TAILINGS STORAGE FACILITY REPORT ON 2009 ANNUAL INSPECTION





<u>PREPARED FOR</u>

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TAILINGS STORAGE FACILITY REPORT ON 2009 ANNUAL INSPECTION (REF. NO. VA101-1/27-1)

EXECUTIVE SUMMARY

The Mount Polley copper and gold mine is owned by Mount Polley Mining Corporation (MPMC). It is located 56 kilometres northeast of Williams Lake, in central British Columbia. Mr. Les Galbraith, P.Eng., of Knight Piésold completed an annual inspection of the Tailings Storage Facility (TSF) Inspection and associated works on September 24, 2009, in the company of Mr. Ron Martel.

The TSF at Mount Polley has three embankments; the Main Embankment, the Perimeter Embankment, and the South Embankment. The embankments are zoned earthfill embankments that are constructed using the modified centreline construction method. The Main Embankment is the highest of the three embankments at approximately 41 m high.

The Canadian Dam Association updated their 'Dam Safety Guidelines' in 2007. The updated classification of the TSF is now "significant", which is analogous to the previous "low" classification. The update has not changed the design criteria for the Mt. Polley TSF.

The TSF embankments were in good condition with no geotechnical issues outstanding. No major unexpected or uncontrolled seepage was observed from the embankments.

The TSF is required to have sufficient live storage capacity for containment of runoff from the 72-hour Probable Maximum Precipitation (PMP) at all times, plus 0.8 m of freeboard for wave run-up. MPMC has operated the tailings pond within these tolerances over the past year. The site water balance is updated regularly by MPMC with periodic reviews by Knight Piésold.

The TSF instrumentation currently consists of four slope inclinometers installed at the Main Embankment and 62 operating vibrating wire piezometers installed in the Main, Perimeter and South Embankments. The piezometers monitor the pore pressures in the foundation materials, embankment fill materials, the tailings mass and the embankment drains. There have been no significant deviations in the inclinometers and no unexpected or anomalous pore pressures reading in the vibrating wire piezometers. However, inclinometer SI01-02 is showing slight deviations at an approximate depth of 10 m below ground in the lacustrine silts. This is being closely monitored by MPMC who have increased the monitoring frequency of the inclinometers to weekly. MPMC has also expanded the buttress at the Main Embankment as a result of the measured displacements in SI01-02.

The Southeast Sediment Pond, Millsite Sump, and South Bootjack Dam were observed to be in good condition with no geotechnical issues outstanding. The Southeast Sediment Pond is no longer in service and runoff that previously reported to the Southeast Sediment Pond is now being routed to the Perimeter Embankment Seepage Collection Pond.



The Operations, Maintenance and Surveillance Manual (OMS Manual) and the Emergency Preparedness and Response Plan are updated on a regular basis to remain current with the development of the mine site.

A Dam Safety Review (DSR) was performed in 2006. The next Dam Safety Review should be carried out by 2011, or during detailed closure design, whichever is earlier.



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SECTION 1.0 - INTRODUCTION

1.1 PROJECT DESCRIPTION

The Mount Polley Copper and gold mine is owned by Mount Polley Mining Corporation (MPMC). The mine is located approximately 56 kilometres northeast of Williams Lake, in central British Columbia. The project site is accessible by paved road from Williams Lake to Morehead Lake and then by gravel road for the final 12 km. Mount Polley Mine started production in 1997 and had milled approximately 27.5 million tonnes of ore prior to suspending operations in October 2001. The mine operated under care and maintenance conditions from October 2001 to March 2005, when the mine started operation again. The mine is currently mining the South East Zone and the Springer Pit. Mine tailings are deposited as slurry into the Tailings Storage Facility (TSF). Process water in the TSF is collected and recycled back to the mill for re-use in the milling process. The mine throughput is approximately 20,000 tpd. The overall site plan showing the Stage 6 footprint of the TSF is shown on Drawing 101-1/18-100. The Stage 6 TSF General Arrangement is shown on Drawing 101-1/18-102.

1.2 SCOPE OF REPORT

Mount Polley Mining Corporation requested that Knight Piésold complete a site inspection of the TSF and prepare an Annual Inspection Report that meets the guidelines outlined by the Ministry of Energy, Mines and Petroleum Resources (MEMPR). Mr. Les Galbraith, P.Eng., of Knight Piésold (KP) conducted the 2009 annual inspection on September 24, 2009, in the company of Mr. Ron Martel of MPMC. This report presents the results of the annual inspection. The inspection involved making visual observations of the TSF and includes a review of the instrumentation records. This report also includes a review of the annual methanism pipelines, the Millsite Sump, the Southeast Sediment Pond and the South Bootjack Dam.

