170	2.9	35
7914289.124	563150.669	589.004	MR1-06-90	16718	Baff2011	14.21	15.17	Hanging Wall Schist	Volcanic Tuff	0.1	0.02	0.03	50000	12	2.9	0.33	0.23	1500	0.02	30	630	14	95000	160	10	44000	220	1	90	320	630	3.3		0.8	0.7	0.5	4.3	200	0.02	0.58	65	1.7	49
7914292.595	563143.225	587.556	MR1-06-90	16720	Baff2011	22.5	23.56	Hanging Wall Schist	Volcanic Tuff	0.1	0.02	0.05	37000	2.5	120	1.7	0.37	1200	0.06	13	150	27	61000	8600	15	27000	850	3.1	260	51	540	10		0.8	0.7	0.7	5.3	1560	0.27	1.6	45	3.9	31
7914224.949	563113.466	559.336	MR1-06-84	16746	Baff2011	44	44.93	Hanging Wall Schist	Volcanic Tuff	0.1	0.02	0.06	40000	7.4	1.6	0.68	0.09	200	0.02	22	570	54	96000	110	20	43000	540	1.7	87	200	42	1.2		0.8	0.7	0.5	1.1	190	0.02	0.89	36	2.7	25
7914891.943	563633.365	514.512	MR1-08-150	MRARD10 066	AMEC_2010	95	96	Hanging Wall Schist	Volcanic Tuff	0.1			62000	0.5	4.1	0.78	0.09	3100	0.2	27	320	54	71000	450	15	52000	710	0.3	120	94		2.7		0.8	0.7	1.2	3.5	110	0.02	1.8	98		53
7914886.496	563645.046	529.871	MR1-08-150	MRARD10 067	AMEC_2010	75	75.9	Hanging Wall Schist	Volcanic Tuff	0.1			13000	59	2.8	0.48	0.49	3400	0.2	12	19	8.8	210000	410	6	24000	170	39	160	46		3.3		0.9	0.7	1.1	8.4	53	0.15	0.63	13		12
7914885.152	563647.929	533.663	MR1-08-147	MRARD10 089	AMEC_2010	70	71	Hanging Wall Schist	Volcanic Tuff	0.1			56000	0.5	73	1.1	0.09	7800	0.6	31	190	70	85000	8900	54	51000	800	0.6	420	110		5.2		0.8	0.7	0.5	7.2	1500	0.13	0.099	150		88
7914808.644	563630.319	562.638	MR1-08-153	MRARD10 098	AMEC_2010	35	36	Hanging Wall Schist	Volcanic Tuff	0.1			71000	0.5	3.7	1.8	0.09	4500	0.2	30	280	1.5	160000	270	67	54000	550	0.5	300	120		2.6		0.8	0.7	1.8	11	490	0.02	1.6	92		58
7914810.083	563627.231	558.578	MR1-08-156	MRARD10 112	AMEC_2010	40.3	41.3	Hanging Wall Schist	Volcanic Tuff	0.1			50000	0.6	0.64	0.57	0.57	5000	0.2	25	200	80	68000	65	5	49000	540	4.5	70	55		2.5		14	1.4	4.6	12	270	0.5	2.2	58		44

