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MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
TAILINGS STORAGE FACILITY

OPERATION, MAINTENANCE AND SURVEILLANCE MANUAL
(REF. NO. VA101-00001/9-1)

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SECTION 1.0 - INTRODUCTION

1.1 OVERVIEW

This Operations, Maintenance and Surveillance Manual applies to the Tailings Storage Facility and related pipelines and structures at the Mount Polley Mine. This Manual describes the roles and responsibilities of Mount Polley site personnel for the management of the TSF and associated facilities; operation, surveillance and maintenance requirements; inspection requirements; and emergency plans and procedures.

1.2 KEY PERSONNEL AND RESPONSIBILITIES

Table 1.1 identifies current key personnel (December 2004) and their responsibilities for management, operations, surveillance and inspections at the Mount Polley Mine Site and Tailings Storage Facility.

Government agencies involved in the operation, maintenance and surveillance of the Tailings Storage Facility include the Ministry of Energy and Mines (MEM); Ministry of Water, Land and Air Protection (WLAP), Ministry of Forests (MOF); and Department of Fisheries and Oceans (DFO).

1.3 TRAINING REQUIREMENTS

Training programs are required for any personnel involved in the operation, inspection and surveillance of the Tailings Storage Facility. A refresher course is required once per year. The training programs must be conducted by the Environmental Superintendent, qualified Professional Engineer or a suitably qualified individual familiar with the design, operation, maintenance and inspection of all civil and mechanical works associated with the facility.

Each training session must be documented, and a record kept. The records will contain a detailed list of site activities for which the trainee was trained on, and be signed by the person who provided/supervised the training.

1.4 DESIGN AND OPERATING CHANGES

Changes to the design or operating plan for the Tailings Storage Facility and related pipelines and structures must be reviewed, approved and documented. Design changes may be submitted to the Engineer of Record for review. Operational changes will be reviewed and approved by the

Mine Manager. In all cases, documentation of the change, including as-built records, are required.

1.5 CONTROL OF THIS MANUAL

This manual will be controlled by the Environmental Superintendent. Copies will be maintained at the following locations:

- One (1) copy for Mount Polley Mining Corporation (Vancouver office),
- One (1) copy for the Environmental Superintendent's office,
- One (1) copy for the Operating Crew (Mill Shifter's Office),
- Three (3) copies for the Comptroller of Water Rights,
- One (1) copy for the Regional Water Manager (Williams Lake),
- Two (2) copies for the Director of the Provincial Emergency Program (P.E.P.),
- One (1) copy for the WLAP, Dam Safety Engineer,
- One (1) copy for the MEM Geotechnical Manager,
- One (1) copy for the Design Engineer of Record.

Mount Polley Mining Corporation is responsible for maintaining a record of the location of each copy of the Manual and to ensure the copies in these locations are kept up to date.

1.6 REVISIONS TO THE MANUAL

Reviews of the Manual are conducted at least annually in conjunction with the annual inspection as outlined in Section 4.1. This review will be confirmed by a letter to the Ministry of Water, Land and Air Protection. Changes to the Manual are not effective until approved by the Ministry of Energy and Mines in writing. A detailed review of the entire manual will be also be required in conjunction with each Dam Safety Review (DSR) as outlined in Section 4.2.

The operating procedures and personnel at the Mount Polley Mine may change during the operation of the mine. It is the responsibility of the Environmental Superintendent to ensure that the Operations, Maintenance and Surveillance Manual is updated to reflect these changes. Substantial revisions to the Manual shall be submitted to the Ministry of Energy and Mines.

A letter of transmittal that clearly identifies the distribution list must accompany each revision of this manual. An update may comprise the entire manual or be limited to specific pages or sections. A copy of each transmittal letter must be kept on record in the office of the Environmental Superintendent. Each revised page of the manual must be clearly marked as to the revision date prior to replacement. The replaced pages must be filed and kept on record in the office of the Environmental Superintendent.

1.7 REFERENCES

References relating to MPMC's Tailings Storage Facility and associated pipelines and facilities are included in Appendix A.

SECTION 2.0 - DESCRIPTION OF TAILINGS IMPOUNDMENT

2.1 GENERAL

The following sections provide a brief summary of the design and management of the Tailings Storage Facility and associated facilities. Additional information is available in the cited references in Appendix A.

2.2 DESIGN BASIS

Mill tailings are discharged as slurry into the Tailings Storage Facility which has been designed to provide environmentally secure storage of the solid waste. As the solids settle out of the slurry, process fluids are collected and recycled back to the mill for re-use in the milling process. There is no surface discharge of any process solution from the Tailings Storage Facility. The basis of design must address the following:

- Permanent, secure and total confinement of all solid waste materials within a lined engineered impoundment,
- Secure and reliable transportation of the tailings from the mill to the Tailings Storage Facility,
- Collection and transport of runoff from waste rock storage areas to the Tailings Storage Facility,
- Temporary storage of supernatant water on the tailings beach, as required, with maximum recycling to the mill to produce a zero discharge condition for process water,
- Collection of all free draining liquids from the tailings deposit. Temporary storage is provided in lined external ponds. The water from the ponds is pumped into the supernatant pond and recycled to the mill to ensure that no discharges occur,
- Inclusion of monitoring facilities in the Tailings Storage Facility to confirm that the design objectives and operating requirements are being met,
- Staged development of the facility to enable modifications and upgrades to be implemented based on operating experiences and to distribute the capital expenditures over the life of the project.

The design basis and operating criteria for the Tailings Storage Facility and associated pipelines and structures are summarized in Table 2.1.

2.3 PROJECT DESCRIPTION

2.3.1 Site Location

The location of the Mine and access roads are shown on Figure 2.1. The Mount Polley Mine is located in central British Columbia, approximately 60 km northeast of Williams Lake. The main access route is via Likely Road. The turn to the Mine is located approximately 1.5 km east of Morehead Lake. The Mine is located a further 11 km to the southeast, on the Bootjack Lake Forest Service Road.

The Tailings Storage Facility is accessible along the following two routes:

- Along the access road located on the south side of the Mill Site. This is the primary access to the TSF on the Mine site;
- Along the Gavin Lake Forest Service Road which can be access from Likely Road, located approximately 14 km south of Moorhead Lake. The TSF is located at approximately kilometre 16 along the road.

2.3.2 Project History

The Mount Polley mine commenced production in June 13, 1997. Ore is crushed and processed by selective flotation to produce a copper-gold concentrate. The mine was on care and maintenance status from October 2001 to February 2005. The mill throughput rate is approximately 18,500 tonnes per day (approx. 6.8 million tonnes per year). Mill tailings are discharged as slurry into the Tailings Storage Facility located on the south area of the Mine property. Additional historic information regarding the TSF and associated pipelines and facilities are available in the reports cited in Appendix A.

2.4 DESIGN FEATUES

Tailings slurry is conveyed from the Concentrator to the TSF via a tailings discharge pipeline. The tailings is deposited into the impoundment through moveable or fixed spigots on the embankment crest. A floating reclaim pump recycles process water from the supernatant pond in the TSF for use in the mill processing circuit. Sediment ponds and seepage collection ponds are designed to intercept runoff from the surface and seepage from the embankment respectively. Drains, instrumentation and monitoring wells are constructed in and around the TSF to assist in monitoring the performance of the facility. Additional details are available in the reports referenced in Appendix A. As-built drawings for the latest construction program are included in Appendix D.

2.5 DEPOSITION PLAN

The objectives of the long-term tailings deposition strategy is to:

- Maximize the storage capacity of the facility.
- Maintain the supernatant pond in the area of the reclaim barge so as to maximize the amount of clean process water available for reclaim.
- Establish free draining tailings beaches adjacent to the embankments during the winter season to facilitate future embankment raises and to enhance embankment stability.

The above strategy is implemented by sequentially rotating the tailings discharge point along the entire length of the Perimeter, Main and South embankments on the upstream face, which allows inactive areas of the tailings beach to partially dry and consolidate. Eventually, beaches will be formed around the entire upstream perimeter of the Facility and all supernatant water will be centralized around the reclaim barge.

Spigoted tailings settle in the tailings facility and form beaches with three distinct slopes. A sandy beach develops as the coarser tailings fraction settles more rapidly adjacent to the embankment. The average beach slope above water is about 0.5 percent. As the tailings flow into the supernatant pond it forms a submerged beach with a slope of 1 to 2 percent. Finer tailings particles are transported further out into the supernatant pond before settling at a slope of about 0.3 percent. The latest bathymetric survey of the tailings surface in the TSF is included in Figure 2.2.

2.6 CLOSURE PLAN

At closure of the Tailings Storage Facility, it is currently envisaged that the tailings surface will be decommissioned so as to develop a mixed forested/wetlands complex with a gradual transition towards a ponded area at the final spillway. This would require covering of the tailings embankments and the upland portions of the exposed tailings beach with a layer of soil stockpiled during operations. The topsoil would be revegetated with indigenous species of conifer and deciduous trees, willow and marsh land grasses. Ultimately, all water would be routed over the tailings surface, through the wetlands and the final spillway.

Pipework for the tailings and reclaim systems will systematically be removed once all water quality and pit flooding requirements are met. Similarly, the seepage collection ponds and recycle pumps would be retained until monitoring results indicate that drainage flows and seepage from the tailings area are of suitable quality for direct release to the environment. At that time, the seepage collection ponds could be decommissioned and the pumps removed. The groundwater monitoring wells and piezometers in the tailings embankment would be retained for use as long term monitoring devices. On-going monitoring of all reclamation measures will be carried out post closure, to confirm that the reclamation objectives are being achieved and sustained.

SECTION 3.0 - OPERATIONS MAINTENANCE AND SURVEILLANCE

3.1 GENERAL

The Tailings Storage Facility is comprised of several components and associated facilities. These components and facilities must be inspected and maintained regularly to ensure that any changes to the TSF conditions, performance, or a potentially hazardous condition can be identified and promptly addressed. Selected photographs of the TSF and associated components are included in Appendix E. An inspection and surveillance schedule is provided on Table 3.1.

The Mill Superintendent is responsible for ensuring that surveillance is carried out regularly. The Mill Superintendent is responsible for daily management of the TSF and directs an operating crew to carry out routine activities. A list of site personnel and associated responsibilities are provided on Table 1.1.

The Environmental Superintendent will conduct a Dam Surveillance walkover at least once per quarter. All Dam Surveillance reports should be reviewed by the Mill Superintendent and filed at the Mount Polley Mine Site.

Additional (non-routine), documented walkovers of the TSF and associated facilities will be required following extreme or unusual events. The Mill Superintendent must be made aware of any unusual events or observations, and must contact the Design Engineer as required. Typical examples of unusual events and observations to be made during such walkovers are outlined in Table 3.2.

An inspection log is provided in Appendix B to help guide the observation and surveillance process. The inspection log covers major items related the TSF and associated facilities. Additional details are provided in the following sections.

3.2 TAILINGS BASIN

The projected rate at which the tailings basin will fill, combined with storage provisions for make-up and storm water, determine the rate of rise for the embankment. The anticipated filling schedule and staged construction sequence is shown on Figure 3.1.

Close monitoring of the pond elevation, depth, area and volume is important for the following reasons:

- To ensure that there is a sufficient volume of water available as make-up water while the pond is frozen and precipitation is at a minimum.
- To enable monitoring of the supernatant pond depth/area/volume so that tailings characteristics such as dry density can be determined.
- To monitor water recoveries.
- To enable the correlation of the pond level with other data, such as the piezometer pressures and drain flow quantities.

Adjustments to the basin filling curve may be required due to variation between actual and projected mill throughput rates, tailings deposition characteristics, water inputs and outputs and in-situ tailings density. Adjustments to these variables will change the rate of rise for the tailings and embankments.

The TSF was previously operated under a water deficient condition, which means more process water was needed than available in the supernatant pond. This condition is likely to change once the mill starts up again in February 2005 and the mine will be operating under surplus conditions, which means there is more water in the system than is required. Therefore, a combination of careful water management and tailings deposition is required to maximize the storage potential in the embankment without compromising the freeboard or embankment stability.

3.3 TAILINGS POND

3.3.1 Pond Level Operations

The TSF is required to have sufficient live storage capacity for containment of 679,000 cubic meters of runoff from the entire contributing catchment area during a 24-hour PMP event. This volume of stormwater would result in an incremental rise in the tailings pond level of approximately 0.39 meters. The TSF design also incorporates an allowance of 1 metre of freeboard for wave run-up. Therefore, the normal and maximum operating pond levels are as follows:

- Normal Operating Level – Water level at least 1.39 meters below the embankment crest;
- Maximum Operating Level – Water level is 1 meter below the embankment crest, which also means the loss of storage capacity for a 24-hour PMP event.

Tailings deposition will cease if the pond level reaches maximum operating level and the removal of water from the pond will commence using the reclaim barge. The area downstream of the dam will also be evacuated and access restricted as per the Emergency Preparedness Plan.

There are no restrictions, with respect to dam safety on the rate of filling of the supernatant pond up to the normal operating pond level or rate of emergency draw down within the pond.

3.3.2 Surveillance

The pond level must be at least 1.39 meters below the crest elevation under normal operating conditions. Emergency procedures, discussed in Section 5.0, must be followed if the pond reaches the maximum operating level. Regular inspections of the pond level must be carried out according to the schedule outlined in Table 3.1. An inspection log is provided in Appendix B.

Additional pond level inspections are required after an unusual event. Table 3.2 outlines the additional observations that will need to be documented.

3.4 TAILINGS EMBANKMENT

3.4.1 Components

The tailings embankment consists of the Main, Perimeter and South Embankments. The embankments are constructed using zoned earthfill and rockfill and have been raised in stages by a combination of centreline and modified centreline approaches. Details of the design and construction are reported in various Knight Piésold reports and are referenced in Appendix A.

An upstream toe drain on the Main embankment allows for the controlled removal of process water from the upstream face of the embankment. Foundation and chimney drains are also included in the embankments to prevent build-up of excess pore pressures beneath the embankment and to transfer groundwater and/or seepage to the seepage collection ponds located at the downstream toe of the Main and Perimeter Embankments.

Monitoring sumps are located at the downstream toe of the Main and Perimeter Embankments. They are used to facilitate monitoring of flow rates and water clarity from the embankment drains and diversion channels.

