MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
TAILINGS STORAGE FACILITY

OPERATION, MAINTENANCE AND SURVEILLANCE MANUAL

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OPERATION, MAINTENANCE AND SURVEILLANCE MANUAL

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 (March 2010) 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, Mines and Petroleum Resources (MEMPR); Ministry of Environment (MOE), 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 Tailings Project Coordinator, 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 in the Tailings Project Coordinator's office,
- One (1) copy for the Operating Crew (Mill Shifter's Office),
- 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 MEMPR Geotechnical Manager,
- One (1) copy for the Design Engineer of Record,
- One (1) copy for the General Manager,
- One (1) copy for the Mill Superintendent,
- One (1) copy for the Mill Maintenance Superintendent.

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.

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, Mines and Petroleum Resources.

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 Tailings Projects Coordinator.

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 tailings and supernatant for mill process. 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 tailings material 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 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 Polley Lake haul road south of the Wight Pit.
- Along the SE Zone dump road, which in turn ties into the Polley Lake haul road.
- Along the Gavin Lake Forest Service Road, which can be accessed from the 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 on 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 20,000 tonnes per day (approx. 7.3 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 FEATURES

Tailings slurry is conveyed from the Concentrator to the TSF via a tailings discharge pipeline. The tailings are deposited into the impoundment through moveable end discharge pipeline on the embankment crest. Some Tailings are used to construct sand cells. 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.

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.

Staged tailings deposition strategy is currently being implemented by MPMC, and one of the objectives of this plan is to ensure that tailings solids are deposited along the extent of all tailings embankments. The fundamental requirement of the tailings deposition plan is to ensure that a blanket of tailings solids is present immediately upstream of all embankments and along the abutments. Thus, there is a fundamental objective to establish beaches adjacent to the embankments, but it is not necessary to continuously maintain a minimum width of exposed beach adjacent to the embankment, and periodic temporary (less than 2 months duration) shallow flooding (less than 0.5 meters depth) of the beaches is anticipated.

Tailings deposited into sand cells and worked by a dozer along the upstream Zone U of the tailings embankment is also considered to be 'tailings beach' for this evaluation. One of the objectives of the tailings deposition plan currently being implemented by MPMC is to allow for sufficient flexibility to enable these sand cells to be constructed. It is recognized that this deposition strategy may result in short term flooding of the sandy tailings beaches elsewhere within the impoundment, but that the depth of flooding along the submerged tailings beaches must be no greater than 0.5 m depth before tailings deposition is re-instated over that section of flooded beach.

MPMC increases the frequency of measurements to at least once per week for embankment instrumentation systems (piezometer readings, foundation drain flow rate and turbidity) adjacent to embankment areas where tailings beaches are temporarily flooded.

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 marshland 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 Maintenance Superintendent is responsible for ensuring that surveillance is carried out regularly.

The Mill Maintenance 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 Tailings Project Coordinator will conduct a Dam Surveillance walkover at least once per quarter. All Dam Surveillance reports should be reviewed by the Mill Maintenance Superintendent and filed at the Mount Polley Mine Site.
Additional (non-routine), documented drive by's of the TSF and associated facilities will be required following extreme or unusual events, The Environmental 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 to 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 changed once the mill started up again in February 2005. The mine is 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 and Perimeter embankments 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 610 mm diameter DR 11 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.
- The T2 Drop box; (not in use)
- Moveable discharge section;
- A Dump Valve at the start of the Perimeter Embankment & start of the South Embankment;
- Sand cell skids with valve assemblies on the Perimeter & South Embankments;
- "Y" valve assembly at 5 corners;
- Pressure sensor device near the booster station.

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 flat to 8.0% that 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.

The deposition of tailings over the beach in the TSF is accomplished by end dumping. A dump valve is located at the start of the Perimeter and South Embankments to allow discharge of tailings during relocation of the discharge section. A "Y" valve assembly at 5 corners allows for the distribution to the Perimeter/Main or to the South/Main embankments.

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; (refer to Appendix F)
- Ensure that there is an open pathway for tailings to exit before the pipeline is filled.

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 external excessive wear or damage of the pipeline;
- Evidence indicating leakage from the pipeline;
- Ensure a constant grade of all pipelines leading onto the embankments, maintaining a proper flow, to prevent sanding up or freezing of the lines.;
- 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.

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; C/W Spargers
- 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; (filed with maintenance department)
- Evidence indicating leakage from the pipeline;
- Monitor TSF Pond and Barge elevations to ensure that a gradient is maintained in the steel pipe. The barge ramp may need to be relocated higher or a new channel excavated for the re location of the barge;
- 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 East 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 8" (Perimeter) and 8" (Main) 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, by the surface crew, 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 are as follows:

- Water levels in both collection ponds;
- Pump back 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 constructed with various instrumentation to assist in monitoring the facility. The various components are as follows:

- Vibrating Wire Piezometers;
- Slope Inclinometers;
- Groundwater Monitoring Wells.

The locations of the piezometers and slope inclinometers are 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

Four slope inclinometers are currently 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 (to be installed) will be 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 or designate 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 General Manager and the Ministry of Energy, Mines and Petroleum Resources 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 General Manager 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 2011.

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, Mines and Petroleum Resources for review. Similar to the annual inspection report, an action plan should be prepared by the Environmental Superintendent to address the DSR recommendations. A copy of each report will be sent to the Ministry of Energy, Mines and Petroleum Resources 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, Mines and Petroleum Resources 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, Mines and Petroleum Resources within thirty (30) days (five days for upsets and bypasses), unless requested earlier by the Ministry of Energy, Mines and Petroleum Resources. 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.

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, haul trucks 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 Environmental 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, Mines and Petroleum Resources.

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 General Manager and initiate corrective actions and intensified monitoring.

- The General Manager 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 General Manager and initiate corrective actions and/or intensified monitoring, as appropriate.
- The General Manager shall notify MPMC Corporate office, 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 General Manager shall also notify the Ministry of Energy, Mines and Petroleum Resources.

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

SECTION 6.0 - CERTIFICATION

This report was prepared and approved by the undersigned.

Prepared by:

Ron Martel
Environmental Superintendent

Luke Moger
Project Coordinator

Approved by:

Tim Fisch
General Manager

TABLE 1.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
PERSONNEL AND RESPONSIBILITIES LIST

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\\Mountpolleystor\mountpolley\Enviromental\Mount Polley\Ministry Communications\MEM\2010\OSM\[Table 1.1 Personnel_r0.xls]Sheet1 Revised on: Dec 31, 2010

Title	Name	Contact Information		Responsibilities
General Manager	Tim Fisch	Home:	Cell:	Responsible for overall activities of the TSF.
		Office: 250 790 2215	Pager:	
		E-mail: tfisch@mountpolley.com		
Tailings Project Coordinator	Luke Moger	Home:	Cell:	Planning of tailings construction activities.
		Office: 250 790 2215	Pager:	
		E-mail: msilbernagel@mountpolley.com		
Mill Maintenance Superintendent	Darcy Hannas	Home:	Cell:	Responsible for day to day maintenance of TSF and barge moves
		Office: 250 790 2215 ex 102	Pager:	
		E-mail: djackson@mountpolley.com		
Mine Operations Manager	Art Frye	Home:	Cell:	Daily management of the contruction activities, equipment, and related components. Directs the opearting crew in carrying out rountine activities.
		Office: 250 790 2215	Pager:	
		E-mail: afrye@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, Mines and Petroleum Resources	Ramy Kamel		Cell:	
		Office:		
	ramy.kamel@gov.bc.ca	E-mail:		

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TABLE 2.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY PROJECT

DESIGN BASIS AND OPERATING CRITERIA – ULTIMATE TSF CAPACITY

ITEM	DESIGN CRITERIA
1.0 GENERAL DESIGN CRITERIA	
Regulations	MEMPR , MOE
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%.
Embankment Foundation Drains	• Installed in Main, Perimeter and South Embankments • 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.

TABLE 2.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY PROJECT

DESIGN BASIS AND OPERATING CRITERIA – ULTIMATE TSF CAPACITY

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		5 m min. for Stage 6a
Embankment Height (Max.):	Current	954.6 m (Crest El. m)
	Final	58 m (Crest El. 970 m)
Embankment Crest Length:	Current	4000 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.
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” DR11 and 24” DR15.5.
Spigots		• Movable discharge section placed on tailings embankment crest.(not used)

TABLE 2.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY PROJECT

DESIGN BASIS AND OPERATING CRITERIA – ULTIMATE TSF CAPACITY

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 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	

TABLE 2.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY PROJECT

DESIGN BASIS AND OPERATING CRITERIA – ULTIMATE TSF CAPACITY

Design Storm	
Sump Cross-Section	
Normal Operating Level	
Maximum Operating Level	
Flow Control Structures	
Discharge Pipe	
Flow Monitoring	
5.4 Polley Lake Pump Station	See Report 1628/5. (not in use)
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 March 31, 2010.
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. • 3 instrumentation planes for Perimeter Embankment (D,G.H), 4 for the Perimeter Embankment (A,B,C,E) and 2 for the South Embankment (I,F).
Survey Monuments	• Deformation and settlement monitoring of embankments.
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.

TABLE 2.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY PROJECT

DESIGN BASIS AND OPERATING CRITERIA – ULTIMATE TSF CAPACITY

	• 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.

TABLE 3.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
INSPECTION AND SURVEILLANCE SCHEDULE

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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. •	• 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. • Determine the volume of the supernatant ponds**-annually** 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 monthly. 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**.
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 discharge points upstream • Ensure that there is always an open path for the tailings to exit during operations and sand cell 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 and containment ditches **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.

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TABLE 3.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

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\\Mountpolleystor\mountpolley\Enviromental\Mount Polley\Ministry Communications\MEM\2010\OSM\Table 3.1 Inspection and Surveillance Schedule_r0.doc Revised on: Dec 31, 2010

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 meter 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 pump station 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 or re located to a new excavated channel. • Conduct detailed inspections of the reclaim pipeline during **mill maintenance periods**.

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TABLE 3.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
INSPECTION AND SURVEILLANCE SCHEDULE

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COMPONENT	DESCRIPTION	OPERATIONS	INSPECTION AND SURVEILLANCE
Sediment Ponds	Consists of the Mill Site Sump.	• 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. •
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 lay flat & pipelines on embankments **daily** for wear & leaks. • 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. • Inspect pipeline systems for proper gradient to drainage valve, before freeze up**, annually**. • Inspect & maintain pumps twice a year. Once before winter & once before spring. • Forward a report on the status of the collection ponds to the Design Engineer **annually** and include all measured water levels and pumpback data. •

TABLE 3.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
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\\Mountpolleystor\mountpolley\Enviromental\Mount Polley\Ministry Communications\MEM\2010\OSM\Table 3.1 Inspection and Surveillance Schedule_r0.doc Revised on: Dec 31, 2010

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.

TABLE 3.2

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

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

Printed on: Mar-30-10

\\Mountpolleystor\mountpolley\Enviromental\Mount Polley\Ministry Communications\MEM\2010\OSM\Table 3.2 Unusual Events_r0.doc Revised on: July 01, 2008

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

TABLE 3.2

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

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

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.

TABLE 3.2

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

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

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 temperatures. • 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 judgment, 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:17-Mar-2008

M:\1\01\00001\22\A\Data\Rev'd OMS tables\[Table 3.3_r1.xls]Table 3.3_R1 Revised:14-Mar-2008

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	**Not Functioning**		
A0-PE2-01	43675	928.0	Tailings			
A0-PE2-02	43657	927.9	Tailings			
A0-PE2-03	VW5357	944.2	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			
A1-PE1-05	VW5357	947.9	Chimney Drain	2955	2.0	949.9
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	**Not Functioning**		
A2-PE2-02	64103	909.8	Foundation, depth approx. 2.9 m	**Not Functioning**		
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.	**Not Functioning**		
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
A2-PE2-09	VW5355	947.8	Zone U - Sand			
A2-PE2-10	VW5351	948.0	Glacial Till Fill			
B0-PE1-01	69692	939.1	Cycloned Tailings			
B0-PE2-01	43674	927.3	Tailings			
B0-PE2-02	43676	927.2	Tailings			
B0-PE2-03	VW5366	944.2	Tailings			
B1-PE1-01	64107	917.3	Foundation Drain	**Not Functioning**		
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
B1-PE1-04	VW5362	948.2	Chimney Drain	2969	2.0	950.2
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	**Not Functioning**		
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	**Not Functioning**		
B2-PE2-04	64108	921.0	Glacial Till Fill			
B2-PE2-05	64113	921.7	Glacial Till Fill	**Not Functioning**		
B2-PE2-06	43652	914.6	Foundation, depth approx. 2.3 m	**Not Functioning**		
B2-PE2-07	VW5345	948.3	Zone U - Sand			

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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:17-Mar-2008

M:\1\01\00001\22\A\Data\Rev'd OMS tables\[Table 3.3_r1.xls]Table 3.3_R1 Revised:14-Mar-2008

0.3 Identification Number	Serial Number	Tip El. (m)	Zone Monitored	Trigger Level		
				Frequency (Hz)	Pressure (m H2O)	Elevation (m)
B2-PE2-08	VW5358	948.5	Glacial Till Fill			
C0-PE1-01	69694	938.3	Cycloned Tailings	**Not Functioning**		
C0-PE2-01	43673	927.8	Tailings	**Not Functioning**		
C0-PE2-02	43658	927.5	Tailings	**Not Functioning**		
C0-PE2-03	VW5370	945.0	Tailings			
C1-PE1-01	64111	914.7	Foundation Drain	**Not Functioning**		
C1-PE1-02	64115	916.6	Chimney Drain	**Not Functioning**		
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	Foundation	**Not Functioning**		
C2-PE1-03	69698	912.6	Till Foundation, depth 1.5 m	2979	7.5	920.1
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			
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	**Not Functioning**		
C2-PE2-08	43656	914.0	Foundation, depth approx. 2.0 m	3000	8.0	922.0
C2-PE2-09	VW5360	947.7	Zone U - Sand			
C2-PE2-10	VW5364	947.8	Glacial Till Fill			
D0-PE2-01	VW5365	946.9	Tailings			
D1-PE1-02	66520	928.8	Outlet Drain			
D1-PE1-03	50679	934.0	Chimney Drain	**Not Functioning**		
D1-PE1-04	VW5356	948.2	Chimney Drain	2865	2.0	950.2
D2-PE1-01	67193	930.4	Zone T	**Not Functioning**		
D2-PE2-01	64096	931.0	Glacial Till Fill	**Not Functioning**		
D2-PE2-02	67192	927.3	Foundation, depth approx. 3.6 m	3030	9.9	937.2
D2-PE2-03	VW5346	948.6	Zone U - Sand			
D2-PE2-04	VW5343	948.3	Glacial Till Fill			
E0-PE2-01	VW5367	944.6	Tailings			
E1-PE1-01	VW5359	947.9	Chimney Drain	2960	2.0	949.9
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
E2-PE2-03	VW5361	947.6	Zone U - Sand			
E2-PE2-04	VW5363	948.3	Glacial Till Fill			
F2-PE2-01	53765	938.5	Foundation, depth 1.3 m	**Not Functioning**		
F2-PE2-02	VW5347	948.1	Glacial Till Fill			
F2-PE2-03	VW5342	940.0	Foundation, depth approx 0.5 m	2794	6.5	946.5
G0-PE2-01	VW5371	946.9	Tailings			

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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:17-Mar-2008

M:\1\01\00001\22\A\Data\Rev'd OMS tables\[Table 3.3_r1.xls]Table 3.3_R1 Revised:14-Mar-2008

0.3 Identification Number	Serial Number	Tip El. (m)	Zone Monitored	Trigger Level		
				Frequency (Hz)	Pressure (m H2O)	Elevation (m)
G1-PE1-01	50678	934.0	Chimney Drain	**Not Functioning**		
G2-PE2-01	VW5352	947.9	Zone U - Sand			
G2-PE2-02	VW5354	948.1	Glacial Till Fill			
H0-PE2-01	VW5369	947.0	Tailings			
H1-PE1-01	50681	934.0	Chimney Drain	**Not Functioning**		
H2-PE2-01	VW5353	948.1	Zone U - Sand			
H2-PE2-02	VW5350	948.5	Glacial Till Fill			
I2-PE2-02	VW5348	948.1	Glacial Till Fill			
I2-PE2-03	VW5341	944.7	Foundation , dpeth approx. 0.5 m	2765	6.5	951.2

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.
5. The required action to be taken by MPMC in the event of rising piezometer readings is to change the reading frequency to daily. The Design Engineer should be contacted if the piezometer readings continue to rise over a period of a few days or the trigger levels are reached in the foundation or drain piezometers.

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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:17-Mar-2008

M:\1\01\00001\22\A\Data\Rev'd OMS tables\[Table 3.4_r1.xls]Table 3.4_r1 Revised:10-Mar-2008

Inclinometer Identification Number	Ground El. (m)	Depth (m)	Zone Monitored	Horizontal Displacement Trigger Level
SI01-01	915.7	24.4	Foundation	**DAMAGED**
SI01-02	917.3	30.3	Foundation	25 mm
SI06-01	917.0	43.0	Foundation	25 mm
SI06-02	917.0	32.0	Foundation	25 mm
SI06-03	918.0	41.0	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.
2. The required action to be taken by MPMC in the event of an increased horizontal displacement is to change the reading frequency to daily. The Design Engineer should be contacted if the horizontal displacement continues to rise over a period of a few days or if the trigger level is reached.

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TABLE 3.5

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
TAILINGS STORAGE FACILITY

TRIGGER LEVELS FOR SURVEY MONUMENTS

Printed: 30-Mar-2010

\\Mountpolleystor\mountpolley\Enviromental\Mount Polley\Ministry Communications\MEM\2010\OSM\[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.			

Rev 0 - Issued for OMS Manual

TABLE 5.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
EMERGENCY WARNING LEVELS AND REQUIRED ACTIONS

Printed on: Mar-30-10
\\Mountpolleystor\mountpolley\Enviromental\Mount Polley\Ministry Communications\MEM\2010\OSM\Table 5.1 Emergency levels_r0.doc Revised on: July 01, 2008

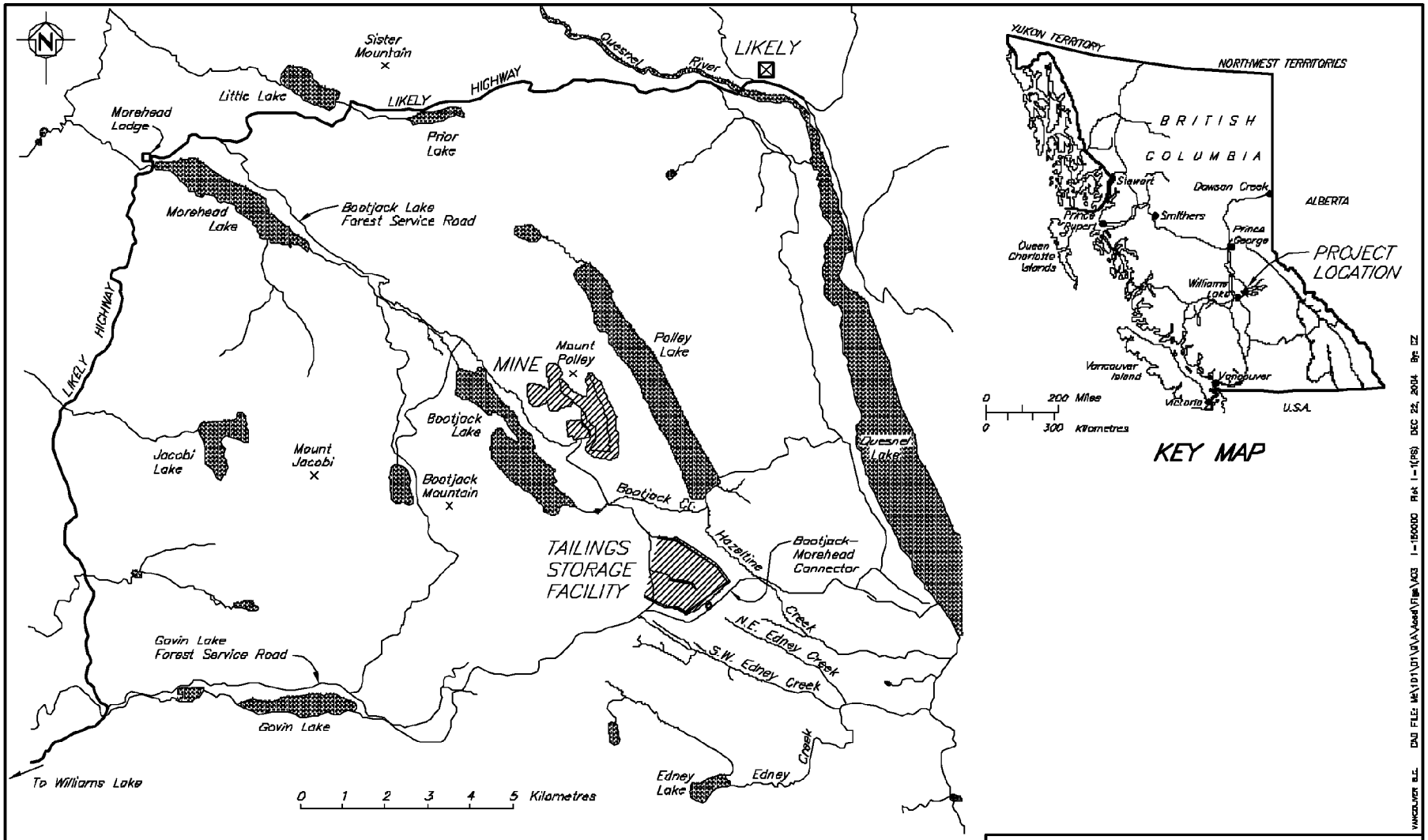
WARNING LEVEL	EMERGENCY CONDITION	REQUIRED ACTIONS
1	Water Levels in the TSF, sediment pond and/or seepage collection pond rising but still under normal operating level.	• Monitor water levels daily.
	Minor surface erosion on embankment crest/slopes and/or pond slopes.	• Repair as necessary. • Determine 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.

TABLE 5.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
EMERGENCY WARNING LEVELS AND REQUIRED ACTIONS

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.



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

VANCOUVER B.C. DWG FILE: MET101\01\VA\Acad\Figs\A03 1:150000 Plot 1:1(PS) DEC 22, 2004 By: IZ

IMPERIAL METALS CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
PROJECT LOCATION PLAN

Knight Piésold CONSULTING

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

FIGURE 2.1

TSF 2008 Bathymetric Survey

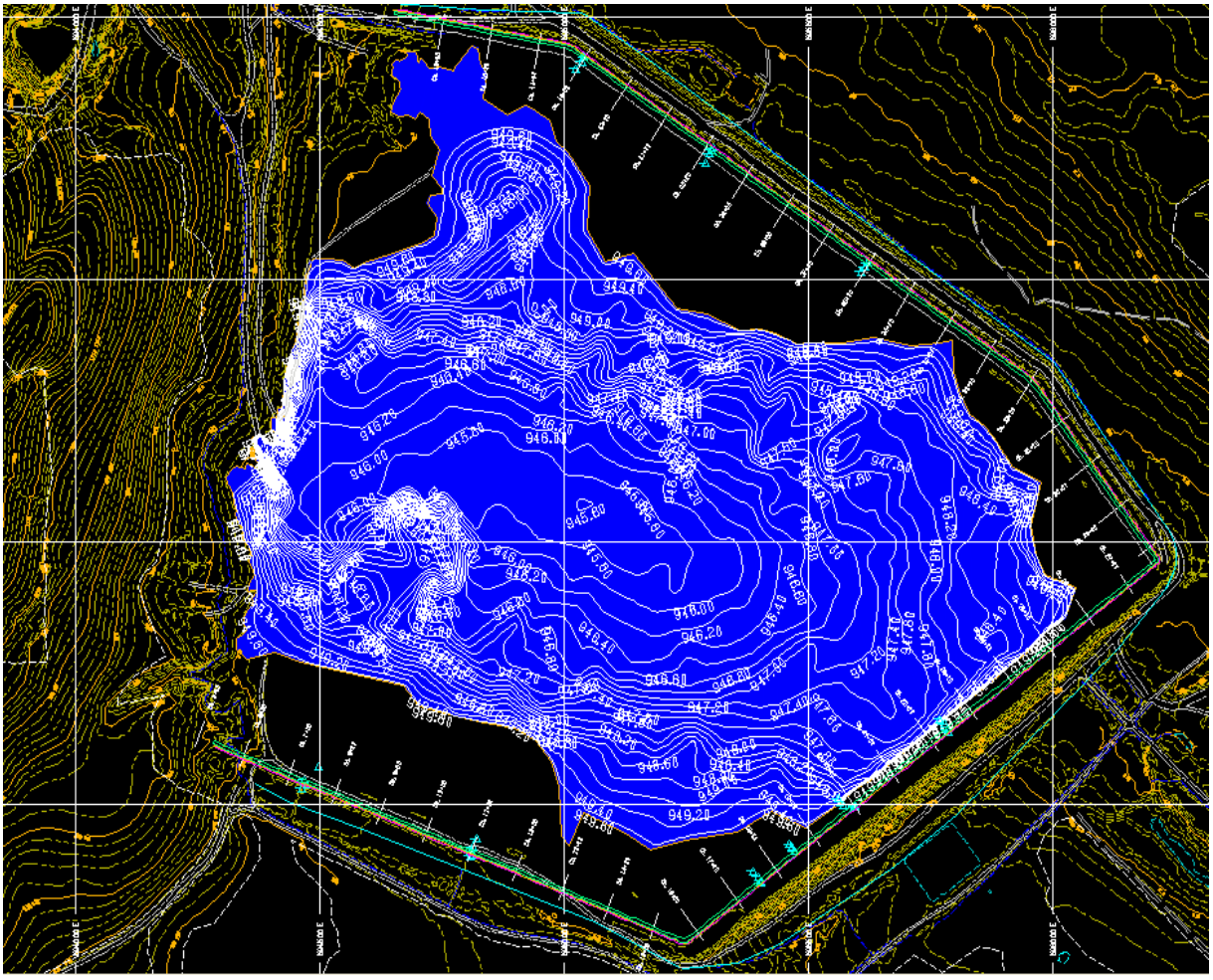
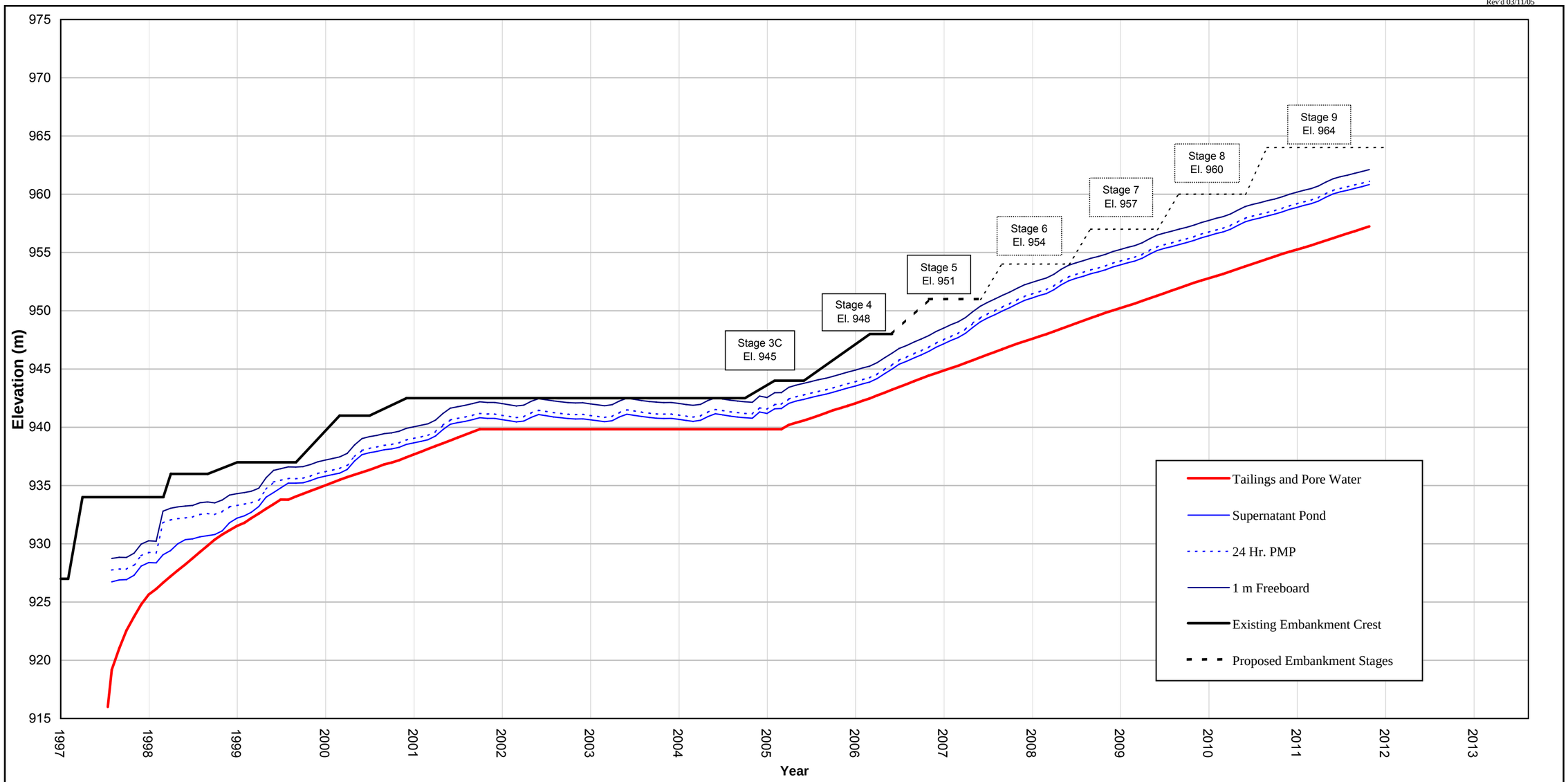


Fig 2.2 Rev 0

M:\1\01\00001\12\A\Data\Filling Curves\951.xls Revised filling schedule

Printed 02/16/2006
Rev'd 03/11/05



Notes:

1. Production rate is estimated 20,000 tpd.
2. Projected bulk tailings dry density is 1.36 t/m3 for tailings reporting to the TSF after August 2000.
3. The filling schedule will be updated as required to reflect actual mine throughput and the supernatant pond volume.

