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MOUNT POLLEY MINE
Tailings Storage Facility Stage 8/8A
2012 As-Built Report

Submitted to:

Mount Polley Mining Corporation,
Likely, BC

Submitted by:

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IMPORTANT NOTICE

TABLE OF CONTENTS

Page

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF DRAWINGS

LIST OF APPENDICES

SUMMARY

This report presents the as-built report documenting the 2012 construction of the Mount Polley Mine Corporation (MPMC) tailings storage facility (TSF). The following gives a general summary of the 2012 TSF activities and key developments.

The Stage 8 TSF raise targeted a minimum crest raise of El. 963.5 m via a modified centerline design. At the request of MPMC, an intermediate Stage 8A TSF raise was designed to El. 965 m which utilized a centerline raise design above El. 963.5 m (AMEC 2012a). The Stage 8A design was requested by MPMC to allow the option of raising the dam during more favourable weather conditions in 2012 (as opposed to spring 2013).

Construction of the Stage 8/8A raise began with the placement of Zone S in early May. Zone S placement was suspended on October 26. At the end of construction the Zone S (till core) was completed to a minimum elevation of 963.5 m with Zones F and T (filter and transition) completed to a minimum elevation of 962.7 m.

The 2012 embankment raise consisted of:

- Placement of zone materials:
  - Zone U – comprised of tailings sand cells along the South and Perimeter Embankments and a portion of the Main Embankment, as well as non acid-generating (NAG) rockfill along the majority of the Main Embankment;
  - Zone S – comprised of compacted glacial till;
  - Zone F – comprised of filter zone NAG rockfill;
  - Zone T – comprised of transition zone NAG rockfill; and
  - Zone C – comprised of run of mine NAG rockfill.
- Foundation preparation of abutment tie-in on the Perimeter and South Embankments.

An AMEC representative was on site to observe the start of the construction and to provide training for the MPMC personnel responsible for the construction monitoring. AMEC provided periodic visits throughout the construction season to verify that the materials and construction methodology satisfied the specifications.

MPMC performed all related earthwork construction for Zone U (Upstream fill), Zone T (Transition) and Zone C (NAG Rock Shell). Material placement and related earthwork construction for Zone S and Zone F were completed by Peterson Contracting Ltd (Peterson). MPMC monitored daily construction, issuing daily reports, material sampling, and conducted instrumentation data gathering internally. AMEC reviewed daily reports, performed laboratory test on the provided samples, reviewed provided instrumentation data, and conducted site visits during critical staged of construction and at minimum on a monthly basis.

1.0 INTRODUCTION

1.1 General

The Mount Polley Mine is located in central British Columbia, approximately 60 km northeast of Williams Lake. The Mount Polley copper and gold mine commenced production in 1997 and operated until October 2001 when operations were suspended for economic reasons. In March 2005 the mine restarted production and has been in continuous operation since. The mill throughput rate is approximately 20,000 tonnes per day (approx. 7.3 million tonnes per year). Mill tailings are discharged as slurry into the Tailings Storage Facility (TSF) located on the south area of the mine property. **Error! Reference source not found.** shows an aerial view of the site from 2012.

The starter dam for the TSF embankment was constructed in 1996 to a crest elevation of 927.0m. The starter dam was constructed out of a homogeneous compacted till fill. Beyond the starter dam the TSF embankment comprised compacted till as well as rockfill zones. The embankment was raised in subsequent years as follows:

- To elevation 934.0 m in 1997.
- To elevation 936.0 m in 1998.
- To elevation 937.0 m in 1999.
- To elevation 941.0 m in 2000.
- To elevation 942.5 m in 2001.
- To elevation 944.0 m in 2004.
- To elevation 946.0 m in 2005.
- To elevation 949.0 m in 2006.
- To elevation 950.9 m in 2007.
- To elevation 951.9 m in 2008.
- To elevation 953.9 m in 2009.
- To elevation 958.0 m in 2010.
- To elevation 960.1 m in 2011.