3.4.2 Surveillance and Maintenance

Regular surveillance of the embankments and associated structures should follow the schedule outlined in Table 3.1. An inspection log is provided in Appendix B. Typical observations to be made during surveillance include:

- Evidence indicating dam structure deformation (e.g. slope bulging, tension cracks on the crest or crest settlement);
- Evidence indicating seepage, runoff or erosion;
- Clarity and quantity (visual estimate) of seepage water entering the seepage collection sumps;
- Possible evidence indicating piping downstream of the embankments;
- Other unusual conditions in the TSF area.

The embankment and associated structures do not require regular maintenance; however, specific maintenance items may be identified as a result of regular observations and surveillance of the embankment.

Table 3.2 outlines additional observations that will need to be documented after any unusual event.

3.5 TAILINGS DISCHARGE PIPELINE

3.5.1 Components and Operation

Tailings slurry is conveyed from the Concentrator through approximately 7000 metres of HDPE pipe to the TSF where it is discharged through a series of spigots along the embankment crest. The pipeline includes the following components:

- A 556 mm diameter DR 17 HDPE pipe from the Concentrator to the T2 Dropbox;
- A 610 mm diameter DR 15.5 HDPE pipe from the T2 Dropbox to the TSF;
- Two short sections of 762 mm diameter DR 15.5 HDPE pipe are included at the start of the two pipeline sections at the Concentrator and the T2 Dropbox to ensure that flows are not restricted at the inlet;
- The T2 Dropbox;
- Moveable discharge section;
- A Dump Valve at the start of the Perimeter Embankment.

The tailings pipeline is located on the shoulder of the access road from the mine. Tailings slurry is gravity fed to the TSF through the tailings pipeline. The tailings pipeline has a variable downhill slope that ranges from 0.5% to 8.0% which ensures drainage.

The T2 Dropbox is located approximately mid-way along the pipeline and allows for the addition of runoff from the Southeast Sediment Pond into the tailings stream. It also serves as an overflow for the reclaim booster sump.

A 200 metre long discharge section connected with six spigots (150 mm diameter) is used to control deposition of tailings over the tailings beach in the TSF. The discharge section can be installed in different locations along the pipeline to facilitate even distribution of tailings onto the beaches. A dump valve is located at the start of the Perimeter Embankment to allow discharge of tailings during relocation of the discharge section.

The tailings discharge pipeline does not require any external adjustments during normal operations. The discharge pipeline will drain by gravity to the TSF in the event of a mill shutdown or power failure. However, the following points must be remembered during operation of the pipeline:

- Never leave all valves closed along the tailings discharge pipeline as they may be permanently blocked from sanding or suffer damages from excessively high pressures;
- Ensure that there is an open pathway for tailings to exit before the pipeline is filled or the spigots are relocated;
- Flush the pipeline prior to shutdown or relocation.

The T2 Dropbox does not require any external adjustments during normal operations. During a mill shutdown or during freezing conditions the valve between the Southeast Sediment Pond and the T2 Dropbox must be open in order to prevent water from filling up the Reclaim Booster Sump when the pumps are not operating.

3.5.2 Surveillance and Maintenance

The tailings discharge pipeline will be inspected and maintained regularly to ensure that the system operates properly. Table 3.1 provides a schedule for regular surveillance of the pipeline. An inspection log is provided in Appendix B. Typical observations to be made during surveillance include:

- Locations of excessive wear of the pipeline;
- Evidence indicating leakage from the pipeline;
- The water level in the T2 Dropbox to ensure that there is no blockage in the discharge pipeline downstream;
- Ensure that the valve between the Dropbox and Southeast Sediment Pond is open during a mill shutdown or freezing conditions when the booster pump is shut off.

Specific maintenance items described by Mount Polley site personnel are as follows:

- High degree of wear at the beads on the butt-welded joints in the section of pipeline between the magazine at the explosives site and the T2 Dropbox. Removal of these beads and replacement of the butt-welds with flanges has minimized the amount of wear, and allows for a more detailed inspection during mill maintenance periods;
- Sections of pipe that are worn on one side are either rotated, so the unworn section conveys the tailings, or the section is replaced;

Additional inspections are required after an unusual event. Table 3.2 outlines additional observations that will need to be documented. Repairs to the discharge pipeline, dropbox and/or discharge sections may be required after any unusual event.

3.6 RECLAIM PIPELINE

3.6.1 Components and Operation

Reclaim water is pumped from the Tailings Storage Facility for re-use at the Mill site. The reclaim pipeline includes the following components:

- Floating Reclaim Pump Barge;
- A 610 mm diameter steel pipe connecting the barge to the reclaim line;
- Booster Pump Station beside the T2 Dropbox;
- A 610 mm diameter HDPE pipe from the steel pipe to the Booster Pump Station;
- A 610 mm diameter HDPE pipe from the Booster Pump Station and the Mill site;

The floating reclaim pump barge is located in the TSF in an excavated channel. The barge is accessible from land along an access walkway. The floating reclaim pump barge was designed by others. Refer to the manufacturer's manual for details related to operations, inspections and maintenance.

The reclaim pipeline is located beside the tailings pipeline on the shoulder of the access road. The pressure rating of the HDPE pipeline decreases as it approaches the Booster Pump Station and Mill site.

The Booster Pump Station is located mid-way along the reclaim pipeline, beside the T2 Dropbox. A valve located on the pipeline leading in from the Southeast Sediment Pond may be used to divert water into the reclaim pipeline. Water from the Southeast Sediment Pond can be diverted into the reclaim pipeline only if it is clear. Two overflow pipes connect the sump beneath the pump station to the T2 Dropbox to ensure water will not overflow in the pump station sump.

The reclaim pipeline does not require any external adjustments during normal operations. However, during maintenance periods, barge relocation or during a prolonged shutdown under extreme cold conditions the reclaim system should be drained via a drain valve located on the barge.

The Pump Barge and Booster Pump Station may be operated from the Mill control room. Both pumps may also be operated locally from the barge or pump station to provide water as required at the Mill site.

3.6.2 Surveillance and Maintenance

The reclaim pipeline, pump barge and booster pump station shall be inspected according to the schedule outlined in Table 3.1 and an inspection log completed as provided in Appendix B. Typical areas to inspect during surveillance of the reclaim pipeline include:

- Locations of excessive wear of the pipeline;
- Evidence indicating leakage from the pipeline;
- Monitor Pond and Barge elevations to ensure that a gradient is maintained in the steel pipe. The barge ramp may need to be relocated higher;
- The de-icing system for the pump barge should be checked to ensure that it is working prior to freezing conditions.
- Monitor water from the Southeast Sediment Pond to ensure that it's clear before diverting it to the reclaim line;

Additional inspections are required after any unusual event. Table 3.2 outlines additional observations that will need to be documented. Repairs to the reclaim pipeline, barge and/or pump station may be required after any unusual event.

3.7 SEDIMENT PONDS

3.7.1 Components and Operation

A series of diversion ditches divert runoff to two collection ponds where the water is then directed to the TSF or pumped back to the Mill site. The two ponds are the Mill Site Sump and the Southeast Sediment Pond.

The Mill Site Sump is located south of the Concentrator Building. Runoff water from the Mill Site area is collected along diversion ditches and directed to the sump. The water collected in the sump is either pumped back to the mill or allowed to flow by gravity to an inlet point (T1) on the tailings pipeline. The normal operating level is the invert of the bottom inlet at the manhole (El. 1102.7 metres). The water level is kept at this low level so that storage capacity for the design storm event is available in the sump. Discharge from the manhole is conveyed to the reclaim line in an 8 inch (200 mm) HDPE pipeline. The pipeline is buried through the Millsite area and runs in the pipe containment channel, where it is connected to the 22 inch DR17 HDPE tailings line via a prefabricated Tee in a section of the pipeline that flows by gravity (non-pressurized flow). Currently, water is pumped into the reclaim line immediately adjacent to the Millsite Sump. The water level is maintained at the bottom inlet on the manhole at all times.

The Southeast Sediment Pond is located south of the waste rock storage area. Runoff water from the waste rock dump is collected along diversion ditches at the toe and directed to the pond. Water is decanted through a manhole which has four valved inlet pipes which can be used to control the water level in the sediment pond. The normal operating level is the invert of the second inlet at the manhole (El. 1054.5 metres). The water shall not be permitted to rise above this so that storage capacity for the design storm event is available in the pond. A 10 inch (250 mm) DR21 HDPE discharge pipeline runs from the manhole to the reclaim booster sump. By using manually operated valves at the sump, the water can be directed to the sump, if sufficiently clear, or into the T2 Dropbox.

3.7.2 Surveillance and Maintenance

The Mill Site Sump and Southeast Sediment Pond shall be inspected according to the schedule outlined in Table 3.1 and an inspection log completed as provided in Appendix B. Typical observations to be made during surveillance include:

- Water levels in the Mill Site Sump and Southeast Sediment Pond;
- Evidence indicating leakage from the pipelines;
- Erosion in the collection ditches;
- Evidence indicating slope deformation or erosion (i.e. tension cracks at the crest, erosion channels, bulging at the toe);
- Evidence indicating seepage out of the ponds.

The sediment ponds do not require regular maintenance; however, specific maintenance items may be identified during regular surveillance of the ponds.

Table 3.2 outlines additional observations that will need to be documented after any unusual event.

3.8 SEEPAGE COLLECTION PONDS

3.8.1 Components and Operation

The Main and Perimeter Seepage Collection Ponds are located at the downstream toe of the Main and Perimeter Embankments respectively. The ponds collect drainage water from the toe and foundation embankment drains as well as from local runoff.

A corrugated steel pipe connects each pond to a seepage recycle sump where recycle pumps are located. The pumps will recycle the seepage water back into the TSF through 6" diameter HDPE pipes that extend over the embankment crest. Level sensors in the seepage recycle sump controls the pumping frequency.

The seepage collection ponds and recycle pumps generally operate without requiring any external adjustments. However, the following special circumstances require adjustments to the operating procedures:

- During spring freshet, the pumps may not be able to keep up with the high inflows. All diversion ditches that feed the ponds may need to be directed away. Also, if water quality and permits allow, discharge of water may be possible.
- Under freezing conditions, the pumps are operated on a timed pumping cycle based on site conditions to prevent the pipes from freezing. The pumps will turn on and off based on the cycle time rather than water level. Once the temperatures return to normal the pumps can operate under normal conditions.

3.8.2 Surveillance and Maintenance

The seepage collection ponds and recycle pumps shall be inspected according to the schedule outlined in Table 3.1 and an inspection log completed as provided in Appendix B. Typical observations to be made during surveillance is as follows:

- Water levels in both collection ponds;
- Pumpback flow rates from both pumps;
- Evidence indicating seepage from the collection ponds;
- Evidence indicating erosion or instability on the slopes of the ponds
- The overflow culverts and pipelines between the monitoring sumps and recycle sumps are free of any obstructions;
- Ensure that the discharge end of the seepage recycle pipeline isn't submerged in tailings.

Additional observations will also be required under special circumstances as follows:

- Monitor the pumping from the ponds during freezing conditions to ensure that the pumping cycle is adequate at keeping the pipes from freezing and in keeping the pond level constant;
- Monitor the water quality in the ponds during spring freshet to ensure that the seepage water from the TSF is at acceptable levels if water permits allow for discharge.

Table 3.2 lists additional events and circumstances that will require increased observations and documentation.

3.9 INSTRUMENTATION

3.9.1 Components and Location

The tailings embankment and associated facilities were installed with various instrumentation to assist in monitoring the facility. The various components are as follows:

- Vibrating Wire Piezometers;
- Slope Inclinometers;
- Survey and Surface Movement Monuments;
- Groundwater Monitoring Wells.

The locations of the piezometers, slope inclinometers, and survey monuments are shown on the drawings located in Appendix D.

The piezometers measure the pore pressures in the foundation soils, embankment foundation drains and embankment fill. They are connected to instrumentation readout panels located on the crest of the embankments and read using a piezometer readout box. A summary of the existing vibrating wire piezometers is presented on Table 3.3 with trigger levels, which if exceeded, will require investigation and possible contingency or remedial actions. Data may be entered on the piezometer data sheet included in Appendix C. A summary of the piezometer data will be sent to Knight Piésold according to the schedule outlined on Table 3.1

Two slope inclinometers were installed at the toe of the Main Embankment in order to measure potential deformation of the embankment materials. Operational procedures for operation of the inclinometer probe and data reduction are provided in the manufacturer's instruction book. Readings are carried out manually and displacements are calculated using software from RST and spreadsheets set up by MPMC. The spreadsheets are updated on site and summaries will be sent to Knight Piésold regularly. A summary of the existing slope inclinometers is presented on Table 3.4 with trigger levels, which if exceeded, will require investigation and possible contingency or remedial actions.

Survey and surface movement monuments are used to measure the vertical and lateral movement of the earthfill dams. Data is entered on the survey data sheet included in Appendix C. Trigger levels and the required appropriate actions are summarized on Table 3.5. A summary of the results will be sent to Knight Piésold according to the schedule outlined on Table 3.1.

Groundwater monitoring wells are located around the perimeter of the TSF. MPMC regularly measures the water levels and water quality from each well and submits the reports to the appropriate agencies. The location of the groundwater monitoring wells is shown on Figure 3.2.

3.9.2 Surveillance and Maintenance

All instrumentation components must be read regularly. The monitoring frequency for each is outlined on the schedule in Table 3.1. Data may be entered on the appropriate sheets included in Appendix C.

Data must be collected, plotted and reported according to the schedule outlined in Table 3.1. The design engineer must be notified of any anomalous trends. Additional readings and inspections as outlined in Table 3.2 will also be required after any unusual event or observation.

Generally, the instruments do not require regular maintenance but may require occasional maintenance as follows:

- The piezometer wires may need to be cut and re-attached if the readout box is unable to acquire any data;
- Piezometer wires that are exposed may become corroded and may need to be trimmed until a fresh surface is exposed to allow readings to be taken;
- Cover survey points with 20 litre buckets to keep snow off in the winter months;
- Protect surface movement monuments with used tires. These monuments need to be re-established and protected again after construction of a new embankment lift.

SECTION 4.0 - SAFETY INSPECTIONS AND REVIEWS

4.1 ANNUAL INSPECTIONS

Annual Inspections of the tailings impoundment and associated facilities are required to evaluate the current and past performance of the facility and to observe potential deficiencies in its condition, performance and/or operation. The Environmental Superintendent is responsible for arranging the inspections. This level of dam safety evaluation should be based on detailed observations made by the Design Engineer on site and the relevant information on the TSF operations collected by site personnel. Additional reviews may be required also as a follow up to the report of an unusual event or observation.