Selected photographs taken during the site inspection are included in Appendix C.

SECTION 2.0 - TAILINGS STORAGE FACILITY AND ANCILLARY WORKS

2.1 TAILINGS STORAGE FACILITY

2.1.1 <u>General</u>

The principal objectives of the TSF are to provide secure containment for tailings solids and to ensure that the regional groundwater and surface water flows are not adversely affected during or after mining operations. The design and operation of the TSF is integrated with the overall water management objectives for the entire mine development, in that surface runoff from disturbed catchment areas is controlled, collected and contained on site. An additional requirement for the TSF is to allow for effective reclamation of the tailings impoundment and associated disturbed areas at closure.

The TSF at Mount Polley has three embankments; the Main Embankment, the Perimeter Embankment, and the South Embankment. The current crest elevation of the TSF embankments is 954 m. The heights of the TSF embankments corresponding to a crest elevation of 954 m are approximately 41 m, 23 m, and 13 m for the Main, Perimeter, and South Embankment, respectively. The tailings embankments have been designed for staged expansion using the modified centreline construction method. The TSF plan and sections, corresponding to the Stage 6a construction program, are shown on the following drawings:

- VA101-1/18-100 Rev 1 Stage 6a Tailings Embankment Overall Site Plan
- VA101-1/18-102 Rev 1 Stage 6a Tailings Embankment General Arrangement
- VA101-1/18-104 Rev 2 Stage 6a Tailings Embankment Material Specifications
- VA101-1/18-210 Rev 2 Stage 6a Main Embankment Plan
- VA101-1/18-215 Rev 2 Stage 6a Main Embankment Section
- VA101-1/18-216 Rev 1 Stage 6a Main Embankment Detail
- VA101-1/18-220 Rev 2 Stage 6a Perimeter Embankment Plan
- VA101-1/18-225 Rev 2 Stage 6a Perimeter Embankment Section
- VA101-1/18-226 Rev 1 Stage 6a Perimeter Embankment Detail
- VA101-1/18-230 Rev 2 Stage 6a South Embankment Plan
- VA101-1/18-235 Rev 2 Stage 6a South Embankment Section 1, and
- VA101-1/18-236 Rev 1 Stage 6a South Embankment Section 2.

2.1.2 Tailings Storage Facility Components

The main components of the TSF are as follows:

- TSF embankments. The TSF embankments are zoned earthfill/rockfill embankments that include the following zones and materials:
 - o Zone S Core zone fine grained glacial till.
 - Zone F Filter, drainage zones, and chimney drain processed sand and gravel. Zone F material provides a filter relationship between the Zone S and the Zone T material.
 - Zone T Transition filter zone select well-graded, fine-grained rockfill. Zone T material provides a filter relationship between the Zone F and the Zone C material.



- Zone C Downstream shell zone rockfill.
- Zone U Upstream shell zone materials vary. Tailings sand cell construction has been the predominant method for Zone U construction in the past year. Zone U provides upstream support for the Zone S core zone for modified centreline construction.
- A low permeability basin liner (natural and constructed) covers the base of the entire facility, at a nominal depth of at least 2 m. The Zone S core zone ties into the basin liner to provide a continuous low permeability seepage barrier within the impoundment. The low permeability basin liner has proven to be effective in minimizing seepage from the TSF as there have been no indications of adverse water quality reporting to the groundwater monitoring wells.
- Seepage collection ponds located downstream of the Main and Perimeter Embankments and a seepage collection sump located downstream of the South Embankment. The ponds and sump were excavated in low permeability soils and collect water from the embankment drains and from local runoff.
- A foundation drain and pressure relief well system located downstream of the Stage 1B Main Embankment. The foundation drain and pressure relief well system prevents the build-up of excess pore pressure in the foundation. Groundwater and/or seepage are transferred to the Main Embankment Seepage Collection Pond.
- Embankment drainage provisions, which include foundation drains, chimney, longitudinal and outlet drains, and upstream toe drains. Flows from the embankment drainage provisions report to their respective Seepage Collection Ponds where the flows are measured prior to being pumped back to the TSF.
- Geotechnical Instrumentation in the tailings, embankment fill materials, embankment drains, and embankment foundation materials. This includes vibrating wire piezometers and slope inclinometers.
- A system of groundwater quality monitoring wells installed around the TSF.