Construction of the Stage 8/8A dam raise began in May 2012 and was suspended in October 2012. The Stage 8/8A raise entailed a raise of approximately 3.4 m from approximate El. 960.1 m to El. 963.5 m. The raise, with a minimum crest (Zone S) of El. 563.5 m is projected to provide storage and freeboard through to summer 2013. The next dam raise is scheduled to be carried out in the spring/summer/fall of 2013.

Figure 1.1: Aerial View of Mount Polley Mine Site: 2012

1.2 Documentation Requirements

This report includes the relevant as-built information for Stage 8/8A (2012) raise. The scope of this report includes the following:

- Description of the Stage 8/8A raise design, and design modifications that were implemented during construction;
- Description of conditions encountered during construction;
- Inspection reports, field and laboratory test results including sample locations and test standards and/or methodologies;
- Description of the quality assurance and quality control (QA/QC) procedures and results;
- Photographs documenting construction progress and final conditions;
- As-built drawings;
- Confirmation that the Stage 8/8A TSF construction was carried out in accordance with the design intent;
- Summary of instrumentation installed within the TSF;
- Selection of construction photographs providing visual record of construction progress and condtions.

2.0 STAGE 8/8A DESIGN OVERVIEW

2.1 General

The Mount Polley TSF is comprised of one overall embankment that is approximately 4.5 km in length. The embankment is subdivided into three (3) sections; referred to as the Main Embankment, Perimeter Embankment and South Embankment. Heights vary along the embankment and are approximately 52 m, 34 m, and 25 m for the Main, Perimeter and South embankments respectively.

2.2 2012 Dam Design

The 2012 construction schedule was initially planned to comprise the Stage 8 TSF embankment design raise targeting an elevation of 963.5 m. At the request of MPMC during 2012 construction, the Stage 8A design was completed to allow for construction of the embankment to an elevation of 965 m. The decision by MPMC was made in hopes to continue raising the dam above El. 963.5 m during more favourable weather conditions in 2012 (as opposed to spring 2013). AMEC prepared a design package presenting the stability analyses and IFC drawings for the raise to El. 965 m which was submitted by MPMC to the MEM for approval.

The design of the Stage 8 raise has not changed from previously approved and constructed Stage 7 raise design cross section, consisting of a downstream shell of NAG rockfill, a central, low permeability till core and a filter sequence downstream of the core. However, the design of the Stage 8A raise included the modification from the modified (upstream) centreline design to a centreline design above El. 963.5 m. Details of the Stage 8 and 8A designs are found in drawings 2012AB.02 – 2012AB.16.

Both Stage 8 and 8A raises maintain a downstream slope of 1.3H:1V, which is temporary as the final dam downstream slope will be flattened as constructed. The NAG rockfill (Zone C) in the dam shell was placed and compacted by dozer and haul truck traffic. Transition material (Zone T) was obtained by selectively sorting run-of-mine waste rock. Sand and gravel filter material (Zone F) was processed by on site crushing of run-of-mine waste rock. Till core fill (Zone S) was obtained from a locally borrowed, low permeability glacial till. Total tailings (Zone U) are deposited into the impoundment and provide upstream support for the embankments, progressively raised in a modified centreline (up to El. 963.5 m) to centreline configuration (above El.963.5 m).

3.0 CONSTRUCTION MONITORING PROGRAM

3.1 Responsibilities for Construction Monitoring

Construction monitoring during the 2012 construction season was mainly carried out by MPMC personnel. AMEC's Support Engineer reviewed daily construction records and performed regular site visits to monitor the quality of construction and assess MPMC's monitoring of the construction.