Rev 0 - Issued for Report

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
FILLING SCHEDULE

PROJECT NO.	REF. NO.	REV.
VA 101-1/9	1	0

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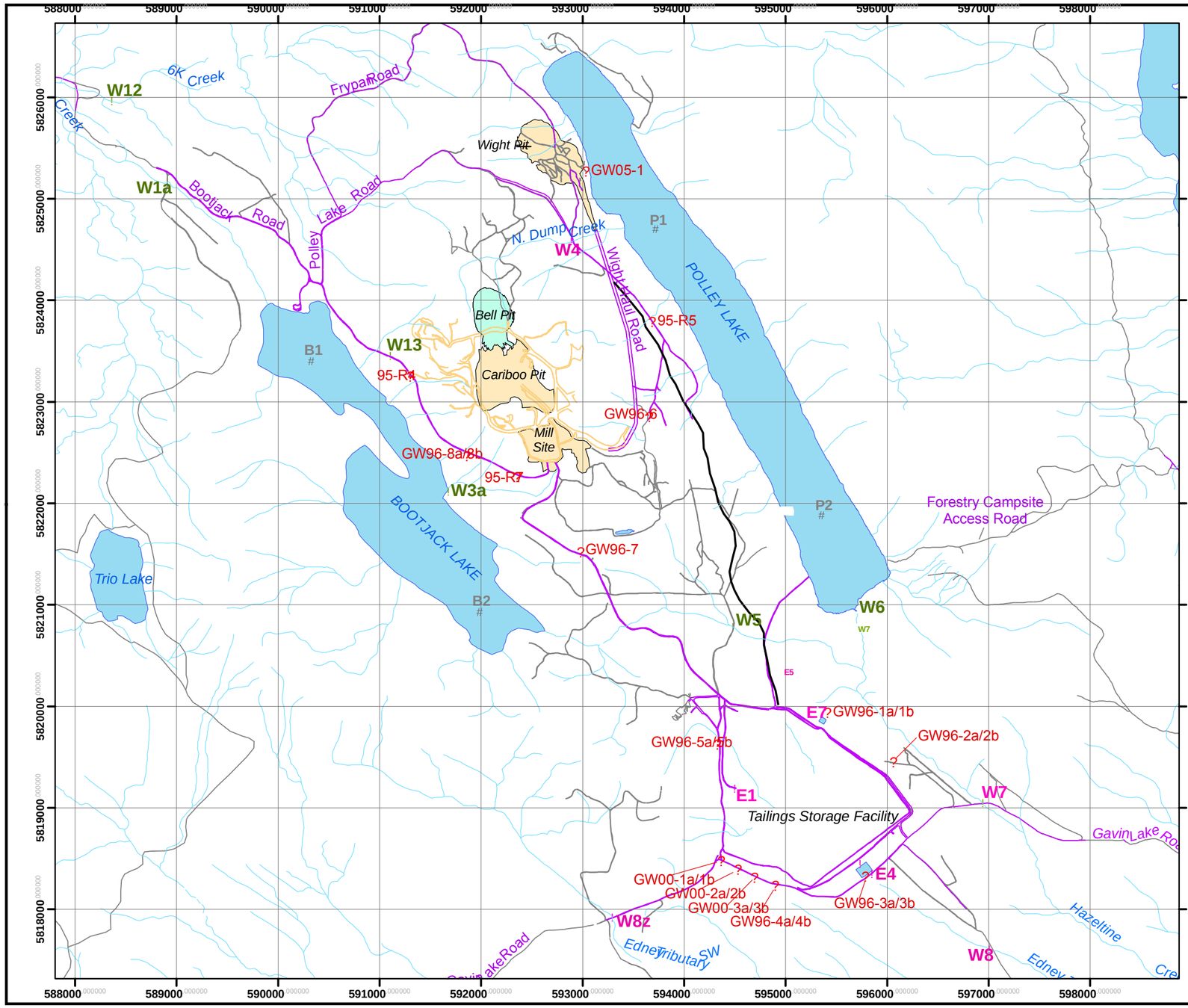
FIGURE 3.1

MOUNT POLLEY MINING CORPORATION
SITE PLAN 2008

3



LEGEND

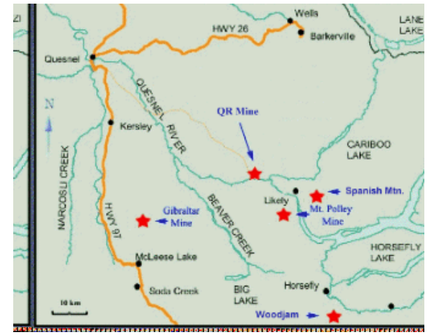
- Surface Water Sampling Sites
  - Monthly
  - Quarterly
  - Bi-Annual
- Secci Disk Testing Sites
- Groundwater Sample Sites
- Polley_Lk_Haul_road
- rivers
- Mine Roads
- Main Roads
- Logging Roads

DATE : Dec 3 2008 DRAWN BY : JJ

Scale: 1: 30 000

0 355 710 1,420 2,130 2,840 Meters

LOCATION MAP



Datum: UTM Nad 83
Zone: 10
Date: November 25 2008

PERMIT:
Date:
(Office Use Only)

Regional Manager, Environmental Protection
for Director, Environmental Management Act
Region:
(Office Use Only)

AMEC010461_0049

TABLE B-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
INSPECTION LOG

Printed on: Mar-30-10

\\Mountpolleystor\mountpolley\Enviromental\Mount Polley\Ministry Communications\MEM\2010\O — Revised on: July 01, 2008

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: Mar-30-10

\\Mountpolleystor\mountpolley\Enviromental\Mount Polley\Ministry Communications\MEM\2010\O

Revised on: July 01, 2008

TABLE B-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
INSPECTION LOG

Printed on: Mar-30-10
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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: Mar-30-10

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Revised on: July 01, 2008

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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VIBRATING WIRE PIEZOMETER MONITORING SHEET

PROJECT: TSF | **PROJECT # :** 101-1/23

DATE:

TIME:

INSPECTOR:

WEATHER:

BAROMETER: (+65)/10 =

POND LEVEL:

FIELD CODE	PIEZO ID	PIEZO SER. #	READINGS: FREQUENCY (Hz)	TEMP. (^{0}C)
	A0-PE2-03	5373		
	A1-PE1-05	5357		
	A2-PE2-09	5355		
	A2-PE2-10	5351		
	B0-PE2-03	5366		
	B1-PE1-04	5362		
	B2-PE2-07	5345		
	B2-PE2-08	5358		
	C0-PE2-03	5370		
	C2-PE2-09	5360		
	C2-PE2-10	5364		
	D1-PE1-04	5356		
	D0-PE2-01	5365		
	D2-PE2-03	5346		
	D2-PE2-04	5343		
	E0-PE2-01	5367		
	E1-PE1-01	5359		
	E2-PE2-03	5361		
	E2-PE2-04	5363		
	F2-PE2-02	5347		
	F2-PE2-03	5342		
	F1-PE1-01	5372		
	F0-PE2-01	9474		
	G0-PE2-01	5371		
	G2-PE2-01	5352		
	G2-PE2-02	5354		
	H0-PE2-01	5369		
	H2-PE2-01	5353		
	H2-PE2-02	5350		
	I2-PE2-02	5348		
	I2-PE2-03	5341		
	I1-PE1-01	5368		
	I0-PE2-01	5344		
	I2-PE2-01	5349		

FIELD CODE	PIEZO ID	PIEZO SER. #	READINGS: FREQUENCY (Hz)	TEMP. (^{0}C)

COMMENTS:

Knight Piésold CONSULTING

VIBRATING WIRE PIEZOMETER MONITORING SHEET

PROJECT: TSF	**PROJECT # :** 101-1/23
DATE:	
TIME:	
INSPECTOR:	
WEATHER:	
BAROMETER:	(+65)/10 =
POND LEVEL:	

			READINGS:	
FIELD CODE	**PIEZO ID**	**PIEZO SER. #**	**FREQUENCY (Hz)**	**TEMP. (^{0}C)**
A1	A1-PE1-01	64100		
A2	A1-PE1-02	64098		
A3	A1-PE1-03	64105		
A4	A2-PE1-01	67191		
A5	A2-PE2-01	64104	DEAD	
A6	A2-PE2-02	64103	DEAD	
A7	A2-PE2-03	64101		
A8	A2-PE2-04	64099	DEAD	
A9	A2-PE2-05	64102		
A10	A2-PE2-08	67195		
A11	A0-PE1-01	69689	DEAD	
A12	A2-PE1-02	69690		
A13	A2-PE1-03	69697	DEAD	
B1	B1-PE1-01	64107		
B2	B1-PE1-02	64106		
B3	B1-PE1-03	64118		
B4	B2-PE1-01	67194		
B5	B2-PE2-01	64110	DEAD	
B6	B2-PE2-02	64116		
B7	B2-PE2-03	64109	DEAD	
B8	B2-PE2-04	64109		
B9	B2-PE2-05	64113	DEAD	
B10	B0-PE1-01	69692	DEAD	
B11	B2-PE1-02	69692		
B12	B2-PE1-03	69696		
C1	C1-PE1-01	64111	DEAD	
C2	C1-PE1-02	64115	DEAD	
C3	C2-PE1-01	67196		
C4	C2-PE2-01	64117	DEAD	
C5	C2-PE2-02	64119		
C6	C2-PE2-03	64112		
C7	C2-PE2-05	64114		
C8	C0-PE1-01	69694	DEAD	
C9	C2-PE1-02	69695		
C10	C2-PE1-03	69698	DEAD	

			READINGS:	
FIELD CODE	**PIEZO ID**	**PIEZO SER. #**	**FREQUENCY (Hz)**	**TEMP. (^{0}C)**
D1	D1-PE1-02	66520		
D2	D2-PE1-01	67193	DEAD	
D3	D2-PE2-01	64096	DEAD	
D4	D2-PE2-02	67192		
R1	A0-PE1-01	43675		
R2	A0-PE2-02	43657		
R3	A2-PE2-06	43650	DEAD	
R4	A2-PE2-07	43651		
R5	B0-PE2-01	43674		
R6	B0-PE2-02	43676		
R7	B2-PE2-06	43652	DEAD	
R8	C0-PE2-01	43673	DEAD	
R9	C0-PE2-02	43658	DEAD	
R10	C1-PE1-04	43653		
R11	C2-PE2-06	43647		
R12	C2-PE2-07	43655	DEAD	
R13	C2-PE2-08	43656		
R14	E2-PE2-01	43651		
R15	E2-PE2-02	43648		
R17	A1-PE1-04	43649		
R18	F2-PE2-01	53765	DEAD	
R19	D1-PE1-03	50679	DEAD	
R20	G1-PE1-01	50678	DEAD	
R21	H1-PE1-01	50681	DEAD	

COMMENTS:

TABLE C-2

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
SLOPE INCLINOMETER DATA SHEET

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: Mar-30-10

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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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TABLE

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY PROJECT

TAILINGS STORAGE FACILITY
MAIN EMBANKMENT SEEPAGE POND SUMP FIELD SHEET

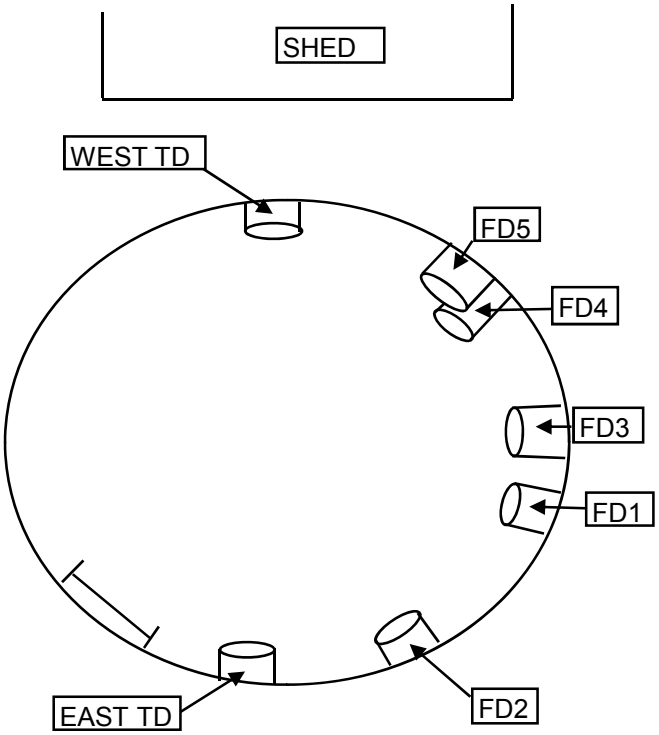
ENGINEER:
DATE:
TIME:
POND ELEVATION:

Pipe ID	Readings					
	Time #1	Time #2	Time #3	Average	Bucket Size	Flow
EAST TD						
WEST TD						
FD1						
FD2						
FD3						
FD4						
FD5						
PE - Up Stream TD						
PE - North Outlet						
PE - South Outlet						
PE - Middle Outlet						
ME/SE Weir						

ME Seepage Pond

Equipment Check List

Gas Detector
Key
Stop Watch
Generator/Fuel
Rubber Boots/Gloves
Rain Gear
Buckets



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FS 64925

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

STAGE 6 DESIGN OF THE TAILINGS STORAGE FACILITY
(REF. NO. VA101-01/18-1)

Rev. No.	Revision	Date	Approved
0	Issued for Report	June 18, 2007	

Knight Piésold
CONSULTING

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

STAGE 6 DESIGN OF THE TAILINGS STORAGE FACILITY (REF. NO. VA101-01/18-1)

EXECUTIVE SUMMARY

The Mount Polley Copper and Gold mine is owned by Mount Polley Mining Corporation (MPMC). It is located 56 kilometres northeast of Williams Lake, in central British Columbia. Mount Polley mine re-opened in March 2005 after managing the facilities on a Care and Maintenance basis since mining activities were temporally suspended in October 2001. MPMC is currently mining the Bell and Wight Pits with the tailings material being deposited as slurry into the Tailings Storage Facility (TSF). Process water is collected and recycled back to the mill for recycle in the milling process.

This report provides supporting documentation to allow for MPMC to permit the staged expansion of the TSF embankments from the existing permitted elevation of 951 m for the Stage 5 expansion to a new Stage 6 elevation of 958 m. The Stage 6 design of the TSF is consistent with the general design and construction methodology for the TSF and consists of adding 7 m to the current crest elevation of the embankments using the modified centreline construction method. This elevation will provide sufficient storage in the TSF for approximately two years of operations while maintaining the required water storage and freeboard requirements. Detailed design reports, construction drawings, technical specifications, and construction reports are prepared for each stage of the TSF expansions by Knight Piésold.

The instrumentation at the TSF consists of vibrating wire piezometers and inclinometers. No unexpected or anomalous pore pressures have been observed while monitoring the vibrating wire piezometers during the TSF construction programs and there have been no significant deviations in the inclinometers since they were installed.

A Dam Safety Review (DSR) for the Tailings Storage Facility was completed by AMEC in October 2006. The results of the DSR were issued in a report to Imperial Metals Corporation in December 2006. The DSR review concluded that the Mount Polley TSF is adhering to an excellent dam safety program. The DSR confirmed that the TSF is performing as designed and meets or exceeds the guidelines set forth by the appropriate guidelines for dam safety. The DSR also provided recommendations concerning the hazard classification, design storm, pond and beach management, instrumentation, and the foundation stability at the Main Embankment. These DSR recommendations are discussed in this report.

Although the Stage 6 design of the TSF is consistent with the general design and construction methodology, there are a few modifications to the design resulting from the DSR and discussions with MPMC, which include:

- Reducing the low permeability core width from 8 m to 5 m.
- Implementing the downstream buttress at the Main Embankment.

The Stage 6 design also includes an upstream toe drain at the South Embankment. Upstream toe drains have previously been installed along the Main and Perimeter Embankments. The upstream toe drains are effective in lowering the phreatic surface, which increases embankment stability and seepage control. The upstream toe drains also remove a certain amount of filtered water from the impoundment, and it may be possible to establish water discharge points below the seepage collection ponds if water quality objectives are met.

Recent mine plans indicate that the total resource for the Mount Polley Mine has increased to approximately 100 million tonnes. This is an increase of 15 million tonnes over the total capacity of 85 million tonnes previously referenced in the Knight Piésold Report “Design of the Tailings Storage Facility to Ultimate Elevation”, Ref. No. VA101-1/8-1, March 14, 2005. The ultimate elevation of the TSF will be approximately 970 m, depending on the volume of water stored in the TSF supernatant pond.

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MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

STAGE 6 DESIGN OF THE
TAILINGS STORAGE FACILITY
(REF. NO. VA101-01/18-1)

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MOUNT POLLEY MINE

STAGE 6 DESIGN OF THE TAILINGS STORAGE FACILITY (REF. NO. VA101-01/18-1)

SECTION 1.0 - INTRODUCTION

1.1 PROJECT DESCRIPTION

The Mount Polley Copper and gold mine is owned by Mount Polley Mining Corporation (MPMC). It is located 56 kilometres northeast of Williams Lake, in central British Columbia. The project site is accessible by paved road from Williams Lake to Morehead Lake and then by gravel road for the final 12 km. The location of Mount Polley Mine is shown on Figure 1.1. Mount Polley Mine started production in 1997 and had milled approximately 27.5 million tonnes of ore prior to temporarily suspending operations from October 2001 to March 2005. MPMC is currently mining the Bell and Wight Pits with the tailings material deposited as slurry into the Tailings Storage Facility (TSF). Process water is collected and recycled back to the mill for recycle in the milling process. The mine throughput is approximately 20,000 tpd. Aerial photographs of the Mount Polley Mine obtained in October 2005 are shown on Figures 1.2 and 1.3. The overall Mount Polley Mine site plan is shown on Drawing 100. The general arrangement of the TSF is shown on Drawing 102.

1.2 SCOPE OF REPORT

MPMC is currently in the process of raising the TSF embankments to the currently permitted Stage 5 expansion elevation of 951 m. Knight Piésold provided the design, technical specifications, and QA/QC for the Stage 5 expansion. The scope of this report is to provide supporting documentation to allow MPMC to obtain permits for the Stage 6 expansion of the TSF embankments to an elevation of 958 m. This elevation will provide sufficient storage in the TSF for approximately two years of operations while maintaining the required water storage and freeboard requirements. The Stage 6 design of the TSF consists of adding 7 m to the Stage 5 crest elevation of the embankments using the modified centreline construction method. The Stage 6 construction of the TSF will take place over a two year period to better utilize the waste materials from the mining operations as construction materials for the TSF embankments. The drawings contained within this report are for permitting support and will be updated prior to being “Issued for Construction”.

This report also discusses and addresses the recommendations provided in the Dam Safety Review completed by AMEC in 2006. The DSR recommendations and the Knight Piésold comments are located in Appendix A.

The design of the TSF to an elevation of 965 m was issued in the Knight Piésold Report "Design of the Tailings Storage Facility to Ultimate Elevation", Ref. No. VA101-1/8-1, March 14, 2005. This elevation will provide sufficient storage in the TSF for approximately 85 million tonnes of tailings while maintaining the required water storage and freeboard requirements. The mine plan has recently been updated and the total resource has been increased to approximately 100 million tonnes. This will require the tailings embankments to be constructed to an elevation of approximately 970 m, depending on the volume of the supernatant pond.

1.3 REFERENCES

This report references the following documents, which provide key supplementary information:

AMEC "Dam Safety Review", December 2006.

Bell, G., Fell, R., MacGregor, P. and Stapledon, D. 2005. Geotechnical Engineering of Dams. Chapter 13, p. 554 to 557.

Knight Piésold Report "Design of the Tailings Storage Facility to Ultimate Elevation", Ref. No. VA101-1/8-1, March 14, 2005.

Knight Piésold Report "Updated Design Report", Ref. No. 1627/2, June 6, 1997.

MAJM Corporation Ltd., Report to Imperial Metals Corporation, "Geotechnical Review, Drainage Aspects Main Embankment Dam, Tailings Storage Facility Report," March 1997.

SECTION 2.0 - TAILINGS STORAGE FACILITY

2.1 GENERAL

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

The main components of the TSF are as follows:

- The TSF embankments incorporate the following zones and materials:
  - Zone S - Core zone - fine grained glacial till.
  - Zone U – Upstream shell zone – parameters vary depending on material availability.
  - Zone CS - Upstream shell - cycloned or spigotted tailings sand.
  - Zone B - Embankment shell zones - fine grained glacial till.
  - Zone F - Filter, drainage zones, and chimney drain - processed sand and gravel.
  - Zone T - Transition filter zone - select well-graded fine-grained rockfill.
  - Zone C - Downstream shell zone – rockfill.
- A low permeability basin liner (natural and constructed) covers the base of the entire facility, at a nominal depth of at least 2 m. The low permeability basin liner has proven to be effective in minimizing seepage from the TSF as there have been no indications of adverse water quality reporting to the groundwater monitoring wells.
- A foundation drain and pressure relief well system, located downstream of the Stage 1B Main Embankment. The foundation drain and pressure relief well system prevent the build-up of excess pore pressure in the foundation, and transfer groundwater and/or seepage to the collection ponds.
- Seepage collection ponds located downstream of the Main and Perimeter Embankments and a seepage collection sump located downstream of the South Embankment. The ponds/sump were excavated in low permeability soils and collect water from the embankment drains and from local runoff.
- Instrumentation in the tailings, earthfill embankments and embankment foundations. This includes vibrating wire piezometers, and slope inclinometers.
- A system of groundwater quality monitoring wells installed around the TSF.

The tailings embankments have been designed for staged expansion using the modified centreline construction method.

2.2 FOUNDATION CONDITIONS

The tailings basin is generally blanketed by naturally occurring well-graded low permeability glacial till, which functions as an in-situ soil liner. However, a basin liner was constructed just upstream of the Main Embankment during Stage 1a to ensure that the basin liner had a minimum thickness of 2 m throughout the tailings basin. The constructed basin liner was tied into the Main Embankment core zone and the existing basin liner where the in-situ thickness exceeded 2 m.

The south ridge between the Main and South Embankments was investigated during the Stage 4 construction program to confirm the thickness of natural low permeability glacial till in this area. The investigation found that the glacial till thickness was less than the required minimum of 2 m near the crest of the ridge. A basin liner was constructed in this area during the Stage 4 construction program to ensure a minimum thickness of 2 m of dense low permeability till extends throughout this area and that it tied into the South Embankment core zone.

The foundation conditions at the Main Embankment consist of low permeability glacial till material at surface underlain by fluvial and lacustrine silts up to 20 m thick. The foundation piezometers at the Main Embankment indicate that this area has slight artesian conditions (less than 3.0 m). The foundation conditions at the Perimeter Embankment consist of low permeability glacial till throughout that is generally in excess of 5 m thick. The foundation conditions at the South Embankment consist of a relatively thin, low permeability glacial till material overlying bedrock. Details of the site geological investigations can be found in the Knight Piésold Report “Updated Design Report”, Ref. No. 1627/2, June 6, 1997.

Laboratory testwork on the foundation soils indicates that the materials have adequate shear strength to ensure foundation stability of the embankments. The lacustrine unit at the Main Embankment is being investigated further and samples have been collected for direct shear testing to confirm the shear strength of this material.

Artesian pressures were identified in the foundation soils at the Main Embankment during initial investigations prior to TSF construction. Pressure relief wells were installed previously at this location to depressurize the underlying glaciofluvial deposits. Ongoing monitoring has confirmed that design objectives are being met during on-going operations as the foundation pore pressures have remained at the baseline level.

2.3 TAILINGS AND RECLAIM PIPELINES

The tailings pipeline comprises 7 km of HDPE pipe of varying diameters and pressure ratings extending from the mill down to the crest of the tailings embankment and has a design flow of 20,000 tonnes/day at 35% solids by dry weight. The tailings pipeline has a single, movable discharge section, which allows for controlled deposition of tailings from an isolated section of the embankment to evenly distribute tailings from around the perimeter of the facility. Evenly discharging the tailings from around the facility optimizes the development of tailings beaches and keeps the supernatant pond clear of the embankments, thereby enhancing embankment stability, increasing seepage paths and limiting seepage loss from the facility. Beached tailings,

when left to drain and consolidate, form the competent foundations needed for the modified centreline construction embankment raises. The minimum recommended tailings beach width is at least 20 m along the abutments of the embankments (where the embankment contacts natural ground) and at least 10 m elsewhere to separate the pond from the embankments. Tailings material was also being used during the Stage 4 and Stage 5 construction programs as Zone U material upstream of the core zone.

The reclaim pipeline system returns water from the TSF to the mill site for re-use in the process. The system comprises a pump barge, a reclaim pipeline and a reclaim booster pump station.

2.4 EMBANKMENT DRAINAGE PROVISIONS

Embankment drainage provisions have been incorporated into the design of the TSF to facilitate drainage of the tailings mass, dewater the foundation soils, and to control the phreatic surface within the embankments. The components of the drainage systems consist of foundation drains, chimney drains, longitudinal drains, outlet drains, and upstream toe drains. The conveyance pipework for all of the drains terminates in the drain monitoring sumps at the Main and Perimeter Embankments where the drain flows and water quality are monitored. A drain monitoring sump was installed at the South Embankment during the Stage 5 construction program. The drainage systems are reviewed as part of the annual inspection and as part of each design phase for the expansion of the TSF. The drainage provisions for the TSF are as follows:

Foundation Drains - A system of foundation drains was installed in the Main and Perimeter Embankment foundations to improve the foundation conditions and enhance the dewatering of near surface soils. Pressure relief wells and pressure relief trenches connected to the foundation drains depressurize the underlying glaciofluvial deposits and enhance the stability of the embankment.

Chimney, Longitudinal and Outlet Drains - Chimney drains have been included in the Main, Perimeter and South Embankments. The chimney drains provide a contingency drainage measure for control of the phreatic surface in the embankments and will also function as a crack stopper downstream of the core zone. Water collected in the chimney drains is routed to the drain monitoring sumps via the longitudinal and outlet drains.