2.1.3 <u>Tailings Dam Classification</u>

The classification of the TSF, which was previously rated as "HIGH", was reviewed as part of the Dam Safety Review in 2006. The Dam Safety Review concluded that the hazard classification be reviewed assuming that the owner's costs were not included in the rating selection. This was discussed with MPMC and the hazard classification for the TSF was subsequently reduced to "LOW" based on the 1999 Canadian Dam Association (CDA) and the British Columbia Dam Safety Regulation guidelines.

The CDA updated their 'Dam Safety Guidelines' in 2007. The updated classification of the TSF is now "SIGNIFICANT", which is analogous to the previous "LOW" classification. The update has not changed the design criteria for the Mt. Polley TSF.

2.2 ANCILLARY WORKS

Ancillary works that are key to the operation of the TSF include the following:

• Tailings and Reclaim Pipelines. The tailings pipeline comprises approximately 7 km of HDPE pipe of varying diameters and pressure ratings extending from the mill down to the crest of the tailings embankment. The tailings pipeline and discharge system extends around the TSF to facilitate tailings



beach development. The tailings pipeline has a design flow of 20,000 tpd at 35% solids by dry weight. The reclaim pipeline system returns water from the TSF to the mill site for re-use in the process. The system comprises a pump barge, a reclaim pipeline and a reclaim booster pump station.

- Mill Site Sump. Runoff from the Mill Site is routed and stored in the Mill Site Sump. Excess water from the sump is routed into the tailings pipeline near the mill for storage in the TSF.
- Southeast Sediment Pond. Runoff from the southeast rock disposal site and the dewatering from the
 northeast zone and associated waste dumps was previously directed to the Southeast Sediment
 Pond where it was routed to the reclaim pipeline at the reclaim booster pump station. The Southeast
 Sediment Pond was drained in 2008 and runoff previously routed to the Southeast Sediment Pond is
 currently routed to the Perimeter Embankment Seepage Collection Pond via a diversion ditch.

2.3 <u>2009 CONSTRUCTION ACITIVITIES</u>

The construction activities at the TSF during the past year included the following:

- Completing the Stage 6a expansion of the TSF that involved raising the crest elevation to 954 m, an increase of 3 m from the Stage 5 crest elevation. The Stage 6a construction program was completed in October 2008. Details of the Stage 6a construction program were issued in the Stage 6a construction report (KP Ref. No. VA101-1/23-1).
- Expanding the TSF Main Embankment buttress. The buttress requirements for the Main Embankment were reviewed and revised by Knight Piésold in 2009 resulting from slight displacements measured in inclinometer SI01-02 (KP Ref. No. VA09-00838).
- On-going construction of Zone U at the TSF. Zone U was constructed using sand cell construction methods involving discharging tailings into constructed cells along the upstream side of the embankments.
- Completing the upstream toe drain installation at the South Embankment.



SECTION 3.0 - SITE INSPECTION

3.1 <u>GENERAL</u>

Les Galbraith arrived on site on September 24, 2009, and held discussions with Ron Martel of MPMC regarding activities and observations at the TSF over the past year. The 2009 inspection of the TSF occurred that afternoon. The weather conditions at the time of the inspection consisted of clear skies.

3.2 TAILINGS STORAGE FACILITY

3.2.1 Tailings Storage Facility Embankments

Pertinent observations regarding the condition of the TSF were as follows:

- No signs of distress were identified on the tailings embankments. The embankment slopes were approximately planar and there was no evidence of cracking, bulging or slumping in the embankment fill. The embankment crest appeared to be relatively level with no signs of differential settlement or distress. There was no evidence of animal burrowing.
- Tailings sand is currently being used as an upstream Zone U construction material. Zone U forms the upstream shell zone immediately adjacent to Zone S (low permeability core zone) and is required to provide upstream support of the Zone S material during modified centerline construction. The sand cell construction method involves discharging tailings into constructed cells along the upstream side of the embankment. The sand cell construction was taking place at the Main Embankment at the time of the inspection.
- No major unexpected or uncontrolled seepage was observed from the embankments, including fill slope and foundations.

The TSF was observed to be in good condition with no geotechnical issues outstanding. Selected photographs of the TSF are presented in Appendix C. The Operations, Maintenance and Surveillance Manual (OMS Manual) and the Emergency Preparedness and Response Plan (EPP document) for the TSF are live documents that are revised as necessary by MPMC.