3.1.1 AMEC Support Engineer

While on site the responsibilities of AMEC's Support Engineer were as follows:

- Monitor, train, and assist MPMC personnel with the requirements of construction monitoring;
- Monitor, sample, and requisition tests of the borrow areas, as required;
- Monitor and perform QA testing of compacted till core soils, as required;
- Review and approval of proposed borrow soils;
- Review and approval of transition and filter material, processing methodology and monitoring practices;
- Monitor and approve the filter trench excavation and preparation;
- Monitor and approve abutment preparation;
- Address any concerns or out-of-compliance situations observed and recorded during construction;
- Carry out the quality control field and laboratory testing;
- Direct the MPMC personnel to address the survey requirements, results, etc.; and
- Meet as required with MPMC to review the construction program.

AMEC's Support Engineer provided on-site supervision during the following periods:

- *May Site Visit*: May 14 to May 18, May 29 to June 1
- *June Site Visit*: June 25 to June 28
- *July Site Visit*: July 3 to July 6, July 9 to July 13, July 16 to July 18, July 25 to July 29
- *August Site Visit*: August 13 to August 15, August 28 to August 29
- *September Site Visit*: September 20 to September 21
- *October Site Visit*: October 25

While in the office the responsibilities of AMEC's Support Engineer were as follows:

- Review daily construction reports submitted by MPMC personnel;
- Review compaction results submitted by MPMC personnel;
- Plot and review instrumentation readings submitted by MPMC personnel;
- Address any concerns or out-of-compliance situations noted by MPMC personnel; and
- Coordinate with MPMC personnel and AMEC's Project Manager/Senior Engineer.

3.1.2 AMEC Senior Support

AMEC's Senior Support Engineer performed a site visit on August 13 to 14. In general, the purpose of the site visit was to view the construction activities, liaise with MPMC project personnel and discuss any issues with the TSF.

3.1.3 MPMC Field Inspector

MPMC Field Inspectors were responsible for the following:

- Monitor and maintain a photographic record of ongoing construction activities;
- Review borrow pit material to verify material consistency;
- Delineate embankment zones with stakes (every 25 to 50 m);
- Perform QC compaction testing of placed Zone S material (as per material placement specifications);
- Collect material samples for QC laboratory testing;
- Conduct as-built surveys of various zones;
- Prepare and submit daily construction reports;
- Collect and submit instrumentation data; and
- Report out-of-compliance situations to AMEC's Support Engineer.

Examples of daily construction reports prepared during the construction season are presented in Appendix C.

3.2 QA/QC Testing

A summary of the testing requirements is given in Table 3.1.

Table 3.1: Embankment Material Types and QA/QC Testing Requirements

MATERIAL TYPE	ON-SITE TESTING	OFF-SITE TESTING	SAMPLE COLLECTION SCHEDULE
Zone S Till Core	<u>Source Classification:</u> Visual inspection of borrow material. <u>In-Place Testing:</u> Visual inspection of zone dimension, and material. ND Density Testing (D6938-10) MDI Density Testing (D680-05) Moisture Content (D4318-10)	<u>Source Classification and In-Place Testing :</u> Proctor (D698-07 / D4718-07) Atterberg (D421-07 / D4318-10) Hydrometer Gradation (D421-07 and D422-07) Sieve Gradation (D6913-09)	<u>Source Classification</u> : One (1) per biweekly per source or One (1) per 10,000 m^3 per source <u>In-Place Testing</u>: One (1) per offset biweekly per source or one (1) per 6,500 linear meters per source <u>Moisture Content</u>: One (1) per 1000 linear meters per lift per day
Zone F Filter	<u>During Production/Transportation:</u> Wash Sieve Gradation (C117-04 and C136-06) <u>During Placement:</u> Visual inspection of material size, compaction, preparation, and zone dimension. Wash Sieve Gradation (C117-04 and C136-06)	<u>During Production/Transportation:</u> Wash Sieve Gradation (C117-04 and C136-06) <u>In-Place Testing:</u> Wash Sieve Gradation (C117-04 and C136-06)	<u>During Production/Transportation</u>: One (1) per 5,000 m^3 per stockpile A duplicate sample for off-site testing one (1) per stockpile <u>In-Place Testing</u>: One (1) per placement event or one (1) per 2,500 linear meters A duplicate sample for off-site testing one (1) per 4,500 linear meters