Upstream Toe Drains – Upstream toe drains have previously been installed in the Main and Perimeter Embankments and one is planned for installation in the South Embankment during the Stage 6 construction program. The purpose of the upstream toe drains is to drain and consolidate the tailings mass near the embankments. The inclusion of upstream toe drains also provides seepage control within the embankment and reduces the likelihood of piping. Piezometer records at the Main Embankment indicate that the upstream toe drain is effective in draining the sandy tailings adjacent to the embankment.

The upstream toe drains also remove a certain amount of filtered water from the impoundment, and it may be possible to establish water discharge points below the seepage collection ponds if water quality objectives are met. Experience at the site has shown that the quality of water

flowing from the toe drains is better than supernatant water quality for most parameters, largely because the suspended solids are effectively filtered by the sandy tailings solids as the water seeps into the drains. The benefits of the upstream toe drains were recognized during an independent third party review conducted by Fred Matich of MATM in 1997 in a "Geotechnical Review, Drainage Aspects" for the Main Embankment.

An upstream toe drain will be constructed at the South Embankment and the outlet pipeworks will be constructed in in-situ foundation materials at approximately chainage 31+00. The conduit will consist of a concrete encased pipe, with the concrete encasement having sloped sides to allow for superior compaction of the earthfill materials against it. A filter diaphragm consisting of Zone F material will be constructed for seepage and piping control (Geotechnical Engineering of Dams, 2005). Flows from the South Embankment upstream toe drain will flow into the Main Embankment Seepage Collection Pond via a ditch. A weir will be installed in the ditch to measure the flows.

2.5 SEEPAGE COLLECTION PONDS

The seepage collection ponds collect water from the embankment drain systems and from local runoff. The Main Embankment Seepage Collection Pond, located immediately downstream of the Main Embankment, was completed at the start of the initial Stage 1a construction program during 1997. The Perimeter Embankment Seepage Collection Pond was excavated during Stage 1b construction in 1997. These ponds were excavated in low permeability glacial till materials. A sump and a seepage recycle pumpback system were installed at the South Embankment during Stage 5.

2.6 INSTRUMENTATION

Piezometers

Vibrating wire piezometers have been installed at the TSF along nine planes designated as Monitoring Plans A to I. The monitoring planes for the Main Embankment, the Perimeter Embankment, and the South Embankment are shown on Drawings 251, 252, and 253 respectively. The piezometer locations for the monitoring planes are shown in section on Drawings 256 to 259. The piezometers are grouped into tailings, foundation, embankment fill and drain piezometers.

The piezometer readings are included in Appendix B. No unexpected or anomalous pore pressures have been observed.

Inclinometers

Five slope inclinometers have been installed to date at the toe of the Main Embankment through the lacustrine silts to measure potential foundation deformation due to embankment loading. Three of the inclinometers were installed during the Stage 4 construction program. One of the two original inclinometers installed in 2001 was damaged during extension of the casing when

shell zone material was being placed and is no longer functional. There have been no significant movements identified in the inclinometers since they were installed. The inclinometer readings are summarized in Appendix B.

Survey Monuments

Survey monuments are only installed on the TSF embankments when construction activities are suspended for a long enough time period to allow reasonable records to be obtained. Survey monuments will be installed following the Stage 6 construction program if there is a sufficient break in the construction activities between the Stage 6 and Stage 7 construction programs.

2.7 WATER MANAGEMENT

MPMC mine personnel complete on-going surface water monitoring and water management activities to ensure compliance with the current mine permits. The water balance for the TSF is updated regularly by MPMC with periodic reviews by Knight Piésold. The site climatic conditions were reviewed by Knight Piésold in 2004 and the water balance input parameters were adjusted to better reflect site conditions. The TSF is currently operating with a water budget surplus, as total inflows from precipitation and surface runoff exceed losses from evaporation, void retention and seepage removal.

The TSF is also required to have sufficient live storage capacity for containment of storm water runoff from the 72-hour PMP volume of 1,070,000 m^3 at all times. This extreme storm water runoff would result in an incremental rise in the tailings pond level of approximately 0.6 m. The 72-hour PMP allowance is in addition to regular inflows from other precipitation runoff, including the spring freshet. Previous TSF designs incorporated an additional allowance of 1 meter of freeboard for wave run-up. The freeboard requirement for wave run-up has been reduced to 0.7 m, for a total updated freeboard requirement of 1.3 m. This is consistent with the previous total freeboard requirement of 1.4 m. However, MPMC has elected to maintain the previous freeboard requirement of at least 1.4 m for the remaining mine life. The freeboard requirement post closure will be reviewed as part of the closure and reclamation plans as they are updated.

MPMC is currently exploring ways to discharge water from the site to reduce the ongoing storage requirements in the TSF as all of the surplus water is currently being stored in the TSF. The TSF filling curve and ultimate height of the TSF assume that there is no discharge of water during operations. This would result in the volume of the tailings pond progressively increasing to approximately 7 to 8 million m^3 at the end of mine operations, prior to closure unless water is discharged during operations. It is noted that a discharge from the TSF would be required at closure and it will be beneficial to implement an appropriate treatment/discharge strategy during operations so that an appropriate system is proven over several years of operations.

SECTION 3.0 - STAGE 6 TAILINGS STORAGE FACILITY DESIGN

3.1 GENERAL

The Stage 6 expansion of the TSF will involve raising the crests of each of the embankments by 7 m to an elevation of 958 m. This will provide storage for tailings and water for approximately two years of operations. The construction of the TSF embankments consists of expanding the embankments using the modified centreline construction method. The design basis and operating criteria for the Stage 6 design of the TSF are shown on Table 3.1. The filling schedule and anticipated staged construction sequence of the TSF is shown on Figure 3.1. The filling schedule has been updated and extended to year 2015 to reflect the current mine plan.

Construction activities to be completed during the Stage 6 expansion of the TSF will include the following:

- Expanding Zones S, F, T, U and C to elevation 958 m. The Zone S core zone will have a minimum width of 5 m. The Zone S core has been reduced from 8 m as the upstream toe drains have proved to be effective in lowering the phreatic surface upgradient of the embankments. Zones F and T will be tied into the existing Zones F and T to ensure that the filter and transition materials are continuous.
- Installing an upstream toe drain on the South Embankment to drain and consolidate the tailings mass near the embankment. The flows from the South Embankment upstream toe drain will be routed to the Main Embankment Seepage Collection and Recycle pond via a ditch.
- Constructing a buttress downstream of the Main Embankment to elevation 925 m to ensure that the required Factor of Safety is achieved for the Stage 6 embankment configuration.
- Extending the slope inclinometers at the Main Embankment concurrently with the downstream shell zone.
- Installing additional vibrating wire piezometers in the embankment fill and tailings materials, as well as installing additional piezometers in the foundation materials at the Main Embankment. The piezometer cables will be extended to readout boxes located beyond the ultimate toe of the embankments. The proposed locations of the new piezometers are shown on Drawings 256 to 259.
- Relocating the south surface water diversion ditch and access road above elevation 970 m.

The Stage 6 Main Embankment Plan, Section and Details are shown on Drawings 210 and 215 respectively. The Stage 6 Perimeter Embankment Plan, Section and Details are shown on Drawings 220 and 225, respectively. The Stage 6 South Embankment Plan and Sections are shown on Drawings 230 and 235, respectively. The material specifications are shown on Drawing 104. Details of the upstream toe drain at the South Embankment are shown on Drawing 240.

3.2 STABILITY ANALYSES

Stability analyses for the TSF embankments were performed using the limit equilibrium computer program SLOPE/W. The stability analyses were updated to reflect the updated 2005 National Building Code Seismic Hazard calculation by Natural Resources Canada, which has increased the seismic ground motions (peak accelerations). Accordingly, the OBE and the MDE have increased to 0.07g and 0.096g respectively. The OBE and MDE are defined as the 1/475 year and the 1/1000 year events respectively based on a Canadian Dam Association hazard classification of LOW. The adopted MDE is from the high end of the LOW classification. The stability analyses were also completed to identify the buttress requirements at the Main Embankment should a weak layer exist in the lacustrine material. The piezometers installed in the lacustrine material indicate slight artesian conditions within this material. The stability analyses were completed with the elevated pore pressures in the lacustrine unit (approximately 2.5m above ground).

Material parameters adopted for the tailings, foundation and earth embankment materials are based on testwork from the 1995 and 1997 geotechnical investigations, from the various quality control records obtained during construction of previous embankment stages, and from experience with typical values for similar materials. The analyses were completed to model the downstream stability and conservatively assumed low strengths for the upstream tailings mass.

The results of the SLOPE/W stability analyses indicate that the factor of safety for the Stage 6 TSF embankments for static conditions was 1.4 for the Main Embankment, 1.7 for the Perimeter Embankment, and 1.8 for the South Embankment. The stability analysis for the Main Embankment includes a downstream buttress constructed to an elevation of 925 m. A study comparing the drained residual strength to the clay content, liquid limit, and effective normal stress was completed by Stark and Eid (1995). The results of the study indicate that the residual strength of a material with a clay content ranging from 25 to 50%, with a liquid of 40%, and an effective normal stress of 700 kPa is in the order of 24 degrees. A conservative friction angle of 24 degrees was applied for the lacustrine unit.

A stability analysis was also completed for the Main Embankment with a crest elevation of 970 m to determine the buttress requirements to meet the closure Factor of Safety objective of 1.5. The results indicate that the buttress will need to be increased to an approximate elevation of 942 m for closure conditions. The required elevation of the buttress will increase from Stage 6 through closure as the embankment gets higher. MPMC should consider constructing the buttress as non-reactive waste material is made available from the development of the open pits to avoid having to develop a rock borrow in the later years of the mine life to construct the buttress.

The seismic analyses included determination of the critical yield acceleration defined as the acceleration required to reduce the Factor of Safety to 1.0. The results of the stability analyses indicate that the critical acceleration for the Stage 6 Main, Perimeter and South Embankments is 0.12g, 0.25g and 0.26g respectively.. The critical acceleration for the Main Embankment at closure is 0.13g. The OBE and MDE peak ground accelerations are 0.07g and 0.096g respectively. The maximum accelerations within the tailings embankment and foundations will be

slightly higher due to local amplification of ground motion. A dynamic response (Shake) analysis was completed for the Main Embankment indicating that amplification of ground motion increases the average ground acceleration by approximately 50 %. Simplified Newmark, Makdisi-Seed, and Swaisgood analyses were completed to estimate potential embankment deformations. A conservative average maximum acceleration of 0.15g along the potential slip surface was used. The deformations will be negligible for the MDE (in the order of 1 cm). Limited deformation of the TSF embankment is acceptable under seismic loading from the MDE, provided that the overall stability and integrity of the facility is maintained and that there is no release of stored tailings or water (ICOLD, 1995). The TSF embankments would be expected to remain functional during and after the OBE and any resulting damage should be easily repairable in a limited period of time.

A post liquefaction analyses was also completed to provide a conservative assessment of the downstream stability of the TSF embankments assuming the tailings material liquefies and has a very low residual strength. The factors of safety for the Main Embankment (the critical embankment as it is the largest) for post liquefaction conditions was 1.4.

The factors of safety for the upstream stability analyses for static, seismic, and under post liquefaction conditions for the Main Embankment were greater than 2.0.

The results of the stability analyses indicate that the Stage 6 and final TSF embankments are stable under static, seismic, and post liquefaction conditions and that the embankments do not rely on the tailings mass for stability.

A stability analysis was also completed to establish a trigger level for the foundation piezometers at the Main Embankment where artesian conditions exist. The trigger level corresponds to the elevated pore pressure that reduces the Factor of Safety to 1.1. The results of the analyses indicate that the trigger level for the Main Embankment foundation piezometers is 15 m above ground.

3.3 SEEPAGE ANALYSES

The seepage analyses was completed using the computer program SEEP/W to delineate the phreatic surface and pore pressures within the tailings mass and the embankment fill materials. The seepage analyses are also used to estimate the seepage from the embankment drainage systems to the seepage collection ponds and also to estimate the unrecoverable seepage from the TSF. Seepage analyses were recently completed by Knight Piésold to estimate the flows from the upstream toe drains installed in the Main, Perimeter, and South Embankments. The results of the seepage analyses were issued in a letter to MPMC, which is included in Appendix C. The results indicated that the flows from the upstream toe drains, assuming that all three drains are in operation, ranges from approximately 17 l/s to 52 l/s.

Additional seepage analyses were completed for the TSF with a crest elevation of 970 m. These seepage analyses were completed with a 5 m and an 8 m wide low permeability core width to

evaluate the difference in TSF seepage associated from the reduction in the core width. The seepage analyses assumed a minimum operating tailings beach width of 10 m.

The results of the seepage analyses indicate the upstream toe drains intercept the majority of the seepage through the embankment and the flows into the upstream toe drains are unaffected by the reduced core width. This result was expected as the toe drains are located upstream of the core zone. The seepage results indicate that the reduction in the low permeability core width from 8 m to 5 m above elevation 951 m will have no impact on the magnitude of seepage losses from the TSF embankments.

3.4 STAGE 6 TSF CONSTRUCTION

The Stage 6 construction program involves expanding Zones S, F, T, U and C to elevation 958 m. over a two year period. The estimated quantities for the TSF Stage 6 expansion, as well as the continued expansion of the TSF to elevation 970, are shown on Table 3.2.

The construction of the TSF assumes that the Zone U will be constructed using sand cells. The sand cells involved discharging tailings into constructed cells upstream of the embankment. The confining berms have culverts installed into them to allow for the water and fine materials to exit the cells and flow into the TSF. The coarse tailings sand that settles out into the cells are constantly worked with a dozer to ensure proper distribution within the cells, to compact the sand and to expedite the drainage of excess water through the culverts. This method of constructing Zone U proved to be effective for Stage 4 and 5.

The lift thickness and compaction requirements for each of the construction materials are shown on Drawing 104. Knight Piésold will provide the construction drawings, technical specifications, and QA/QC for the Stage 6 expansion of the TSF. Knight Piésold will also issue a construction report within six months of the completion date of the Stage 6 construction program.

SECTION 4.0 - CERTIFICATION

This report was prepared and approved by the undersigned.

Prepared by: _____

Les Galbraith, P.Eng.
Senior Engineer

Approved by: _____

Ken J. Brouwer, P.Eng.
Managing Director

TABLE 3.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

STAGE 6 DESIGN BASIS AND OPERATING CRITERIA

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ITEM	DESIGN CRITERIA
1.0 GENERAL DESIGN CRITERIA	
Regulations	MEM, 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	8.5 Years (as of 2007)
Tailings Production Information	20,000 tonnes/day, 35% solids, 2.65 SG, 100 million tonnes total production, 1.40 tonnes/m^3 final average tailings dry density
Hazard Rating:	LOW by CDA Consequence Classification/British Columbia Dam Safety Regulation of the Water Act. Revised from HIGH in 2007 based on the Dam Safety Review. Owners costs not included in the Hazard Rating.
Site Elevation	910 to 1150 metres
Climate	Average Annual Rainfall = 740 mm, Annual Evaporation = 423 mm, Mean Annual Temp = 4.0 C (Likely), 24-hour PMP storm = 203 mm. 72-hour PMP storm = 320 mm.
Updated Design Earthquakes[1]: OBE (operations) MDE (closure)	 1 in 475 Year Event (M = 6.5, $A_{max.}$ = 0.070 g). 1 in 1000 Year Event or MCE (M = 6.5, $A_{max.}$ = 0.096 g).
Seepage Control	Low permeability glacial till liners (natural and constructed) in basin, with foundation drain system below main embankment. Foundation and chimney drain seepage is contained within the 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	
Geological and Geotechnical Conditions	The TSF basin and foundation comprises glacial soils of variable permeability and strength.
Basin Liner	• In-situ low permeability glacial till, or • Constructed glacial till liner. Required in areas with <2 m depth of in-situ glacial till.
Embankment Foundation Drains	• Installed in Main and Perimeter Embankment foundations. Foundation drain installed at the South Embankment during the Stage 5 expansion. • Foundation drains discharge to the seepage collection ponds at the Main and Perimeter Embankments via drain monitoring sumps. The foundation drain at the South Embankment discharges to a sump where the flows are monitored and pumped back to the TSF.

[1] Design Earthquakes updated in 2007 to reflect the 2005 NBC Seismic Hazard Calculation by Natural Resources Canada.

TABLE 3.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

STAGE 6 DESIGN BASIS AND OPERATING CRITERIA

Stripping		• Required at areas directly affected by construction (embankments, basin liners, seepage collection ponds, reclaim barge channel stockpiles, road, etc). • Remove organic soil to topsoil stockpiles
3.0 TAILINGS EMBANKMENT		
Function		• Storage of tailings and process water for design life • Provide emergency containment of runoff for 72-hour PMP storm. • Provision for routing PMF at closure
Embankment Crest Width		5m min for Zone S.
Embankment Height:	Stage 5 Stage 6 Final	El. 951 m (scheduled for completion July 31, 2007) El. 958 m El. 970 m (base on 100,000,000 tonnes)
Design Tonnage		7,300,000 tpy (20,000) tpd
Solids Content of Tailings Stream		35% (before Millsite and waste dump runoff added to tailings stream)
Freeboard:	Operations Closure	1.4 m – includes for the 72-hour PMP event plus 0.7m for wave run. (as per the Dam Safety Review) Sufficient to provide routing of PMF plus wave run-up.
Storage Capacity		100 million tonnes (Crest Elevation of 970 m).
Tailings Density:		1.4 t/m^3
Tailings Specific Gravity		2.65
Emergency Spillway Flows:	Operations Closure	Not required. Design flow for routing PMF event.
Filling Rate		Refer to Figure 2.1. – Stage 6 to design is for 2 years of operations.
Fill Material / Compaction Requirements		Refer Drawing 101-1/18-104.
Sediment Control		Primary control provided by the TSF Embankments. Secondary control provided by the seepage collection ponds.
Seepage Control		Seepage collection ponds and pumpback systems.
Spillway Discharge Capacity		Not required during operations.
Surface Erosion Protection		Re-vegetation with grasses on final reclaimed embankment slopes.
4.0 PIPEWORKS		
4.1 Tailings Pipeworks		
Function		Transport tailings slurry and mill site and waste dump runoff to TSF.
Tailings Pipeline		• Free draining, gravity flow pipeline. • Butt fusion welded HDPE with 24" / 30" DR15.5 and 22" DR17.
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.
Spill Containment:		

TABLE 3.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

STAGE 6 DESIGN BASIS AND OPERATING CRITERIA

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 Drop box. • 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 at reclaim barge for ease of maintenance.
Spill Containment	• See Item 4.1 above. • 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 maximum weekly seepage flow quantity. • Excavated in low permeability natural soils, 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 WATER MANAGEMENT	
5.1 General	• To contain runoff from disturbed project areas when and as required to meet the project Water Management Plan objectives. To divert clean water from the project areas. • Permitted discharge volume of 700,000 m^3 per year from the ME Seepage recycle pond. Excess water stored in the TSF pond.
5.2 Millsite Sump	
Catchment Area	Approx. 20 ha direct catchment, plus pit dewatering.
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	Reference Report 1627/2, Drawing No. 1625.232.
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)

TABLE 3.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

STAGE 6 DESIGN BASIS AND OPERATING CRITERIA

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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	Reference Report 1627/2, Drawing No. 1625.232.
Discharge Pipe	250 mm HDPE DR 21 to Reclaim sump or T2 Dropbox
Flow Monitoring	None.
INSTRUMENTATION AND MONITORING	
6.1 General	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. • Four instrumentation planes for Main Embankment, three for the Perimeter Embankment, and two for the South Embankment. • 56 piezometers installed to date. Additional piezometers to be installed in Stage 6 to provide redundancy (as per the Dam Safety Review). • Foundation piezometers at the Main Embankment have a trigger level set at 6 m above ground surface due to artesian condition in this area.
Survey Monuments	• Deformation and settlement monitoring of embankments.
Inclinometers	• Measure potential deformation of the embankment materials. • Installed by qualified technical personnel. • Five slope inclinometers installed at the toe of the Main Embankment. Four are still functional.
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 Operational Monitoring	• As per the OM&S Manual.

TABLE 3.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

STAGE 6 DESIGN BASIS AND OPERATING CRITERIA

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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. • Concurrent reclamation of the final downstream embankment slopes. • Wetlands treatment system to treat routed water from the TSF prior to discharge to environment.
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 PMF without overtopping embankments. Designed to consider protection against beaver dams. • Spillway to be located on the Northeast corned of the TSF on the Perimeter Embankment.

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 3.2

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

EMBANKMENT MATERIAL QUANTITIES ESTIMATE

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ZONE	Stage							Net Total
	6a	6b	7a	7b	8a	8b	9	
U	392,000	229,000	252,000	194,000	159,000	90,000	142,000	1,458,000
S	96,000	63,000	42,000	63,000	42,000	42,000	63,000	411,000
F	20,000	15,000	10,000	15,000	10,000	10,000	15,000	95,000
T	20,000	15,000	10,000	15,000	10,000	10,000	15,000	95,000
C	302,000	165,000	81,000	98,000	49,000	35,000	25,000	755,000
C BUTTRESS	140,000		-	-	-	-	350,000	490,000

Notes:
1.) Volumes are calculated in cubic meters
2.) Volumes are based on neat line quantities

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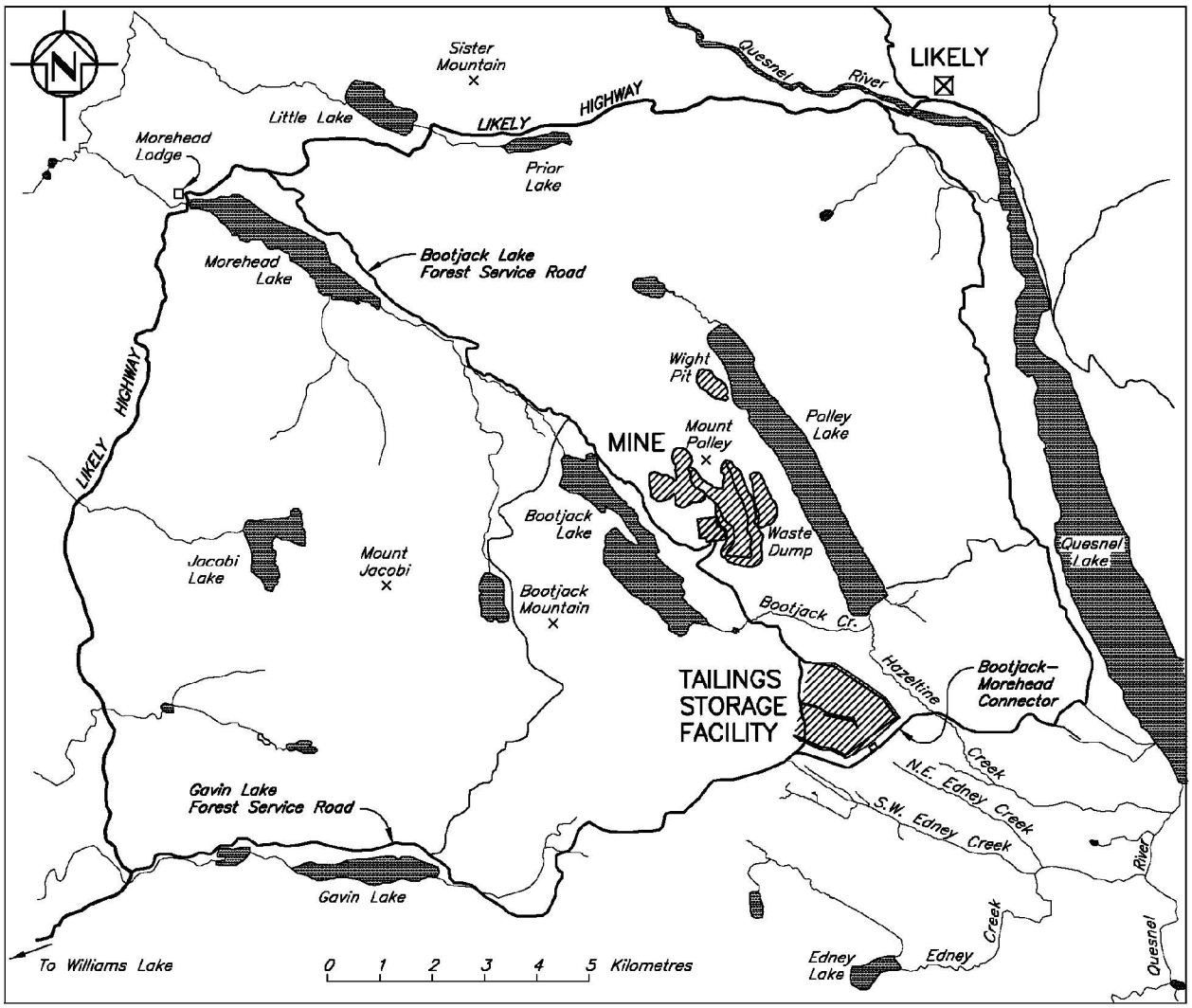
KEY MAP



LOCATION MAP

VANCOUVER B.C. CAD FILE: #:\1\01\00001\ENV\Acad\Fig#\01.DWG 1=125000 PLOT 1=(PS) Jun 06 2007 bydjang Time @ 18:11

XREF FILE : -

REV.	DATE	ISSUED
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING

MOUNT POLLEY MINING CORPORTATION

MOUNT POLLEY MINE

PROJECT LOCATION AND ACCESS PLAN

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.	REV.
VA101-1/18	1	0

FIGURE 1.1

Notes:
1) Photograph taken in October 2005

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

AERIAL PHOTOGRAPH OF MOUNT POLLEY MINE VIEWING NORTH

Knight Piésold CONSULTING

PROJECT / ASSIGNMENT NO.	REF NO.
VA 101-1/18	1

FIGURE 1.2

REV. 0

Notes:
1) Photograph taken in October 2005

MOUNT POLLEY MINING CORPORATION

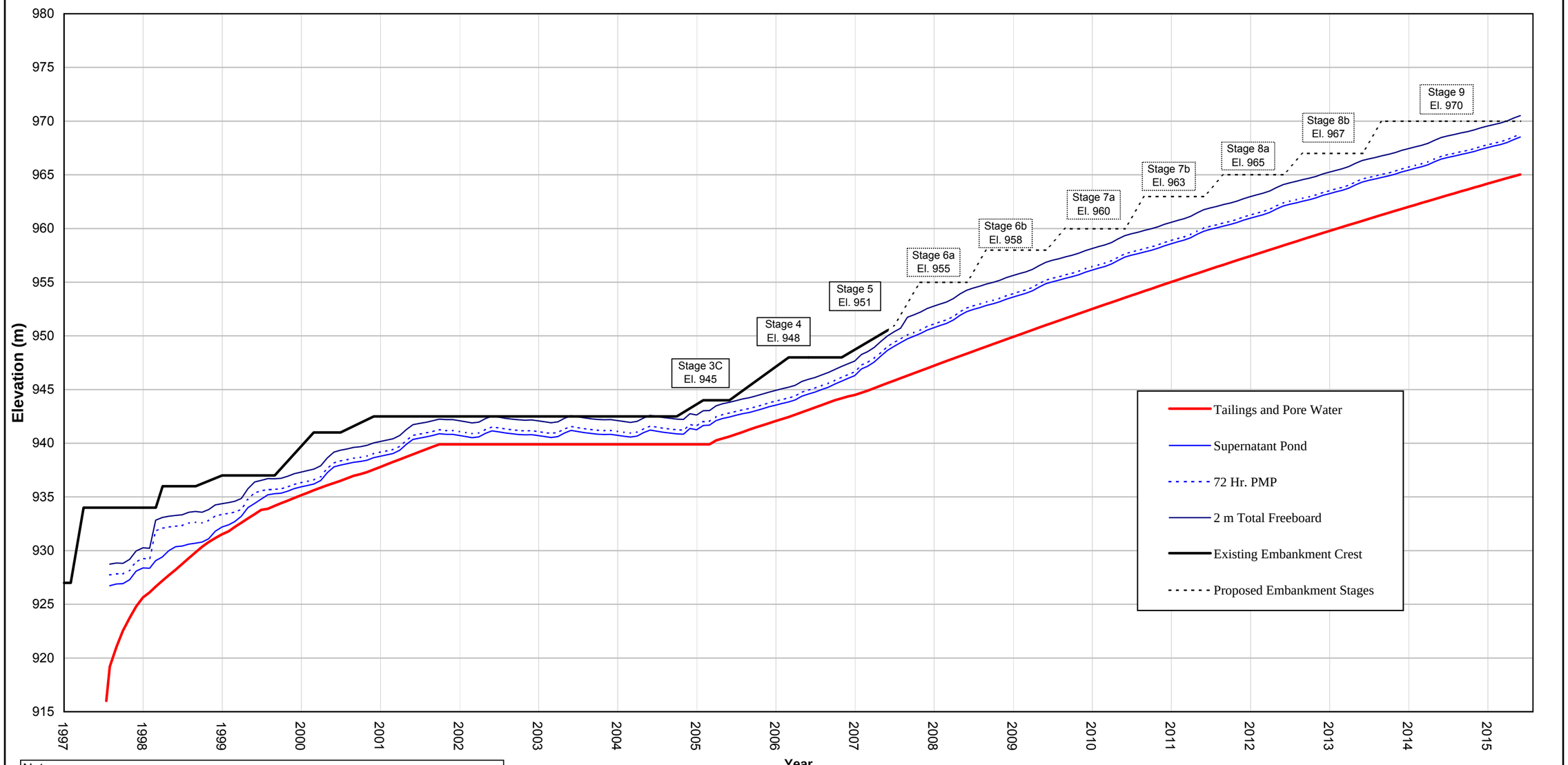
MOUNT POLLEY MINE

AERIAL PHOTOGRAPH OF MOUNT POLLEY MINE VIEWING SOUTH

Knight Piésold CONSULTING

PROJECT / ASSIGNMENT NO.	REF NO.
VA 101-1/18	1

FIGURE 1.3 REV. 0



Notes:

1. Based on a production rate pf 20,000 tpd .
2. Projected bulk tailings dry density is 1.4 t/m3 for tailings reporting to the TSF after August 2000.
3. The filling schedule will be updated as required to reflect actual mine throughput and the supernatant pond volume.