Appendix B:
Mine Site Waste Rock Sedimentation Pond Earthworks & Drainage Plan

DWG. NO. H349000-4230-10-035-0001

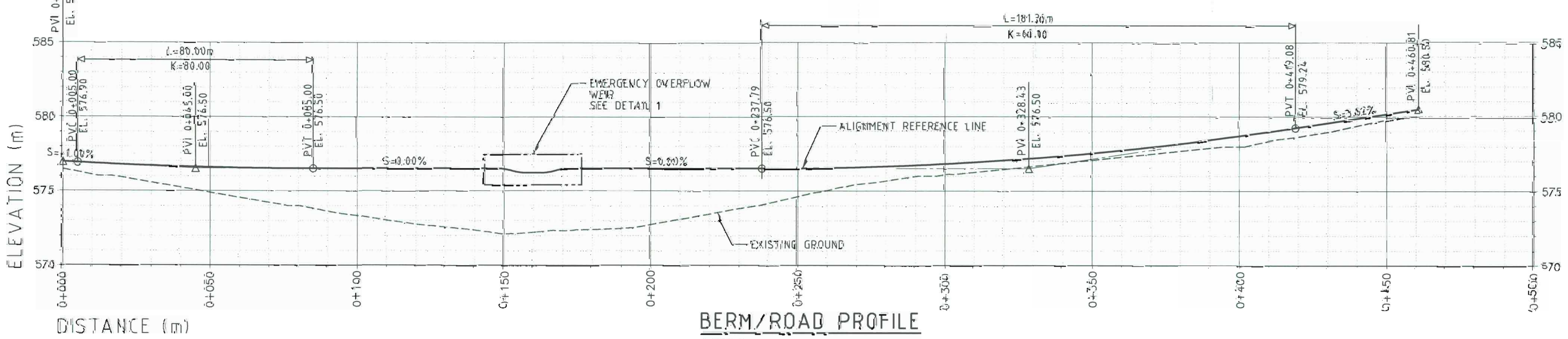
LINE TABLE		
NAME	LENGTH	DIRECTION
L1	30.2036	N 20°44'27.00" W
L2	166.4941	S 80°37'10.35" E

CURVE TABLE							
NAME	RADIUS	ARC LENGTH	CHORD LENGTH	TANGENT LENGTH	MIDDLE ORDINATE	EXTERNAL DISTANCE	CHORD DIRECTION
C1	100.00	209.6512	173.3108	173.6292	50.0917	100.3674	N 39°19'11.33" E
C2	50.00	54.4653	51.8121	30.2886	7.2346	8.4585	S 49°24'47.60" E



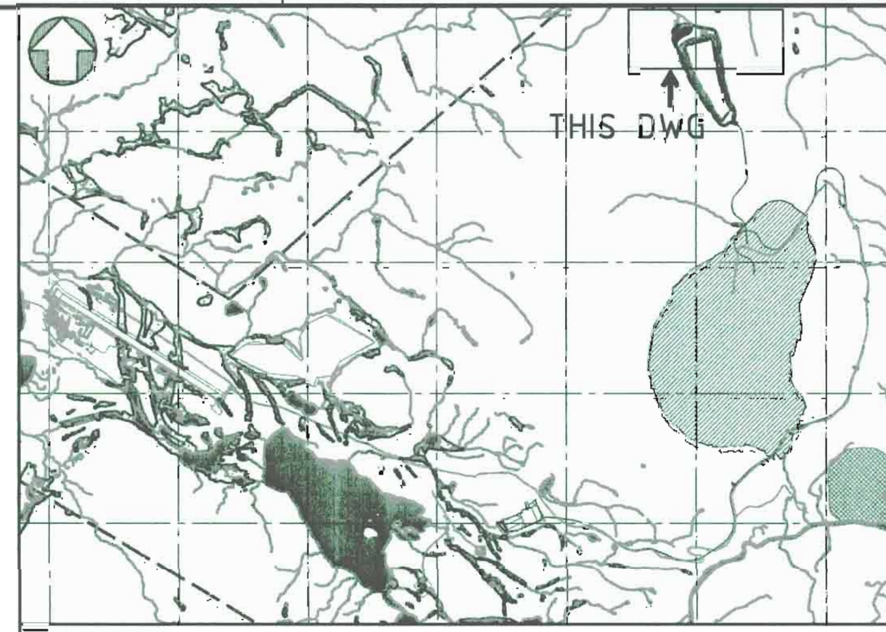
PLAN

1:1000



BERM/ROAD PROFILE

1:1000 H
1:250 V



KEY PLAN

LEGEND:

	EXISTING WATER BODY
	EXISTING DEPRESSION
186.5	EXISTING GROUND CONTOUR
	FILL SLOPE
	TOE OF SLOPE
%	GRADING SLOPE
	FLOW DIRECTION
	RIP RAP
	CROSS SECTION DISTANCE
PT	POINT OF TANGENT
PC	POINT OF CURVE
PI	POINT OF INTERSECTION
POB	POINT OF BEGINNING
POE	POINT OF END
PVC	POINT OF VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENT
K	RATE OF VERTICAL CURVATURE
HWL	HIGH WATER LEVEL
FB	FREEBOARD

NOTES:

1. TOPOGRAPHY PROVIDED BY TERRAPOINT CANADA INC.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. CONTOUR INTERVAL IS 2.0 METRES.
4. ALL DIMENSIONS AND ELEVATIONS SHOWN ARE IN METRES UNLESS NOTED OTHERWISE.
5. EXISTING MARSH WITHIN THE EARTHWORKS LIMIT SHALL BE DEWATERED AND CLEANED FROM VEGETATION AND UNSUITABLE MATERIAL PRIOR TO BACKFILLING AND LINER INSTALLATION.
6. TO BE READ IN CONJUCTION WITH DOCUMENT No. H349000-4230-10-144-0001 "WASTE ROCK SEDIMENTATION POND BERM STAKEOUT REPORT".
7. EXISTING DEPRESSION TO BE DEWATERED AND BACKFILLED.

FOR CONSTRUCTION

DRAWING NO.	DRAWING TITLE
H349000-4230-00-014-0001	MINE SITE - SITE LAYOUT

REFERENCE DRAWINGS

PERMIT TO PRACTICE
HATCH LTD
Signature
Date 30 Aug 13
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

NO.	DESCRIPTION	BY	CHK'D	APP'D	DATE

REVISIONS

REGISTERED PROFESSIONAL ENGINEER
M.M.S. HASSAN
LICENSEE
30 Aug 13
NT/NU

REV.	ISSUE FOR	APPR.	BY	DATE
0	CONSTRUCTION	SH	RM	2013-08-30

ISSUE AUTHORIZATION

HATCH

DESIGNED BY R. VANGOGHEHRI DATE 2013-08-26
DRAWN BY R. VANGOGHEHRI DATE 2013-08-26
CHECKED BY A. SAMEH DATE 2013-08-30
DISCIP. ENGR. S. HASSAN DATE 2013-08-30
AREA DES. COORD. T. PERTELL DATE 2013-08-30
PROJ. ENGR. J. CLELAND DATE 2013-08-30
PROJ. MGR. S. PERRY DATE 2013-08-30