Zone T Transition	In-Place Testing: Wash Sieve Gradation (C117-04 and C136-06) Confirmation of waste rock inertness, as required. Visual inspection of material size, compaction, preparation, and zone dimension.	In-Place Testing: Wash Sieve Gradation (C117-04 and C136-06)	In-Place Testing: One (1) per 5,000 m^3 material placed. A duplicate sample for off-site testing one (1) per 10,000 m^3
Zone C Rockfill	Confirmation of waste rock inertness, as required. Visual in-place inspection of material size, preparation, and placement.	Not Applicable	Not Applicable

3.3 Instrumentation Monitoring

MPMC personnel are responsible for monitoring both vibrating wire piezometers and inclinometers located within the TSF. During the 2012 construction period, the instrumentation was generally read once every two weeks with inclinometers readings offset a week from the piezometer readings.

For the period prior to and after the 2012 construction period through the end of 2012, instrumentation monitoring was reduced to readings once a month.

4.0 TSF EMBANKMENT - STAGE 8/8A CONSTRUCTION OVERVIEW

4.1 General

Construction of the Stage 8/8A raise entailed a raise of approximately 3.4 m from approximate El. 960.1 m to a minimum crest El. 963.5 m. Till core (Zone S) placement took place between May 30 and October 26, 2012. The following subsections provide a brief summary of the 2012 construction activities for the TSF.

Drawing 2012AB.01 provides a general mine layout and the location of the borrow sources used in the Stage 8/8A construction. Drawing 2012AB.02 shows the as-built embankment in plan view while drawings 2012AB.03 through 2012AB.05 show the as-built sections of the embankment in relation to the design.

Throughout the report, references to specific photographs are listed to better illustrate given details about the embankment construction process. In each case, the photograph will be noted by a number; the photographs are presented in Appendix A.

4.2 Foundation Preparation

Foundation preparation of the abutments was carried out in accordance with the guidelines outlined in AMEC's 2011 Construction Monitoring Manual (AMEC 2012b). Preparation was conducted on the south and perimeter abutments and consisted of the following:

- **Removal of overburden** – Areas within the dam footprint and 2 m beyond, were stripped of organic material, loose or soft soils and deleterious material (including previously placed waste rockfill).

- **Test pitting** – Prior to cutoff trench construction, excavation of two test pits were performed (one at each the south and perimeter abutments) to confirm that a minimum of 2 m depth of native till was present beneath the embankment core limits. The test pits were completed downstream of the core limits such that the existing soils under the till core contact were not compromised. Bedrock was not encountered in any of the test pits. (see Photos 1, 2)

- **Drainage Blanket construction** - Prior to placement of the drainage blanket, proof-rolling of the exposed native abutment material was completed using a 10 ton vibratory smooth drum compactor. A drainage blanket consisting of a 0.6 m thick lift of Zone F material was then placed to the full extents of the embankment shell. Thickness of the blanket lift was verified by hand digging a number of test pits in randomly selected locations. (see Photos 3, 4)

- **Drainage ditch construction** – Construction of a drainage ditch was performed by excavating a ditch approximately 0.6 to 1.0 m in depth and 2.0 m in width, along the Perimeter and South Embankments downstream of the abutment core extensions. (see Photo 5) The ditch was constructed in order to accommodate drainage trench detail implemented in past raises, aligned along the toe of the dam. On the South Embankment the corrugated drainage pipe was extended and placed at the base of the trench. The trenches were then backfilled with filter material (Zone F).