Rev 0 - Issued for Report

MOUNT POLLEY MINING CORPORATION

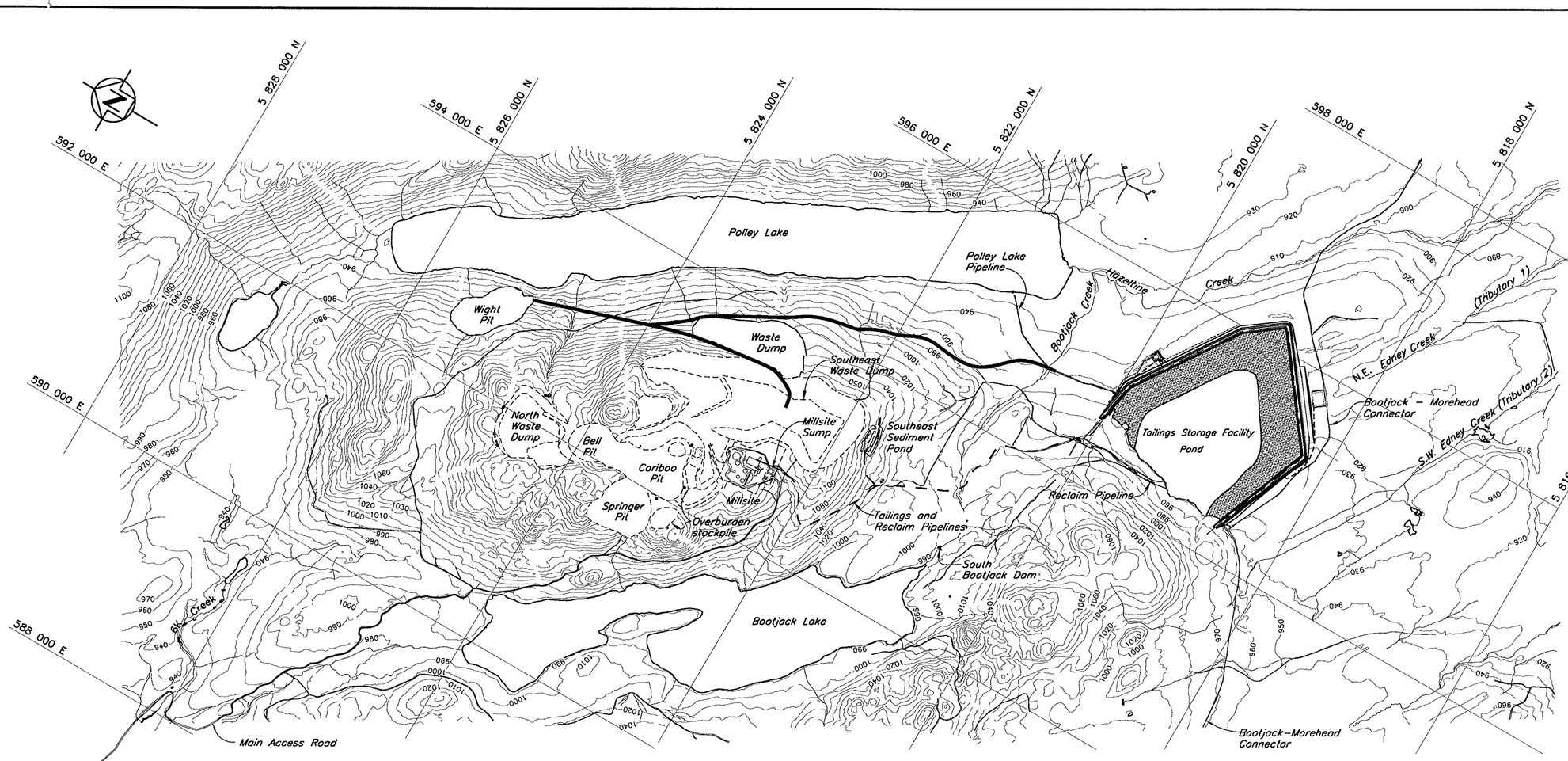
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
FILLING SCHEDULE

PROJECT NO.	REF. NO.	REV.
VA 101-1/18	1	0

Knight Piésold CONSULTING

FIGURE 3.1



Scale 400 0 400 800 1200 1600 2000 m

NOT FOR CONSTRUCTION

NOTES

1. *Open Pits and Waste Dumps are shown in their final configurations.*
2. *Topography at TSF generated from points and break lines sent from MPMC in July 1999. The topography outside the TSF area is from 1997 flyover. UTM, NAD83, ZONE 10.*
3. *Drawing is for reference only.*

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — L.J. GRIMMITH — 25493 — June 18/07

Knight Piésold CONSULTING

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 6 TAILINGS EMBANKMENT
OVERALL SITE PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/18	100	0

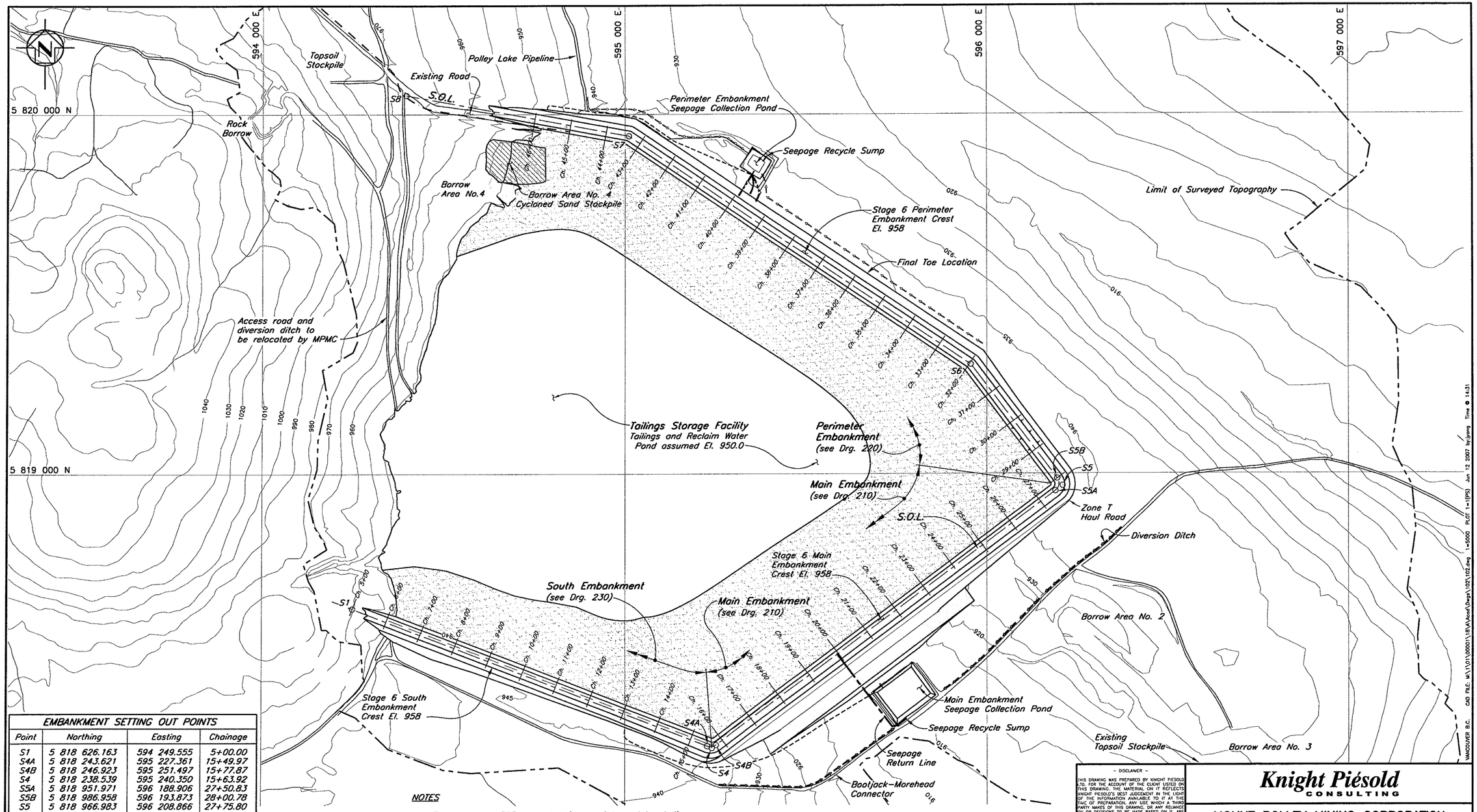
DRG. NO.	DESCRIPTION
REFERENCE DRAWINGS	

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
REVISIONS						

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BB	LJG
REVISIONS						

VANCOUVER B.C. CAD FILE: M:\1\01\00001\16\A\Acad\Dwgs\100\100.dwg 1=20000 PLOT 1=1(PS) Jun 12 2007 byjoong Time 14:29

XREF FILE : TOP099, Stage6_Plan



EMBANKMENT SETTING OUT POINTS			
Point	Northing	Easting	Chainage
S1	5 818 626.163	594 249.555	5+00.00
S4A	5 818 243.621	595 227.361	15+49.97
S4B	5 818 246.923	595 251.497	15+77.87
S4	5 818 238.539	595 240.350	15+63.92
S5A	5 818 951.971	596 188.906	27+50.83
S5B	5 818 986.958	596 193.873	28+00.78
S5	5 818 966.983	596 208.866	27+75.80
S6	5 819 304.035	595 955.881	31+97.23
S7	5 819 939.748	595 010.249	43+36.69
S8	5 820 053.034	594 396.471	49+60.83

NOTES

1. Topography at TSF generated from points and break lines sent from MPMC in July 1999. The topography outside the TSF area is from 1997 flyover. UTM, NAD83, Zone 10.
2. Stage 6 crest El. 958.0.

Scale 100 0 100 200 300 400 500 m

NOT FOR CONSTRUCTION

DRG. NO.	DESCRIPTION
220	T.S.F. – STAGE 6 PERIMETER EMBANKMENT – PLAN
210	T.S.F. – STAGE 6 MAIN EMBANKMENT – PLAN
230	T.S.F. – STAGE 6 SOUTH EMBANKMENT – PLAN AND SECTION

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BB	LJG

REVISIONS

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA L.J. GALBRAITH 22495 — 15/07

Knight Piésold CONSULTING

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 6 TAILINGS EMBANKMENT
GENERAL ARRANGEMENT

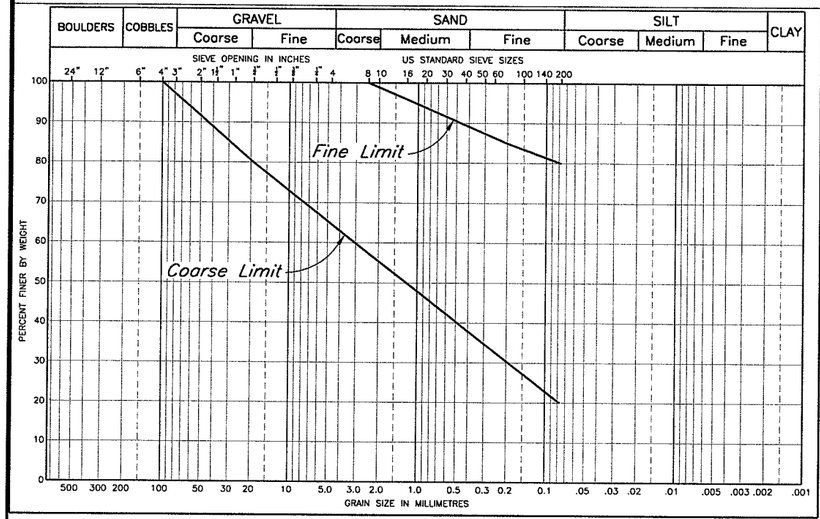
PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/18	102	0

XREF FILE: - TOPO99, Stage6_Plan

CAD FILE: M:\1\01\00001\18\A\Acad\Dwgs\102.dwg PLOT: 1=1 (IPS) 1=5000 Jun 12 2007 by:jpong Time: 14:31 VANCOUVER B.C.

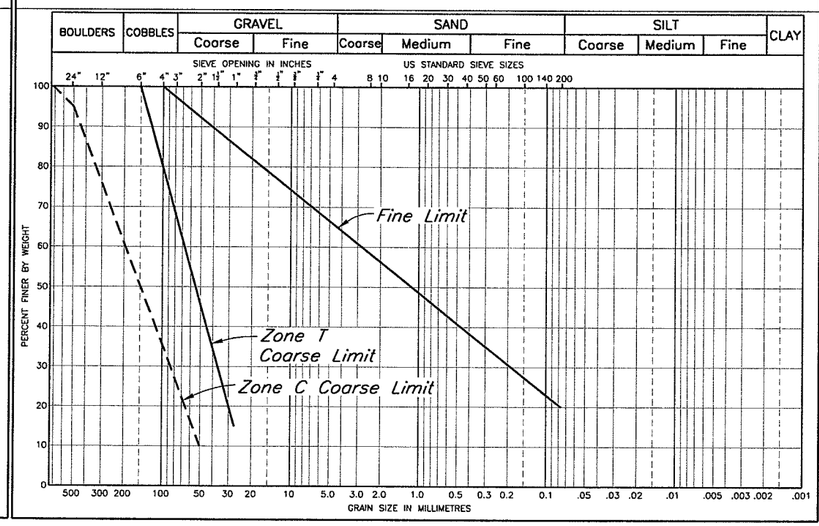
UNIFIED SOIL CLASSIFICATION SYSTEM

ZONE S



UNIFIED SOIL CLASSIFICATION SYSTEM

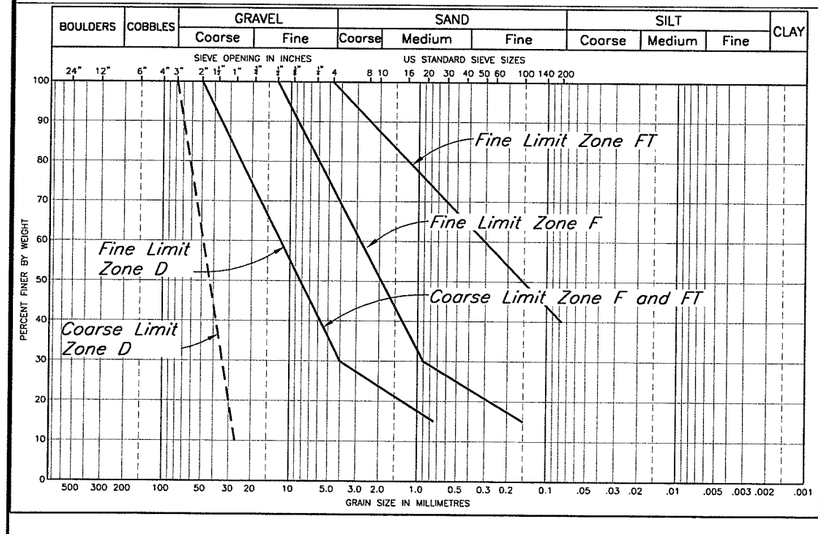
ZONE T and ZONE C



ZONE	MATERIAL TYPE	LOCATION	PLACEMENT & COMPACTION REQUIREMENTS
S	Glacial till	Core Zone	Placed, moisture conditioned and spread in maximum 300 mm thick layers (after compaction). Vibratory compaction to 95% of Standard Proctor maximum dry density or as approved by the Engineer.
C	Rock	Shell Zone	Placed and spread in maximum 2000 mm thick layers and compacted by selective routing of mine haul trucks.
T	Rock	Transition Zone/ Confining Berm	Placed and spread in maximum 600 mm thick layers and compacted with minimum 4 passes of 10 ton smooth drum vibratory roller, or as approved by the Engineer.
F	Filter sand	Chimney Drain	Placed and spread in maximum 600 mm thick layers and compacted with minimum 4 passes of 10 ton smooth drum vibratory roller, or as approved by the Engineer.
FT	Sand	Downstream Foundation	Placed and spread in maximum 300 mm thick layers and compacted with minimum 4 passes of 10 ton smooth drum vibratory roller, or as approved by the Engineer.
U	Select Fill	Upstream Toe	Placement and compaction requirements to be determined based on material selection.
CBL	Select Coarse Rockfill	Upstream Toe	Placed to establish a firm foundation for subsequent fill placement.
D	Drainage Gravel	Drains	Placed around drainage pipes and wrapped with geotextile.

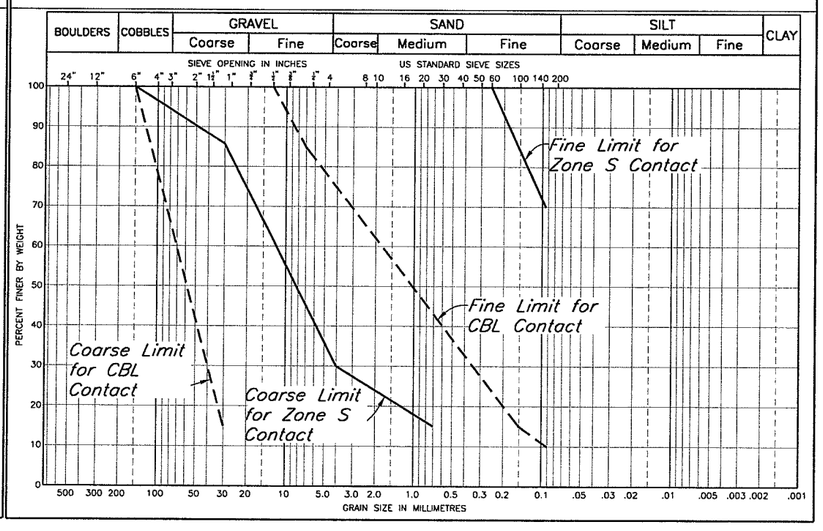
UNIFIED SOIL CLASSIFICATION SYSTEM

ZONE F AND ZONE FT



UNIFIED SOIL CLASSIFICATION SYSTEM

ZONE U



DRG. NO.	DESCRIPTION
235	STAGE 6 SOUTH EMBANKMENT – SECTIONS
225/226	STAGE 6 – PERIMETER EMBANKMENT – SECTIONS AND DETAILS
215/216	STAGE 6 – MAIN EMBANKMENT – SECTIONS AND DETAILS
240	STAGE 6 UPSTEAM TOE DRAIN – SECTIONS AND DETAILS

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BB	KLS

REVISIONS

NOT FOR CONSTRUCTION

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — 25493 — Jun 08/07

Knight Piésold CONSULTING

MOUNT POLLEY MINING CORPORATION

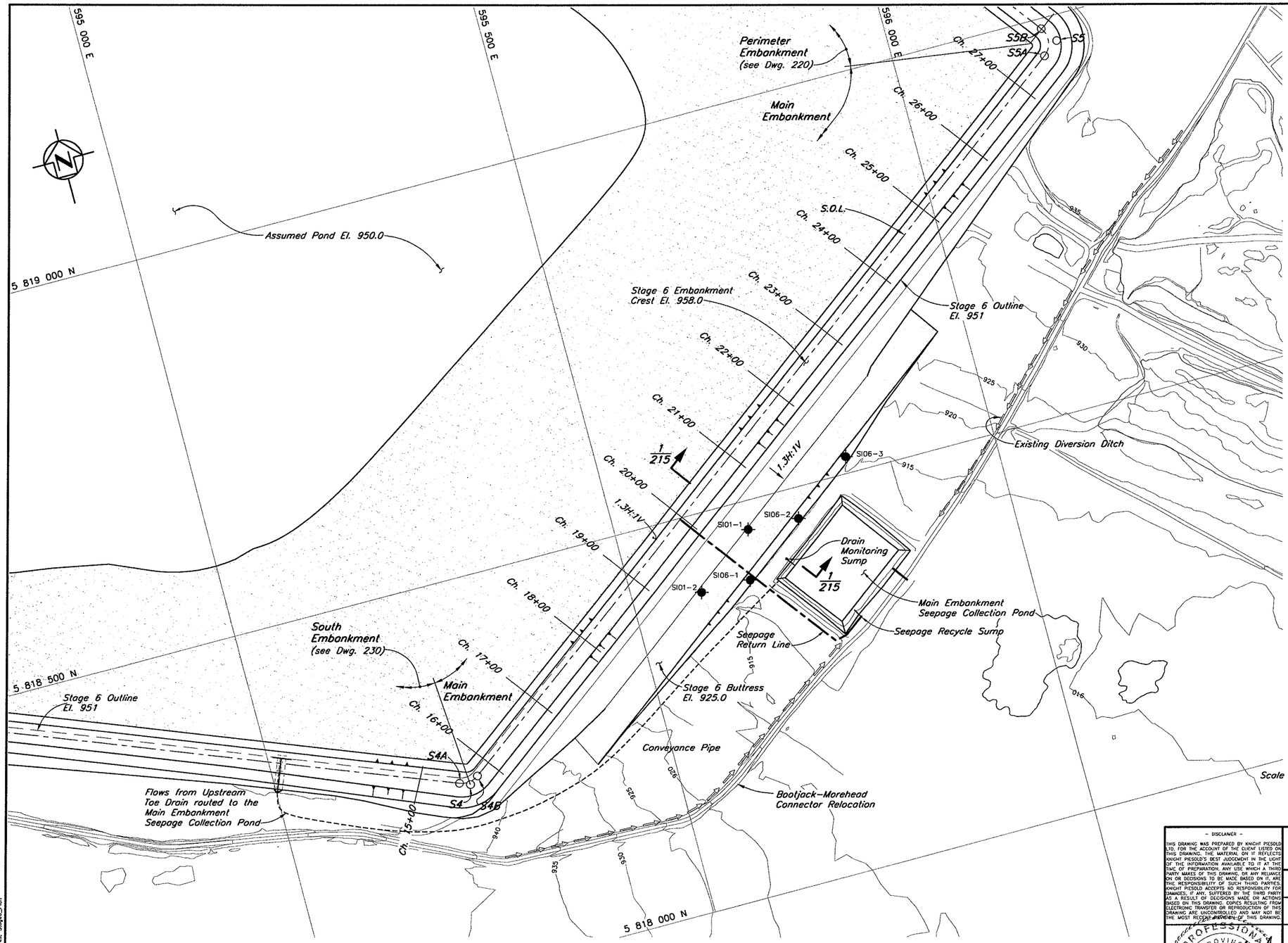
MOUNT POLLEY MINE

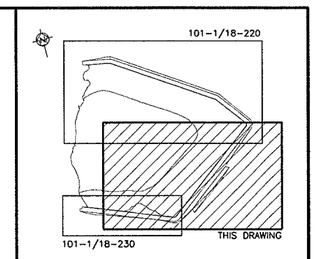
TAILINGS STORAGE FACILITY
STAGE 6 TAILINGS EMBANKMENT
MATERIAL SPECIFICATIONS

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA1010–1/18	104	0

XREF FILE: -

VANCOUVER B.C. CAD FILE: M:\1\01\00001\18\A\dwgs\Dwgs\104\104.dwg 1=1 PLOT: 1=1(PS) Jun 08 2007 Anjana Time: 16:23





KEY PLAN

LEGEND

S101–3 Existing Inclinometer

NOTES

1. Topography from 2004 flyover
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.

Scale 50 0 50 100 150 200 250 m

NOT FOR CONSTRUCTION

DRG. NO.	DESCRIPTION
230	STAGE 6 SOUTH EMBANKMENT – PLAN
220	STAGE 6 PERIMETER EMBANKMENT – PLAN
215	STAGE 6 MAIN EMBANKMENT – SECTIONS AND DETAILS

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BB	KJG

REVISIONS

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Knight Piésold CONSULTING

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 6 MAIN EMBANKMENT
PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101–1/18	210	0

XREF FILE : Topo2004, Features, Stage6_Plan

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VANCOUVER, B.C.

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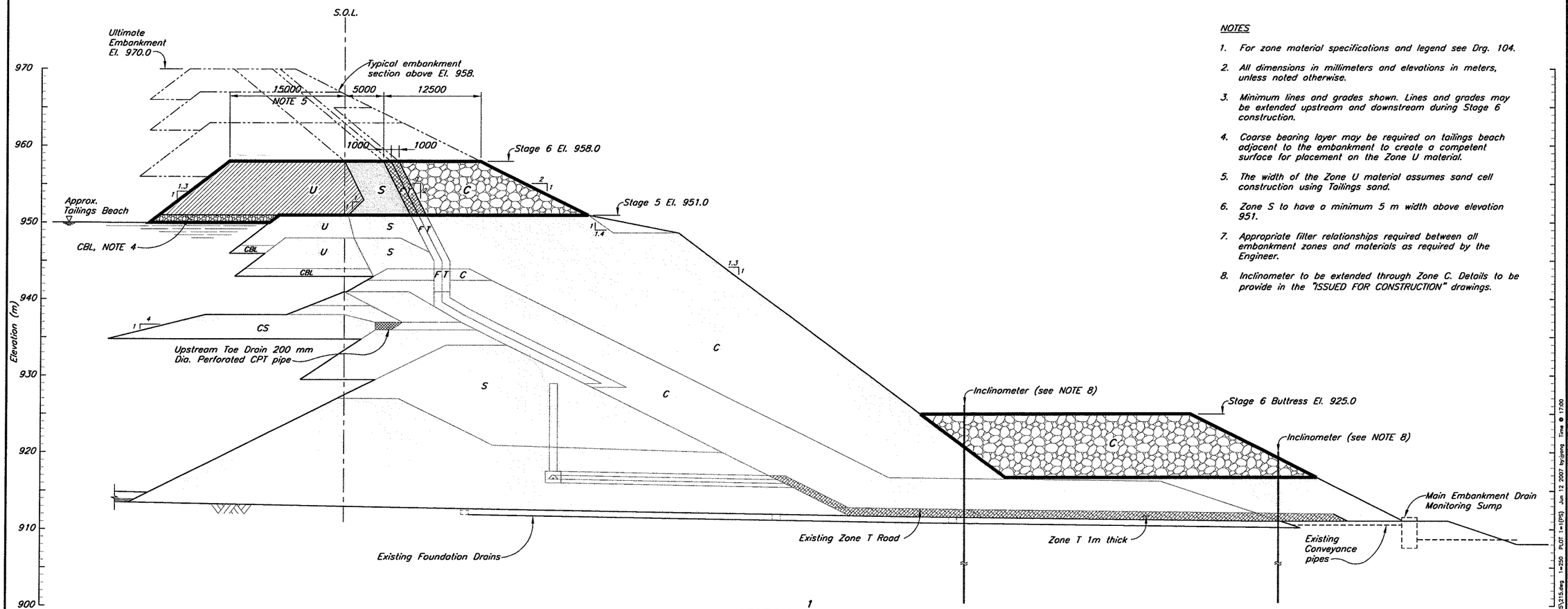

SECTION 1/210

NOTES

1. For zone material specifications and legend see Drg. 104.
2. All dimensions in millimeters and elevations in meters, unless noted otherwise.
3. Minimum lines and grades shown. Lines and grades may be extended upstream and downstream during Stage 6 construction.
4. Coarse bearing layer may be required on tailings beach adjacent to the embankment to create a competent surface for placement on the Zone U material.
5. The width of the Zone U material assumes sand cell construction using Tailings sand.
6. Zone S to have a minimum 5 m width above elevation 951.
7. Appropriate filter relationships required between all embankment zones and materials as required by the Engineer.
8. Inclinometer to be extended through Zone C. Details to be provide in the "ISSUED FOR CONSTRUCTION" drawings.