The Environmental Superintendent should accompany the Design Engineer during the annual inspection. The Design Engineer will evaluate the safety of the TSF and incorporate a routine review of the following:

- The consequences classification of the dam;
- The operations and maintenance manual;
- The availability of all documents pertaining to dam safety on site;
- The site surveillance practice;
- Changes in relevant regulatory requirements since the last inspection.

The Design Engineer will issue an annual inspection report after completing the review. The report will include the following:

- Conclusions on the status of the TSF;
- Statements indicating completion of recommendations from previous inspections and reviews;
- New recommendations if necessary.

The Mill Superintendent and the Ministry of Energy and Mines should review each annual inspection report. Copies of the reports should be made available on site and are available in the office of the Design Engineer. The Mill Superintendent should prepare and execute an appropriate action plan to ensure that all recommendations made in the annual inspection report are followed. This action plan should be documented.

4.2 DAM SAFETY REVIEW

The principle objective of a Dam Safety review (DSR) is to ascertain that a dam has an adequate margin of safety, based on the current engineering practice and updated design input data. A DSR may also be carried out to address a specific problem.

A qualified engineer will be responsible for conducting each DSR at the Tailings Storage Facility. The engineer conducting the DSR must be qualified to conduct safety evaluations and be familiar with the designs and other site-specific conditions and requirements pertaining to operations of

the impoundment and associated facilities; but ideally should not have been involved in the design, construction or operation of the TSF.

Routine DSR's at the TSF will be carried out every 5 years but this scheduling requirement should be confirmed or revised at the time of each annual inspection. The next DSR for the TSF is scheduled for 2006.

A detailed scope of work for each DSR will be defined by the engineer prior to conducting the review, and be consistent with current engineering practice at the time it is conducted. Each DSR will evaluate the safety of the TSF and incorporate a detailed review of the following:

- The consequences classification of the dam;
- The adequacy of past annual inspection practice, the annual inspection recommendations, and their implementation;
- The Operation and Maintenance Manual;
- Timing for the next regular DSR.

Each DSR report should include conclusions and, if necessary, recommendations pertaining to the safety of the TSF. Copies of the DSR will be sent to the Environmental Superintendent and the Ministry of Energy and Mines for review. Similar to the annual inspection report, an action plan should be prepared by the Mill Superintendent to address the DSR recommendations. A copy of each report will be sent to the Ministry of Energy and Mines and will also be available at the site and at the office of the Design Engineer.

SECTION 5.0 - EMERGENCY PREPAREDNESS AND RESPONSE PLANS

5.1 GENERAL

This Emergency Preparedness and Response Plan will enable MPMC to identify emergency and hazardous conditions threatening the TSF, expedite effective response actions to prevent failure, and reduce loss of life and property damage should failure occur.

In the event that MPMC is unable to comply with any of the terms and conditions of the permit, due to any cause, MPMC will:

1) Immediately notify the Ministry of Energy and Mines of the failure to comply.
2) Immediately take action to stop, contain, and clean up unauthorized discharges or otherwise stop the non-compliance, correct the problem, and if applicable, repeat sampling and analysis of any non-compliance immediately.
3) Submit a detailed written report to the Ministry of Energy and Mines within thirty (30) days (five days for upsets and bypasses), unless requested earlier by the Ministry of Energy and Mines. The report will contain a description of the non-compliance, including exact dates and times, if the non-compliance has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the non-compliance.

Copies of the Emergency Preparedness and Response Plan will be kept in the following locations:

- One (1) copy for Mount Polley Mining Corporation (Vancouver office),
- One (1) copy for the Environmental Superintendent's office.
- One (1) copy for the Office (near office radio and telephone).
- One (1) copy for the Operating Crew (Mill Shifter's Office),
- Three (3) copies for the Comptroller of Water Rights,
- One (1) copy for the Regional Water Manager (Williams Lake),
- Two (2) copies for the Director of the Provincial Emergency Program (P.E.P.),
- One (1) copy for the WLAP, Dam Safety Engineer,
- One (1) copy for the MEM Geotechnical Manager,
- One (1) copy for the Design Engineer of Record.

5.2 WARNING SIGNS

Three levels of emergency conditions (or warning signs) can be identified with respect to the site operations. These are defined as follows:

Level 1
Unusual conditions that do not yet represent a potential emergency, but do require prompt investigation and resolution.

Level 2
Conditions that represent a potential emergency, if sustained or allowed to progress, but no emergency situation is imminent.

Level 3
An emergency defined by either failure of a significant component of the TSF and/or associated facility or a significant failure of the performance of a component of the TSF. Such failure may have already occurred, or be imminent.

Typical situations that would be classified under the three levels of emergency conditions (Level 1, 2 or 3) and the actions to be taken, are outlined in Table 5.1 and described below:

Level 1 Situation

The action in the event of a Level 1 Emergency Condition will typically involve an investigation, intensified monitoring, inspecting and/or testing, and defining and implementing possible corrective measures.

Construction equipment will be available at the Mine and include, but not be limited to, an excavator, a grader, and a bulldozer. Material will be available both at the TSF and at the Mine for use in repairing or remediation of any damaged areas.

Level 2 Situation

The first action in the event of a Level 2 Emergency Condition is to discuss and define an action plan, at the site, under the direction of the Mill Superintendent. After such a plan is prepared, it must be presented to the Mine Manager for approval. Construction equipment should be made available, if required, at short notice.

Level 3 Situation

The first actions in the event of any Level 3 Emergency Condition are:

- Check that all persons who could possibly be affected are safe; and
- Initiate the appropriate chain of communications.

The person who initiated the communication should then stand-by at a safe location near the problem area and await further instructions or decisions. All those involved in emergency response, after first having communicated with the appropriate parties, should consider two types of actions as first steps in the emergency response, with respect to the protection of human life and health, environment and property:

- What can be done to prevent the situation from worsening?
- What can be done to reduce the consequences of the impending or actual failure?

Any such action must be presented to the Mine Manager who will decide on its implementation in consultation with the Ministry of Energy and Mines.

5.3 INCIDENT NOTIFICATION PROCEDURES

The following incident notification procedures are to be followed for all emergency conditions.

Level 1 and Level 2

The notification procedures are as follows:

- The person first noticing a Level 1 or Level 2 Emergency Condition shall notify the Mill Superintendent and initiate corrective actions and intensified monitoring.
- The Mill Superintendent shall notify the Design Engineer as appropriate.

Level 3

The notification procedure for a Level 3 Emergency Condition is as follows:

- The person noticing a Level 3 Emergency Condition shall notify the Mine Manager and Mill Superintendent and initiate corrective actions and/or intensified monitoring, as appropriate.
- The Mine Manager shall notify MPMC Public relations, MPMC Project director, and the Design Engineer.

In the event of an emergency situation that will result in an actual or potentially imminent dam failure, or release of untreated water, the Mine Manager shall also notify the Ministry of Energy and Mines.

Names and telephone numbers for the key contacts are given in Table 1.1.

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TABLE 1.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
PERSONNEL AND RESPONSIBILITIES LIST

Printed on: Dec-21-04

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Revised on: Dec 20, 2004

Title	Name	Contact Information				Responsibilities
Mine Manager	Howard Bradley	Home:		Cell:		Responsible for overall activities of the TSF.
		Office:	250 790 2215	Pager:		
		E-mail:	hbradley@mountpolley.com			
Mill Superintendent	Tim Fisch	Home:		Cell:		Daily management of the milling process and ensuring proper operation of the process system, equipment, and related components. Directs the opearting crew in carrying out rountine activities.
		Office:	250 790 2215	Pager:		
		E-mail:	tfisch@mountpolley.com			
Mine Superintendent	Terry Isaacs	Home:		Cell:		Daily management of any TSF construction activities.
		Office:	250 790 2215	Pager:		
		E-mail:	tisaacs@mountpolley.com			
Environmental Superintentent	Ron Martel	Home:		Cell:		Arranges for an Annual Inspection of the TSF. Plans for future design raises and submitts required permit admendments. Responsible for ensuring that mining and milling activities comply with the requirements of the applicable regulations governing the milling and tailings facilities. Responsible for updating the OMS manual
		Office:	250 790 2215	Pager:		
		E-mail:	rmartel@mountpolley.com			
Tailings Storage Facility Design Engineer	Ken Brouwer	Home:		Cell:		Familiar with the technical aspects as well as maintenance and inspection requirements of the TSF.
		Office:	(604) 685-0543	Pager:		
		E-mail:	kbrouwer@knightpiesold.com			
Ministry of Energy and Mines	Chris Carr	Home:		Cell:		
		Office:	250 952 0485	Pager:		
		E-mail:	chris.carr@gems7.gov.bc.ca			

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TABLE 2.1

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MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY PROJECT

DESIGN BASIS AND OPERATING CRITERIA – ULTIMATE TSF CAPACITY

ITEM	DESIGN CRITERIA
1.0 GENERAL DESIGN CRITERIA	
Regulations	MEI, WLAP
Codes and Standards	ASTM, ACI, ANSI, CSA, CDSA, HSRC (Health, Safety and Reclamation Code for Mines in BC), NBC and related codes
Design Operating Life	12 Years
Tailings Production Information	18,500 tonnes/day, 35% solids, 2.65 SG, 75.4 million tonnes planned mill production, 1.45 tonnes/m^3 final average tailings dry density
Hazard Rating: During Operations After Closure	 LOW by CDA Hazard Classification HIGH by CDA Hazard Classification
Site Elevation	910 to 1150 metres
Climate	Average Annual Rainfall = 755 mm, Annual Evaporation = 423 mm, Mean Annual Temp = 4.0 C (Likely), Design 24 hour PMF storm = 203 mm.
Design Floods and Freeboard: During Operations: After Closure:	 Sufficient freeboard to store 1 in 10 year 24 hour PMF on top of maximum pond volume. Additional 1 m freeboard provided. No spillway. Final spillway in place, freeboard to pass the Probable Maximum Flood (PMF) in the tailings basin.
Design Earthquakes: During "Operations: Design Basis Earthquake (DBE) Maximum Design Earthquake (MDE) After Closure: Maximum Credible Earthquake (MCE):	 1 in 475 Year Event (M = 6.5, A max. = 0.037 g). 50% of the 1 in 2500 Year Event or MCE (M = 6.5, A max. = 0.065 g). 1 in 2500 Year Event (MCE). GRG to Check / Confirm
Seepage Control	Glacial Till Liners (natural and constructed) in basin, with Foundation Drain System below Main Embankment. Seepage reports to Seepage Collection Ponds.
Tailings Pipework	Butt fusion welded HDPE pipe, gravity flow, discharge predominantly from embankment, spill containment by gravity flow to tailings basin.
2.0 TAILINGS BASIN	
Site Selection	Extension and embankment raise of existing facility.
Geological and Geotechnical Conditions	• Extensive dense glacial till deposits form a natural low permeability base to the impoundment.
Basin Liner	• Natural fine grained till, or • Compacted glacial till with frost protection layer required in areas with <2 m in-situ glacial till. • Liner placed in 3 - 150 mm lifts. • Liner compacted to 95% Std. Proctor max. dry density (ASTM D698) at optimum moisture content minus 1% to plus 2%.

DESIGN BASIS AND OPERATING CRITERIA – ULTIMATE TSF CAPACITY

Embankment Foundation Drains		• Installed in Main Embankment and Perimeter. Foundation. Optimisation study to determine requirement for South embankment. • Geotextile wrapped 1000 mm x 800 mm gravel/drain with 100 mm perforated CPT drain pipe. • Drain conveyance pipes are solid HDPE. • Discharge to Main Embankment Seepage Collection Pond via Drain Monitoring Sump.
Stripping		• Required at areas directly affected by construction (embankments, basin liners, seepage collection ponds, reclaim barge channel, stockpiles, roads etc.). • Remove organic soil to topsoil stockpiles.
3.0 TAILINGS EMBANKMENT		
Function		• Storage of tailings and process water for design life. • Provide storage for 24 hour PMF storm. • Provision for routing PMF at closure.
Embankment Crest Width		6 m min. (main embankment) for Stage 3C. Final width, 9 m.
Embankment Height (Max.):	Current	33 m (Crest El. 945 m)
	Final	50.5 m (Crest El. 962.5 m)
Embankment Crest Length:	Current	1345 m
	Final	4345 m
Design Tonnage		6,800,000 tpy (18888) tpd
Solids Content of Tailings Stream		35% (before Millsite and waste dump runoff added to tailings stream)
Freeboard:	Operations	24 hour PMF event (679,000 m^3) plus 1.0m wave run.
	Closure	Sufficient to provide routing of PMF plus wave run-up.
Storage Capacity		74 million tonnes.
Tailings Density:	Year 1	1.3 t/m^3
	Year 2	1.4.5t/m^3
	Year 3-12	1.4.5 t/m^3
Tailings Specific Gravity		2.65
Borrow Material Properties		See Section 3.0 of 10162/7-5.
Construction Diversion		Not required.
Emergency Spillway Flows:	Operations	Not required.
	Closure	Design flow for routing PMF event.
Filling Rate		Currently being updated.
Fill Material Properties		See Drawing No. 10162-9-104.
Compaction Requirements		See Drawing No. VA101-1/5-104
Geotechnical Data		See Section 3.0 of 10162/7-5 and Section 2 of 10162/9-2.
Seepage Analysis		Section 5.6 of 10162/9-3.
Stability Analysis		Section 5.7 of 10162/9-3.
Sediment Control		Primary control from Main Embankment. Main Embankment Seepage Collection Pond provides secondary sediment control.
Seepage Control		Seepage collection ponds and pumpback well systems.
Seismic Parameters		See Section 2.3 of 10162/9-3.
Spillway Discharge Capacity		Not required during operations.
Settlement		See Section 5.5 of 10162/9-3.
Surface Erosion Protection		Re-vegetation with grasses on final embankment slope.