4.3 Fill Placement

4.3.1 Zone U – Upstream Shell

Upstream support for the raising of the TSF embankment is provided by NAG tailings. The majority of the upstream shell comprised end of pipe spigotted tailings, utilizing cells, reworked with a dozer to achieve proper distribution, provide compaction and expedite excess water drainage. (see Photo 14) Further shaping of Zone U confining berms was done with the aid of an excavator. The majority of this work was carried out without AMEC supervision. Where the tailings could not be used for shell construction due to pipeline and pumping limitations, NAG waste rock was brought to the TSF by haul truck and placed/shaped by excavators and dozers. Specifically, NAG waste rock was substituted for use as Zone U along the Perimeter Embankment between Corner 1 and Corner 2 and along the central portion of the Main Embankment between Corner 2 and Corner 3. Waste rock used along the Perimeter Embankment was done by combining the placement of both tailings and NAG waste rock, due to poor tailings grain size distribution. Prior to Zone S placement downstream of Zone U, AMEC's Support Engineer inspected the NAG waste rock that had been used as Zone U to ensure that large boulders (diameter > 1 m) did not exist near the Zone U/Zone S interface.

4.3.2 Zone S – Till Core

The till fill core material used in the construction of the TSF embankment was obtained from a single source, the Perimeter Borrow, during the 2012 construction. The borrow was located downstream of the Perimeter Embankment between Corner 1 and Corner 1.5. (see Photos 6, 21, 23)

The placement of Zone S material was performed by Peterson and generally followed the methodology outlined below:

- Prior to placement of the first lift of till core during 2012, the existing till (Zone S and native till on the abutments) was prepared by proof-rolling with a 10 ton vibratory smooth drum roller. Areas that were noted to be soft or affected by the frost were removed and replaced with approved Zone S material.
- The top 0.1 m of the prepared surface was scarified with the aid of a dozer/grader, to promote bonding between successive lifts. (see Photo 7)
- The surface was moisture conditioned as required to further promote proper bonding of successive till lifts. (see Photo 11)
- The till fill was end dumped by haul trucks and spread in 0.3 m thick lifts with a dozer. (see Photo 12)
- Compaction of the till was primarily achieved using a 10 ton smooth drum vibratory compactor, with additional compaction performed occasionally by haul truck traffic.
- On average, for every two (2) to three (3) lifts placed, the downstream face of the till was trimmed and shaped by an excavator to maintain design lines. (see Photo 15)

4.3.3 Zone F – NAG Filter Rock

The material utilized for Zone F sand and gravel was crushed on site at the primary crusher. Haul trucks were used to transport and stockpile the material around the TSF embankment for use in construction. Drawing 2012AB.02 illustrates the stockpile locations used during the 2012 construction.

Prior to placement of Zone F material, the previously placed filter material was exposed to ensure vertical continuity of the filter. This was carried out by excavator in concert with the downstream limits trimming process of the core. (see Photo 16) The filter material was then placed in 0.6 m lifts against the trimmed downstream limits of the core. The material was transported by dump trucks and spread/shaped with the aid of an excavator, grader, or loader. (see Photo 17)

The placed Zone F material was lightly compacted in conjunction with Zone T material, by 10 ton smooth drum compactor and haul truck trafficking.

4.3.4 Zone T – Transition NAG Rock

The material utilized for Zone T was crushed on site and transported to the embankment as required. Zone T material was hauled and placed by MPMC in 0.6 m to 1.2 m thick lifts with the aid of a loader and grader. Prior to placement of the Zone T material, the interface between the lifts was exposed or/and scarified to remove any pavement like surfaces.

The compaction of the transition material was achieved with a 10 ton smooth drum compactor and haul truck trafficking.

4.3.5 Zone C – Downstream Shell NAG Rock

The Zone C downstream rockfill shell (placed by MPMC) was constructed with NAG rockfill obtained from the Springer pit. Prior to placement, the surface was scarified with the aid of a grader/dozer in areas where pavement like surfaces had developed. The scarification was performed to avoid continuous, low hydraulic conductivity zones within the rockfill shell, thus promoting downward drainage through the rockfill. The NAG rock was transported from active mining areas to the embankment via haul truck and placed and spread by dozers.