3.2.2 Impoundment Freeboard Requirements

The design basis for the TSF includes a freeboard allowance to contain the 72-hour PMP event, which corresponds to approximately 1,070,000 m³. This would result in an increase in the TSF pond elevation of approximately 0.6 m. The freeboard requirement for wave run-up is approximately 0.8 m, for a total freeboard requirement of 1.4 m. The supernatant pond was at elevation 951.4 m at the time of Mr. Galbraith's inspection on September 24, 2009. The freeboard requirement of 1.4 m has been maintained during the previous year by MPMC.

3.2.3 <u>Seepage Collection Ponds</u>

The Main and Perimeter Embankment seepage collection ponds are located immediately downstream of their respective embankments. These ponds were excavated in low permeability glacial till materials in 1996 and collect water from the embankment drain systems and from local



runoff. The seepage collection ponds were observed to be in good condition with no observed erosion activity.

The South Embankment sump was excavated in 2006. The water flowing into the sump at the South Embankment is currently limited to runoff from the downstream slope of the embankment. The water was being released to a vegetated area down gradient of the access road at the time of the inspection.

3.2.4 Drain Flow Data

The upstream toe drain and foundation drains at the Main Embankment flow into the sump at the Main Embankment Seepage Collection Pond where the flows are measured. The flow rates have been measured since July 2000; however the flow rates from the drains were not monitored during the Care and Maintenance Period as the drain outlets were submerged within the sump. This condition was anticipated as flow monitoring is only possible during operations when the seepage pond level has been pumped down.

The upstream toe drain at the Perimeter Embankment drains into the Perimeter Embankment Seepage Collection Pond via a ditch. The flow rates are currently measured at the end of the pipe which exits the concrete encasement.

Water from the foundation drains and upstream toe drains flows into the seepage collection ponds where it is temporarily stored prior to being pumped back into the TSF. The flow rates for the foundation drains are shown on Figure 3.1. The flow rates for the upstream toe drains are shown on Figure 3.2. The total flows from foundation drains FD-1 to FD-5 have remained fairly constant during the past year at approximately 2.0 l/s. The flows from the upstream toe drains fluctuate throughout the year in response to the tailings deposition location and the tailings pond location. The flow from the Main Embankment upstream toe drain, as measured in June 2009, was approximately 11 l/s, which is slightly less than the same flows measured in June 2009, was approximately 8 l/s, which is consistent with the measured flows from 2008.

Samples from the Foundation Drains and the Upstream Toe Drains are collected by MPMC for water quality testing. The results are available from MPMC and are reported in the Annual Environmental Reports.

3.2.5 <u>Piezometer Data</u>

3.2.5.1 General

Vibrating wire piezometers have been installed at the TSF along nine planes, designated as monitoring planes A to I. Monitoring planes A, B, C and E are located on the Main Embankment, monitoring planes D, G, and H are located on the Perimeter Embankment, and monitoring planes F and I are located on the South Embankment. The location of the TSF monitoring planes are shown on Drawing 255. The Monitoring Planes are shown in section on Drawings 256, 257, 258, and 259. The piezometers are grouped



into tailings, foundation, fill and drain piezometers. The results from each group are discussed below. The timeline plots for the piezometers are included in Appendix A.

3.2.5.2 Tailings Piezometers

A total of 18 piezometers have been installed in the tailings mass of which 13 remain in operation. Timeline plots of the tailings piezometer data are included in Appendix A1. The pore pressures in the tailings piezometers have remained relatively steady over the past year.

3.2.5.3 Embankment Foundation Piezometers

A total of 19 piezometers have been installed in the embankment foundations of which nine remain in operation. Timeline plots of the embankment foundation piezometers are included in Appendix A2.

Artesian conditions are present in four foundation piezometers installed under the Main Embankment. This is consistent with baseline data, and no changes have occurred. The piezometers installed in this area are used to monitor the pore pressures and to confirm that they remain below the threshold level of 6 m above ground level (KP Ref. No. 1162/7-2). No unexpected high pore pressure increases were noted during the reporting period with the artesian pressures ranging from 0.21 m to 3.0 m above ground. The artesian head values (above ground surface level) measured in September 2009 are summarized in Table 3.1.

3.2.5.4 Embankment Fill Piezometers

A total of 35 piezometers have been installed in the embankment fill materials of which 25 remain in operation. Timeline plots of the embankment fill piezometer data are included in Appendix A3.

There have been no significant changes in the trends of the embankment fill piezometers.