TABLE 2.1

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MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY PROJECT

DESIGN BASIS AND OPERATING CRITERIA – ULTIMATE TSF CAPACITY

4.0 PIPEWORKS	
4.1 Tailings Delivery and Discharge Pipework	See Section 7.0 of 10162/9-3.
Function	Transport tailings slurry and mill site and waste dump runoff to Tailings Storage Facility (TSF).
Tailings Pipeline	• Free draining, gravity flow pipeline. • Butt fusion welded HDPE with 30" DR15.5, 22" DR17 and 24" DR15.5.
Spigots	• Movable discharge section placed on tailings embankment crest.
Flow Rate	• Design throughput 770 tonnes/hr dry solids. • Slurry solids content 35%. • Design flow 19.6 cfs (0.55m^3/s). Increases to 23.8 cfs (0.67m^3/s) at 30% solids content with addition of 4.2 cfs storm water runoff.. • Waste dump and Millsite runoff will be added to tailings stream, increasing flow and decreasing solids content.
Spill Containment: - Mill site to Bootjack Creek - Bootjack Creek Crossing - Bootjack Creek to TSF	 • Pipeline laid in pipe containment channel. There is an overflow pond for the T2 Dropbox. • Pipeline sleeved in pipe containment channel. • Pipeline laid in pipe containment channel.
4.2 Reclaim Water System	
Function	Primary source of water for milling process. (Pump and Barge System Designed by Others.)
Reclaim Barge	• Prefabricated pump station on barge in excavated channel in TSF. • Local and remote control from Millsite.
Reclaim Pipeline	• 24" pipeline with a steel section at the reclaim barge and HDPE with varying pressure ratings along length.
Reclaim Booster Pump Station	• Prefabricated pump station located between TSF and Millsite. • Identical pumps, sensors and controls as reclaim barge for ease of maintenance.
Spill Containment	• See Item 4.1 above, all same for pipelines. • Booster pump station has closed sump.
4.3 Seepage Recycle System	
Function	Return seepage and foundation drain flows to TSF.
Drain Monitoring Sumps	Flow quantity and water quality measurements on individual drains.
Seepage Collection Ponds	• Sized to hold 10 times max. weekly seepage flow quantity. • Excavated in low permeability natural soil liner, operated as groundwater sink.
Seepage Recycle Pumps	• Set in vertical pump sumps. • Submersible pumps, system by Others. • Pumps discharge back to TSF via 150 mm HDPE pipes.
5.0 MAKE-UP WATER SUPPLY	
5.1 General	
Function	To direct runoff from the Millsite and Southeast Sediment pond to the TSF, providing additional water for recycle to the mill. Also, to implement the Polley Lake Pump Station when and as required to meet the project Water Management Plan objectives.
5.2 Millsite Sump	
Catchment Area	Approx. 20 ha direct catchment, plus pit dewatering.

DESIGN BASIS AND OPERATING CRITERIA – ULTIMATE TSF CAPACITY

Design Storm	1.5 x 1 in 10 yr. 24 hour event runoff (6,000 m^3)
Sump Cross-Section	3:1 inside slope, 2:1 outside slope, 4m crest width.
Normal Operating Level	1102.7 m
Maximum Operating Level	1106.2 m
Flow Control Structures	See Drawing No. 1625.232 for layout details.
Discharge Pipe	300 mm HDPE DR 21 to plant or tailings line.
Flow Monitoring	None.
5.3 Southeast Sediment Pond	
Catchment Area	Approx. 150 ha direct catchment.
Design Storm	1 in 10 yr. 24 hour event runoff (25,000 m^3)
Sump Cross-Section	3:1 inside slope, 2:1 outside slope, 4m crest width.
Normal Operating Level	1054.5 m
Maximum Operating Level	1057.4 m
Flow Control Structures	See Drawing No. 1625.232 for layout details.
Discharge Pipe	250 mm HDPE DR 21 to Reclaim sump or T2 Dropbox
Flow Monitoring	None.
5.4 Polley Lake Pump Station	See Report 1628/5.
Max. Volume to be extracted	1,000,000 m^3 annually
Period for water extraction	Freshet
Max. Intake Velocity	0.11 m/s
Intake Screen Opening	0.1 inch (No. 8 Mesh wire cloth)
Spill Containment at Pump	Collection into a Holding Basin
Discharge Pipe	22 ½ inch ID, 350 ft of 19 ½ inch ID and 5200 ft of 17 ½ inch ID pipe.
Max. Flow	5,500 US GPM
Flow Monitoring	Flows in Hazeltine Creek, water level on Polley Lake, pumping hours times measured flow rate.
Security and Access	Signs for buried or submerged components, buoys attached to intake in Polley Lake.
5.5 Caribou Pit	
Maximum Operating Volume	2,500,000 cubic meters of water in storage as of Dec. 2004

6.0 INSTRUMENTATION AND MONITORING	
6.1 General	
Function	To quantify environmental conditions and performance characteristics of the TSF to ensure compliance with design objectives.
6.2 Geotechnical Instrumentation and Monitoring	
Piezometers	• Measure pore pressures in drains, foundations, fill materials and tailings. • Vibrating wire piezometers. • Installed by qualified technical personnel. • Three instrumentation planes for Main Embankment and one for Perimeter Embankment.
Survey Monuments	• Deformation and settlement monitoring of embankments.

DESIGN BASIS AND OPERATING CRITERIA – ULTIMATE TSF CAPACITY

6.3 Flow Monitoring	• To provide data for on-going water balance calculations. • Drain flows regularly monitored. • Reclaim and seepage pump systems flow meters. • Tailings output monitored at millsite. • Stream flow monitoring.
6.4 Water Quality Monitoring	• To ensure environmental compliance. • Water quality samples taken at regular intervals from sediment ponds, drains (at drain monitor sump), groundwater monitoring wells, seepage ponds and tailings pond. • Upstream and downstream samples for impact analysis.
6.5 Hydrometeorology	• Operator weather station for input to water balance calculations. • Precipitation (rain and snow). • Evaporation. • Air quality monitoring (dust, etc.).
6.6 Operational Monitoring	• Quantify operation of tailings storage facility. • Rate of tailings accumulation in terms of mass and volume. • Tailings characteristics and water recovery. • Supernatant pond (depth, area and volume).
7.0 CLOSURE REQUIREMENTS	
7.1 General	Return impoundment to equivalent pre-mining use and productivity by establishing a wetland area adjacent to a final spillway and re-vegetating remainder of tailings surface with indigenous species of trees, shrubs and grasses adjacent to embankment grading to aquatic species along and adjacent to final pond.
7.2 Spillway	Two stage spillway with lower channel outlet designed to pass 1 in 200 yr. 24 hour flood event and upper wider outlet section designed to pass Probable Maximum Flood without overtopping embankments.

Notes:

1. The closure plan will remain flexible during operations to allow for future changes in the mine plan and to incorporate information from on-going reclamation programs.

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TABLE 3.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
INSPECTION AND SURVEILLANCE SCHEDULE

Printed on: Dec-21-04

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COMPONENT	DESCRIPTION	OPERATIONS	INSPECTION AND SURVEILLANCE
Tailings Pond	Consists of process water and tailings solids	• Pond required to store 24 hr.PMP event plus provide an additional 1 metre of freeboard. To achieve this the pond level should be at least 1.39 metres below the crest elevation during normal operations. • Compare pond levels with design filling schedules. • Relocate spigots as necessary to prevent excessive erosion on the tailings beach.	• Record Tailings throughput **daily.** • Inspect the tailings discharge location **daily** and note the approximate extent of beach development in the facility • Inspect the tailings beach **daily.** Note any sinkholes or excessive beach erosion. • Measure and monitor the pond water levels **weekly.** Increase to **daily** during spring freshet. • Take photographs of the pond **monthly.** • Determine the volume of the supernatant pond **semi-annually** (after spring freshet and prior to winter freeze-up) by sounding the pond depths from a boat.
Tailings Embankment	Consists of the Perimeter, Main and South Embankments; upstream toe drain; foundation drains and drain monitoring sumps.	• Visually estimate flow rates entering the monitoring sumps • Maintain access roads on the embankment crest	• Inspect flows into the Drain monitoring sumps **weekly.** Check for clarity and provide visual estimate of flow rate. • Inspect the embankments **weekly** and look for evidence indicating instability or deformation. • Inspect downstream face **weekly** for evidence of seepage, runoff, erosion or piping. • Compile the flow rate data from the monitoring sumps **monthly.** Forward brief report to Design Engineer with flow rate data. • Take photographs of the embankments **quarterly.**
Tailings Discharge Pipeline	Consists of the tailings pipeline, T2 Dropbox and Discharge spigots.	• Ensure that the discharge pipeline is fully flushed prior to relocating the spigot point upstream • Ensure that there is always an open path for the tailings to exit during operations and spigot relocation • Keep spigot points downstream of active spigotting sections open to allow the unused pipeline to drain • Maintain non-erosive laminar flow over the tailings beaches • Ensure that the valve between the Southeast Sediment Pond and T2 Dropbox remain open as an overflow if the booster pump is not functioning	• Record the tailings line pressure from all pressure gauges **daily.** • Inspect the tailings pipeline and valves **daily** and note areas of excessive wear. • Inspect the pipeline **daily** for evidence indicating leakage. • Conduct detailed inspections of the tailings pipeline during **mill maintenance periods.** • Monitor the water level in the T2 Dropbox **daily** to ensure that tailings has not filled it up. • Inspect the pipeworks leading to the dropbox **daily** to ensure it is free from blockage. • Take photographs of the tailings discharge pipeline **quarterly.**

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COMPONENT	DESCRIPTION	OPERATIONS	INSPECTION AND SURVEILLANCE
Reclaim Pipeline	Consists of the floating reclaim barge, reclaim pipeline and booster pump station.	• Ensure that the pipeline is fully drained during maintenance periods, barge relocation or prolonged shutdown under extreme cold conditions. A drain valve located on the barge may be used to drain the pipeline. • The pump barge and booster pump may be controlled from the Mill control room, or separately at each site. • Adjust the pump barge mooring as required. Ensure extra pipes, mooring lines, anchors, winches, etc. are available if the barge needs to be relocated. • Monitor the barge elevation relative to the ball joint (connecting the HDPE pipe to the steel pipe). The ball joint has a maximum operating range of 15 degrees only and barge relocation may be necessary. The barge can relocate in 3 metre increments. • Ensure that the de-icing equipment on the barge is working properly prior to freezing conditions. • Monitor water clarity at the Southeast Sediment Pond and divert water into the reclaim line at the booster pumpstation if required. Water diversion is controlled by a valve on the pipeline between the Pond and pump station.	• Inspect the reclaim pipeline and valves **daily** and note areas of excessive wear. • Inspect the pipeline **daily** for evidence of leakage. • Inspect the floating barge **daily** as per the barge operating manual, including pumps, de-icing equipment, mooring, lighting, ball joint and walkway. • Conduct a detailed inspection of the pump barge and pump station **annually** for corrosion, wear and tear, etc. and make necessary repairs. • Inspect the booster pump station **daily**. Record **daily** flow rates, total volumes pumped and line pressure at the pump and discharge manifolds. • Monitor and assess the barge elevation **weekly** and determine if it needs to be raised. • Conduct detailed inspections of the reclaim pipeline during **mill maintenance periods.** • Take photographs of the reclaim pipeline **quarterly**.

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MOUNT POLLEY MINING CORPORATION
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TAILINGS STORAGE FACILITY
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COMPONENT	DESCRIPTION	OPERATIONS	INSPECTION AND SURVEILLANCE
Sediment Ponds	Consists of the Mill Site Sump and Southeast Sediment Pond.	• Ensure that the water level in both ponds remain at least 3 metres below the crest elevation to store the 10 yr. 24hr. storm event • Ensure that the drainage collection ditches are free of obstruction and debris.	• Inspect the Mill Site Sump manhole and Southeast Sediment Pond manhole and associated pipeworks **daily**. Note which inlets are actively discharging water. • Inspect the water level in both ponds **weekly**. Comment on water clarity. • Inspect the flows exiting both ponds **weekly**. • Inspect the embankment slopes around both ponds **weekly** and note any signs of instability or evidence indicating seepage. • Inspect the drainage collection ditches **weekly**. • Forward a report on the status of the sediment ponds to the Design Engineer **annually** and include all measured water levels. • Take photographs of the sediment ponds and manholes **quarterly**.
Seepage Collection Ponds	Consists of the Main and Perimeter Seepage Collection Ponds and associated Seepage Recycle Pumps	• Ensure that the water levels in both ponds remain at the inlet level of the seepage recycle pipeline to maintain capacity for the design storm event. • Regularly confirm that the power supply to the pumping system is operating as required to prevent discharge to the environment. • Ensure portable pumps are available to lower the pond level in case of an emergency. • Direct diversion ditches away from collection ponds during spring freshet as the pumps may not be able to maintain pumping capacity to lower the pond fast enough. • Operate pumps on a timed pumping cycle during freeing conditions to prevent the pipes from freezing. Cycle time based on site conditions - operators should inspect and adjust accordingly to prevent ice formation in the pipes. • Monitor water quality in both ponds.	• Measure water levels **weekly**. • Inspect the pumpback system (incl. Power supply) and discharge outlet **weekly**. • Inspect the overflow culverts and pipelines from the monitoring sumps and recycle sumps **weekly** and ensure that there are no obstructions. • Record the average pumpback flow rates from the recycle pumps **weekly**. • Inspect the pond slopes **weekly** for signs of erosion, damage or instability. • Inspect the downstream slopes **weekly** for signs of seepage or piping from the ponds. • Forward a report on the status of the collection ponds to the Design Engineer **annually** and include all measured water levels and pumpback data. • Take photographs of the seepage collection ponds and pumps **quarterly**.