4.4 Survey Control

Survey control requirements for the 2012 construction of the TSF included the following:

- Establishing and maintaining upstream and downstream limits of the Zone S (the stakes were generally placed every 25 to 50 m along the entire length of the embankment, and as requested by Peterson);
- Maintaining the downstream crest chainage during construction;
- Verifying that a 5 m till core width was maintained during construction;
- Establishing and verifying the Zone F/T transition line for placement of Zone T material;
- Conducting spot checks to confirm that the minimum width of Zone F and Zone T were achieved;

- Surveying the location and elevation of in-situ density tests;
- Collecting and storing data as required for the as-built record; and
- Providing location and elevation data as required by the AMEC Support Engineer.

MPMC personnel performed the survey control described above for the 2012 construction season.

4.5 Quality Control and Quality Assurance Testing

QA/QC testing of the fills used in the construction of the embankment involved on-site and off-site tests. On-site testing included in-situ nuclear densometer tests (ASTM D6938-10) to confirm adequate compaction of the till fills placed. Sieve analyses of the Zone F filter material to assess particle size gradation (ASTM D-422-63) were also performed on-site to confirm adequate compliance to specifications.

Off-site tests of the fills included Standard Proctor Density (SPD) tests (ASTM D-698) that provided reference values used in the field to assess whether the compacted fill had achieved the 95% SPD in the design specifications. Tests of the fill material particle size gradation (ASTM D-422-63) were performed to assess whether the fill material satisfied the allowable gradation envelope according to the design specifications. Test of the core materials Atterberg limits (ASTM D-4318-98) were also performed. The results of these tests are presented in Appendix B.

During the 2012 construction season, the testing frequencies as outlined in Section 3.2 were generally maintained. A summary of the quantities of each different material type and the number and types of tests performed on the fills is provided in Table 4.1.

Table 4.1: TSF Summary of Material Quantities and Laboratory testing

Material Type	Source Of Material	Volume Placed (m^3)	QA/QC Tests Performed
Zone C – Downstream Shell NAG Rock	Springer Pit (ROM)*	XX	Visual
Zone T – Transition NAG Rock	Springer Pit (Road Crush product)		2 gradations (MPMC) 1 Gradations (AMEC)
Zone F – NAG Filter Rock	Springer Pit (Filter Crush)	XX	11 Gradations (MPMC) 4 Gradations (AMEC)
Zone S - Till Core	Perimeter Borrow	XX	15 Proctor 18 Gradation 18 Atterberg limits 20 QA ND field density (AMEC) 778 QC ND field density(MPMC) 36 Laboratory Moisture tests
	Total Fill Volume Placed	**XX**	

*Run of mine material (no processing required)

4.5.1 Zone S – Till Core

In 2012, till placed on the embankment was obtained from the perimeter borrow pit, located downstream of the Perimeter Embankment between Corner 1 and Corner 1.5. Till material found in the borrow pit was generally consistent, within the specification and was classified as a low plasticity Sandy Silt, some clay with some to trace gravel.

A glaciolacustrine unit was encountered interbedded within the till in some areas of the borrow pit. The glaciolacustrine material typically meets the core material specification, however due to its poor workability, this material was wasted or whenever possible intermixed with till in a ratio of 1 part glaciolacustrine and 2 parts till.

The in-situ density and moisture content of the compacted till were determined by a nuclear densometer (ASTM D6938-10). (see Photo 18) Where field test results indicated that the specified 95% Standard Proctor Maximum Dry Density (SPMDD) was not achieved, the area was re-compacted until satisfactory test results were achieved. Samples of till were also collected and periodically sent to AMEC's Prince George lab facility for geotechnical index testing.

The SPMDD value used in the field was selected from the first SPMDD (2094 kg/m^3) lab result for the 2012 construction season and adjusted as necessary based on observations of the soil. The average of the SPMDD lab results over the 2012 construction season was 2055 kg/m^3.

In general, the fills achieved 95% SPMDD. Test results were recorded and entered into a spreadsheet. Plots of the test results were prepared and are presented in Appendix B.