Baffinland

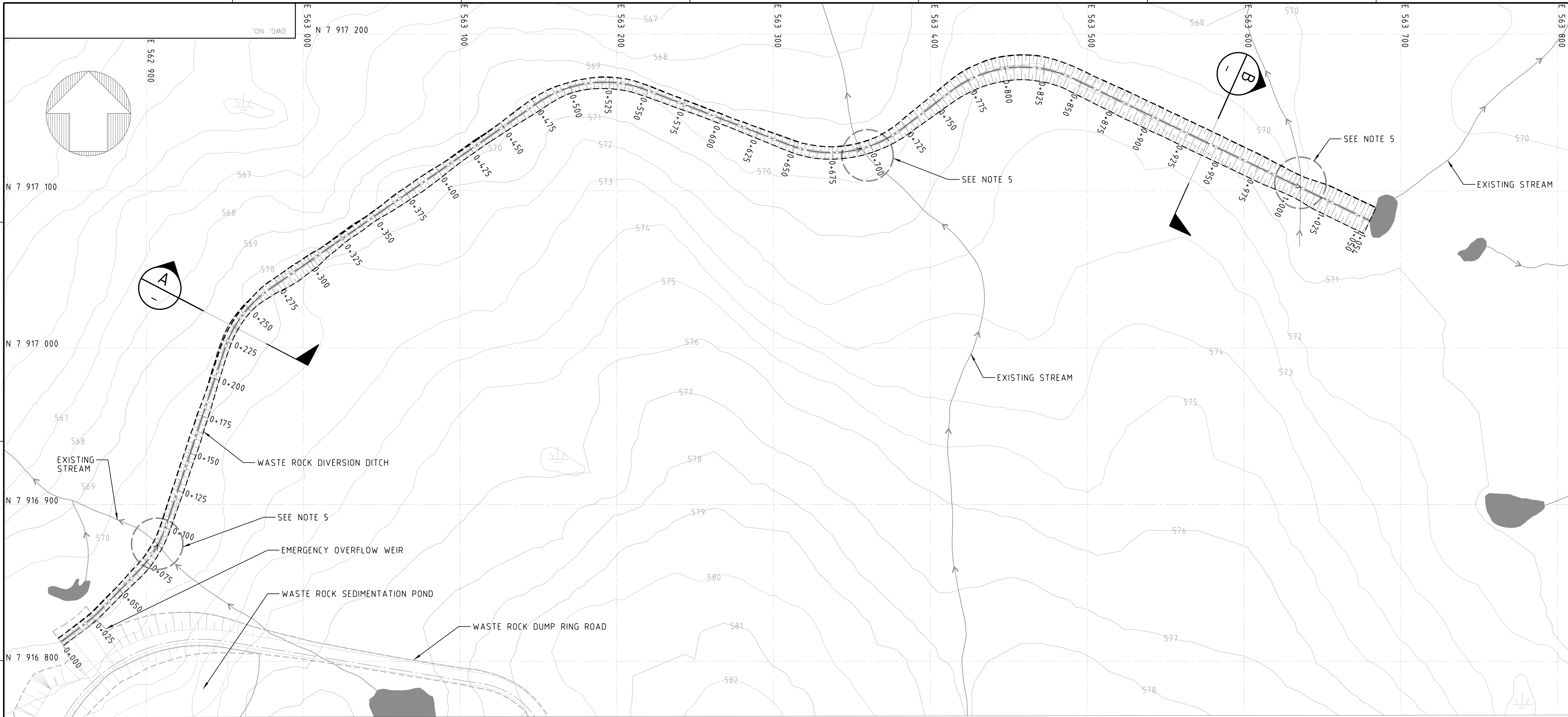
MARY RIVER PROJECT

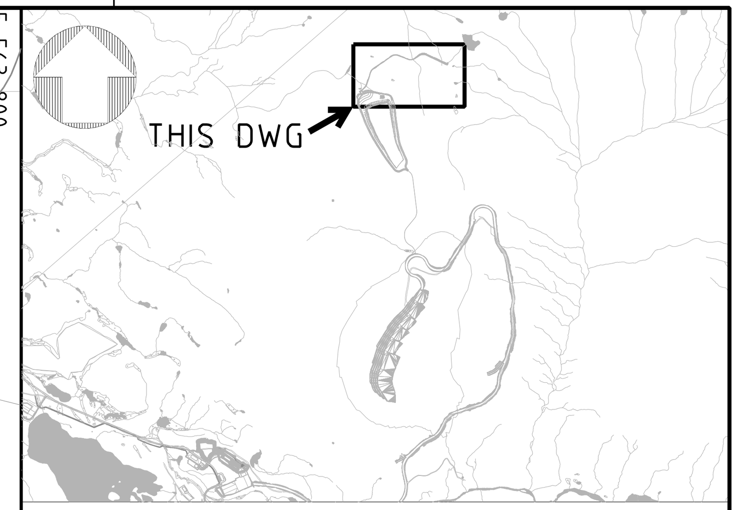
MINE SITE
WASTE ROCK SEDIMENTATION POND
EARTHWORKS & DRAINAGE - PLAN

SCALE 1:1000
DWG. NO. H349000-4230-10-035-0001
REV. 0

ORIGINAL SHEET SIZE: ISO A1 (841 x 594)

Appendix C:
Mine Site Rock Drainage – Diversion Ditch Plan and Profile





KEY PLAN

LEGEND:

- CENTERLINE OF DITCH
- EXISTING WATER BODIES
- EXISTING GROUND CONTOURS
- EXISTING STREAM
- OVERLAND FLOW PATH
- FILL SLOPE
- CUT SLOPE

NOTES:

1. TOPOGRAPHY PROVIDED BY TERRAPOINT CANADA INC.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. CONTOURS ARE IN METRES. CONTOUR INTERVAL IS 1 METRE.
4. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES UNLESS NOTED OTHERWISE.
5. THE DIVERSION DITCH HAS BEEN DESIGNED TO INTERCEPT AND CONVEY DISCHARGE FROM THE EXISTING STREAMS SOUTH OF THE DITCH.