Scale 5 0 5 10 15 20 25 m

NOT FOR CONSTRUCTION

REFERENCE DRAWINGS	
DRG. NO.	DESCRIPTION
210	STAGE 6 MAIN EMBANKMENT – PLAN
104	MATERIAL SPECIFICATIONS

XREF FILE : –

REVISIONS						
REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BB	KJS

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 6 MAIN EMBANKMENT
SECTION

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/18	215	0

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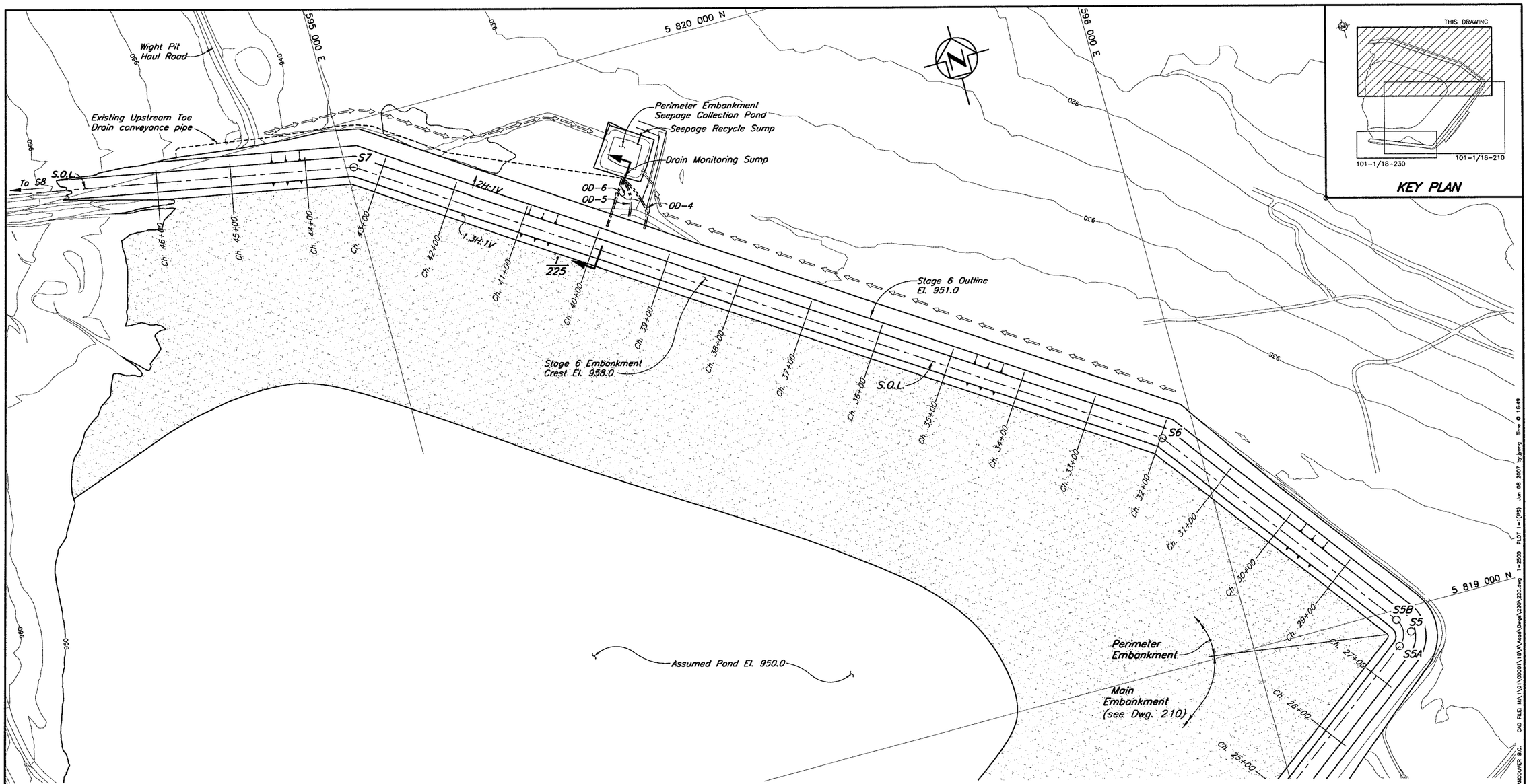
VANCOUVER B.C.



EMBANKMENT SETTING OUT POINTS			
Point	Northing	Easting	Chainage
S1	5 818 626.163	594 249.555	5+00.00
S4A	5 818 243.621	595 227.361	15+49.97
S4B	5 818 246.923	595 251.497	15+77.87
S4	5 818 238.539	595 240.350	15+63.92
S5A	5 818 951.971	596 188.906	27+50.83
S5B	5 818 986.958	596 193.873	28+00.78
S5	5 818 966.983	596 208.866	27+75.80
S6	5 819 304.035	595 955.881	31+97.23
S7	5 819 939.748	595 010.249	43+36.69
S8	5 820 053.034	594 396.471	49+60.83

NOTES

1. Topography from 2004 flyover.
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.

Scale 50 0 50 100 150 200 250 m

NOT FOR CONSTRUCTION

REFERENCE DRAWINGS	
DRG. NO.	DESCRIPTION
240	STAGE 6 PERIMETER EMBANKMENT – UPSTREAM TOE DRAIN
230	STAGE 6 SOUTH EMBANKMENT – PLAN
225	STAGE 6 PERIMETER EMBANKMENT – SECTIONS
210	STAGE 6 MAIN EMBANKMENT – PLAN

REVISIONS						
REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS						
REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BS	LJG

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA L.J. GRIMMETT 25493 — 31 Aug 07

Knight Piésold CONSULTING

MOUNT POLLEY MINING CORPORATIOIN

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY STAGE 6 PERIMETER EMBANKMENT PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/18	220	0

XREF FILE: Topo200A Features

CAD FILE: M:\1\01\00091\18\A\Acad\Dwgs\220\220.dwg 1=2500 PLOT 1=1(PS) Jun 08 2007 by:jhong Time: 16:49

VANCOUVER B.C.

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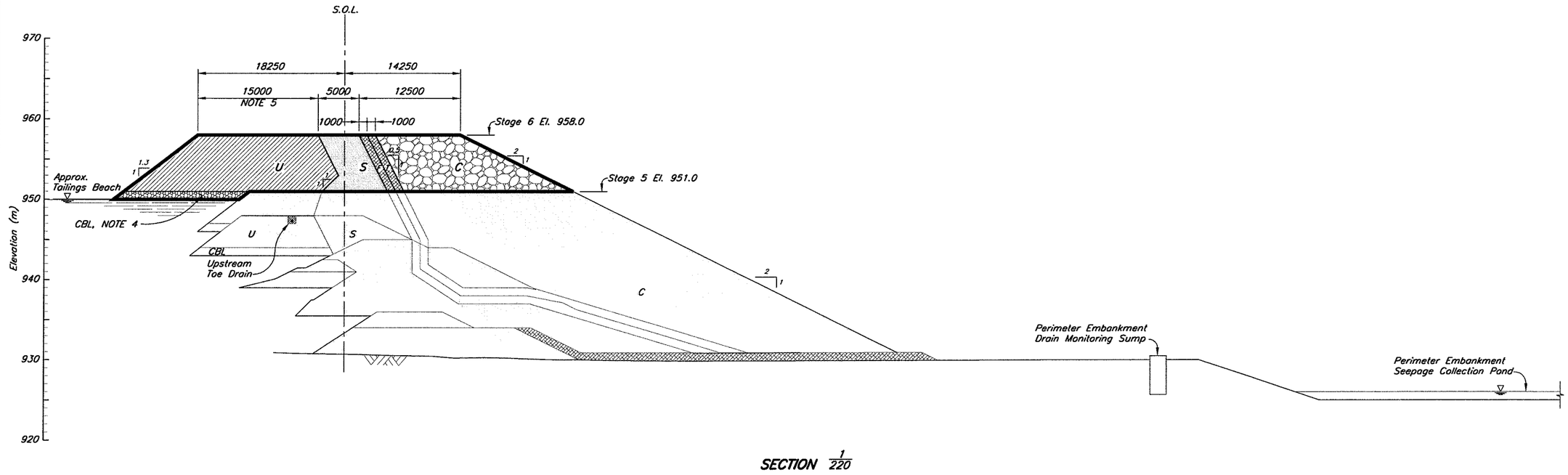

SECTION 1/220

NOTES

1. *For zone material specifications and legend see Drg. 104.*
2. *All dimensions in millimetres and elevations in metres, unless noted otherwise.*
3. *Minimum lines and grades shown. Lines and grades may be extended upstream and downstream during Stage 6 construction.*
4. *Coarse bearing layer may be required on tailings beach adjacent to the embankment to create a competent surface for placement of the Zone U material.*
5. *The width of the Zone U assumes sand cell construction using Tailings sand.*
6. *Zone S have a minimum 5 m width above elevation 951.*
7. *Appropriate filter relationships required between all embankment zones and materials as required by the Engineer.*

Scale 5 0 5 10 15 20 25 m

NOT FOR CONSTRUCTION

DRG. NO.	DESCRIPTION
226	STAGE 6 – PERIMETER EMBANKMENT – DETAIL
220	STAGE 6 – PERIMETER EMBANKMENT – PLAN
104	STAGE 6 – MATERIAL SPECIFICATIONS

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BB	LJG

REVISIONS

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA L.J. GALAMBOS 25493 18/07

Knight Piésold CONSULTING

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 6 – PERIMETER EMBANKMENT
SECTION

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/18	225	0

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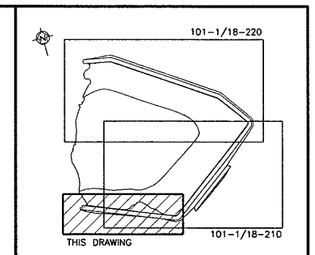
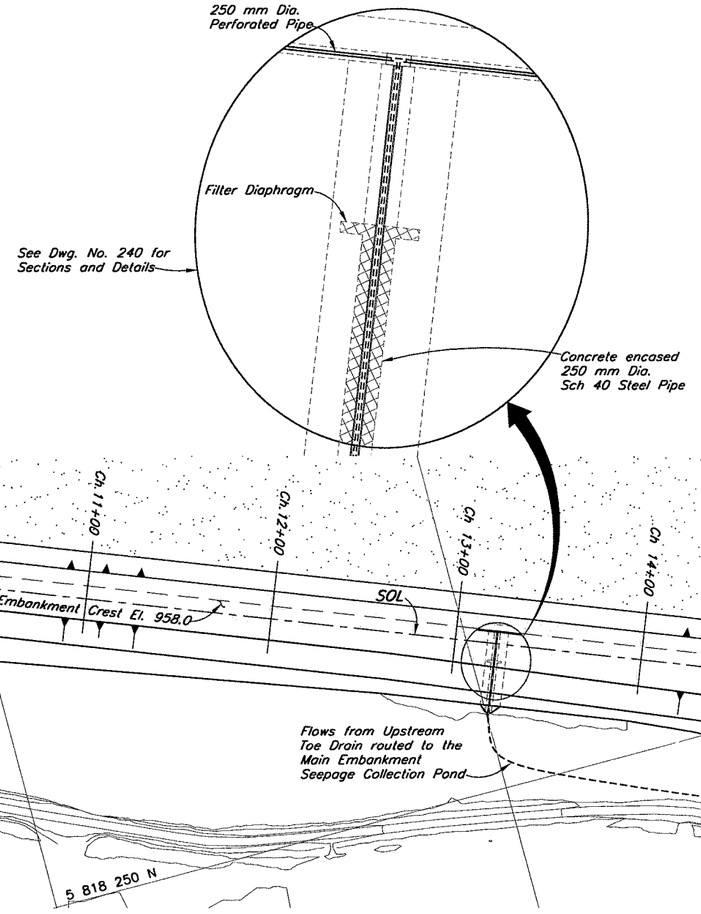
VANCOUVER B.C.



KEY PLAN



PLAN

Scale 30 0 30 60 90 120 150 m

NOT FOR CONSTRUCTION

NOTES

1. Topography from 2004 flyover.
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.

DRG. NO.	DESCRIPTION
235	STAGE 6 SOUTH EMBANKMENT – SECTIONS
220	STAGE 6 PERIMETER EMBANKMENT – PLAN
210	STAGE 6 MAIN EMBANKMENT – PLAN
104	STAGE 6 TAILINGS EMBANKMENT – MATERIAL SPECIFICATIONS

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	[illegible]	[illegible]

REVISIONS

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA L.J. GALBRAITH 25493 Jun 12/07

Knight Piésold CONSULTING

MOUNT POLLEY MINE CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 6 SOUTH EMBANKMENT
PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/18	230	0

XREF FILE: -
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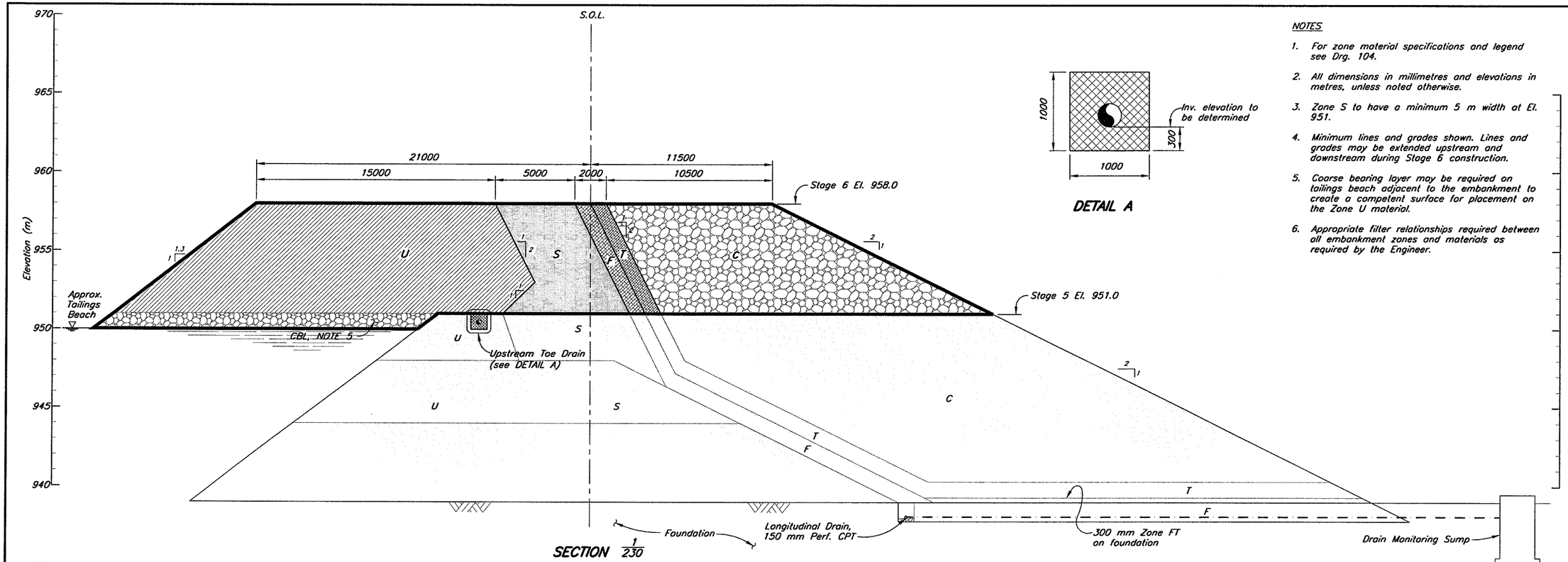
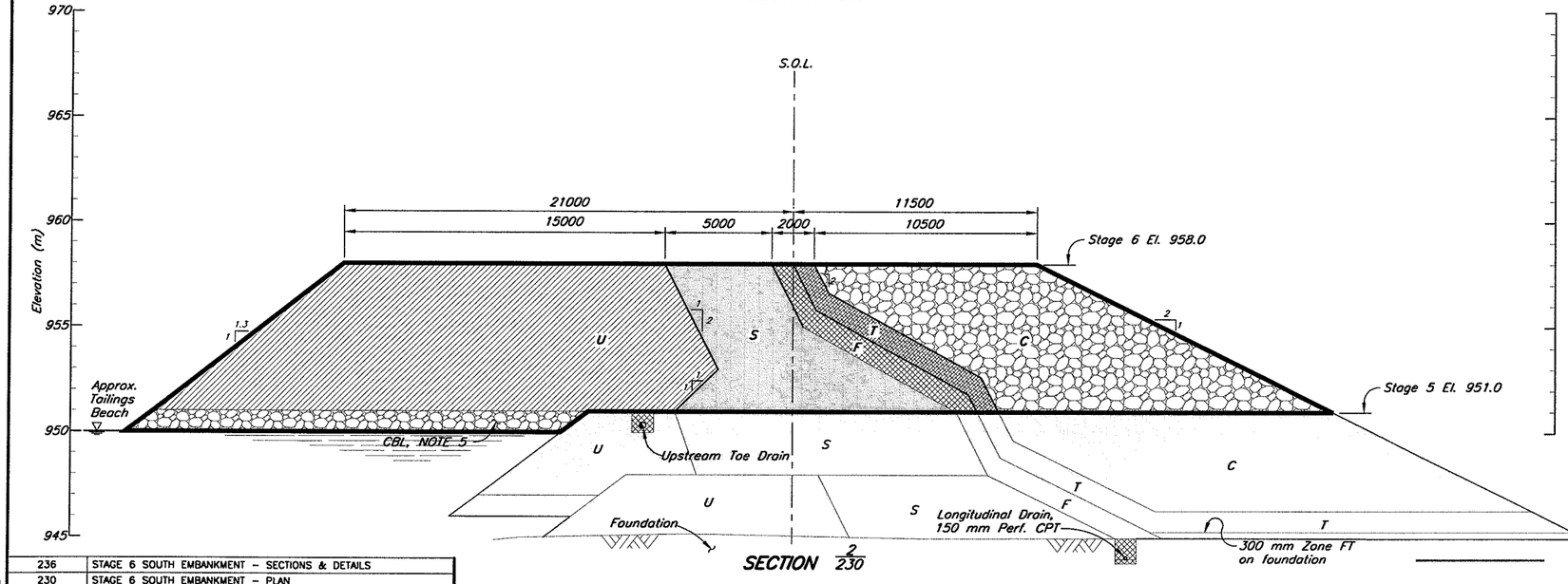


SECTION 1/230

DETAIL A

NOTES

1. For zone material specifications and legend see Drg. 104.
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Zone S to have a minimum 5 m width at El. 951.
4. Minimum lines and grades shown. Lines and grades may be extended upstream and downstream during Stage 6 construction.
5. Coarse bearing layer may be required on tailings beach adjacent to the embankment to create a competent surface for placement on the Zone U material.
6. Appropriate filter relationships required between all embankment zones and materials as required by the Engineer.



SECTION 2/230

Scale 2.5 0 2.5 5 7.5 10 12.5 m

NOT FOR CONSTRUCTION

DRG. NO.	DESCRIPTION
236	STAGE 6 SOUTH EMBANKMENT – SECTIONS & DETAILS
230	STAGE 6 SOUTH EMBANKMENT – PLAN
104	STAGE 6 TAILINGS EMBANKMENT – MATERIAL SPECIFICATIONS

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BB	KHS

REVISIONS

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA L.J. GRIFFITH 25493 — Jun 15/07

Knight Piésold CONSULTING

MOUNT POLLEY MINING CORPORATION

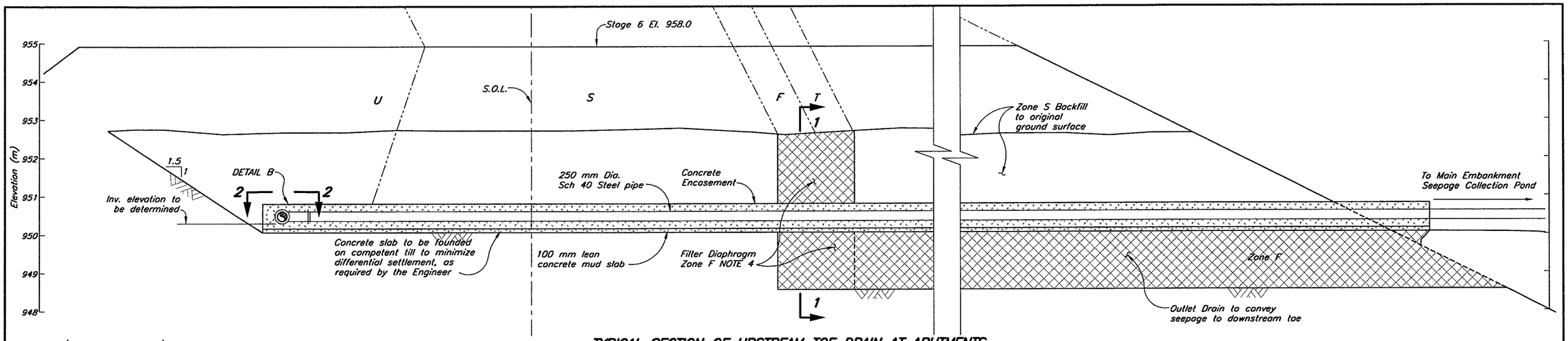
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 6 SOUTH EMBANKMENT
SECTIONS

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/18	235	0

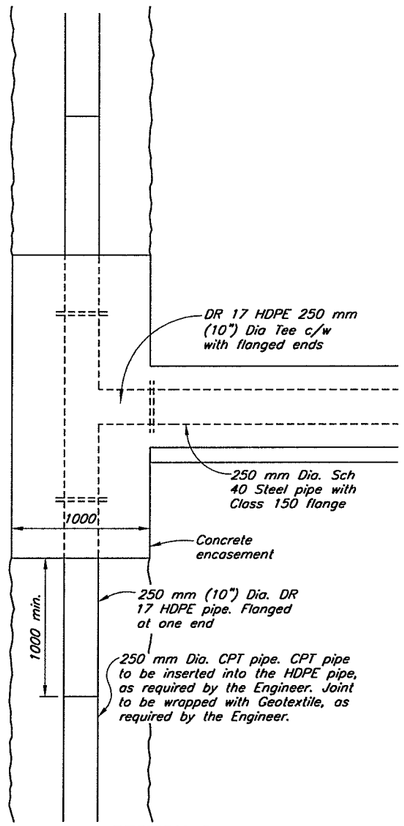
XREF FILE : –

VANCOUVER B.C. CAD FILE: M:\1\01\00001\18\A\Acad\Dwgs\235\235.dwg 1=125 PLOT 1=1(PS) Jun 15 2007 tryjong Time ● 15:51



TYPICAL SECTION OF UPSTREAM TOE DRAIN AT ABUTMENTS

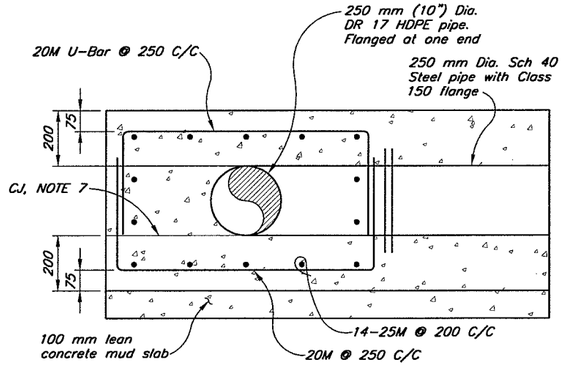
Scale A



SECTION 2

UPSTREAM TOE DRAIN TO OUTLET DRAIN CONNECTION

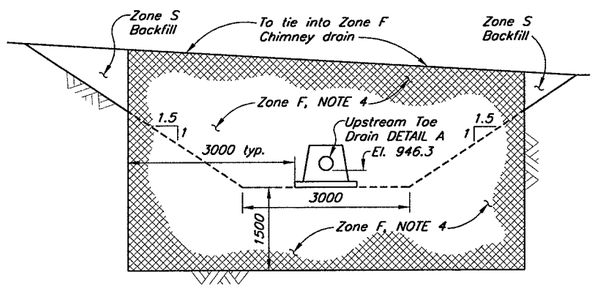
Scale C



DETAIL B – UPSTREAM TOE DRAIN

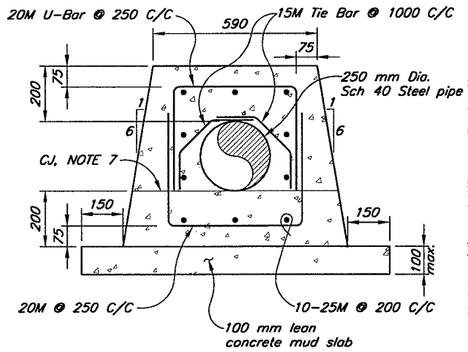
CONCRETE ENCASEMENT REINFORCEMENT DETAILS

Scale B



SECTION 1 – FILTER DIAPHRAGM

Scale A



DETAIL A – OUTLET DRAIN

CONCRETE ENCASEMENT REINFORCEMENT DETAILS

Scale B

NOTES

1. Concrete strength: Type C30–20 (30 MPa with 20 mm course aggregate).
2. Minimum concrete cover 40mm.
3. Reinforcement steel to CSA G30.18 Grade 400R.
4. Zone F to be placed and spread in maximum 300 mm thick layers and compacted as appproved by the Engineer.
5. All dimensions in millimetres and elevations in metres, unless noted otherwise.
6. Upstream Toe Drain Steel pipe and HDPE elbows to be pressure tested for 2 hours at 640 kPa (100 psi.) prior to and after encasing in concrete.
7. After casting first pour and once concrete has achieved initial set, pressure blast horizontal construction joint surface to remove all laitance and expose top surface of coarse aggregate. Do not over-blast or undercut coarse aggregate. Remove all dirt, dust, rubbish and other deleterious material from surface of construction joint prior to casting second pour.