4.5.2 Zone F – NAG Filter Rock

Filter Zone F was produced by running run-of-mine NAG waste rock through the mill crusher. The majority of the material brought to and placed on the embankment was fairly consistent, plotting within the accepted filter design criterion. Approximately half of the on-site tested samples plotted slightly to the coarse side of the specified envelope for the finer range of sizes (D_{15} to D_{30}), as indicated on the grain size analyses curves shown in Appendix B. This slight deviation from the gradation specification could be due to inexperienced MPMC lab testing personnel and/or segregation of the material during transportation and placement. Generally, based on the visual assessments as well as the laboratory testing results, the Zone F was judged an acceptable filter for the Zone T.

4.5.3 Zone T – Transition Zone

Transition Zone T was produced by running run-of-mine NAG waste rock through the mill crusher. Visual inspections of the Zones F and T interface indicated acceptable filter compatibility. Routine visual assessments were carried out during construction to determine qualitatively the conformance of Zone T transition to the gradation specifications and its acceptability as a filter for Zone F filter rock. Based on the visual assessments, the Zone T was judged an acceptable filter for the Zone F. Sieve analyses were also conducted on samples of the Zone T and results are presented in Appendix B.

4.5.4 Zone C – Downstream Shell NAG Rock

The Zone C downstream rockfill shell was constructed with NAG rockfill obtained from the Springer Pit. The Zone C gradation specifications call for a broad range of sizes smaller than 1 m (maximum diameter). Routine visual assessments were carried out during construction to determine qualitatively the conformance of Zone C transition to the gradation specifications and its acceptability as a filter for Zone T filter rock. Based on the visual assessments, the Zone C was judged an acceptable filter for the Zone T.

4.6 Conformance of 2012 Construction with Design Intent

In general, the 2012 Stage 8/8A raise of the embankment is judged to have been carried out in conformance with design intent. This conclusion is based on AMEC's periodic observations of the construction, review of reports prepared by MPMC when AMEC was not on site, and the review of QA/QC records.

However, there are two items which are currently out of compliance with original design intent but do not pose any immediate concerns to embankment stability or overall function. The items listed below are to be corrected prior to or at the beginning of the 2013 construction season:

- **Zone F & Zone T elevation**: Zones F and T are at elevations lower than the Zone S elevation in each of the three embankments. As-built elevations immediately recorded after the suspension of construction in 2012 were provided to AMEC by MPMC. The elevations indicated that the difference between the Zone S and Zone T/F lifts was approximately 1 m, 0.5 m and 0.9 m in the Perimeter, Main and South embankments, respectively. Maintenance of the Zones F and T above the tailings/pond level is part of the TSF design requirements. MPMC was made aware that the elevation of the tailings was to be closely monitored following the 2012 construction, raising the level of the filter and transition materials as necessary.

- **Zone S width**: In several areas (~ X m in total length) of the Main and Perimeter embankments the till core width was found to be less than the minimum design width of 5.0 m based on field survey inspections. The upstream limits of the till core were found to deviate inwards in some areas by about 0.5 m to 1.0 m. (see Photo 24) The downstream limits were placed within the specified construction tolerances in order to maintain continuity and integrity of the filter and transition zones.

  The design deviation was discussed with MPMC project personnel. Prior to commencement of the 2013 construction season, the existing core is to be surveyed and clearly marked in the locations that are less than required 5 m width. In these marked areas, the core will need to be widened in the upstream direction by completing the following:

  - *Step 1*: Clear the area extending from the existing upstream till core to approximately 1.5 m upstream of the surveyed core limits, making sure to remove all loose, dry material that is inconsistent with approved Zone S.