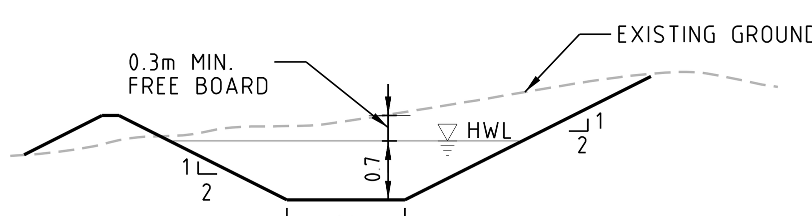
NOT FOR CONSTRUCTION

PRELIMINARY

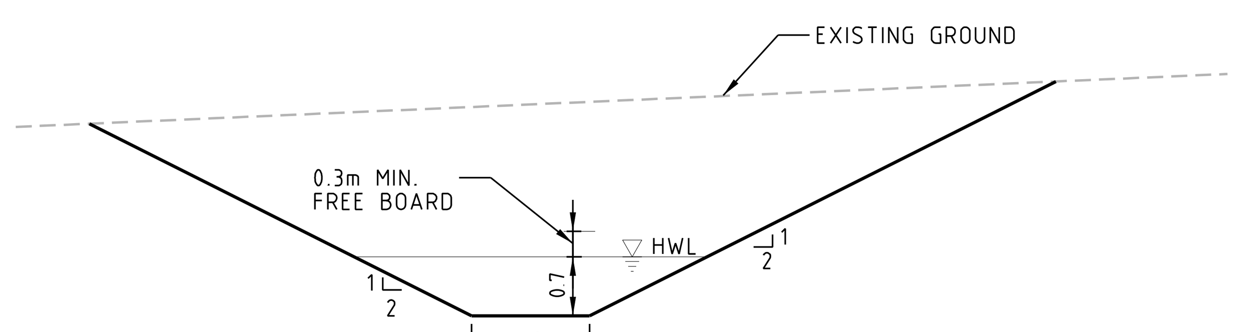
DIVERSION DITCH-PLAN

1:1500 H

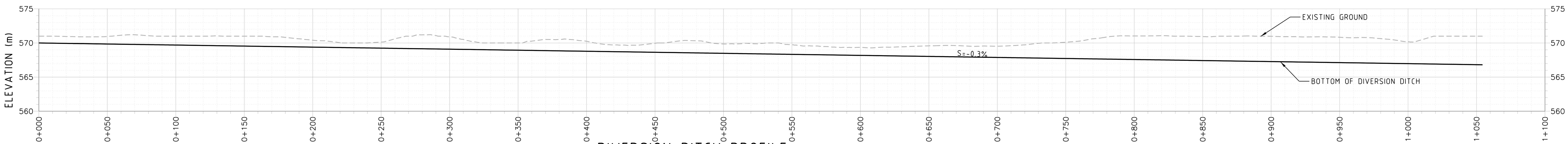
0 15 30 45 60 75
SCALE IN METRES



TYPICAL DITCH CROSS-SECTION A / -



TYPICAL DITCH CROSS-SECTION B / -



DIVERSION DITCH-PROFILE

1:1500 H
1:300 V

DRAWING NO.	DRAWING TITLE
H349000-4230-10-035-0002	WASTE ROCK SEDIMENTATION POND-EARTHWORKS & DRAINAGE PLAN

REFERENCE DRAWINGS

NO.	DESCRIPTION	BY	CHK'D	APP'D	DATE

REVISIONS

REV.	ISSUE FOR	AUTH. BY	DATE
A	INTERNAL/CLIENT REVIEW	SH GJ	2014-03-19

ISSUE AUTHORIZATION

HATCH

DESIGNED BY: G. JUBINVILLE, DATE 2014-03-19	DRAWN BY: G. JUBINVILLE, DATE 2014-03-19
CHECKED BY: A. MOHEBKHANI, DATE 2014-03-19	DISCIP. ENGR.: S. HASSAN, DATE 2014-03-19
PROJ. DES. COORD.: T. THERTELL, DATE 2014-03-19	PROJ. ENGR.: J. CLELAND, DATE 2014-03-19
PROJ. MGR.: S. PERRY, DATE 2014-03-19	

Baffinland

MARY RIVER PROJECT

MINE SITE
WASTE ROCK DRAINAGE – DIVERSION DITCH
PLAN AND PROFILE

SCALE	DWG. NO.	REV.
1:1500 OR AS NOTED	H349000-4230-10-035-0003	A

ORIGINAL SHEET SIZE: ISO A1 (841 x 594)

APPENDIX E.8.3.5

BAFFINLAND RESPONSE TO ECCC NOTICE OF INVESTIGATION

NOVEMBER 21, 2017

Baffinland

November 21, 2017

Curtis Didham
Enforcement Officer
Environment and Climate Change Canada
933 Mivvik Street
Iqaluit, Nunavut
X0A 0H0

Dear Mr. Didham,

Re: Investigation under subsection 36(3) of the Fisheries Act in regards to an effluent seepage and controlled discharges from the Waste Rock Stockpile Sedimentation Pond (WRSSP) located at Baffinland's Mary River Project (the Project).

Please find below a summary response prepared by Baffinland Iron Mines Corporation (Baffinland) in response to the investigation under the Fisheries Act and Metal Mining Effluent Regulations (MMER) initiated by Environment and Climate Change Canada (ECCC) on September 13, 2017.

Project Development