C 0 0.5 0 0.5 1 1.5 2 m

B 0.2 0 0.2 0.4 0.6 0.8 1.0 m

A 1 0 1 2 3 4 5 m

NOT FOR CONSTRUCTION

DRG. NO.	DESCRIPTION
220	STAGE 6 PERIMETER EMBANKMENT – PLAN
125	ULTIMATE PERIMETER EMBANKMENT – SECTIONS
120	ULTIMATE PERIMETER EMBANKMENT – PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BB	

REVISIONS

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MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 6 – SOUTH EMBANKMENT
UPSTREAM TOE DRAIN
SECTIONS AND DETAILS

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/18	240	0

XREF FILE : –
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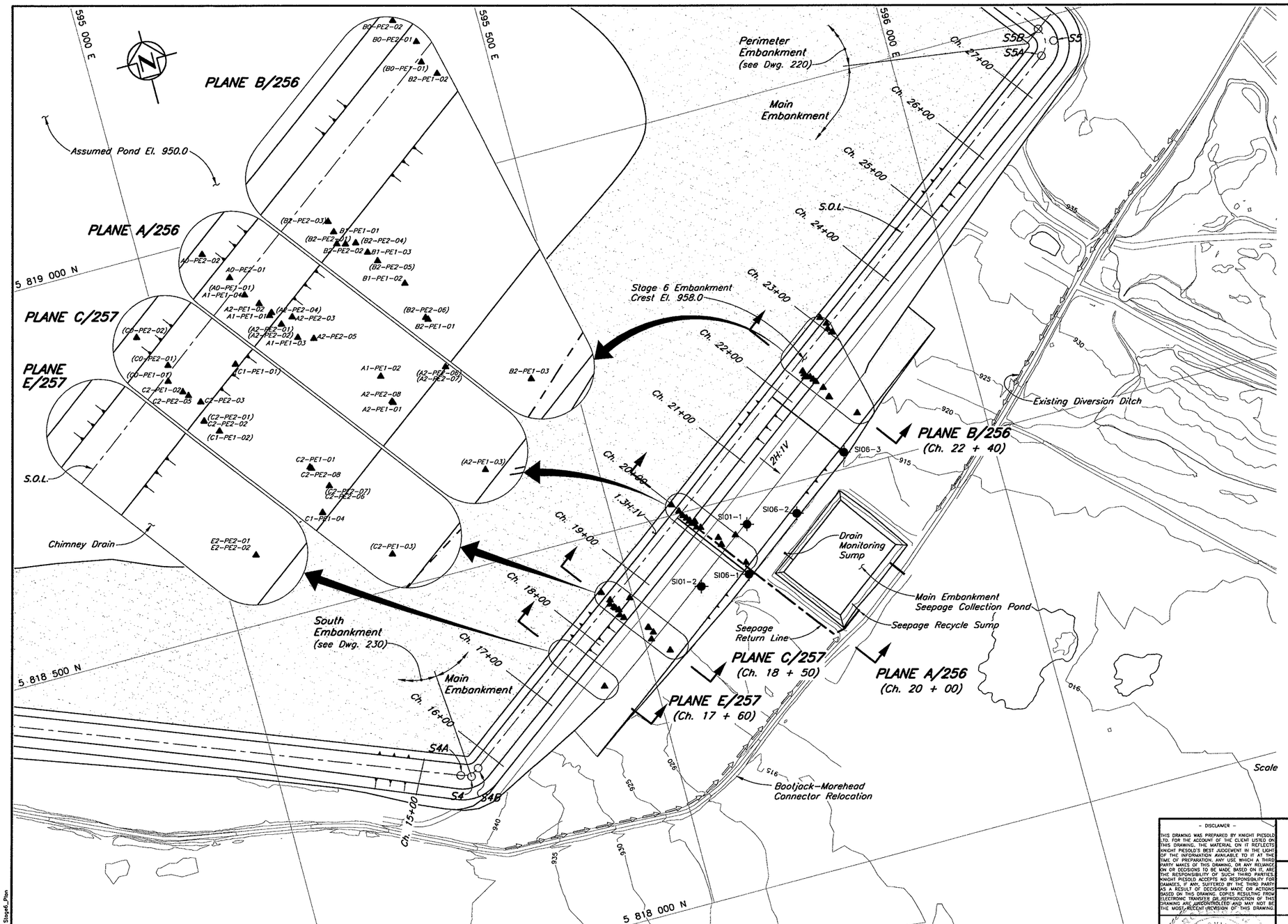

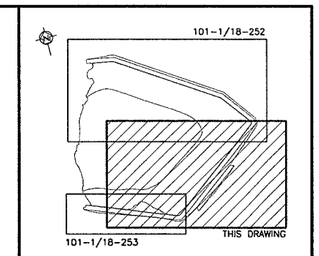

KEY PLAN

LEGEND

S106-2 Existing Inclinometer

▲B1-PE1-01 Previously installed piezometer

▲(B1-PE1-01) Piezometer no longer functioning

NOTES

1. Topography from 2004 flyover
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Proposed Stage 6 piezometer installations shown on drawings 256 to 259.
4. The Stage 5 piezometers not installed at the time this report was issued. The Instrumentation Plans and Sections will be updated for the Stage 5 Construction Report.

Scale 50 0 50 100 150 200 250 m

NOT FOR CONSTRUCTION

DRG. NO.	DESCRIPTION
230	STAGE 6 SOUTH EMBANKMENT – PLAN
220	STAGE 6 PERIMETER EMBANKMENT – PLAN
215	STAGE 6 MAIN EMBANKMENT – SECTION

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BRS	KHS

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TAILINGS STORAGE FACILITY
STAGE 6 MAIN EMBANKMENT
INSTRUMENTATION PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/18	251	0

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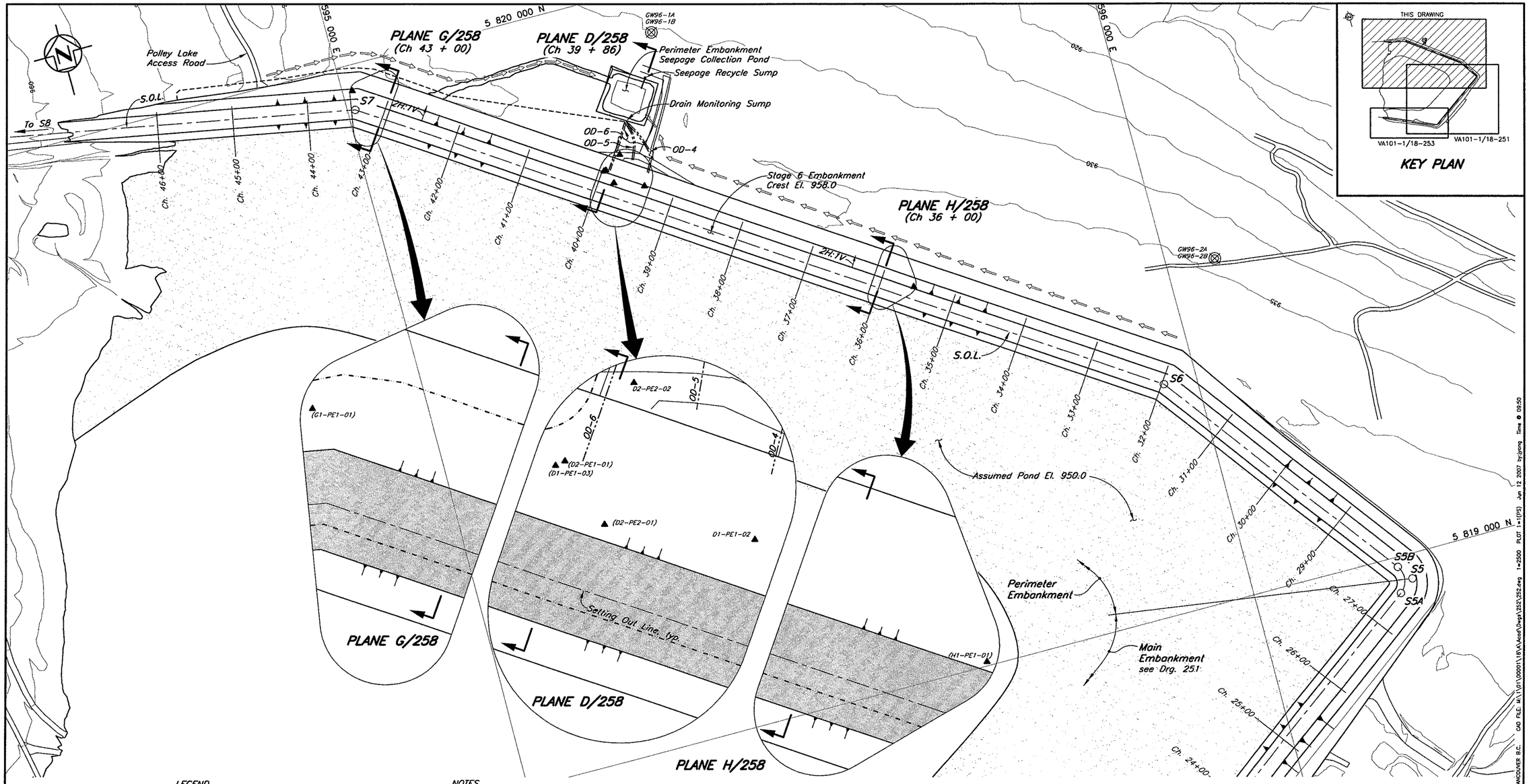

LEGEND

- GW96-9 — Groundwater Monitoring Well
- ▲ A1-PE1-01 — Previously installed Piezometer
- ▲ (A1-PE1-01) — No longer functioning Piezometer

NOTES

1. Topography from 2004 flyover
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Proposed Stage 6 piezometer installations shown on drawings 256 to 259.
4. The Stage 5 piezometers not installed at the time this report was issued. The Instrumentation Plans and Sections will be updated for the Stage 5 Construction Report.

Scale 50 0 50 100 150 200 250 m

NOT FOR CONSTRUCTION

REFERENCE DRAWINGS		
DRG. NO.	DESCRIPTION	
258	STAGE 6 INSTRUMENTATION DRAWINGS – PLANES D, G AND H	
257	STAGE 6 INSTRUMENTATION DRAWINGS – PLANES C AND E	
253	STAGE 6 SOUTH EMBANKMENT – INSTRUMENT PLAN	
251	STAGE 6 MAIN EMBANKMENT – INSTRUMENT PLAN	

REVISIONS						
REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BB	KJB

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TAILINGS STORAGE FACILITY
STAGE 6
PERIMETER EMBANKMENT– INSTRUMENTATION PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/18	252	0

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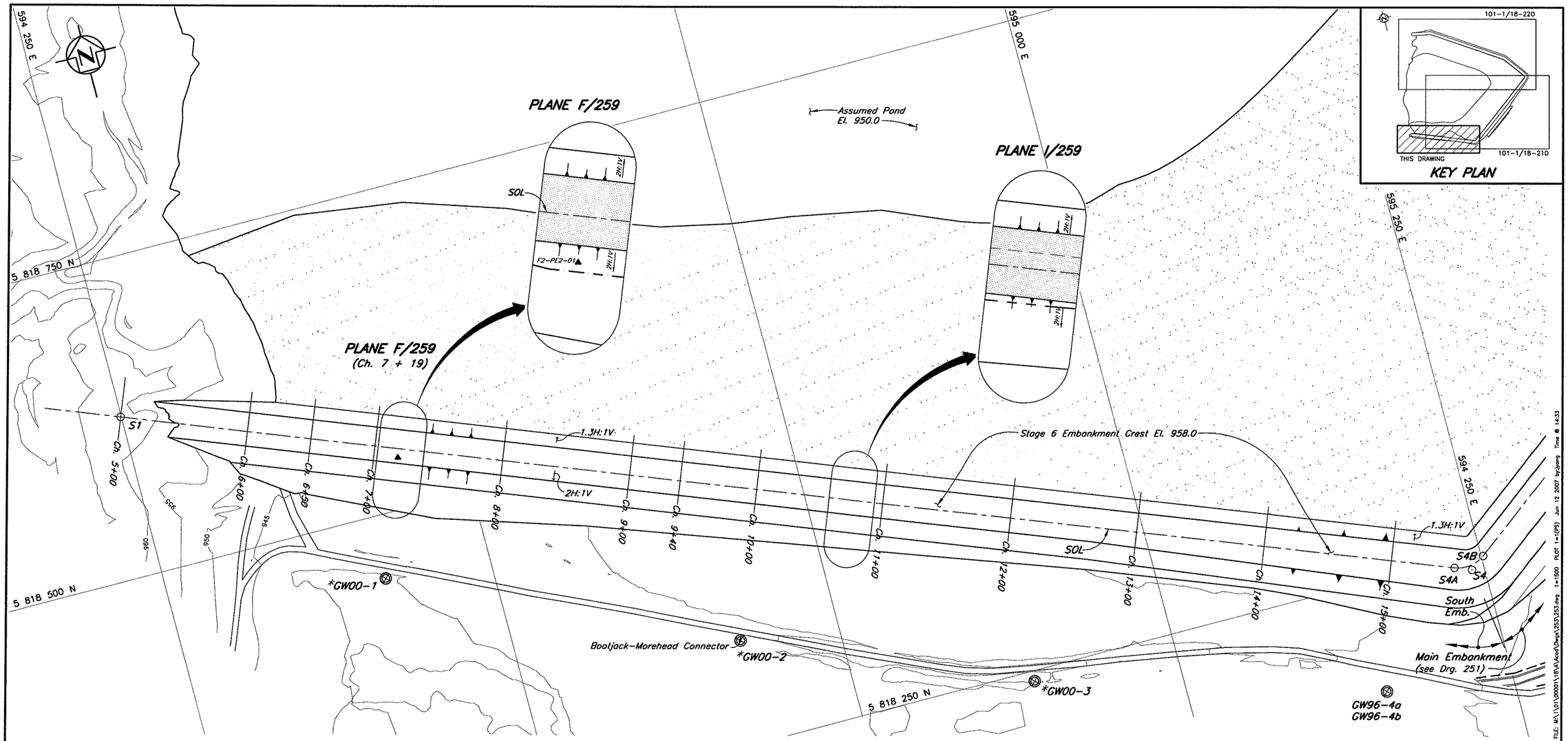

NOT FOR CONSTRUCTION

LEGEND

- ⊗ GW96-9 — Groundwater Monitoring Well
- ▲ A1-PE1-01 — Previously installed Piezometer
- ▲ (A1-PE1-01) — No longer functioning Piezometer

NOTES

1. Topography from 2004 flyover
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Proposed Stage 6 piezometer installations shown on drawings 256 to 259.
4. The Stage 5 piezometers not installed at the time this report was issued. The Instrumentation Plans and Sections will be updated for the Stage 5 Construction Report.

DRG. NO.	DESCRIPTION
259	STAGE 6 INSTRUMENTATION DRAWINGS – PLANES F AND I
252	STAGE 6 PERIMETER EMBANKMENT – INSTRUMENT PLAN
251	STAGE 6 MAIN EMBANKMENT – INSTRUMENT PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BB	EJVS

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TAILINGS STORAGE FACILITY
STAGE 6
SOUTH EMBANKMENT – INSTRUMENTATION PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/18	253	0

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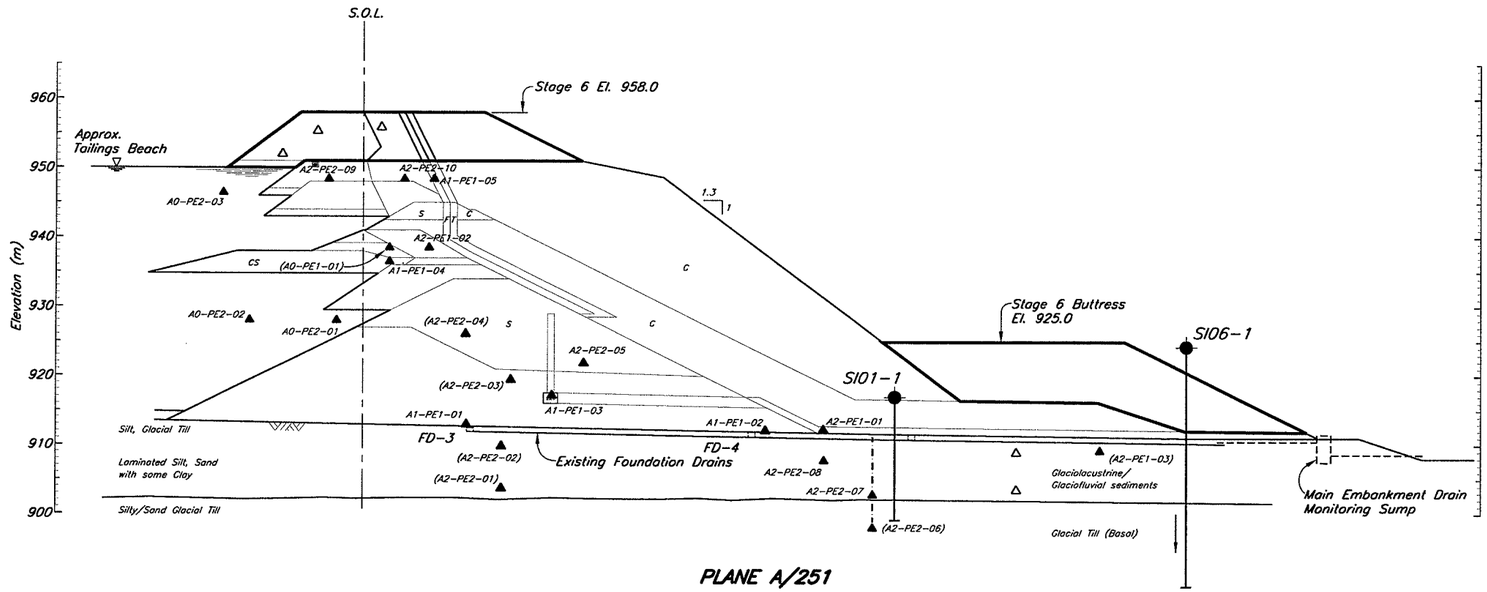
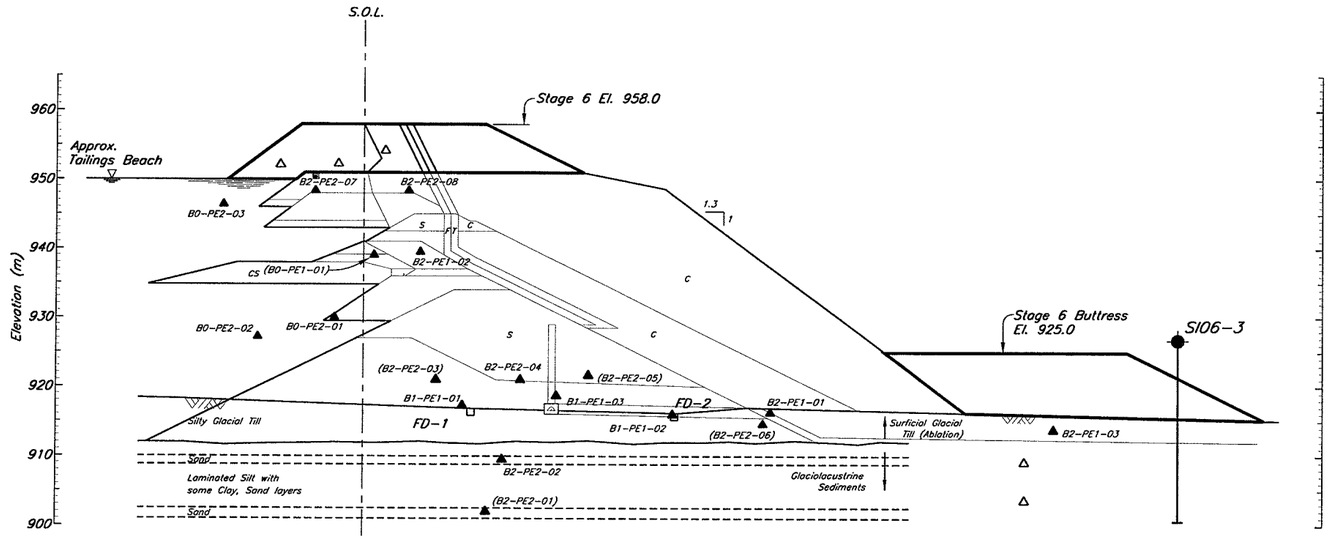


PLANE A/251



PLANE B/251

LEGEND

- Plane I.D. (A, B etc.)
- Area (0-Tailings, 1-Drain, 2-Embankment)
- A0-PE1-01 — Number I.D.
- Pressure Rating (1-Low, 2-High)
- Type of Instrumentation (PE-Piezometer electric, SM-Survey Monument)

A2-PE2-03 ▲ Previously installed Piezometer

△ Proposed Stage 6 Piezometers

Scale 8 0 8 16 24 32 40 m

NOT FOR CONSTRUCTION

REFERENCE DRAWINGS	
DRG. NO.	DESCRIPTION
210	TSF – MAIN EMBANKMENT – PLAN
257	STAGE 6 INSTRUMENTATION DRAWINGS – PLANES C AND E

XREF FILE: -

REVISIONS						
REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS						
REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BB	DJS

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 6 – INSTRUMENTATION
MAIN EMBANKMENT
PLANES A AND B

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/18	256	0

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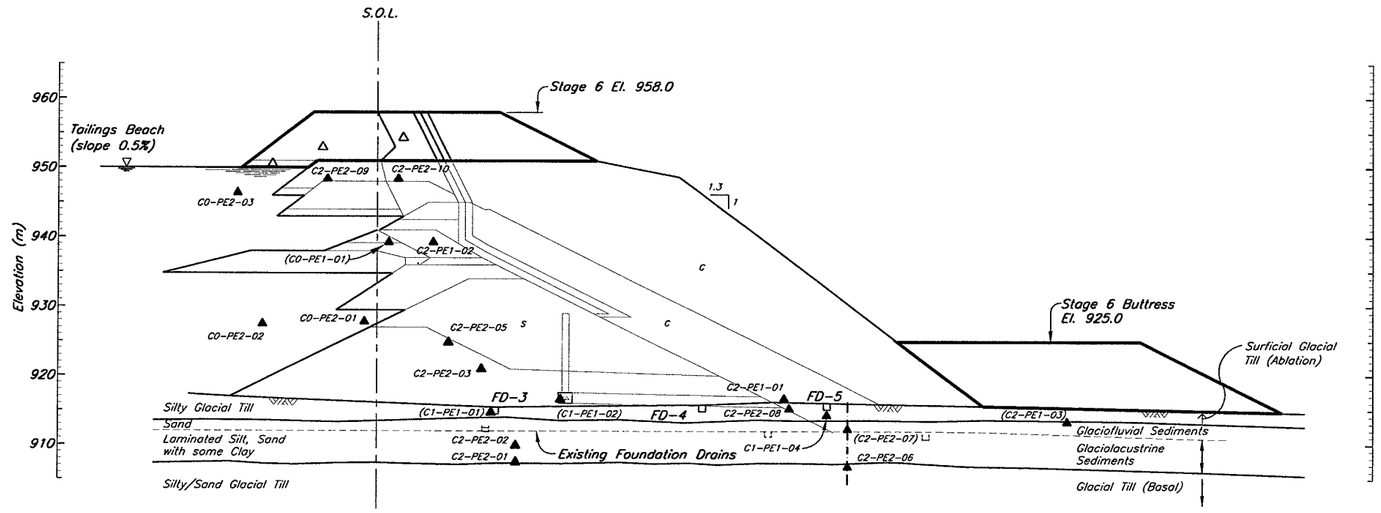
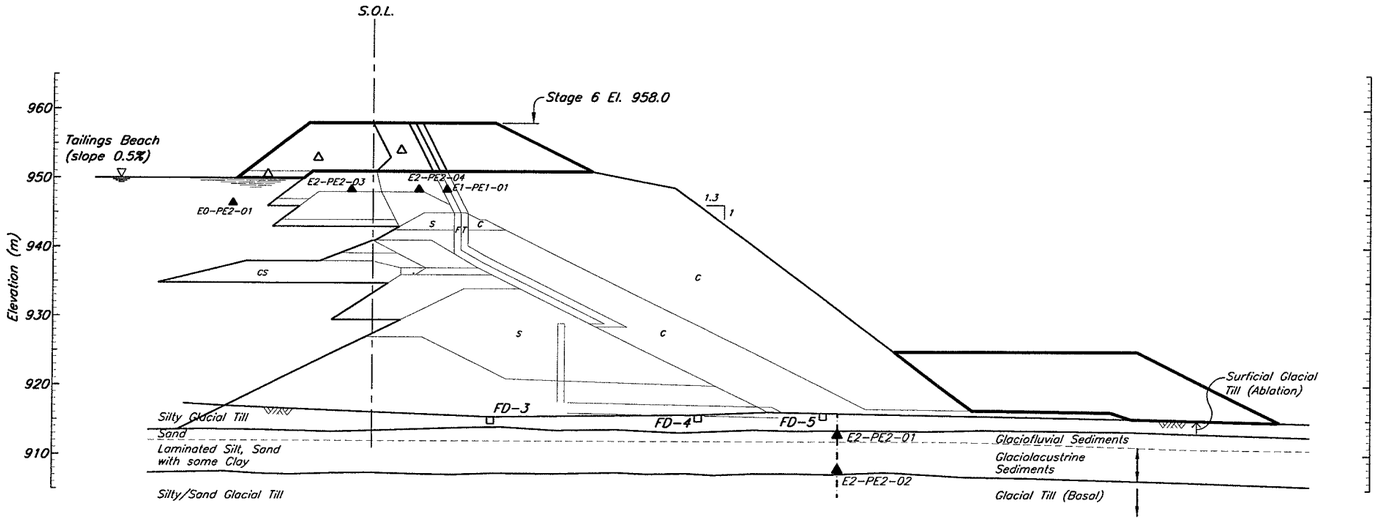


PLANE C/251



PLANE E/251

LEGEND

Plane I.D. (A, B etc.)
Area (0–Tailings, 1–Drain, 2–Embankment)
A0–PE1–01 — Number I.D.
Pressure Rating (1–Low, 2–High)
Type of Instrumentation (PE–Piezometer electric, SM–Survey Monument)

A2–PE2–03 ▲ Previously installed Piezometer

△ Proposed Stage 6 Piezometers

Scale 8 0 8 16 24 32 40 m

NOT FOR CONSTRUCTION

DRG. NO.	DESCRIPTION
256	STAGE 6 INSTRUMENTATION DRAWINGS – PLANES A AND B
210	TSF – PERIMETER EMBANKMENT – PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BB	RJS

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TAILINGS STORAGE FACILITY
STAGE 6 – INSTRUMENTATION
MAIN EMBANKMENT
PLANES C AND E

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/18	257	0

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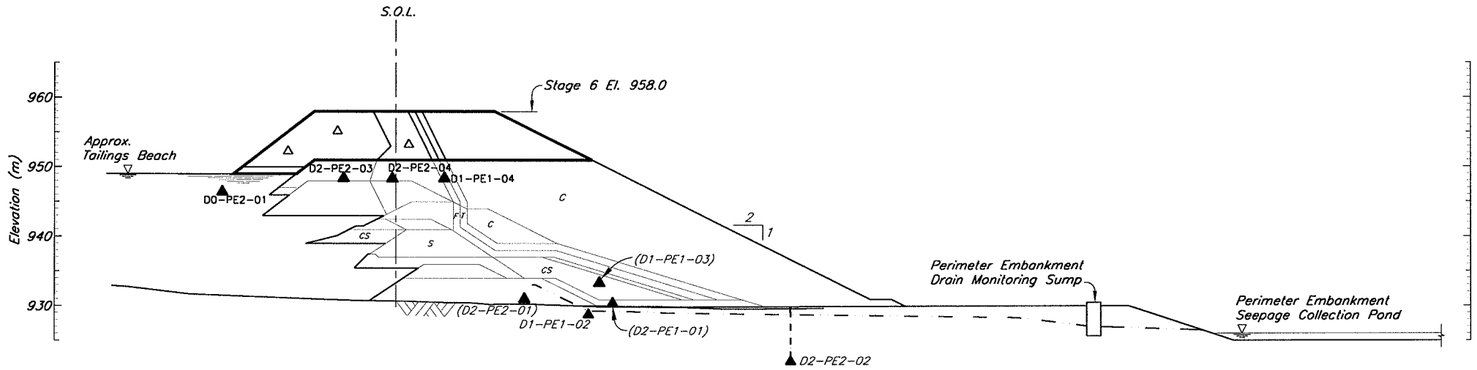
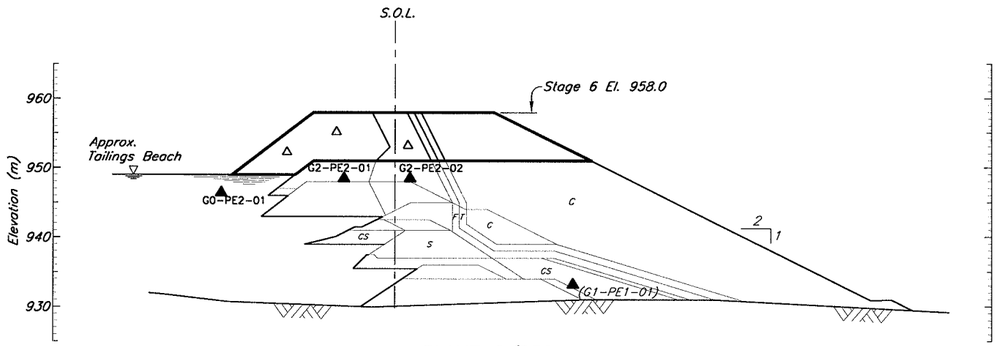
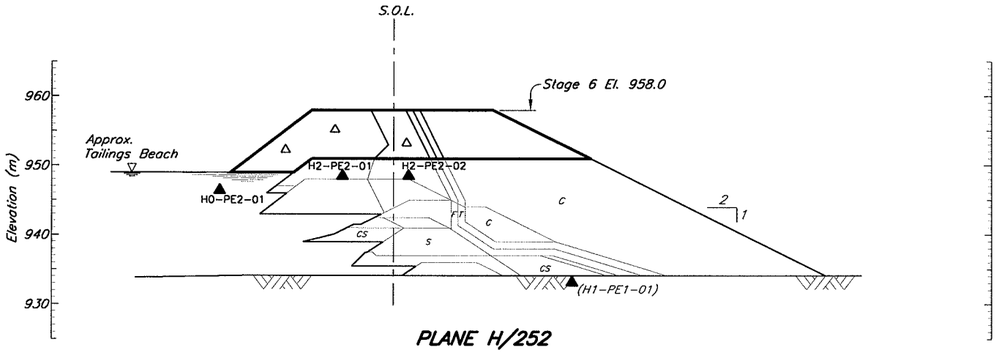