  - *Step 2:* In the prepared areas (Step 1), excavate a trench that extends approximately 0.6 m downstream of the existing upstream core limits, to a minimum of 2.5 m upstream of that point (i.e. within the Zone U). The depth of trench shall extend a minimum of 0.6 m or until survey confirms that the upstream till design limits are satisfied. The trench shall have a minimum width of 1 m at its base and side slopes of 1H:1V, which are recommended to ensure proper tie-in and compaction are achieved.

- *Step 3:* Within the approved trench, approved till material shall be placed in loose lifts of 0.3 m and compacted to 95% SPD. If compaction cannot be achieved using normal compactive methods (i.e. smooth drum roller), then compaction of thin till lifts with a walk-behind or plate-tamping compactor, or tamping with a hoe bucket may be required.

In general, the repair of the Zone S core (i.e. trench excavation, till core placement and compaction) shall be completed at the direction of the AMEC field engineer.

5.0 INSTRUMENTATION MONITORING

5.1 General

Instrumentation functioning in the TSF currently consists of eight (8) slope inclinometers (SI) and eighty one (81) vibrating wire piezometers (VW). The as-built locations of the inclinometers and piezometers (organised by planes) is shown in plan view on Drawing 2012AB.07.

5.2 Piezometers

Vibrating wire piezometers have been installed in each of the embankments in the following locations: foundation, tailings, upstream fills, Zone F, Zone S and in various embankment drains. The piezometric data has been organized by planes. Drawings 2012AB.08 through 2012AB.16 show the relative placement of the vibrating wires within the embankment and the foundation in section view.

5.3 Slope Inclinometers

A total of 8 slope inclinometers installed in the TSF are currently functional, one in the Perimeter embankment and 7 in the Main embankment. Drawings 2012AB.10 through 2012AB.13, and 2012AB.16 show the locations of the inclinometers in section view.

5.4 New Instrumentation

In late 2012, readings from an inclinometer located downstream of the Perimeter embankment (SI11-04) showed deformation consistent with settlement at depths from ground surface to 15 m below. AMEC recommended that new instrumentation be installed, as the SI11-04 would likely cease functioning due to the deformation. Upon the approval of MPMC a site investigation program was initiated (in conjunction with an AMEC water well drilling program) and consisted of the installation 2 slope inclinometers along the downstream toe of the Perimeter embankment. The first inclinometer (SI12-01) was installed directly adjacent SI11-04 and the second one (SI12-02) adjacent the location of vibrating wire J1. Locations of the inclinometers are shown in section on Drawings 2012AB.14 and 2012AB.16. The new slope inclinometers are scheduled to be initialized in early 2013.

6.0 WORKS TO BE COMPLETED

There are a number of outstanding tasks pertaining to the ongoing development of the tailings storage facility. These tasks are important to the proper completion of the development of the tailings embankment and AMEC is to be updated on their progress. These tasks include, but are not limited to:

- *Placement of the downstream filter and transition materials (Zones F and T)*: Zone F and T placement on the Perimeter, Main and South embankments to the minimum crest elevation of 963.5 m needs to be completed prior to the pond elevation reaching 963.5 m and/or the commencement of the 2013 construction period.

- *Repair of the till core (Zone S)*: Construction of the till core needs to be completed in the areas where survey indicates the width to be less than the minimum design width of 5.0 m.

- *Instrumentation monitoring:* Monitoring of all TSF instrumentation needs to continue at the recommended intervals outlined in the 2012 Construction Monitoring Manual (AMEC 2012b). As well, initialization of 2012 installed slope indicators needs be completed as soon as possible, specifically prior to the 2013 construction season.

7.0 REPORT CLOSURE

This report has been prepared for the exclusive use of Mount Polley Mine Corporation for specific application to the area within this report. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. AMEC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. It has been prepared in accordance with generally accepted geotechnical and tailings dam engineering practices. No other warranty, expressed or implied, is made.

Respectfully submitted,

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DRAWINGS

APPENDIX A

2012 CONSTRUCTION SEASON PHOTOGRAPHS

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APPENDIX B

MATERIAL TESTING RESULTS

APPENDIX C

SAMPLE REPORTS