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TABLE 3.1

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TAILINGS STORAGE FACILITY
INSPECTION AND SURVEILLANCE SCHEDULE

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M:\1\01\00001\09\A\Data\OMS Tables\Tab 3-1 Monitoring Schedule_r0.doc Revised on: Dec 20, 2004

COMPONENT	DESCRIPTION	OPERATIONS	INSPECTION AND SURVEILLANCE
Instrumentation	Consists of vibrating wire piezometers, slope inclinometers, survey and surface movement monuments and groundwater monitoring wells.	• Operate the piezometer readout box according to the manufacturer's operating manual. • Enter piezometer, slope inclinometer and survey data into spreadsheets setup by Knight Piesold Ltd. and plot data onto graphs. • Check for corrosion and trim or re-attach piezometer cables if readings are unattainable. • Make note of any piezometers that are not functioning. • Operate the slope inclinometer probe according to the manufacturer's operating manual. • Use 'poor boy' (rebar attached to a rope) to determine if casing has been displaced • Prevent snow cover on top of the survey monuments during winter by covering with buckets. • Prevent damage to surface movement monuments by placing used tires around the structures. • Notify Design Engineer of any anomalous trends in the data.	• Collect piezometer readings **monthly** as a minimum (take readings **weekly** during construction programs). Include the barometric pressure at the time of the readings. Ensure that the readout panel box is closed when not in use. • Use 'poor boy' slope inclinometer **monthly** to determine if the inclinometer casing has displaced (take readings **twice monthly** during construction on the Main embankment) • Collect slope inclinometer readings with the inclinometer probe **annually.** • Compile all piezometer and inclinometer data **annually** and develop graphical plots. Forward the data plots and a brief report to the Design Engineer. • Measure survey monuments **annually.** • Measure surface movement monuments **quarterly** and calculate displacements if any. • Compile data and plot results on a graph **quarterly** and forward to Design Engineer for review. • Monitor water levels in each groundwater monitoring well and obtain water quality samples three times a year. Data is compiled by the Environmental Superintendent and a report is forwarded to the appropriate agencies **annually.** Forward a copy to the Design Engineer.

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TABLE 3.2

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
UNUSUAL EVENTS AND OCCURRENCES REQUIRING NON-ROUTINE WALKOVERS

Printed on: Dec-21-04
M:\1\01\00001\09\A\Data\OMS Tables\Tab 3-2 Unusual Events_r0.doc Revised on: Dec 20, 2004

EVENT / OBSERVATION	RECOMMENDED ACTION
Extreme Rainfall or Runoff Event	• Monitor the TSF pond levels against the critical levels daily (or more) until inflows into the pond reduce to normal. • Monitor the Sediment Collection pond levels daily to ensure water does not overflow. Open additional manhole inlets and/or increase pumping capacity. • Monitor the Seepage Collection pond levels daily (or more). Water must not overflow the ponds. Increase pumping capacity back into the TSF. Use portable pumps if necessary. • Inspect T2 Dropbox and ensure that the water entering the tailings pipeline does not exceed the operating capacity. Water may need to drain to overflow culverts. • Inspect the Booster Pump Station to ensure water doesn't flood the sump. Allow water to overflow to the T2 Dropbox or increase pumping capacity to remove water. • Inspect the embankments, sediment ponds and seepage collection pond embankments for signs of concentrated runoff and erosion. • Inspect the TSF embankments for indications of localized slumping or instability • Note areas of saturated or soft ground. • Read piezometers daily to monitor pore pressure response to increased precipitation. • Discuss findings with the Design Engineer.
TSF, Seepage and/or Sediment Pond level close to or approaching maximum operating level	• Monitor Pond levels every 3 hours • Immediately Reduce the pond level (mobilization of pump and treatment equipment) • Contact the Design Engineer

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TABLE 3.2

MOUNT POLLEY MINING CORPORATION
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TAILINGS STORAGE FACILITY
UNUSUAL EVENTS AND OCCURRENCES REQUIRING NON-ROUTINE WALKOVERS

Printed on: Dec-21-04
M:\1\01\00001\09\A\Data\OMS Tables\Tab 3-2 Unusual Events_r0.doc Revised on: Dec 20, 2004

EVENT / OBSERVATION	RECOMMENDED ACTION
Extreme earthquake event	• Carry out a detailed walkover of the TSF, pipeline and associated structures. Investigate downstream and upstream (visible) slopes to look for signs of cracks, bulging, settlement and/or other deformations. • Look for and note any changes in seepage, particularly with respect to the rate of seepage flow at the embankment toe and seepage clarity. • Read all piezometers • Survey all surface movement monuments. • Inspect downstream embankment toes for sand boils and along the slopes for sinkholes. Inspect the tailings beach upstream to look for whirlpools. • Discuss findings with the Design Engineer. • Check and ensure that the seepage collection pond pumps are still functioning.
Rupture of pipeline at the embankment	• Stop pumping tailings to the TSF. • Check the upstream slope and crest for erosion. • Take photographs and make notes of exact location and cause (if known) of leak. • Contact the Design Engineer.
Significant, rapid erosion of embankment slopes; Sudden seepage break on embankment slope or downstream of embankment in form of continuous seepage or boils	• Estimate seepage flow rate. • Estimate size of area. • Take photographs and make notes of exact location (if known) of erosion. • Contact the Design Engineer.
Extreme or prolonged freezing temperatures	• Drain reclaim pipeline if not in use. • Ensure de-icing system on reclaim barge is functioning properly. System should be checked prior to expected onset of freezing temperatures. • Operate seepgae recycle pumps on a timed pumping cycle. Check pond levels and recycle outlet in TSF to ensure that the pipelines are not freezing. • Check T2 Dropbox and Seepage Recycle Sump regularly to ensure pipelines are not frozen. • Check Sediment Ponds and manholes to ensure pipelines are not frozen. • Take photographs and make notes of any damages or unusual observations.

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TABLE 3.2

MOUNT POLLEY MINING CORPORATION
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TAILINGS STORAGE FACILITY
UNUSUAL EVENTS AND OCCURRENCES REQUIRING NON-ROUTINE WALKOVERS

Printed on: Dec-21-04
M:\1\01\00001\09\A\Data\OMS Tables\Tab 3-2 Unusual Events_r0.doc Revised on: Dec 20, 2004

EVENT / OBSERVATION	RECOMMENDED ACTION
Power Failure	• Ensure that the valve between the Southeast sediment pond and T2 Dropbox remains open to act as an overflow to prevent the Booster Pump Sump from overflowing. • Drain the reclaim pipeline if power failure occurs duing extreme freezing temeratures. • Monitor water levels in the TSF daily (or hourly) and check against critical levels. If the pond level is close to the critical or maximum level portable generators may be required to power the reclaim pump until power is restored. • Monitor water levels in the Seepage Collection Ponds frequently. Use portable pumps if the water level rises above normal operating levels.
Significant change in the piezometer level(s)	• Re-check the reading. • Contact the Design Engineer.
Other events/observations	• Use judgement, consult your peers.

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TABLE 3.3

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
TAILINGS STORAGE FACILITY

SUMMARY OF VIBRATING WIRE PIEZOMETERS AND TRIGGER LEVELS

Printed:21-Dec-2004

M:\1\01\00001\09\A\Data\OMS Tables\[Table 3.3_r0.xls]Table 3.3_R0 Revised:20-Dec-2004

0.3 Identification Number	Serial Number	Tip El. (m)	Zone Monitored	Trigger Level		
				Frequency (Hz)	Pressure (m H2O)	Elevation (m)
A0-PE1-01	69689	938.5	Cycloned Tailings			
A0-PE2-01	43675	928.0	Tailings			
A0-PE2-02	43657	927.9	Tailings			
A1-PE1-01	64100	913.0	Foundation Drain	3000	2.0	915.0
A1-PE1-02	64098	912.1	Foundation Drain	3040	2.0	914.1
A1-PE1-03	64105	917.2	Chimney Drain	3015	2.0	919.2
A1-PE1-04	43649	936.3	Upstream Toe Drain			
A2-PE1-01	67191	913.3	Zone T Fill			
A2-PE1-02	69690	938.5	Glacial Till Fill			
A2-PE1-03	69697	909.3	Foundation, depth 1.5 m	Not Functioning		
A2-PE2-01	64104	903.7	Foundation, depth approx. 9.0 m	2875	15.0	918.7
A2-PE2-02	64103	909.8	Foundation, depth approx. 2.9 m	3000	8.9	918.7
A2-PE2-03	64101	919.4	Glacial Till Fill			
A2-PE2-04	64099	926.1	Glacial Till Fill	Not Functioning		
A2-PE2-05	64102	921.9	Glacial Till Fill			
A2-PE2-06	43650	898.9	Foundation, depth approx.	2810	20.5	919.4
A2-PE2-07	43654	902.8	Foundation, depth approx.	2840	16.6	919.4
A2-PE2-08	67195	907.6	Foundation, depth approx.	2995	11.8	919.4
B0-PE1-01	69692	939.1	Cycloned Tailings			
B0-PE2-01	43674	927.3	Tailings			
B0-PE2-02	43676	927.2	Tailings			
B1-PE1-01	64107	917.3	Foundation Drain	3090	2.0	919.3
B1-PE1-02	64106	916.0	Foundation Drain	3080	2.0	918.0
B1-PE1-03	64118	918.7	Chimney Drain	3115	2.0	920.7
B2-PE1-01	67194	916.3	Zone T			
B2-PE1-02	69693	939.4	Glacial Till Fill			
B2-PE1-03	69696	914.1	Foundation, depth 1.5 m	2964	7.5	921.6
B2-PE2-01	64110	902.0	Foundation, depth approx. 15.0 m	2840	21.0	923.0
B2-PE2-02	64116	909.5	Foundation, depth approx. 7.9 m	2865	13.9	923.4
B2-PE2-03	64109	921.0	Glacial Till Fill			
B2-PE2-04	64108	921.0	Glacial Till Fill			
B2-PE2-05	64113	921.7	Glacial Till Fill			
B2-PE2-06	43652	914.6	Foundation, depth approx. 2.3 m	2980	8.5	923.0
C0-PE1-01	69694	938.3	Cycloned Tailings			
C0-PE2-01	43673	927.8	Tailings	Not Functioning		
C0-PE2-02	43658	927.5	Tailings	Not Functioning		
C1-PE1-01	64111	914.7	Foundation Drain	3070	2.0	916.7
C1-PE1-02	64115	916.6	Chimney Drain	3070	2.0	918.6
C1-PE1-04	43653	914.3	Foundation Drain	2960	2.0	916.3
C2-PE1-01	67196	915.0	Zone T			
C2-PE1-02	69695	938.5	Glacial Till Fill			
C2-PE1-03	69698	912.6	Till Foundation, depth 1.5 m	2979	7.5	920.1

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TABLE 3.3

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
TAILINGS STORAGE FACILITY

SUMMARY OF VIBRATING WIRE PIEZOMETERS AND TRIGGER LEVELS

Printed:21-Dec-2004

M:\1\01\00001\09\A\Data\OMS Tables\[Table 3.3_r0.xls]Table 3.3_R0 Revised:20-Dec-2004

0.3 Identification Number	Serial Number	Tip El. (m)	Zone Monitored	Trigger Level		
				Frequency (Hz)	Pressure (m H2O)	Elevation (m)
C2-PE2-01	64117	907.5	Foundation	Not Functioning		
C2-PE2-02	64119	910.5	Foundation, depth approx. 5.2 m	2955	11.2	921.7
C2-PE2-03	64112	921.0	Glacial Till Fill			
C2-PE2-05	64114	924.8	Glacial Till Fill	Not Functioning		
C2-PE2-06	43647	906.6	Foundation, depth approx. 9.1 m	2940	15.4	922.0
C2-PE2-07	43655	912.3	Foundation, depth approx. 3.7 m	3000	9.7	922.0
C2-PE2-08	43656	914.0	Foundation, depth approx. 2.0 m	3000	8.0	922.0
D1-PE1-02	66520	928.8	Outlet Drain			
D1-PE1-03	50679	934.0	Chimney Drain			
D2-PE1-01	67193	930.4	Zone T			
D2-PE2-01	64096	931.0	Glacial Till Fill			
D2-PE2-02	67192	927.3	Foundation			
E2-PE2-01	43651	914.2	Foundation, depth approx. 4.6 m	2930	10.6	924.8
E2-PE2-02	43648	909.7	Foundation, depth approx. 9.1 m	2980	15.1	924.8
F2-PE2-01	53765		Foundation, depth 1.3 m			
G1-PE1-01	50678	934.0	Chimney Drain			
H1-PE1-01	50681	934.0	Chimney Drain			

Notes:

1. Trigger level is the level at which the monitoring frequency must be increased (daily) and when contingency or remedial plans must be developed.
2. The trigger level for foundation piezometers is approx. 6.0 metres above ground and is based on the level where the factor of safety is approaching 1.1.
3. The trigger level for drain piezometers is approx. 2.0 metres of head.
4. Fill piezometers have no set trigger level, but must be closely monitored for pressure increases.

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TABLE 3.4

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
TAILINGS STORAGE FACILITY

SUMMARY OF SLOPE INCLINOMETERS AND TRIGGER LEVELS

Printed:21-Dec-2004

M:\1\01\00001\09\A\Data\OMS Tables\[Table 3.4_r0.xls]Table 3.4_r0 Revised:20-Dec-2004

Inclinometer Identification Number	Ground El. (m)	Depth (m)	Zone Monitored	Horizontal Displacement Trigger Level
SI01-01	915.70	24.38	Foundation	25 mm
SI01-02	917.30	30.33	Foundation	25 mm

Notes:

1. Trigger level is the level at which the monitoring frequency must be increased (daily) and when contingency or remedial plans must be developed.

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TABLE 3.5

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
TAILINGS STORAGE FACILITY

TRIGGER LEVELS FOR SURVEY MONUMENTS

Printed: 21-Dec-2004

M:\1\01\00001\09\A\Data\OMS Tables\[Table 3.5_r0.xls]Tab 3-5_r0

Revised: 20-Dec-2004

DISPLACEMENT TYPE	DESCRIPTION	LEVEL	MAGNITUDE OF DISPLACEMENT (m)	ACTION
Settlement	Loss of fill elevation associated with small displacements in upstream or downstream direction.	1	DEI = -0.01 to -0.02	Continue survey and inspections.
		2	DEI = -0.02 to -0.05	See Contingency 1.
		3	DEI > -0.05	Inspect embankment for cracking, sloughing or slumping, If observed, complete actions for Contingency 2. If not, notify Design Engineer, increase survey frequency to monthly and complete daily inspections.
Crest Movement	Displacement in the upstream or downstream directions, associated with minor changes in embankment crest elevation.	1	Dxy = ±0.03	Slight deformations in the downstream direction may occur during initial basin filling. Continue inspections and surveys.
		2	Dxy = ±0.05	See Contingency 1.
		3	Dxy > 0.05	Inspect embankment for cracking, sloughing or slumping, If observed, complete actions for Contingency 2. If not, notify Design Engineer increase survey frequency to monthly and complete daily inspections.
Contingency Actions				
1	Inspect the embankment crest and slopes for cracking, sloughing or slumping. If any of these are noted see Contingency 2. Otherwise continue with survey and inspection. Forward results to the Design Engineer immediately.			
2	Cracks, sloughing or slumping found; determine size of affected area and photograph. Collect baseline measurements (e.g. length of crack, separation amount of movement, and rate of movement- if any). Closely inspect the embankment crest and slopes for other deformations, and the tailings beach for sinkholes or for unusual tailings or water movement or disturbance. Contact the Design Engineer with this information immediately. Inspect again, and determine if cracking or movement is continuing or accelerating. Arrange for additional survey monuments and increase frequency of inspection to twice daily. Survey daily until it is determined if displacements are continuing or accelerating. Arrange for an inspection by a suitably qualified Engineer.			