PLANE D/252



PLANE G/252



PLANE H/252

LEGEND

- Plane I.D. (A, B etc.)
- Area (0-Tailings, 1-Drain, 2-Embankment)
- A0-PE1-01 — Number I.D.
- Pressure Rating (1-Low, 2-High)
- Type of Instrumentation (PE-Piezometer electric, SM-Survey Monument)

A2-PE2-03 ▲ Previously installed Piezometer

△ Proposed Stage 6 Piezometers

Scale 8 0 8 16 24 32 40 m

NOT FOR CONSTRUCTION

VANCOUVER B.C. CAD FILE: M:\1\01\00001\18\A\Acad\Dwgs\258\258.dwg 1=400 PLOT 1=1(PS) Jan 08 2007 bryjeong Time ● 13:09

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DRG. NO.	DESCRIPTION
256	STAGE 6 INSTRUMENTATION DRAWINGS – PLANES A AND B
220	STAGE 6 PERIMETER EMBANKMENT – PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BB	KHS

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MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 6 – INSTRUMENTATION
PERIMETER EMBANKMENT
PLANES D, G AND H

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
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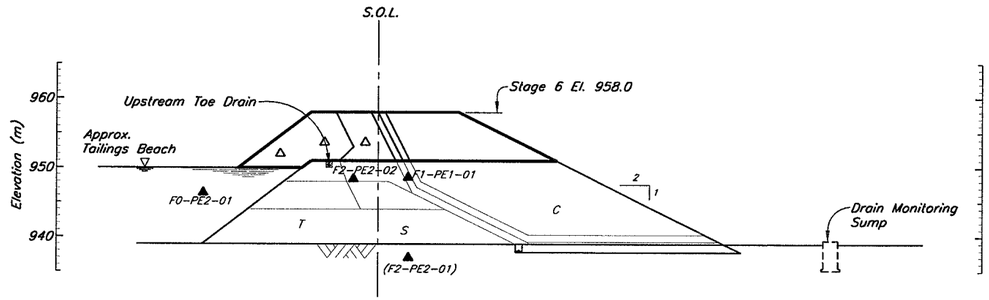
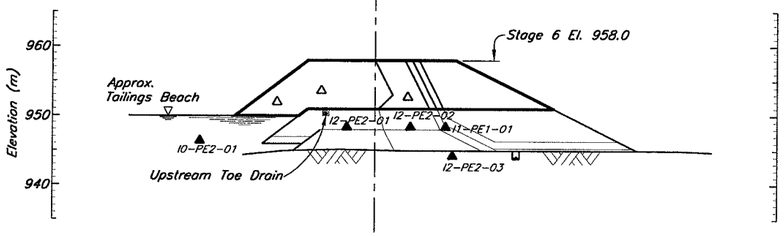


PLANE F/253



PLANE I/253

LEGEND

Plane I.D. (A, B etc.)
Area (0-Tailings, 1-Drain, 2-Embankment)
A0-PE1-01 — Number I.D.
Pressure Rating (1-Low, 2-High)
Type of Instrumentation (PE-Piezometer electric, SM-Survey Monument)

A2-PE2-03 ▲ Previously installed Piezometer

△ Proposed Stage 6 Piezometers

Scale 8 0 8 16 24 32 40 m

NOT FOR CONSTRUCTION

DRG. NO.	DESCRIPTION
256	STAGE 6 INSTRUMENTATION DRAWINGS - PLANES A AND B
230	STAGE 6 SOUTH EMBANKMENT - PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	08JUN'07	ISSUED FOR STAGE 6 PERMITTING	LJG	JY	BB	KJB

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Knight Piésold CONSULTING

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 6 - INSTRUMENTATION
SOUTH EMBANKMENT
PLANES F AND I

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/18	259	0

XREF FILE : -

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VANCOUVER B.C.

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APPENDIX A

OVERVIEW OF 2006 DAM SAFETY REVIEW

(Pages A1 to A4)

APPENDIX A

OVERVIEW OF 2006 DAM SAFETY REVIEW

General

A Dam Safety Review (DSR) for the Tailings Storage Facility at Mount Polley Mine was completed by AMEC in October 2006. The results of the DSR were issued in a report to Imperial Metals Corporation in December 2006. The DSR indicated that "the three embankments that impound the Mount Polley Tailings are well designed and well constructed entities from a dam safety perspective. Each of the three dams has demonstrated similar good performance behaviour with little indication of potential concerns in the future provided the design, continuance of past construction practices, and inspection procedures remain in place".

However, there were a few operational issues raised in the DSR, as discussed below:

1. *Operating criteria for pond and beach management are presently at odds with the optimal dam seepage performance and stated closure objectives, with the latter issue being of greatest concern.*

A beach width of at least 20 m is to be maintained along the abutments of the embankments (where the embankment contacts natural ground) and at least 10 m width elsewhere to keep the pond away from the embankments. Knight Piésold has recommended that MPMC develop a plan and schedule to enable the minimum target beach widths to be re-established within a 2 week period should they be infringed upon. MPMC shall increase the frequency of measurements to at least once per week for embankment instrumentation systems (piezometers and foundation drains - flow rate and turbidity) during any periods that ponded water encroaches within the minimum target beach widths.

The use of tailings sand is currently being used as upstream Zone U construction material. Zone U forms the upstream shell zone immediately adjacent to Zone S (low permeability core zone) and is required to provide upstream support of the Zone S material during modified centerline construction. The sand cell construction method involves discharging tailings into constructed cells along the upstream side of the embankment. Prolonged discharge of tailings from the Perimeter Embankment has resulted in the tailings pond migrating over to the Main Embankment, which has resulted in increased flows reporting to the Main Embankment upstream toe drain. MPMC has recently purchased additional HDPE pipe to facilitate the deposition of tailings from around the entire facility without having to relocate the tailings pipeline. This will allow MPMC to quickly develop tailings beaches in response to the pond encroaching on the embankments.

The current mine plan has the mine operating at 20,000 tpd for the next 8 years. It is recognized that improvements in tailings deposition will be beneficial for optimizing beach development round the facility but this is only a minor consideration for closure planning. The current tailings deposition practices are not particularly relevant for the closure plan unless one considers sudden pre-mature mine closure during the next few months which is extremely unlikely (impossible?) given current metal prices and excellent operating performance of the Mount Polley Mine. This

concern, expressed in the DSR with respect to satisfying closure objectives are not particularly relevant during the current stage of mine operations. The closure objectives for the TSF are currently under review by MPMC. The tailings pond will continue to be managed in accordance with the TSF closure objectives in the later years of the mine life.

2. *As the facility has no operating spillway, the selection of the 24-hour PMP event may not be appropriately conservative. The amount of wave induced freeboard being allowed for is likely excessive by a factor of two.*

The previous design basis required the TSF to have sufficient live storage capacity for containment of runoff from the 24-hour PMP volume of 679,000 m^3 at all times, which would result in an incremental rise in the tailings pond level of approximately 0.4 m. The 24-hour PMP allowance was in addition to regular inflows from other precipitation runoff, including the spring freshet. The TSF design also incorporated an additional allowance of 1 meter of freeboard for wave run-up, for total freeboard requirement of 1.4 m.

The design basis has been updated to include storm water freeboard for the 72-hour PMP event. The volume of water associated with the 72-hour PMP event is approximately 1,070,000 m^3, which would result in an increase in the TSF pond elevation of approximately 0.6 m. The freeboard requirement for wave run-up has been reduced to 0.7 m, for total updated freeboard requirement of 1.3 m, which is consistent with the previous freeboard requirement. However, MPMC has elected to maintain the previous freeboard requirement of at least 1.4 m for the remaining mine life. The freeboard requirement post closure will be reviewed as part of the closure and reclamation plans as they are updated.

3. *The lack of potential of the nature of pre-shearing in the glaciolacustrine foundation leads to uncertainty in terms of present and post closure stability. There is an uncertainty in the need, or lack thereof, of the closure berm.*

Knight Piésold has been studying the lacustrine unit at the Main Embankment and investigating the potential for a weak layer within this unit since the initial design of the TSF embankments. The upper portion of this unit was investigated thoroughly by Knight Piésold during the excavation of the Main Embankment Seepage Collection Pond during the initial construction program in 2006, and no evidence of a pre-shear or a weak layer within this unit was discovered. The Lacustrine unit was also investigated in 1996 (CPT drilling) and in 2001 and 2006 when the inclinometers were installed. The results of the investigations indicate that the lacustrine unit is typically comprised of very stiff silt and clay. However, this does not prove that a pre-sheared or weak layer could not exist within the unit and it is therefore prudent to incorporate suitable contingency features in the design of the embankment. This has resulted in the installation of five inclinometers (of which four are still functioning) at the Main Embankment and the inclusion of a downstream closure buttress. The inclinometers are read on a regular basis during construction programs with an inclinometer probe and no deviations have been observed to date. The results of the readings for the inclinometers are shown in Appendix B.

The Stage 6 design of the TSF includes provisions to ensure stability in the event that a weak layer exists in the lacustrine material. A buttress at the Main Embankment has been included in the design to ensure that the integrity of the Main Embankment is not compromised by a

potentially weak layer in the lacustrine unit, even though there is no direct evidence that indicates that such a feature is present.

A study comparing the drained residual strength to the clay content, liquid limit, and effective normal stress was completed by Stark and Eid (1995). The results of the study indicate that the residual strength of a material with a clay content ranging from 25 to 50%, with a liquid of 40%, and an effective normal stress of 700 kPa is in the order of 24 degrees. Samples of the lacustrine material have recently been collected for direct shear testing, as recommended in the DSR, however the testing had not been completed at the time this report was issued. The results of the direct shear tests will be reviewed once received and the design of the Stage 6 buttress will be adjusted if required.

4. *The hazard classification of the TSF embankments is "HIGH" and is based on the economic and social loss category. The classification based on the Loss of Life and Environmental Loss Categories is LOW. The DSR recommends that the hazard classification be reviewed assuming that the owner's costs are not included.*

The classification of the TSF has been assessed using the Canadian Dam Association and the British Columbia Dam Safety Regulation guidelines. These guidelines look at the consequences of failure and consider life safety, economic and social losses, and environmental and cultural losses. The life safety category considers the potential for multiple loss of life after ascertaining the degree of development within the inundation area. The economic and social loss category considers damage to infrastructure, public and commercial facilities that are in and beyond the inundation area. This includes damage to railways, highways, powerlines, residences etc. The environmental and cultural loss considers damage to fish habitat at the regional, provincial, and national level, wildlife habitat, including water quality, and unique landscapes or sites of cultural significance.

Previous assessments of the TSF have resulted in a "HIGH" hazard classification (or consequence category) based on the economic and social loss category. The classification for the life safety and environmental and cultural loss categories is "LOW", as there is low potential for loss of life, the inundation area is typically undeveloped, and there is unlikely to be loss or significant deterioration of provincially or nationally important fish habitat. However, the estimated costs associated with repairing any damage to the TSF, loss of service to the mine, and the potential economic impact on Imperial Metals, could exceed $1,000,000, which placed the TSF into the "HIGH" economic and social losses category under the British Columbia Dam Safety Regulation guidelines.

The hazard classification of the TSF was discussed with MPMC and it was agreed that the owner's costs should not be included in the classification of the TSF embankments. The hazard classification for the TSF embankments has therefore been reduced to "LOW", based on the Canadian Dam Association and the British Columbia Dam Safety Regulation guidelines.

The maximum design earthquake (MDE) for the TSF with a LOW hazard classification is the 1 in 1000 year event. This corresponds to a peak ground acceleration of 0.096, based on the 2005 National Building Code Seismic Hazard Classification.

5. *There were "about the right" number of piezometers installed in the embankment dams, however there is nothing in the way of much redundancy and any lost instrument locations need to be re-established with a new installation.*

A total of 57 vibrating wire piezometers have been installed at the TSF as of the end of the Stage 4 construction program. The piezometers are grouped into tailings, foundation, embankment fill and drain piezometers. A total of 22 piezometers were accidentally destroyed during the Stage 4 construction program, and six additional piezometers have previously stopped functioning. MPMC and Knight Piésold attempted to locate and splice the damaged piezometers and successfully repaired five of them. The number of functioning piezometers at the end of the Stage 4 construction program was 34. Additional piezometers will be installed in the tailings and embankment fill materials and tailings during the Stage 5 construction program, which is currently in progress.

No unexpected or anomalous pore pressures have been observed while monitoring the vibrating wire piezometers during the TSF construction programs. The timeline plots for the piezometers on planes A through I are provided in Appendix A. The timeline plots indicate that the pore pressures increased slightly in piezometers A2-PE2-03, B2-PE2-03, and B2-PE1-02, which are fill piezometers installed in the Zone S glacial till. These pore pressure increases were expected as these piezometers have shown similar trends in previous construction programs where the pore pressures have increased during fill placement activities and subsequently decreased following the construction programs as the pore pressures dissipate. The pore pressures have also increased in the piezometers installed in the tailings, which is a direct result of the increase in elevation of the tailings pond. There has been no increase in the pore pressures in the foundation piezometers.

Although a number of piezometers are no longer functioning at the TSF, replacing all of them is not practical nor considered necessary at this time as there are functioning piezometers in the vicinity of most that were damaged. However, five of the damaged piezometers were foundation piezometers at the Main Embankment, where there are slight artesian conditions (less than 3.0 m). Additional piezometers will be installed in the Main Embankment foundation materials during Stage 6 to offset those that are no longer functioning. The foundation piezometers at the Main Embankment will have a trigger level of 15 m above ground, which corresponds to the elevated pore pressure that reduces the factor of safety to 1.1.

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APPENDIX B

INSTRUMENTATION MONITORING

(Pages B1 to B12)

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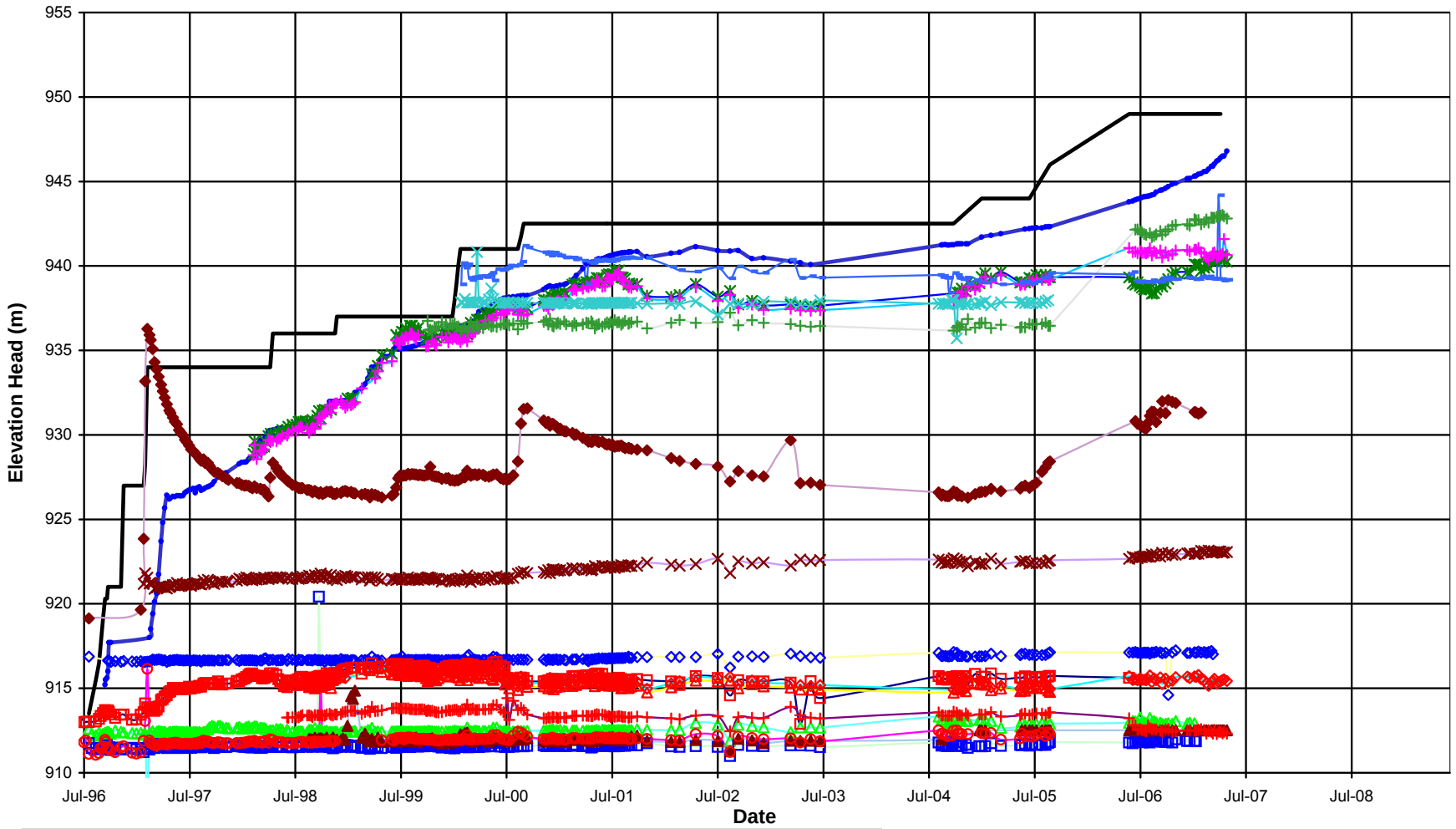
Rev'd May/30/07



Note:
1. Piezometers in parenthesis no longer functioning.
2. Figure does not show the Stage 5 and Stage 6 piezometers as they have yet to be installed.

Rev 0 - Issued with Stage 6 Design Report

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
PLANE A PIEZOMETERS
GRAPH OF ELEVATION HEAD vs. TIME

Knight Piésold CONSULTING

PROJECT NO.	REF. NO.	REV.
VA101-1/18	1	0

FIGURE B-1

AMEC010461_0110

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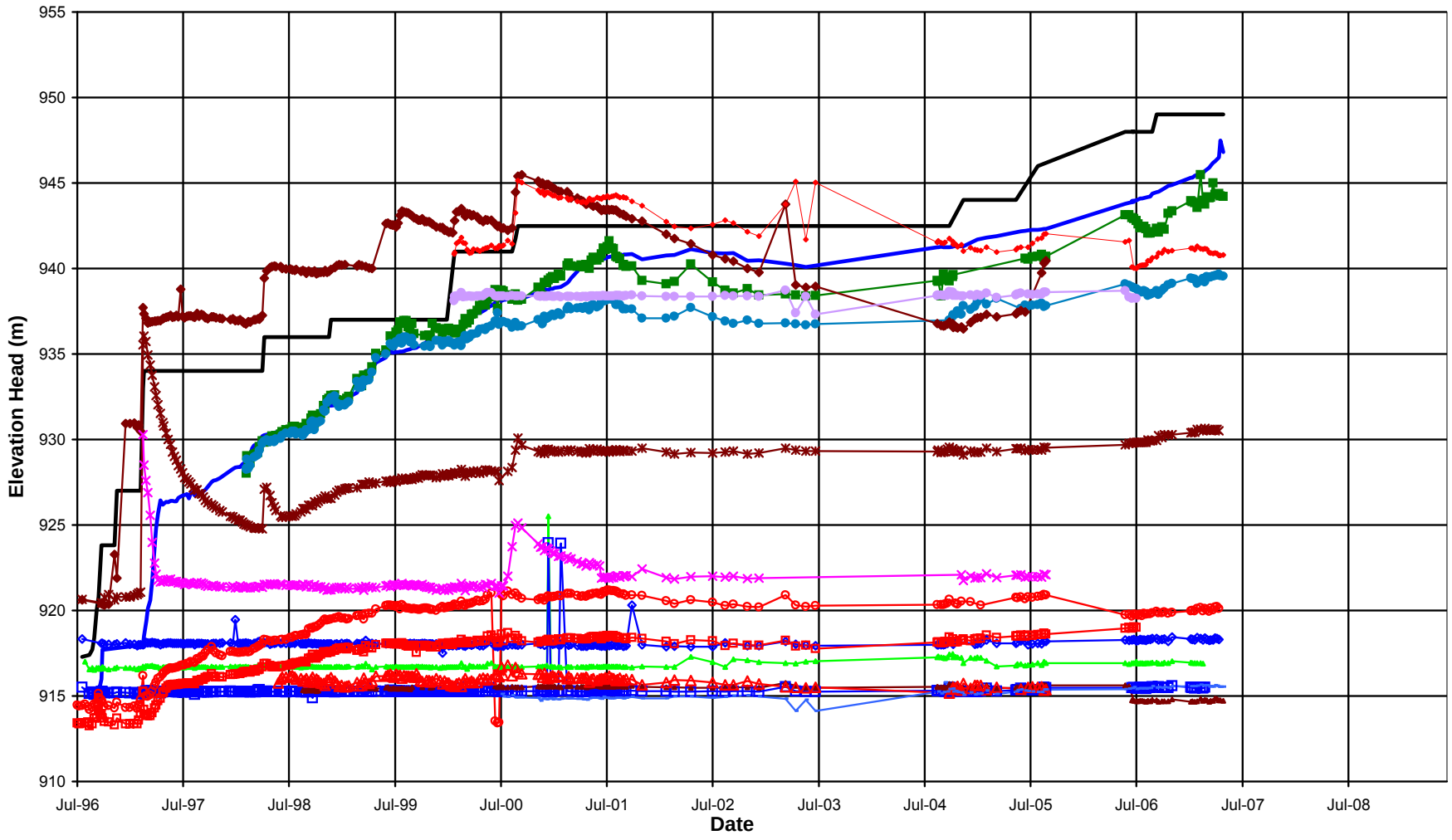
Rev'd May/30/07



Note:
1. Piezometers in parenthesis no longer functioning.
2. Figure does not show the Stage 5 and Stage 6 piezometers as they have yet to be installed.

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
PLANE B PIEZOMETERS
GRAPH OF ELEVATION HEAD vs. TIME

Knight Piésold CONSULTING

PROJECT NO.	REF. NO.	REV.
VA 101-1/18	1	0

FIGURE B-2

AMEC010461_0111

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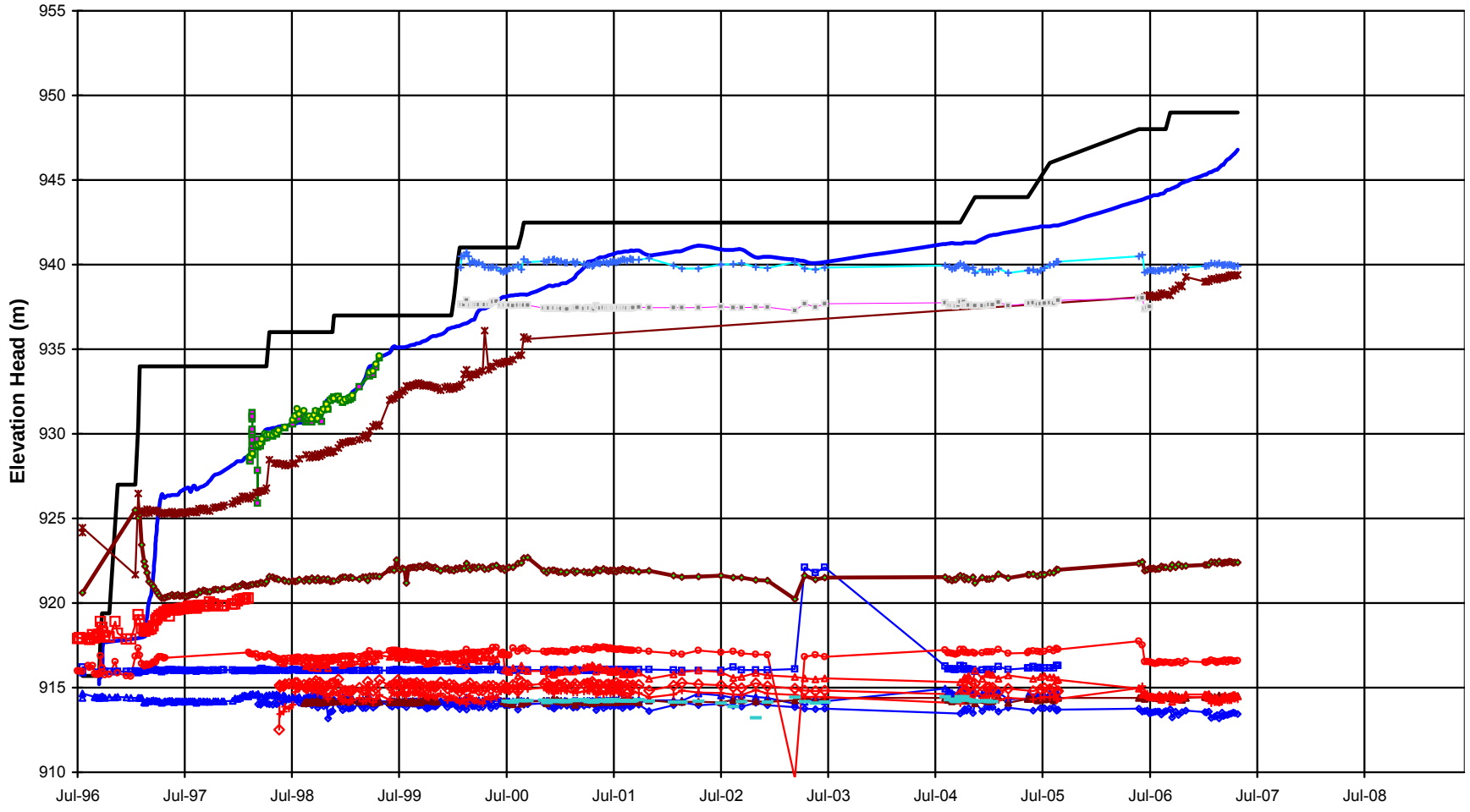
Rev'd May/30/07



Note:
1. Piezometers in parenthesis no longer functioning.
2. Figure does not show the Stage 5 and Stage 6 piezometers as they have yet to be installed.