Baffinland proposed to develop the Project in a phased approach, and began construction for the Early Revenue Phase (ERP) in 2013, followed by the initial mining of Deposit 1 in September 2014. Prior to the development of Deposit 1, Baffinland had retained AMEC in 2012 to conduct water quality modelling of runoff and seepage originating from the Deposit 1 waste rock stockpile. The report concluded that, with the exception of total suspended solids (TSS), the water quality of runoff and seepage would meet the MMER discharge requirements. To address the estimated solids loading from the runoff and seepage and facilitate the monitoring of discharges, sedimentation ponds downstream of the waste rock stockpile(s) were proposed. In 2014, Baffinland retained AMEC to investigate the metal leaching and acid rock drainage (ML/ARD) potential of waste rock generated from ERP operations on Deposit 1. Results from AMEC's investigation were presented in a technical memo titled "Mary River Deposit 1, 5-Year Pit ML/ARD Characterization". AMEC had determined that approximately 85% of waste rock samples had neutralization potential ratios (NPR) greater than 2 pH and were classified as non-potentially acid generating and were unlikely to generate acidic drainage. Approximately 10% of the samples had NPR values of less than 1 pH, and 5% of the samples were classified as having uncertain acid generating potential (1<NPR<2). Humidity cell testing for historical samples of the Waste Rock Stockpile has stayed relatively consistent previous to 2017, indicating stable conditions in the majority of cells

Construction of the current WRSSP commenced in September 2015 and became operational in May 2016. A Construction Summary Report (CSR) produced by Hatch Ltd. (Hatch) for the current sedimentation pond, which was included in the 2016 Qikiqtani Inuit Association (QIA) and Nunavut Water Board (NWB) Annual

Report for Operations, was signed off by Baffinland in January 2017 and provided to regulators and stakeholders on March 31, 2017.