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TABLE 5.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
EMERGENCY WARNING LEVELS AND REQUIRED ACTIONS

Printed on: Dec-22-04
M:\1\01\00001\09\A\Data\OMS Tables\Tab 5-1 Emergency levels_r0.doc Revised on: Dec 20, 2004

WARNING LEVEL	EMERGENCY CONDITION	REQUIRED ACTIONS
1	Water Levels in the TSF, sediment pond and/or seepage collection pond rising but still under normal operating level.	• Monitor water levels daily.
	Minor surface erosion on embankment crest/slopes and/or pond slopes.	• Repair as necessary. • Determine the cause of the erosion.
	Unusually high piezometer reading(s)	• Re-check the reading again. • Continue monitoring daily until readings return to normal. Otherwise see Level 3 Response.
2	Water Levels in the TSF, sediment pond and/or seepage collection pond near normal operating level and rising steadily.	• Monitor water levels daily (or more). • Open additional manhole inlets to facilitate drainage of the sediment ponds. • Prepare to increase pumping capacity of the reclaim and/or seepage recycle pumps. • Ensure portable pumps are available.
	Major erosion of on downstream slope or crest. Sediment buildup at the toe of the embankment from erosion.	• Contact Design Engineer. • Prepare to carry out corrective repairs.
	Soft toe condition or seepage at the downstream slope or toe.	• Determine if water source is natural or from the tailings pond. • Contact the Design Engineer. • Commission a field investigation program. • Prepare to carry out corrective repairs.
	Cracks developing at the embankment crest or slope	• Conduct embankment walkovers daily until the problem is understood and addressed. • Contact the Design Engineer. • Monitor crack development (e.g. crack size, extent, etc.). • Prepare to carry out corrective repairs
	High turbidity in seepage collection flow	• Conduct embankment walkovers daily until the problem is understood and addressed. • Take water samples for suspended solids determination twice a week. • Contact the Design Engineer. • Prepare to carry out corrective repairs.
	Failure of Reclaim and/or Seepage Recycle Pumps	• Monitor water levels daily. • Ensure portable pumps are available. • Repair or replace failed pumps ASAP.
	Tailings Pipeline blocked (and/or T2 Dropbox filled with tailings)	• Stop tailings discharge. • Flush pipeline with water to clear obstruction. Inspect the pipeline for damages or leaks. • Clean out the dropbox. • Determine the cause or reason for blockage.
	Slope inclinometer and/or surface movement monument readings indicate significant deviation	• Re-check readings/measurements. • Contact the Design Engineer. • Check for embankment deformations following Level 3 recommendations.

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TABLE 5.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
EMERGENCY WARNING LEVELS AND REQUIRED ACTIONS

Printed on: Dec-22-04
M:\1\01\00001\09\A\Data\OMS Tables\Tab 5-1 Emergency levels_r0.doc Revised on: Dec 20, 2004

WARNING LEVEL	EMERGENCY CONDITION	REQUIRED ACTIONS
	Any other situations which may lead to a potential emergency	• Discuss with the Tailings Co-ordinator. • Seek advice from the Design Engineer. • Check for Level 3 conditions.
3	Failure or suspected imminent failure of a dam (any reason)	• Initiate chain of communications and ensure safety of people. • Stop tailings discharge into the TSF. • Monitor water levels every 3 hours if safe to do so. • Lower pond by any practical means approved by the Design Engineer. • Mobilize pumps and earthmoving equipment. • Contact the Design Engineer. • Construct confinement berms downstream of the embankment and ponds where feasible. • Contact the Ministry of Energy and Mines.
	Water Levels in the TSF, sediment pond and/or seepage collection pond near **maximum** operating level.	• Follow procedures in shaded box above. • Conduct a detailed inspection of the TSF and ponds after pond levels have decreased.
	Unusually high piezometer reading(s) maintained over a few days.	• Re-check readings. • Continue daily readings. • Contact the Design Engineer.
	Slumping, sliding, or bulging of a dam slope or adjacent ground	• Follow procedures in shaded box above. • Do not attempt construction of a stabilizing berm until the Design Engineer is on site
	Boils observed d/s of dam	• Follow procedures in shaded box above. • Place granular filter buttress over the boils, if approved by the Design Engineer.
	Water vortex within the pool	• Follow procedures in shaded box above. • Check d/s of the dam area for increased and/or turbid seepage discharge. • Place granular filter buttress against any such areas, if approved by the Design Engineer.
	Large earthquake and significant loss of freeboard	• Follow procedures in shaded box above. • Carry out detailed post-earthquake inspection of the dam with the assistance of the Design Engineer. • Restore dam as directed by the Design Engineer.
	Rupture of the tailings pipeline	• Stop pumping tailings. • Check for erosion on the tailings embankment. • Build confinement berms as necessary to contain the tailings. • Clean up tailings. • Determine cause of rupture.

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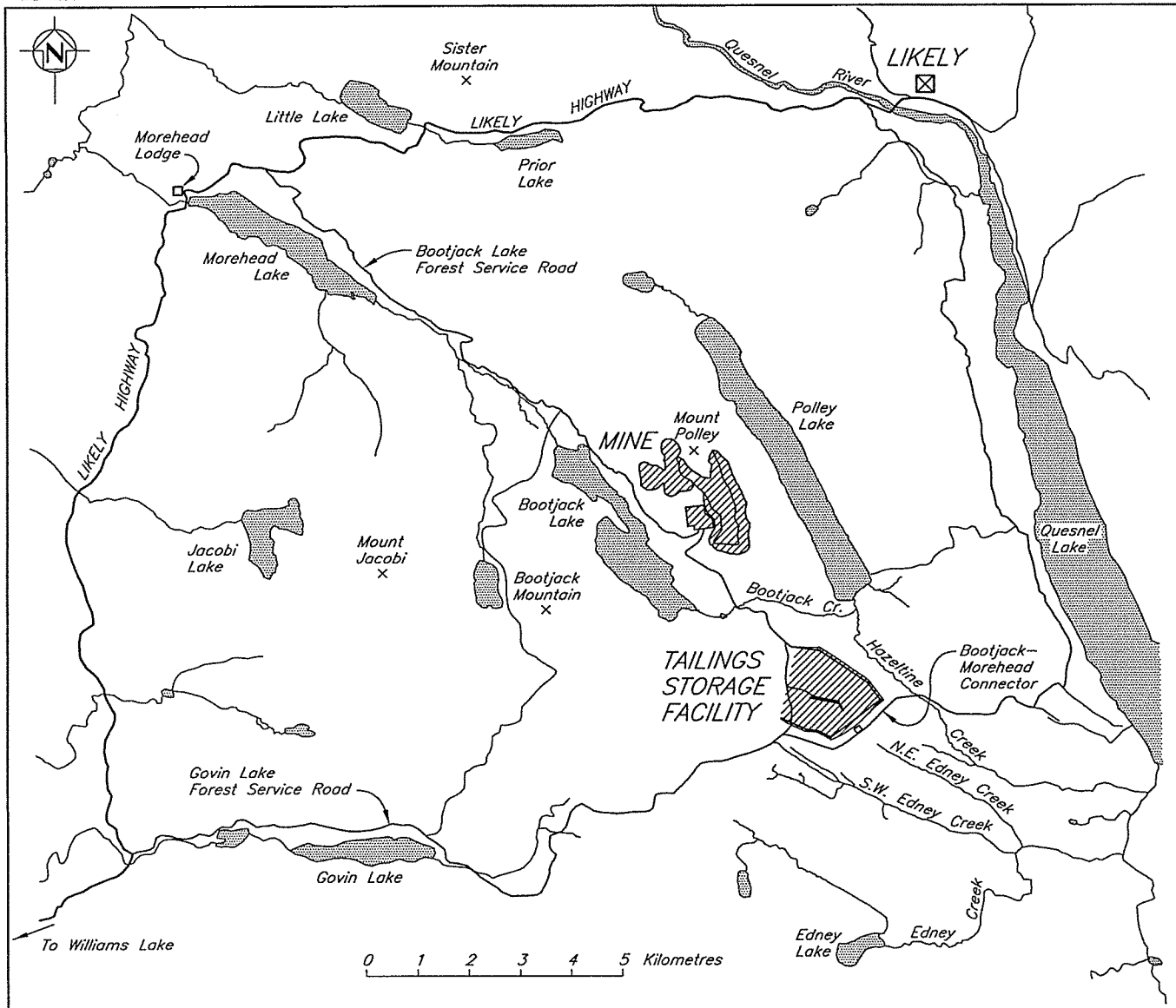

LOCATION MAP

KEY MAP

VANCOUVER B.C. CAD FILE: M:\101\01\9\A\Acad\Figs\A03 1=150000 Plot 1=1(PS) DEC 22, 2004 By: CZ

REV.	DATE	DESCRIPTION
0	22DEC'04	ISSUED FOR OMS REPORT

IMPERIAL METALS CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
PROJECT LOCATION PLAN

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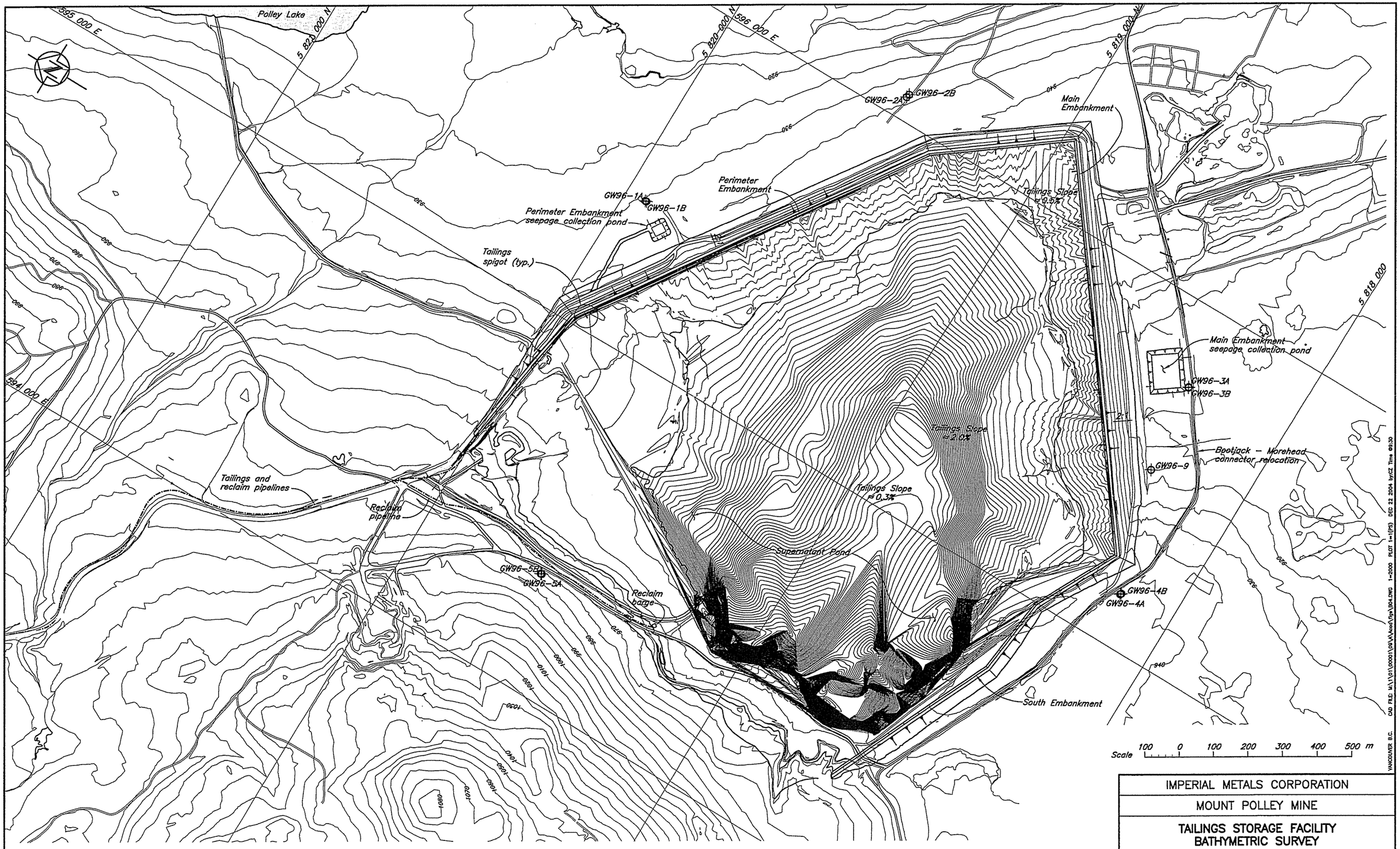
PROJECT/ASSIGNMENT NO.	REF. NO.	REV.
VA101-1/9	1	0

FIGURE 2.1



NOTE:
Topography provided by MPMC, Nov 10, 2004.