3.2.5.5 Drain Piezometers

A total of 19 piezometers have been installed in the embankment drains, of which 15 remain in operation. Timeline plots for the drain piezometers are shown in Appendix A4.

The majority of the drain piezometers showed near-zero pore pressures, indicating the drains are functioning as intended. Piezometer A1-PE1-04 showed an increase in pore pressures starting in approximately June 2006. This piezometer is located in the upstream toe drain at the Main Embankment and the increased pressures are a result of the tailings pond being in close proximity to the Main Embankment at this instrumentation plane. The positive trend of the pore pressures coincides with the increased flow rates measured from the Main Embankment upstream toe drain.

The 2006 Dam Safety Review (DSR) stated that there were "about the right number of piezometers installed in the embankment dams". The DSR also noted that there was little redundancy with respect to the piezometers and lost instrument locations should be



re-established with new installations. Mount Polley Mine is currently developing a program to re-establish/replace the damaged piezometers.

3.2.6 Slope Inclinometers

A total of five slope inclinometers have been installed at the Main Embankment to measure potential displacements in the lacustrine unit that underlies the embankment. One of the inclinometers (SI01-01) was damaged during the placement of the shell zone material and is no longer functioning. The last reading for SI01-01 was March 2006. There are four functioning inclinometers installed at the Main Embankment.

The results of the inclinometer readings indicate that there have not been any significant deviations measured in the three of the inclinometers since their installation. However, inclinometer SI01-02 is showing slight deviations (less than 3 mm) at an approximate depth of 10 m below ground in the lacustrine silts. This is being closely monitored by MPMC who have increased the monitoring frequency of the inclinometers to weekly. MPMC has also expanded the buttress at the Main Embankment as a result of the measured displacements in SI01-02. The expansion of the buttress appears to have been effective as no additional displacements have been measured in inclinometer SI01-02. The results of the readings for inclinometers are included in Appendix B.

3.2.7 Survey Monument Data

There are currently no survey monuments installed on the TSF embankment crests due to the ongoing construction of the TSF embankments.

3.3 WATER MANAGEMENT

3.3.1 <u>General</u>

MPMC mine personnel complete on-going surface water monitoring and water management activities to ensure compliance with the current mine permits. The site inspection evaluated the physical aspects of the water management program at the TSF. Knight Piésold has not reviewed the geochemical characteristics of the water management operations. This report instead focuses on the aspects of the water management plan that are significant from a dam safety perspective.

3.3.2 <u>Surface Water Control</u>

Surface water control at the mine site comprises the interception of runoff from disturbed (and some undisturbed) catchment areas for diversion into the TSF. Surface water control structures include the following:

- Mill Site Area Surface water from the Mill Site Area is routed into the Mill Site Sump where it is transferred to the TSF via the tailings pipeline.
- Southeast Rock Disposal Site Surface water is intercepted by runoff collection ditches and transferred to the Perimeter Embankment Seepage Collection Pond via a diversion ditch.

- North East Zone Pit and Waste Dumps Surface and groundwater from the North East Zone are stored in the North East Zone Pit. Surface runoff from the North East Zone Waste Dumps is directed to the Perimeter Embankment Seepage Collection Pond via a diversion ditch.
- Tailings Storage Facility Area Clean surface water runoff from the undisturbed catchment area above the impoundment is routed around the TSF to reduce the accumulation of water within the impoundment. The diversion ditch was unobstructed at the time of the inspection and the water flowing in the ditch was clear.

3.3.3 <u>Water Balance Review</u>

MPMC mine personnel complete on-going surface water monitoring and water management activities to ensure compliance with the current mine permits. The water balance for the TSF is updated regularly by MPMC with periodic reviews by Knight Piésold.

The mine site is currently operating with a water surplus, as total inflows from precipitation and surface runoff exceed losses from evaporation, void retention in the tailings mass in the TSF, and seepage loss. Site surplus water is currently being stored in the TSF and the Cariboo Pit. MPMC is currently exploring ways to discharge water from the site to reduce the increasing site storage requirements in the TSF and the Cariboo Pit.

The Mount Polley Mine has undergone considerable development in the last couple of years. The water balance is reviewed and updated by MPMC on a monthly basis to ensure that it is current with the on-going development of the mine site.

3.3.4 External Water

MPMC staff carries out water quality monitoring of external water regularly. The water being monitored includes surface water from ditches, streams, creeks and lakes, as well as groundwater from monitoring wells. The results of the site water quality monitoring are reported by Mount Polley in the Annual Environmental and Reclamation Report. This report is submitted to the appropriate Agencies (Ministry of Environment and the Ministry of Energy, Mines and Petroleum Resources).