Under Part D, Item 18, of Baffinland's Type "A" Water License 2AMMRY1325 Amendment No. 1 (Water License), two annual geotechnical inspections are performed on water and waste retention structures. Barry H. Martin Consulting Engineer and Architect conducted two inspections in 2017. The Aug 1-10th bi-annual inspection did not identify integrity or containment issues concerning the WRSSP. Additionally, inspections of the facility from ECCC and Indigenous and Northern Affairs Canada (INAC) in 2016 and spring/early summer 2017 also did not identify seepage from the WRSSP or identify water quality concerns associated with the system. Internal compliance inspections are completed bi-monthly during the open water season on this facility and daily monitoring is completed during discharge which focuses on monitoring water quality in accordance with Baffinland's Water License and Schedule 4 of the MMER, as well as overall WRSSP conditions and operations. There were no issues of compliance with water quality limits in 2016 or in the first half of 2017.

The following summarizes the four incidents that occurred in August and September and remediation measures undertaken.

Spill Report 17-289

A heavy rain event was experienced over a period of several days in late July increasing the runoff into the pond and led to the requirement to de-water and maintain suitable pond freeboard. The pH results leading up to August 1st, which were measured by both YSI meter field readings and the ALS laboratory analyses, were consistently greater than 6.40. In early August low pH water was discharged to the environment on August 1st and 3rd. On August 1st, water chemistry and toxicity testing occurred. Results received indicated the pH of the water was below 6.0 which resulted in a toxicity failure for both Daphnia Magna and Rainbow Trout. No discharge to the environment occurred after receiving official ALS laboratory results.

August 10th - 24th:

- pH adjustment treatment of the WRSSP was planned with Wood Group PLC (formally AMEC Foster Wheeler) to determine the most effective treatment of the WRSSP with resources on site. On August 22-24th, batch treatment of the WRSSP was completed using sodium carbonate to effectively raise the pH from approximately 4 to 7.
- Golder Associates Ltd. (Golder) was consulted to commence work on increasing the storage capacity of the WRSSP.

Spill Report 17-312

On August 23, 2017 during an inspection of the WRSSP with ECCC and INAC, seepage was observed originating from the central toe of the WRSSP in approximately four discrete but closely clustered locations. Water quality samples were taken from the seepages occurring at the toe of the WRSSP in concert with ECCC and INAC on August 23rd and 24th during their on-site inspection and external analytical results indicated that, aside from nickel and TSS, water quality was compliant under the MMER and Water License.

August 25th:

- Construction of an emergency containment ditch downstream of the seepage.

September 1st:

- Hatch was consulted to explore options to stop the seepage from the toe of the WRSSP and identify potential remedial activities to the facility.
- Hatch recommended the placement of a till blanket upstream of the WRSSP liner key-in to allow for proper re-grading in an effort to reduce pooling on the inlet, as well as constructing two sumps to tie into the emergency containment ditch downstream of the WRSSP seepage.

September 2nd:

- Baffinland submitted a notification to regulators detailing the plan to mitigate the ongoing seepage at the WRSSP.

September 7th - 17th

- Construction of the till blanket and sumps were completed to the design specifications provided by Hatch from September 7th to 17th.

On September 26th, during an inspection of the WRSSP and down gradient seepage area, discoloured water was observed outside of the emergency containment ditch under ice and snow. Water quality sampling was conducted, which included acute toxicity testing. Analytical results showed nickel and TSS above applicable guidelines, though the acute toxicity test passed.

October 4th - 24th:

- Golder and Le Groupe Desfor (LGD) consulted to assess the situation and provide expert advice on locating the source and identifying potential remedial solutions.
- LGD Director of Civil Works concluded that the origin of the seepage could not be determined at that time under the existing conditions.
- Principal Geochemist from Golder conducted a detailed hydrological assessment and concluded that the pond design appears appropriate for its intended use.

October 19th:

- Story Environmental was contacted to provide recommendations for the utilization and implementation of using rhodamine dye to determine whether the WRSSP was the potential source of the seepage.
- Monitoring of the seepage for the presence of rhodamine occurred using a YSI meter with a rhodamine sensor. Rhodamine was detected in seepage grab samples indicating that the WRSSP liner's integrity may have been compromised. Current conditions limit the ability to confirm this to be true and further investigations into the matter are required when conditions allow.