REV.	DATE	ISSUED
0	22DEC'04	ISSUED FOR OMS REPORT

IMPERIAL METALS CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
BATHYMETRIC SURVEY

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PROJECT/ASSIGNMENT NO.	REF. NO.	REV.
VA101-1/9	1	0

FIGURE 2.2

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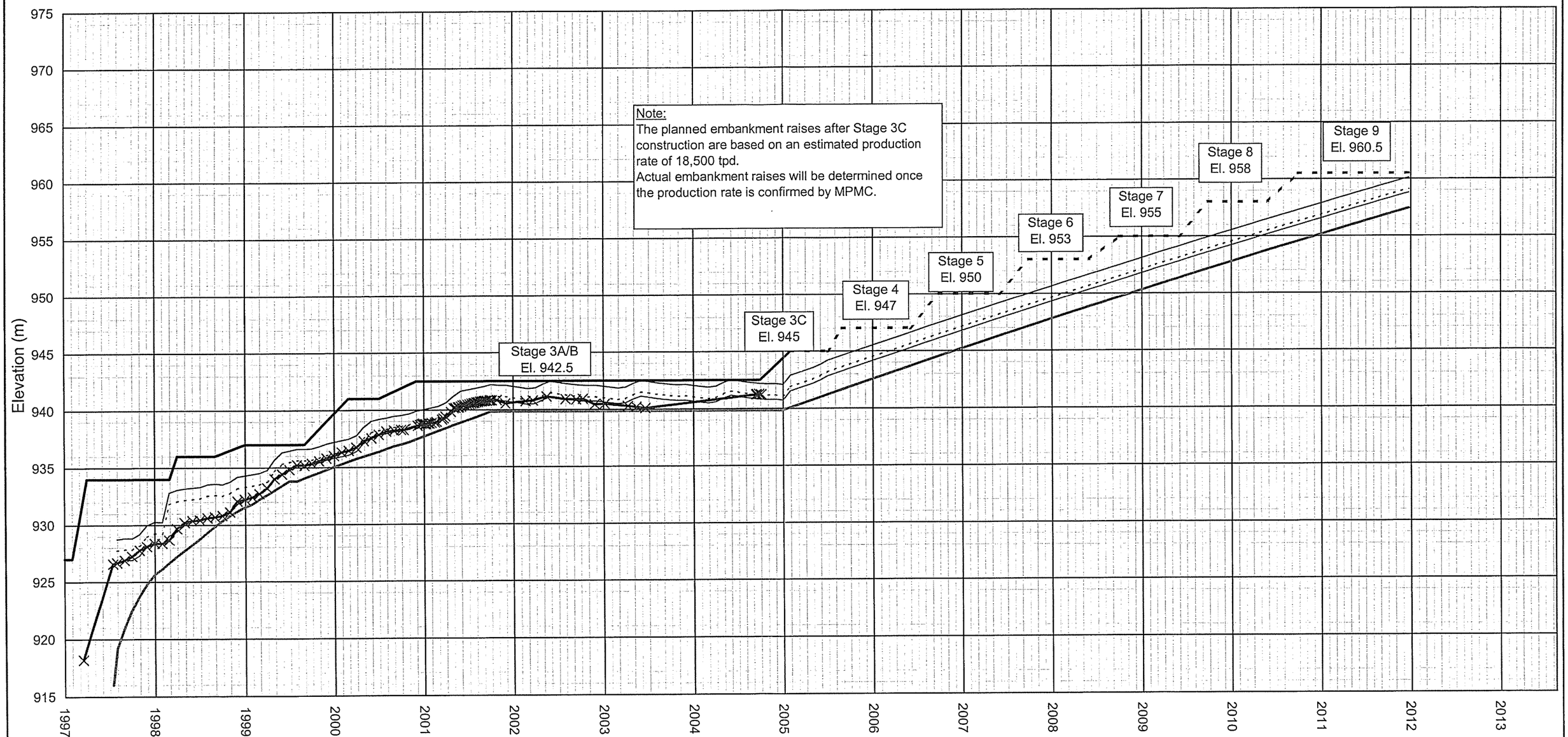
VANCOUVER B.C.

XREF FILE : -



- Existing Embankment Crest
- 1 m Freeboard
- 24 Hr. PMP (679,000 m3)
- Reclaim Water
- Measured Pond El.

Notes:
1. Production rate is estimated at 18,500 tpd.
2. Projected bulk tailings dry density is 1.36 t/m^3 for tailings reporting to the TSF after August 2000.
3. Supernatant pond volume maximum of 3,000,000 m^3.
4. Water in supernatant pond at startup 2.6 M m^3.

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
FILLING SCHEDULE AND STAGED CONSTRUCTION
18,500 tpd

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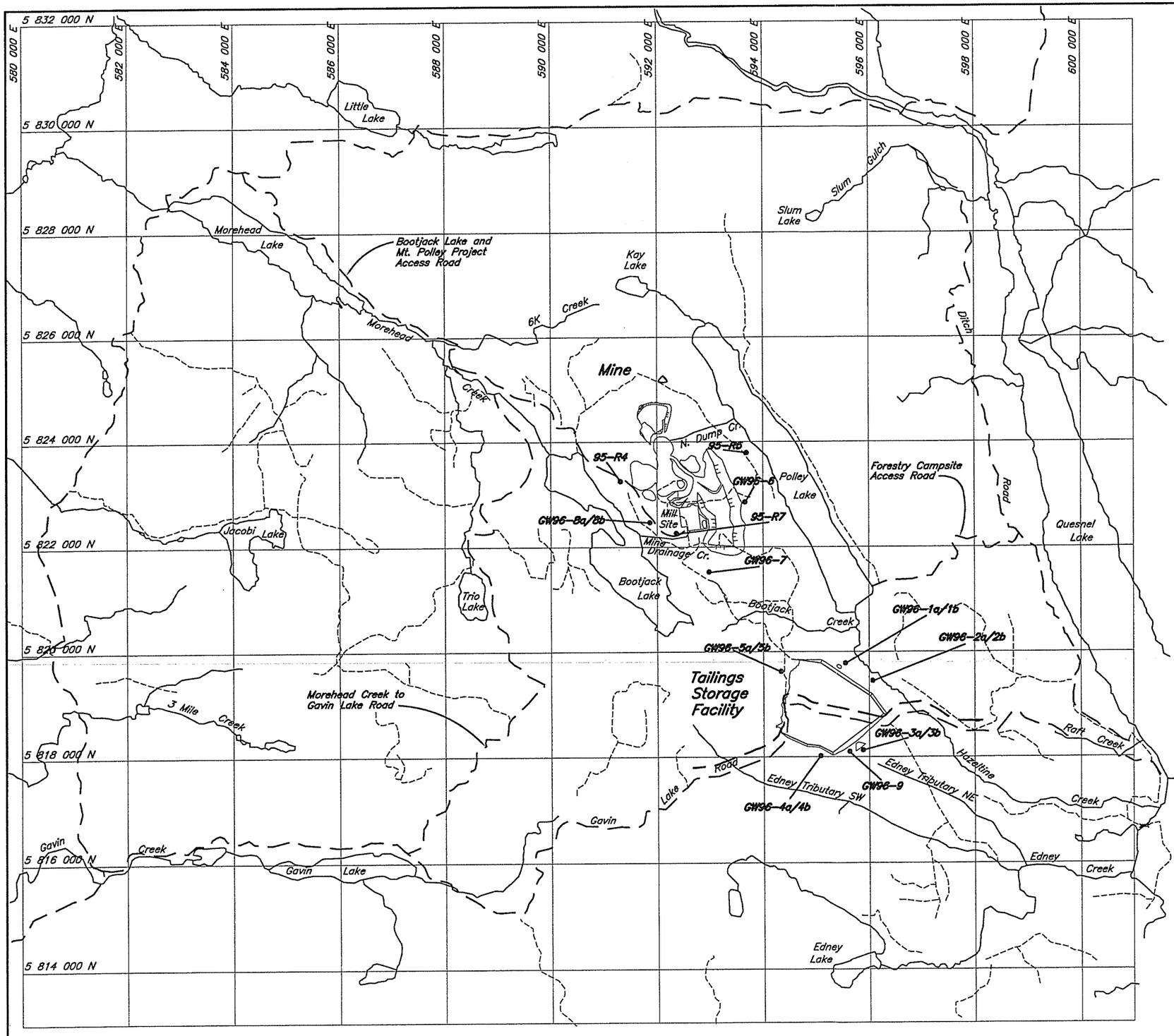
PROJECT / ASSIGNMENT NO	REF NO	REV.
VA101-1/9	1	0

FIGURE 3.1



LEGEND

GW96-6	Groundwater Monitoring Wells
— — —	Main Roads
----------	Logging Roads

Scale 800 0 800 1600 2400 3200 4000 m

REV.	DATE	ISSUED
0	22DEC'04	ISSUED FOR OMS REPORT

IMPERIAL METALS CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
GROUNDWATER MONITORING WELL LOCATIONS

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PROJECT/ASSIGNMENT NO.	REF. NO.	REV.
VA101-1/9	1	0

FIGURE 3.2

VANCOUVER B.C. CAD FILE: H:\1\01\00001\09\A\Acad\fig\JB02.DWG 1=40000 PLOT 1=1(PS) DEC 21 2004 by:CZ Time @ 16:48
XREF FILE : -

APPENDIX A

REFERENCES

REFERENCES

1) Imperial Metals Corp. Mt. Polley Project, Report on Geotechnical Investigations and Design of Open Pit, Waste Dumps and Tailings Storage Facility, February 19, 1990.

2) Imperial Metals Corp. Mt. Polley Project, Stage I Environmental and Socioeconomic Impact Assessment, Response to Comments by the Agencies, January 16,1991

3) Imperial Metals Corp. Mt. Polley Project, Report on 1995 Geotechnical Investigations for Mill Site and Tailings Storage Facility, Ref. No. 1623/1, March 14, 1995.

4) Imperial Metals Corp. Mt. Polley Project, Report on Project Water Management, Ref. No. 1624/1, February 6, 1995.

5) Imperial Metals Corp. Mt. Polley Project, Groundwater Monitoring Program, Ref. No. 1624/2, June 3, 1996.

6) Imperial Metals Corp. Mt. Polley Project, Tailings Storage Facility, Design Report, Ref. No. 1625/1, May 26, 1995.

7) Imperial Metals Corp. Mt. Polley Project, Tailings Storage Facility, Site Inspection Manual, Ref. No. 1625/2, May 26, 1995.

8) Imperial Metals Corp. Mt. Polley Project, Tailings Storage Facility and Ancillary Works, Part 10 - Technical Specifications, Ref. No. 1625/3 DRAFT, May 25, 1996.

9) Imperial Metals Corp. Mt. Polley Project, Manual on Sampling and Handling Guidelines for Determination of Groundwater Quality, Ref. No. 1625/5, May 8, 1997.

10) Imperial Metals Corp. Mt. Polley Project, Response to Review Comments on Tailings Embankment Design, Ref. No. 1625/6, January 25, 1996.

11) Imperial Metals Corp. Mt. Polley Project, Response to Review Comments on Groundwater Monitoring Program, Ref. No. 1625/7, September 12, 1996.

12) Imperial Metals Corp. Mt. Polley Project, Requirements and Specifications for the 1996 Groundwater Monitoring Program, Ref. No. 1625/8, September 12, 1996.

13) Mount Polley Mining Corporation, Mount Polley Project, Tailings Storage Facility, Operation, Maintenance and Surveillance Manual for Stage 1a Embankment (El. 927 m), Ref. No. 1627/1, March 11, 1997.

14) Mount Polley Mining Corporation, Mount Polley Project, Tailings Storage Facility, Updated Design Report, Ref. No. 1627/2, June 6, 1997.

15) Mount Polley Mining Corporation, Mount Polley Project, T.S.F. Operation, Maintenance and Surveillance Manual for Stage Ib Embankment (El. 934 m), Ref. No. 10162/7-3, November 24 1997.

16) Mount Polley Mining Corporation, Mount Polley Project, Tailings Storage Facility and Ancillary Features, May 1, 1997 Site Inspection, Ref. No. 1627/4, June 3 1997.

17) Mount Polley Mining Corporation, Mount Polley Project, Report on Stage Ia/Ib Construction, Ref. No. 10162/7-5, August 14 1997.

18) Imperial Metals Corp. Mt. Polley Project, Report on Geotechnical Investigations and Design of Open Pits and Waste Dumps, Ref. No. 1628/1, July 5, 1996.

19) Imperial Metals Corp. Mt. Polley Project, Specification for Drilling, Monitoring Well Installations and Related Services, Ref. No. 1628/3, September 18, 1996.

20) Mount Polley Mining Corporation, Mount Polley Project, 1996 Groundwater Monitoring Well Installation Program, Ref. No. 1628/4, February 7, 1997.

21) Mount Polley Mining Corporation, Mount Polley Project, Polley Lake Pumping System, Ref. No. 1628/5, February 19, 1997.

22) Mount Polley Mining Corporation, Mount Polley Project, Tender Documents for Stage 2A Tailings Facility Construction, Ref. No. 10162/9-1, November 11 1997.

23) Mount Polley Mining Corporation, Mount Polley Project, Stage 2A Tailings Facility Construction Select Excerpts from Reference Information, Ref. No. 10162/9-2, November 6 1997.

24) Mount Polley Mining Corporation, Mount Polley Project, Report on On-going Construction Requirements, Ref. No. 10162/9-3, December 2 1997.

25) Mount Polley Mining Corporation, Mount Polley Project, Contract Documents for Stage 2A Tailings Facility Construction, Ref. No. 10162/9-4, January 29 1998.

26) Mount Polley Mining Corporation, Mount Polley Project, 1998 Annual Inspection Report, Ref. No. 10162/9-5, June 26 1998.

27) Mount Polley Mining Corporation, Mount Polley Project, Report on 1998 Construction and Annual Inspection, Ref. No. 11162/10-1, June 16 1999.

28) Mount Polley Mining Corporation, Mount Polley Project, Evaluation of Cycloned Tailings Embankment Construction, Ref. No. 11162/11-1, Rev 0, June 16 1999.

29) Mount Polley Mining Corporation, Mount Polley Project, Stage 3 Cycloned Sand Tailings Embankment Project Procedures Manual, Ref. No. 11162/12-1, Rev 0, October 13, 1999.

30) Mount Polley Mining Corporation, Mount Polley Project, Report on Cycloned Sand Construction of Stage 3 and On-going Stages of the T.S.F., Ref. No. 11162/12-2, Rev 0, Volumes I & II, December 13 1999.

31) Mount Polley Mining Corporation, Mount Polley Mine, Project Procedures Manual for Stage 2C and 3 Tailings Storage Facility (Ref. No. 11162/13-1, Rev. 0), March 15, 2000.

32) Mount Polley Mining Corporation, Mount Polley Mine, Contract Documents for Construction of Stage 3 Tailings Storage Facility (Ref. No. 11162/13-2, Rev. 2), June 8, 2000.

33) Mount Polley Mining Corporation, Mount Polley Mine, Operation, Maintenance and Surveillance Manual for Stage 3 (El. 944) Embankment (Ref. No. 11162/13-3, Rev. A) DRAFT, August 17, 2000.