3.4 ANCILLARY WORKS

Ancillary works that are key to the operation of the TSF include the tailings and reclaim pipelines, the Mill Site Sump, Southeast Sediment Pond, and the South Bootjack Dam:

3.4.1 <u>Tailings and Reclaim Pipelines</u>

The tailings pipeline was in operation at the time of the inspection with tailings being discharged at the Main Embankment for construction of the sand cells. There have been no reported problems with the tailings pipeline.

The reclaim pipeline was recycling supernatant water back to the mill for re-use in the process at the time of the inspection. There have been no reported problems with the reclaim pipeline and the pipeline was observed to be in sound condition.

3.4.2 <u>Mill Site Sump</u>

Surface water from the Mill Site Area is routed into the Mill Site Sump where it is transferred to the TSF via the tailings pipeline. The embankments at the Mill Site Sump were observed to be in good condition, and no cracks, seepage or slumping was noted. The emergency overflow culvert was clear of obstructions.

3.4.3 <u>Southeast Sediment Pond</u>

The Southeast Sediment Pond is no longer in service and runoff that previously reported to the Southeast Sediment Pond is now being routed to the Perimeter Embankment Seepage Collection Pond. The embankment at the Southeast Sediment Pond was observed to be in good condition.

3.4.4 South Bootjack Dam

The South Bootjack Dam was observed to be in good condition at the time of the inspection. Observations include the following:

- The water level was low
- Both upstream and downstream fill slopes were in good condition, with no evidence of seepage or slumping
- No cracks were observed on the dam crest, and
- The spillway contained some minor vegetation, but was generally unobstructed.



SECTION 4.0 - SUMMARY AND RECOMMENDATIONS

Mr. Les Galbraith, P. Eng., of Knight Piésold completed an annual inspection of the TSF and associated works on September 24, 2009, in the company of Mr. Ron Martel. The TSF at Mount Polley has three embankments; the Main Embankment, the Perimeter Embankment, and the South Embankment. The embankments are zoned earthfill embankments that are constructed using the modified centreline construction method. The heights of the TSF embankments corresponding to a crest elevation of 954 m will be approximately 41 m, 23 m, and 13 m for the Main, Perimeter, and South Embankments, respectively.

The Canadian Dam Association updated their 'Dam Safety Guidelines' in 2007. The updated classification of the TSF is now "significant", which is analogous to the previous "low" classification. The update has not changed the design criteria for the Mt. Polley TSF.

The TSF embankments were observed to be in good condition. No seepage or slumping was observed and no signs of instability were observed in the embankment fill slopes. No major unexpected or uncontrolled seepage was observed from the embankments.

The TSF at Mount Polley is required to have a minimum freeboard of 1.4 m at all times for containment of the 72-hour PMP event and wave run-up requirements. The freeboard requirements for the TSF were achieved during the past year.

The instrumentation at the TSF consists of vibrating wire piezometers and inclinometers. There have been no unexpected or anomalous pore pressures reading in the vibrating wire piezometers installed in the TSF Embankments. There are four operating inclinometers installed through the lacustrine unit at the Main Embankment. The inclinometer readings indicate there have not been any significant deviations measured in the inclinometers since their installation. However, inclinometer SI01-02 is showing slight deviations at an approximate depth of 10 m below ground in the lacustrine silts. This is being closely monitored by MPMC who have increased the monitoring frequency of the inclinometers to weekly. MPMC has also expanded the buttress at the Main Embankment as a result of the measured displacements in SI01-02.

The Southeast Sediment Pond, Millsite Sump, and South Bootjack Dam were observed to be in good condition with no geotechnical issues outstanding. The Southeast Sediment Pond is no longer in service and runoff that previously reported to the Southeast Sediment Pond is now being routed to the Perimeter Embankment Seepage Collection Pond.

Recommendations for on-going operations of the TSF are summarized below:

- Continue monitoring the instrumentation at the required frequency reported in the Operations, Maintenance and Surveillance Manual, (KP Ref. No. 101-1/9-1). The exception to this is the instrumentation at the Main Embankment, which should be monitored on a weekly basis in response to the deviations measured in slope inclinometer SI01-02.
- Continue to update the Operations, Maintenance and Surveillance Manual and the Emergency Preparedness and Response Plan Manuals as required.