October 21st – November 06:

- Construction of a new berm was completed around the outside perimeter of the emergency containment ditch to increase the ditch's containment capacity.
- Water was pumped from the containment ditch back to the WRSSP in order to effectively place ¾ inch rock at the base of the ditch to arrest further seepage.

Spill Report 17-328 and 17-361

On August 27th, visual observations of the turbidity of the WRSSP prompted the discharge to be shut down. Samples later confirmed that the TSS exceeded the Water License and MMER guidelines for an approximate 14-hour period. Discharge resumed again on August 28th after the pond had settled and TSS criteria was found to be below guidelines.

August 24th – 28th

- An Environment Effects Monitoring (EEM) study was performed by Minnow Environmental (Minnow). No exceedances were observed or recorded under applicable guidelines in discharge exposed Tributary F or Mary River except for aluminum. The aluminum is not exposure-related as aluminum was found to be present in the reference sites and is related to known historical turbidity-related colloidal effects in Mary River. The discharge from the WRSSP travels approximately 2.2 km from the Final Discharge Point (FDP) to where Tributary F becomes a defined channel which is non-fish bearing. The confluence with Mary River is located approximately 3 kilometers in distance from that location.

Discharging to the environment continued from August 30th to September 6th and water samples analyzed using the on-site ALS laboratory equipment run by Baffinland personnel were found to be compliant up to September 6th under the MMER and Water License discharge criteria for pH. In addition to the on-site laboratory results, samples were also shipped offsite to ALS Waterloo. The pH results received from the ALS laboratory in Waterloo from September 1st to 6th were below the MMER and Water License criteria. In consultation with the ALS Environmental Technical Director, it was determined that the initial pH measurements from the on-site laboratory taken by Baffinland Staff (within one to four hours of sampling) should be the most reliable and defensible pH measurements representing the conditions of the samples at time of sampling, rather than test results measured by ALS Waterloo which represent the pH of the sample after several days of potential acid rock drainage related redox reactions. The discharge to the environment was stopped on September 6th.

September 1st:

- Aquatic Effects Monitoring Plan (AEMP) data for stations at the confluence of the tributary, (Tributary F) that receives WRSSP effluent and the nearest fish bearing waters, were examined and did not show readily detectable influence from the discharge, exhibiting pH of approximately 8.

Additional Mitigation Measures

Additional mitigation measures were taken to address deficiencies identified with internal environmental systems, protocols and procedures:

- An Emergency Response Plan has been revised for the WRSSP in accordance with MMER requirements outlined in Section 30.
- A Working Near Water Containment Facilities Procedure has been drafted to provide a set of operational standards to ensure work is conducted in a safe and environmentally-compliant manner.

- The Site Environment team reporting structure was changed to include a Site Environmental Manager that will provide leadership and oversight to all site activities.

Additional mitigation measures that are in progress or planned are:

- Initiate a geochemical review of the waste rock dump layout and materials to develop a better understanding of low pH conditions observed on site and, if necessary, develop supplemental mitigation measures to reduce or eliminate production of acidic water from entering the WRSP.
- Review on-site equipment and consider whether additional equipment could more efficiently treat and discharge water from the WRSSP.
- Revise Waste Rock Management Plan to incorporate discharge and ARD mitigation measures
- Resource additional certified ALS Technician(s) and testing equipment during the summer season
- Evaluate and source appropriate coagulants if treatment required.
- Long Term - Design and implement fit for purpose AMD containment and treatment technology for prevention, source control and remediation.

Overall no impacts were observed in the receiving water bodies as shown through Baffinland's EEM and AEMP studies. Engineered mitigation measures to address water quality, seepage and pond capacity issues are currently being reviewed. Through the rhodamine testing early indications are that the source of the seepage is related to the integrity of the WRSSP liner, although further investigations are required to confirm these findings and upon confirmation we will immediately act upon.

Regards,

Todd Burlingame | Vice-President, Sustainable Development
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