34) Mount Polley Mining Corporation, Mount Polley Mine, Addendum To Report On Cycloned Sand Construction Of Stage 3 And On-Going Stages Of The Tailings Storage Facility, Ref. No. 11162/13-4, Rev. 0), May 11, 2000.

35) Mount Polley Mining Corporation, Mount Polley Mine, Report on 1999 Construction (Ref. No. 11162/13-5, Rev. 0), August 30, 2000

36) Mount Polley Mining Corporation, Mount Polley Mine, Stage 3 Tailings Storage Facility - Selected Excerpts from Reference Information (Ref. No. 11162/13-6, Rev. 0), April 20, 2000.

37) Mount Polley Mining Corporation, Mount Polley Mine, Site Inspection Manual for Stage 3 Construction of Main and South Embankments (Ref. No. 11162/13-7, Rev. 0), June 23, 2001.

38) Mount Polley Mining Corporation, Mount Polley Mine, TSF Rock Borrow Bench Stability Assessment (Ref. No. 11162/13-8, Rev. A), August 18, 2000.

39) Mount Polley Mining Corporation, Mount Polley Mine, Report on 1999 Annual Inspection (Ref. No. 11162/13-9, Rev. 0), October 16, 2000.

40) Mount Polley Mining Corporation, Mount Polley Mine, Tender Documents for Construction of Stage 3b Tailings Storage Facility (Ref. No. 11162/14-1, Rev. A), June 27, 2001.

41) Mount Polley Mining Corporation, Mount Polley Mine, Report on 2000 and 2001 Annual Inspection (Ref. No. 11162/14-2, Rev. 0), October 3, 2001.

42) Mount Polley Mining Corporation, Mount Polley Mine, Report on Stage 3 Construction (Ref. No. 11162/14-3, Rev. 0), October 19, 2001.

43) Mount Polley Mining Corporation, Mount Polley Mine, Stage 3b Tailings Storage Facility Selected Excerpts from Reference Information (Ref. No. 11162/14-4), July 3, 2001.

44) Mount Polley Mining Corporation, Mount Polley Mine, Report on Feasibility Design of Leach Pad and Ponds (Ref. No. VA101-00001/2-1, Rev. 0), September 13, 2004.

45) Mount Polley Mining Corporation, Mount Polley Mine, Tailings Storage Facility Report on 2002 Annual Inspection (Ref. No. VA101-00001/3-1), May 5, 2003.

APPENDIX B

TAILINGS STORAGE FACILITY – INSPECTION LOG

TABLE B-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
INSPECTION LOG

Printed on: Dec-21-04
M:\1\01\00001\09\A\Data\OMS Tables\[TabB-1 Inspection Log_r0.xls]Sheet1 Revised on: Dec 20, 2004

INSPECTOR:	
DATE:	
WEATHER CONDTION:	

General Notes to Inspectors

- Take photographs of the tailings storage facility, pipeworks and associated structures **regularly** (and of all unusual observations and events) for use as a photographic record of the storage facility.

- Forward all applicable data and reports to the Design Engineer **as per the inspection schedule outlined in Table 3.1 of the OMS Manual**

Tailings Pond	
Daily Inspection	
Tailings throughput	
Location of Tailings deposition and approx. length of exposed beach	
Condition of Tailings Beach (e.g. flat, sinkholes? Eroded?)	
Weekly Inspection: Next Inspection on	
Pond Water Level	
Freeboard distance between Crest and Pond	
Semi-Annually: Next Inspection on	
Complete tailings and pond survey to check volumes stored (before spring freshet and winter)	
Additional Notes	

Tailings Embankment	
Weekly Inspection: Next Inspection on	
Estimate flow rates into monitoring sumps & note clarity	
Embankment Condition (e.g. cracks, bulging at toe, etc.)	
Condition of downstream embankments (note erosion, damage, evidence of instability)	
Additional Notes	

Tailings Discharge Pipeline	
Daily Inspection	
Tailings pipeline pressure gauge readings	
Check for wear on pipeline (location & degree of damage)	
Check for pipeline leakage or evidence of leakage (location & degree of leakage)	
T2 Dropbox Water level	
Check for presence of tailings in T2 Dropbox	
Inspect for blockage in all pipelines entering Dropbox	
Additional Notes	

TABLE B-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
INSPECTION LOG

Printed on: Dec-21-04
M:\1\01\00001\09\A\Data\OMS Tables\[TabB-1 Inspection Log_r0.xls]Sheet1 Revised on: Dec 20, 2004

Reclaim Pipeline	
Daily Inspection	
Daily flow rate in reclaim pipeline	
Total daily volume pumped in reclaim pipeline.	
Reclaim pipeline pressure gauge readings at pump and discharge manifold	
Check for wear on pipeline (location & degree of damage)	
Check for pipeline leakage or evidence of leakage (location & degree of leakage)	
Inspect for blockage in all pipelines entering the Booster sump	
Check reclaim barge and note condition of pumps, de-icing equipment, mooring, lighting and walkway	
Weekly Inspection: Next Inspection on	
Barge Elevation	
Inspect ball joint connection (is the water elevation near the joint? Does the pad need to be raised?)	
Additional Notes	

Sediment Ponds	
Daily Inspection	
Check for blockage in manhole pipelines	
Weekly Inspection: Next Inspection on	
Water Level in Mill Site Sump	
Water Level in Southeast Sediment Pond	
Estimate flow exiting through Mill Site Sump manhole	
Estimate flow exiting through SE Sed. Pond manhole	
Condition of pond embankments (note erosion, damage, evidence of instability)	
Check drainage ditches for obstructions (note damaged areas and erosion)	
Additional Notes	

TABLE B-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
INSPECTION LOG

Printed on: Dec-21-04
M:\1\01\00001\09\A\Data\OMS Tables\[TabB-1 Inspection Log_r0.xls]Sheet1 Revised on: Dec 20, 2004

Seepage Collection Ponds	
Weekly Inspection: Next Inspection on	
Water Level in Main and Perimeter collection pond	
Average pumpback flow rate from each recycle pump	
Check for blockage in pipelines leading in and out of ponds	
Check that seepage return pumps are operating.	
Condition of pond embankments (note erosion, damage, evidence of instability)	
Downstream of Embankment (note erosion, seepage, piping, etc.)	
Additional Notes	
Instrumentation	
Monthly Inspection: Next Inspection on	
Collect piezometer readings and barometric pressure. (**Weekly** during Construction Program)	
Check for displacements in inclinometer boreholes using 'poor boy' slope inclinometer (**Twice-Monthly** during Construction on Main Embankment)	
Quarterly Inspection: Next Inspection on	
Check condition of survey and surface movement monuments (Clear of vegetation and debris)	
Measure embankment displacements with surface movement monuments	
Annual Inspection: Next Inspection on	
Check displacements in inclinometer boreholes using probe	
Measure groundwater levels in monitoring wells. Forward information to Environmental Superintendent	
Take water samples from groundwater wells as directed by Environmental Superintendent	
Additional Notes	

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APPENDIX C

TAILINGS STORAGE FACILITY – INSTRUMENTATION DATA SHEETS

TABLE C-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
PIEZOMETER DATA SHEET

Printed on: Dec-21-04

M:\1\01\00001\09\A\Data\OMS Tables\[TabC-1 Piezo Log_r0.xls]Sheet1 Revised on: Dec 6, 2004

INSPECTOR:	
DATE:	
WEATHER CONDTION:	

Piezometer ID	Barometric Pressure (inches Hg)	Frequency Reading (Lu)	Temperature (^{o}C)

Piezometer ID	Barometric Pressure (inches Hg)	Frequency Reading (Lu)	Temperature (°C)

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TABLE C-2

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
SLOPE INCLINOMETER DATA SHEET

Printed on: Dec-21-04

M:\1\01\00001\09\A\Data\OMS Tables\[TabC-2 Slope Inclinometer_r0.xls]Sheet1 Revised on: Dec 6, 2004

INSPECTOR:						
DATE:						
WEATHER CONDTION:						
Depth	A0	A180	B0	B180	A Deviation	B Deviation

Depth	A0	A180	B0	B180	A Deviation	B Deviation

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TABLE C-3

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
SURVEY DATA SHEET

Printed on: Dec-21-04
Revised on: Dec 6, 2004

M:\1\01\00001\09\A\Data\OMS Tables\[TabC-3 Survey_r0.xls]Sheet1

Monitoring and Survey Data						Displacements Between Readings (m)					Total Displacements (m)				
Monument	Date	Comments	N_n	E_n	El_n	DN	DE	DEl	D_{xy}	D_{xyz}	DN	DE	DEl	$D_{xy\text{-}total}$	$D_{xyz\text{-}total}$

Notes:
1. Calculate displacements as follows:
2. NM- Not Measured

Total Displacements from initial survey

$DN = N_n - N_o$

$DE = E_n - E_o$

$DEl = El_n - El_o$

$D_{xy\text{-}total} = (DN^2 + DE^2)^{1/2}$

$D_{xyz\text{-}total} = (DN^2 + DE^2 + DEl^2)^{1/2}$

Displacements between readings

$DN = N_{(n+1)} - N_n$

$DE = E_{(n+1)} - E_n$

$DEl = El_{(n+1)} - El_n$

$D_{xy} = (DN^2 + DE^2)^{1/2}$

$D_{xyz} = (DN^2 + DE^2 + DEl^2)^{1/2}$

Comments on calculations

1. Coordinate system is (Easting, Northing, Elevation) = f(x,y,z).

2. Coordinate system is as shown on Drawings.

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APPENDIX D

TSF STAGE 3 AS-BUILT DRAWINGS

TSF STAGE 3 AS-BUILT DRAWINGS WILL BE INCLUDED AFTER CONCLUSION OF THE STAGE 3C CONSTRUCTION PROGRAM

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APPENDIX E

SELECTED PHOTOS OF TSF COMPONENTS

PHOTO # 1 – M1 Dump Valve

PHOTO # 2 – Tailings Beach

PHOTO # 3 – Tailings and Reclaimed Water Pipelines (View 1)

PHOTO # 4 – Tailings and Reclaimed Water Pipelines (View 2)

PHOTO # 5 – Reclaim Booster Pumpstation and T2 Dropbox

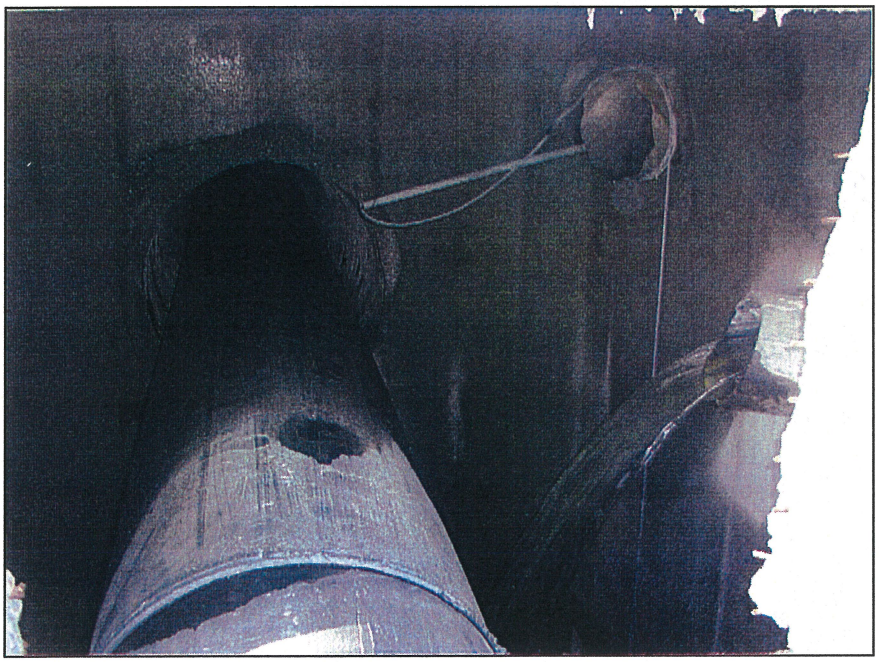

PHOTO # 6 – T2 Dropbox (Inside)

PHOTO # 7 – Water Reclaim Barge

PHOTO # 8 – Tailings Discharge from M1 Dump Valve

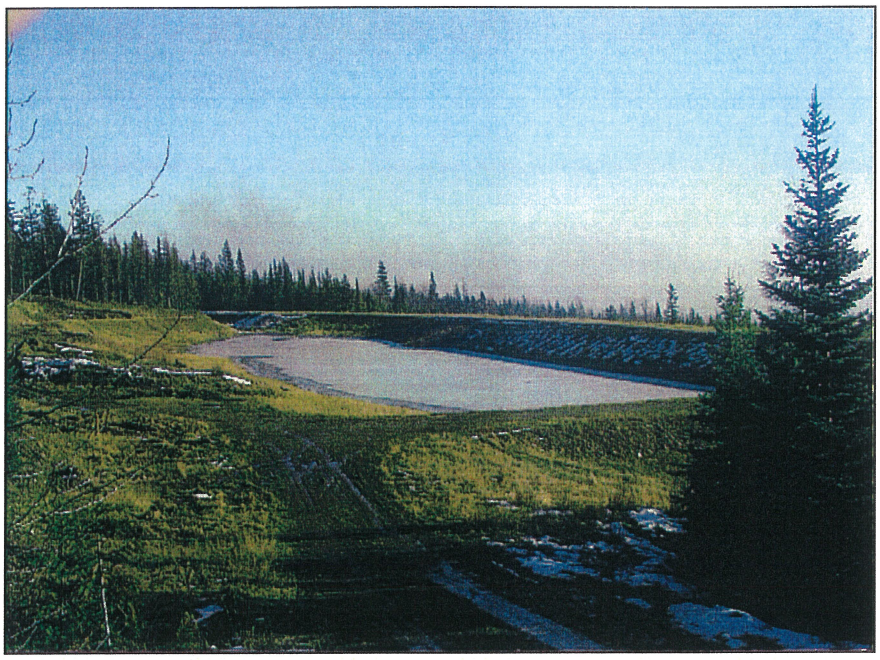

PHOTO # 9 – SE Sediment Pond

PHOTO # 10 – SE Sediment Pond showing Outlet Pipes

PHOTO # 11 – Main Embankment Seepage Collection Pond

PHOTO # 12 – Perimeter Embankment Seepage Collection Pond

PHOTO # 13 – Mill Site Sump

PHOTO # 14 – SINCO Terminal Panel for Piezometers