- Continue with the deposition of tailings from around the facility to facilitate the development of tailings beaches and manage the location of the tailings pond.
- Continue regular monitoring of the water quality and levels in the surrounding groundwater wells.
- Continue regular monitoring of the tailings pond elevation. The TSF is required to have sufficient live storage capacity for containment of runoff from the 72-hour PMP, in addition to regular inflows from other precipitation runoff, including the spring freshet, while maintaining the minimum freeboard requirements.
- Review the Water Management Plan and site water balance on a regular basis to ensure they are consistent with updated plans for ongoing operations and development of the mine site.

A Dam Safety Review was completed in 2006. The next Dam Safety Review should be carried out by 2011, or during detailed closure design, whichever is earlier.



SECTION 5.0 - CERTIFICATION

This report was prepared and approved by the undersigned.



Prepared:

Les Galbraith, P.Eng. Senior Engineer

Reviewed and Approved:

Ken J. Brouwer, P.Eng. Managing Director

This report was prepared by Knight Piésold Ltd. for the account of Mount Polley Mining Corporation. The material in it reflects Knight Piésold's best judgement in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, is the responsibility of such third parties. Knight Piésold Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions, based on this report. This numbered report is a controlled document. Any reproductions of this report are uncontrolled and may not be the most recent revision.



TABLE 3.1

MOUNT POLLEY MINING CORPORATION MOUNT POLLEY PROJECT

TAILINGS STORAGE FACILITY MAIN EMBANKMENT FOUNDATION PIEZOMETERS

			Sont 2000 Prossure	Sent 2000 Artesian
Piezometer	Piezometer Elevation	Surface Elevation	Elevation	Pressure
	(m)	(m)	(m)	(m)
A2-PE2-01	903.68	912.67	No Longer Functioning	-
A2-PE2-02	909.77	912.67	No Longer Functioning	-
A2-PE2-06	898.01	912.91	No Longer Functioning	-
A2-PE2-07	902.81	912.91	915.73	2.82
A2-PE2-08	907.56	913.36	912.44	-0.92
B2-PE1-03	914.05	915.55	915.89	0.34
B2-PE2-01	901.98	916.98	No Longer Functioning	-
B2-PE2-02	909.51	916.98	919.98	3.00
B2-PE2-06	914.59	916.89	No Longer Functioning	-
C2-PE1-03	912.59	-	No Longer Functioning	-
C2-PE2-02	910.53	915.71	916.73	1.02
C2-PE2-06	906.84	915.99	914.89	-1.10
C2-PE2-07	912.29	915.99	No Longer Functioning	-
C2-PE2-08	914.03	915.99	914.43	-1.56
D2-PE2-02	927.32	930.92	931.13	0.21
E2-PE2-01	914.21	918.81	917	-1.81
E2-PE2-02	909.66	918.81	916.32	-2.49

M:\1\01\00001\27\A\Report\Tables\[foundation piezos.xls]Table 3.1

0	18DEC'09	ISSUED WITH REPORT VA101-1/27-1	MACS	LJG	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D











ΝE	MATERIAL TYPE	LOCATION	PLACEMENT & COMPACTION REQUIREMENTS
	Glacial till	Core Zone	Placed, moisture conditioned and spread in maximum 300 mm thick layers (after compaction). Vibratory compaction to 95% of Standard Proctor maximum dry density or as approved by the Engineer.
2000	Rock	Shell Zone	Placed and spread in maximum 2000 mm thick layers and compacted by selective routing of mine haul trucks.
	Rock	Transition Zone/ Confining Berm	Placed and spread in maximum 600 mm thick layers and compacted with minimum 4 passes of 10 ton smooth drum vibrotory roller, or as approved by the Engineer.
	Filter sand	Chimney Drain	Placed and spread in maximum 600 mm thick layers and compacted with minimum 4 passes of 10 ton smooth drum vibratory roller, or as approved by the Engineer.
	Sand	Downstream Foundation	Placed and spread in maximum 300 mm thick layers and compacted with minimum 4 passes of 10 ton smooth drum vibratory roller, or as approved by the Engineer.
	Select Fill	Upstream Toe	Placement and compaction requirements to be determined based on material selection.
No.	Select Coarse Rockfill	Upstream Toe	Placed to establish a firm foundation for subsequent fill placement.
0000	Drainage Gravel	Drains	Placed around drainage pipes and wrapped with geotextile.

				3
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LEGEND -Plane I.D. (A, B etc.) -Area (0-Tailings, 1-Drain, 2-Embankment) AO-PE1-01-Number I.D. -Pressure Rating (1-Low, 2-High) -Type of Instrumentation (PE-Piezometer electric, SM-Survey Monument) A2-PE2-03 Installed Piezometer (C1-PE1-02) Piezometer no longer functioning NOTE: 1. Piezometer pore pressures used to estimate phreatic surface. 24 40 m 16 32 Scale COLUMN TWO IS - DISCLAMER Knight Piésold DRAWING WAS PREPARED BY KNIGHT FOR THE ACCOUNT OF THE CLENT I DRAWING. THE MATERIAL ON IT F HT PESOLD'S BEST AUDGMENT IN T THE INFORMATION AVAILABLE TO IT OF PREPARATION. AVAILABLE TO IT NADE MOUNT POLLEY MINING CORPORATION MOUNT POLLEY MINE TAILINGS STORAGE FACILITY STAGE 6a - INSTRUMENTATION MAIN EMBANKMENT 25493 BRITISH 2 PLANES C AND E REVISION OJECT/ASSIGNMENT NO NGINEER VA101-1/18 257 1



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ÿ	255	TSF-STAGE 60-INSTRUMENTATION-PLAN VIEW OF PIEZOMETER PLANES								0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LUG	JY	BB	KJB
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APPENDIX A

PIEZOMETER RECORDS

- Appendix A1 Tailings Piezometers
- Appendix A2 Foundation Piezometers
- Appendix A3 Fill Piezometers
- Appendix A4 Drain Piezometers



APPENDIX A1

TAILINGS PIEZOMETERS

(Figures A1.1 to A1.9)

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M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane B PIEZO



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M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane C PIEZOPlane C Tailings





M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane D PIEZOPlane D Tailings

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M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane E PIEZOPlane E Tailings

M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane F PIEZOPlane F Tailings



M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane G PIEZOPlane G Tailings



M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane H PIEZOPlane H Tailings



M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane I PIEZOPlane I Tailings



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APPENDIX A2

FOUNDATION PIEZOMETERS

(Figures A2.1 to A2.7)

VA101-1/27-1 Rev 0 December 18, 2009



M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane B PIEZO



M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane C PIEZOPlane C Foundation





M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane D PIEZOPlane D Foundation



M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane E PIEZOPlane E Foundation

M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane F PIEZOPlane F Foundation









APPENDIX A3

FILL PIEZOMETERS

(Figures A3.1 to A3.9)

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M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane A PIEZOPlane A Fill



M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane C PIEZOPlane C Fill







M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane E PIEZOPlane E Fill



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M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane F PIEZOPlane F Fill



M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane G PIEZOPlane G Fill



M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane H PIEZOPlane H Fill



M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane I PIEZOPlane I Fill





APPENDIX A4

DRAIN PIEZOMETERS

(Figures A4-1 to A4-8)

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M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane A PIEZOPlane A Drain



M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane B PIEZOPlane B Drain


M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane C PIEZOPlane C Drain





M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane D PIEZOPlane D Drain

M:\1\01\00001\26\A\Data\Piezometers\Readings\Plane E PIEZOPlane E Drain



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APPENDIX B

INCLINOMETER DATA

(Figures B.1 to B.4)

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APPENDIX C

2009 ANNUAL INSPECTION PHOTOGRAPHS

(Pages C-1 to C-6)

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PHOTO 1 – Tailings beach development on the Perimeter Embankment



PHOTO 2 – Perimeter Embankment Toe Drain flow.

MOUNT POLLEY MINING CORPORATION MOUNT POLLEY MINE

C-1 of 6 M:\1\01\00001\27\A\Report\1 - Report On 2009 Annual Inspection\Rev 0\Appendices\Appendix C\Inspection Photos.Doc





PHOTO 3 – Main Embankment Seepage Collection Pond



PHOTO 4 – Main Embankment Seepage Collection Pond Return Pipe





PHOTO 5 - Main Embankment looking west



PHOTO 6 - Perimeter Embankment Seepage Collection Pond





PHOTO 7 – South Embankment upstream toe drain.



PHOTO 8 – Sand cell construction on Main Embankment.





PHOTO 9 – Buttress construction at the Main Embankment.



PHOTO 10 - Mill Site Sump Embankment





PHOTO 11 - Southeast Sediment Pond, west end showing outlet pipes



PHOTO 12 - South Bootjack Dam