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
PLANE C PIEZOMETERS
GRAPH OF ELEVATION HEAD vs. TIME

Knight Piésold CONSULTING

PROJECT NO.	REF. NO.	REV
VA 101-1/18	1	0

FIGURE B-3

AMEC010461_0112

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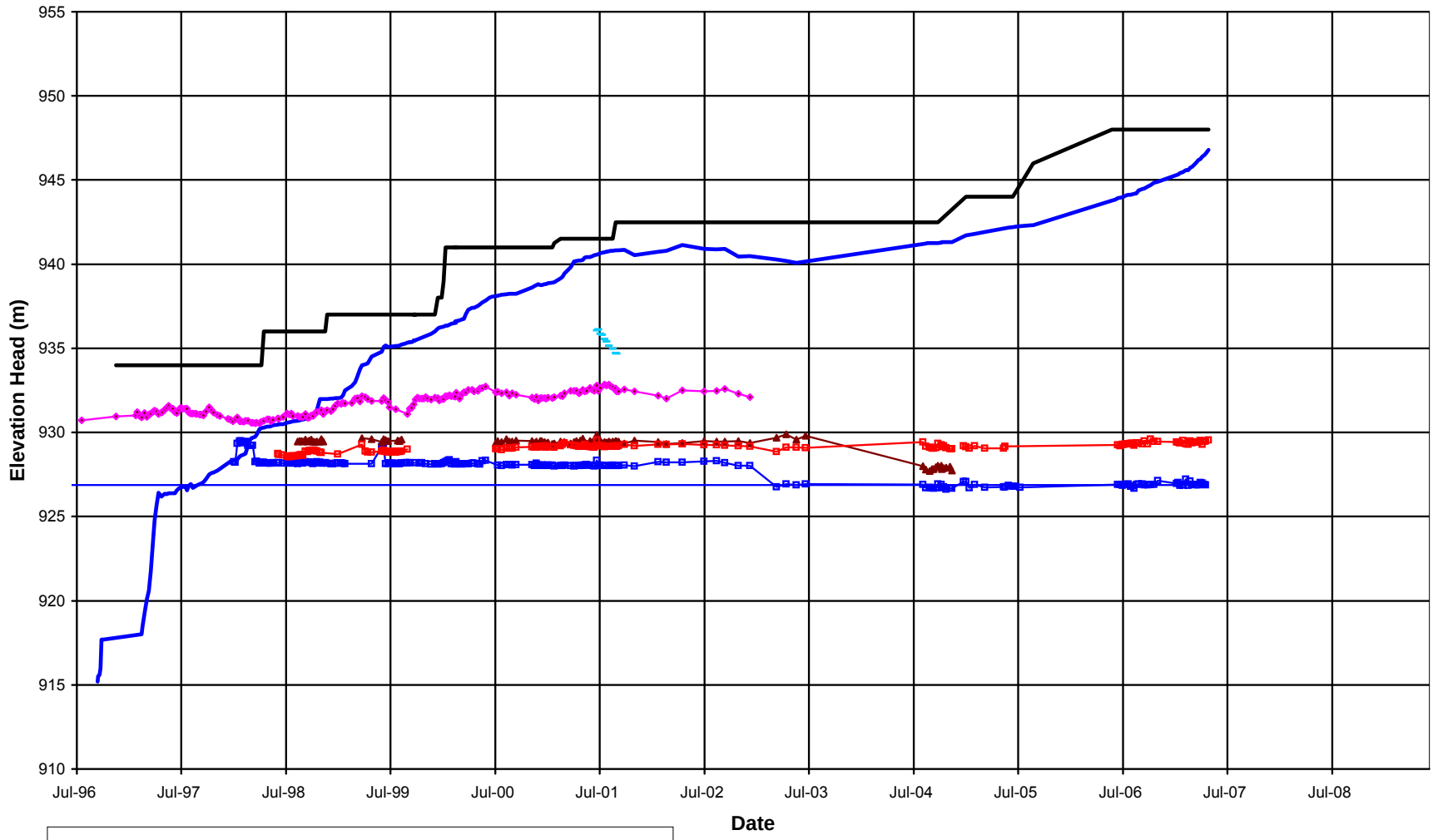
Rev'd May/30/07



Note:
1. Piezometers in parenthesis no longer functioning.
2. Figure does not show the Stage 5 and Stage 6 piezometers as they have yet to be installed.

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
PLANE D PIEZOMETERS
GRAPH OF ELEVATION HEAD vs. TIME

Knight Piésold CONSULTING

PROJECT NO.	REF. NO.	REV.
VA 101-1/18	1	0

FIGURE B-4

AMEC010461_0113

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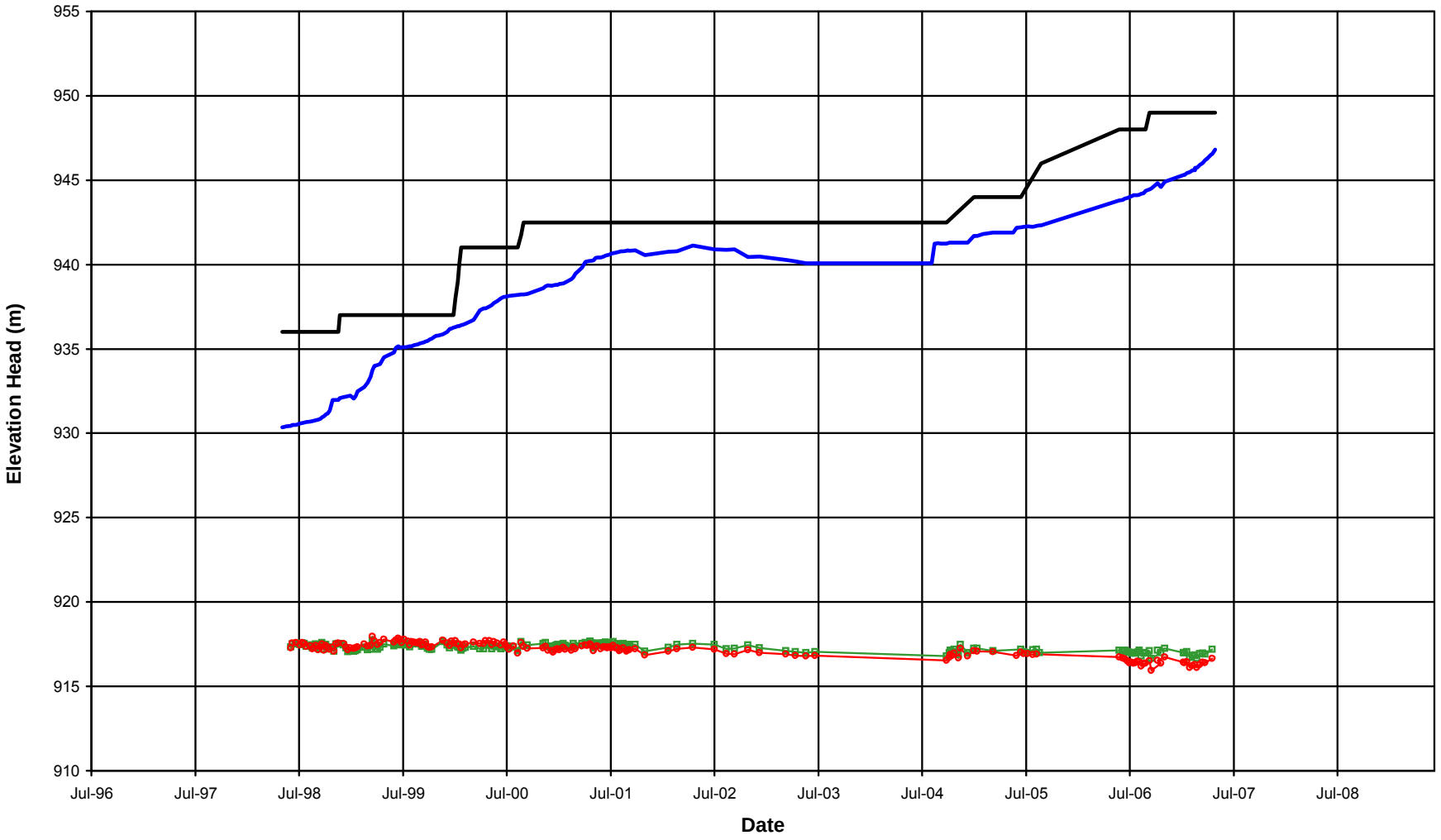

Note:
1. Piezometers in parenthesis no longer functioning.
2. Figure does not show the Stage 5 and Stage 6 piezometers as they have yet to be installed.

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
PLANE E PIEZOMETERS
GRAPH OF ELEVATION HEAD vs. TIME

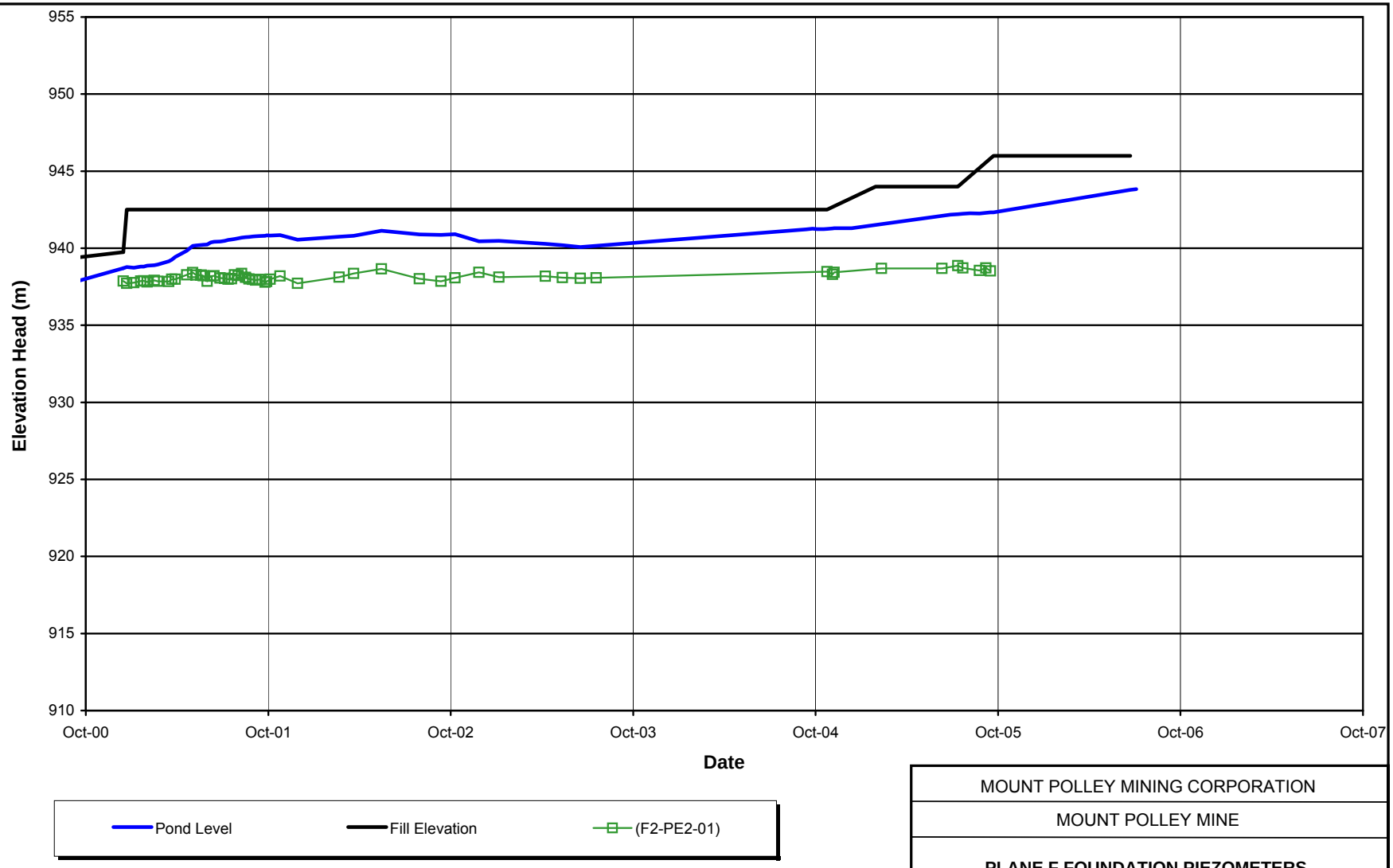
Knight Piésold CONSULTING

PROJECT NO.	REF. NO.	REV
VA 101 - 1/18	1	0

FIGURE B-5

M:\1\01\00001\10\A\Data\Piezos\TSF_Piezos\[Plane F 2005.xls] Fdn Piezos FigB2-6

Rev'd April 19 2006



Note:
1. Piezometers in parenthesis no longer functioning.
2. Figure does not show the Stage 5 and Stage 6 piezometers as they have yet to be installed.

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

PLANE F FOUNDATION PIEZOMETERS
ELEVATION HEAD vs. TIME

Knight Piésold CONSULTING

PROJECT NO.	REF. NO.	REV.
VA 101 - 1/18	1	0

FIGURE B-6

Rev 0 Rev 0 - Issued with Stage 6 Design Report

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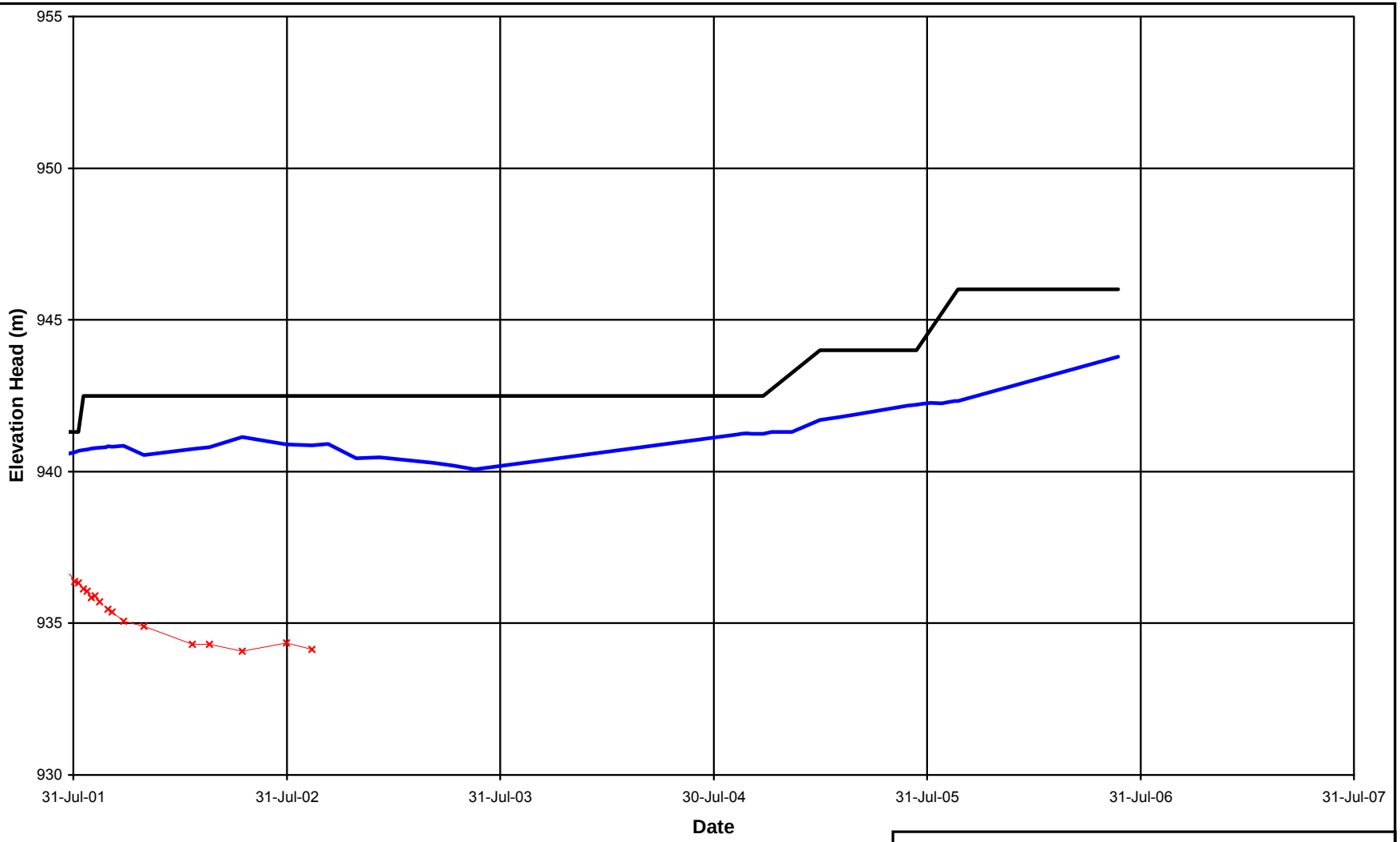
Rev'd May 31, 2007



Note:
1. Piezometers in parenthesis no longer functioning.
2. Figure does not show the Stage 5 and Stage 6 piezometers as they have yet to be installed.

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

PLANE G DRAIN PIEZOMETERS
ELEVATION HEAD vs. TIME

Knight Piésold CONSULTING

PROJECT NO.	REF. NO.	REV.
VA 101 - 1/18	1	0

FIGURE B-7

AMEC010461_0116

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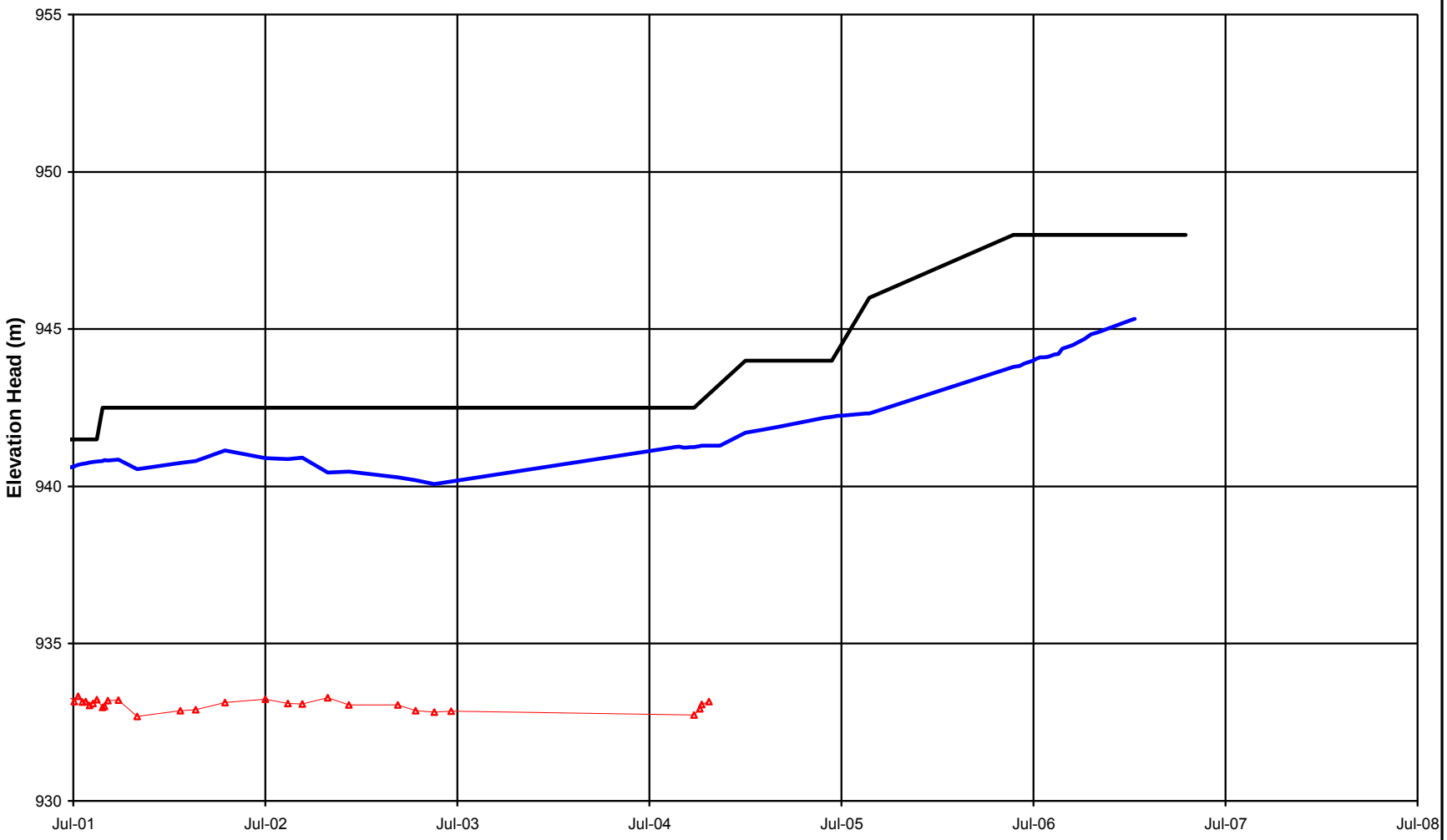
Rev'd April 19 2006



Note:
1. Piezometers in parenthesis no longer functioning.
2. Figure does not show the Stage 5 and Stage 6 piezometers as they have yet to be installed.

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

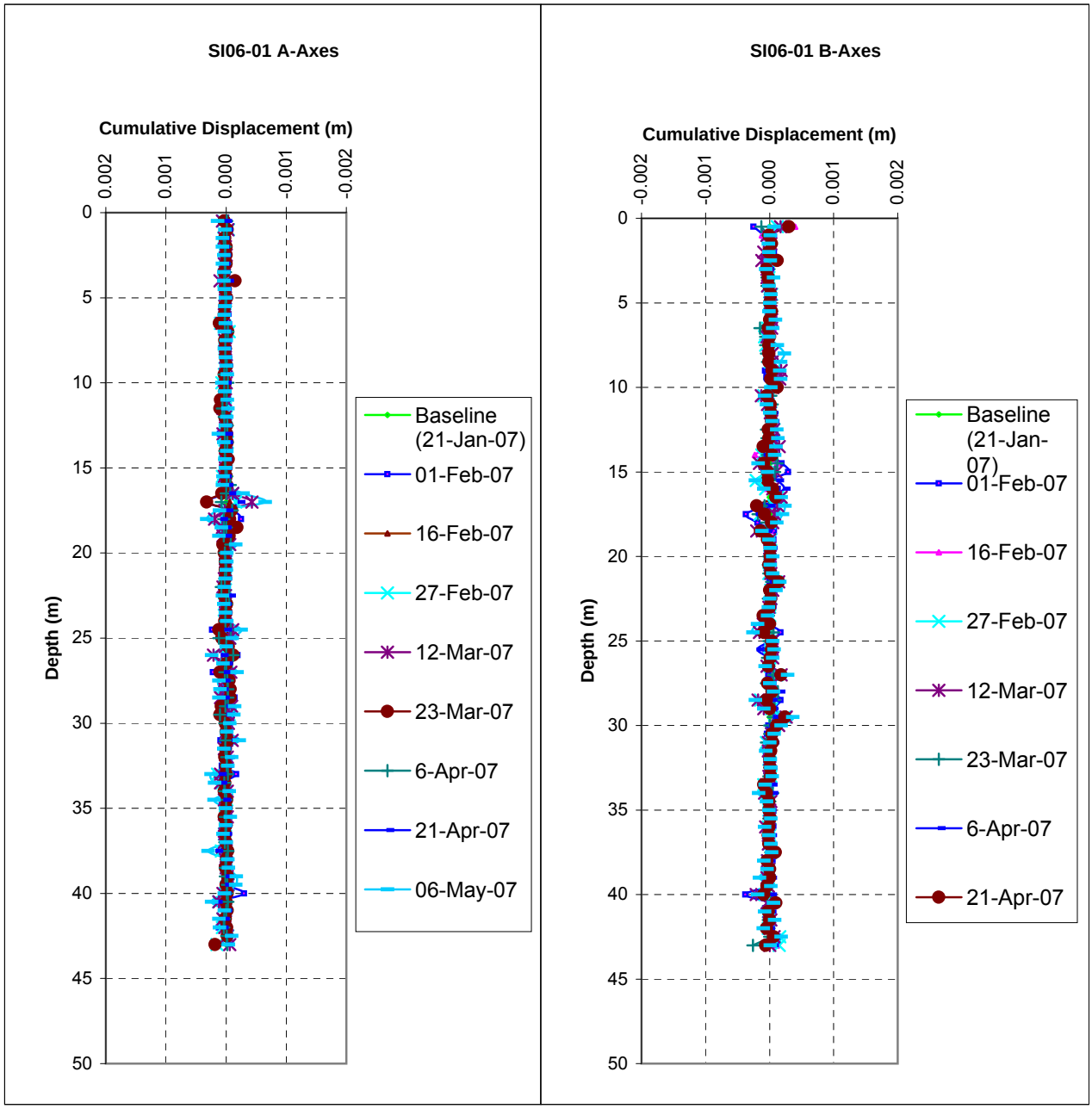
PLANE H DRAIN PIEZOMETERS
ELEVATION HEAD vs. TIME

Knight Piésold CONSULTING

PROJECT NO.	REF. NO.	REV.
VA 101 - 1/18	1	0

FIGURE B-8

AMEC010461_0117



Notes:
1) Displacement is calculated based on the initial data set.
2) New data started in Feb., 2007 as a new probe was purchased.

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
INCLINOMETER SI06-01
DEPTH VS CUMULATIVE DISPLACEMENT

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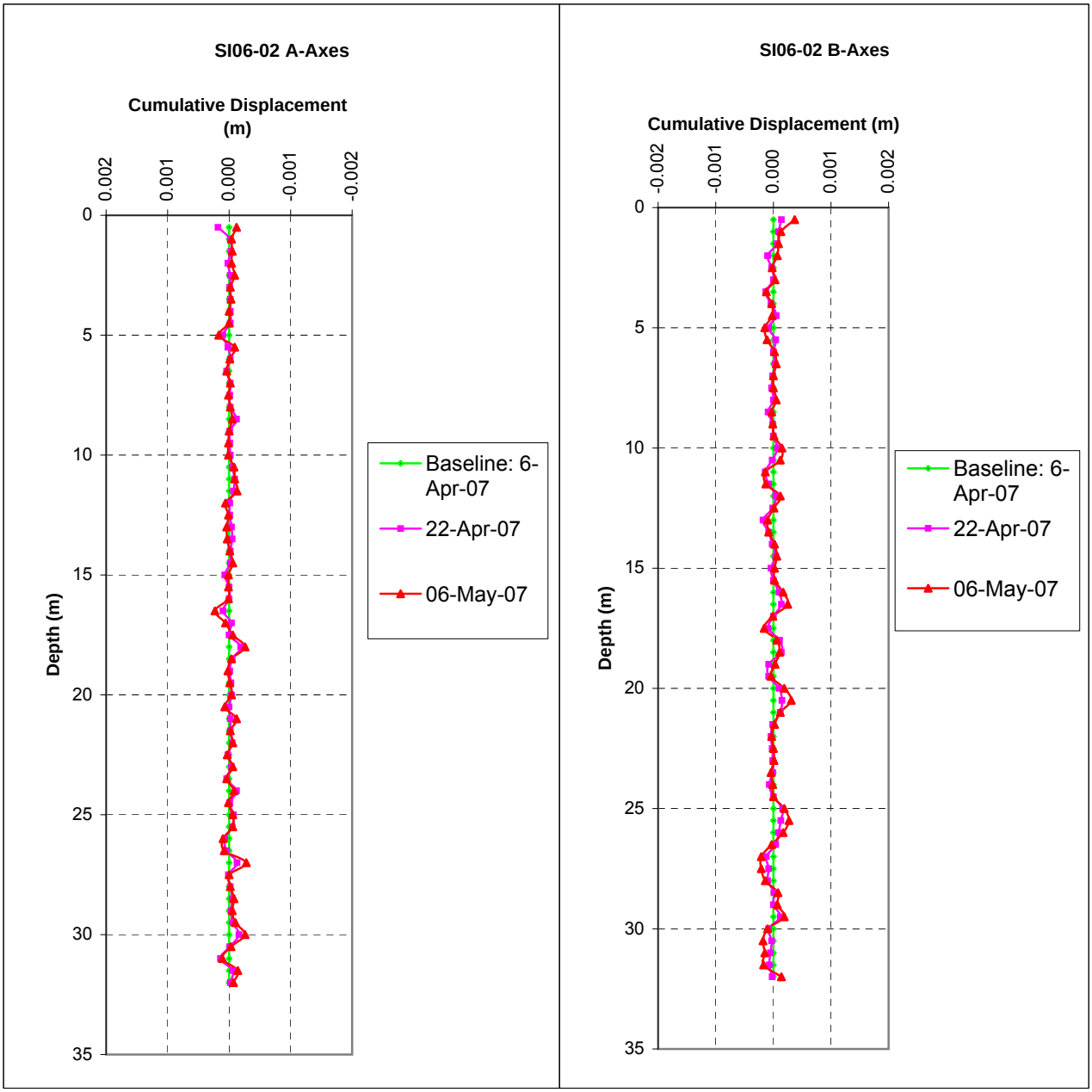
PROJECT / ASSIGNMENT NO.	REF NO.
VA101-1/18	1

FIGURE B-9

REV. 0

Rev 0 - Issued with Stage 6 Design Report



Notes:
1) Displacement is calculated based on the initial data set.
2) New data started in Apr., 2007 as a new probe was purchased.
3) SI06-02 was blocked by ice during the 06/07 winter.

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
INCLINOMETER SI06-02
DEPTH VS CUMULATIVE DISPLACEMENT

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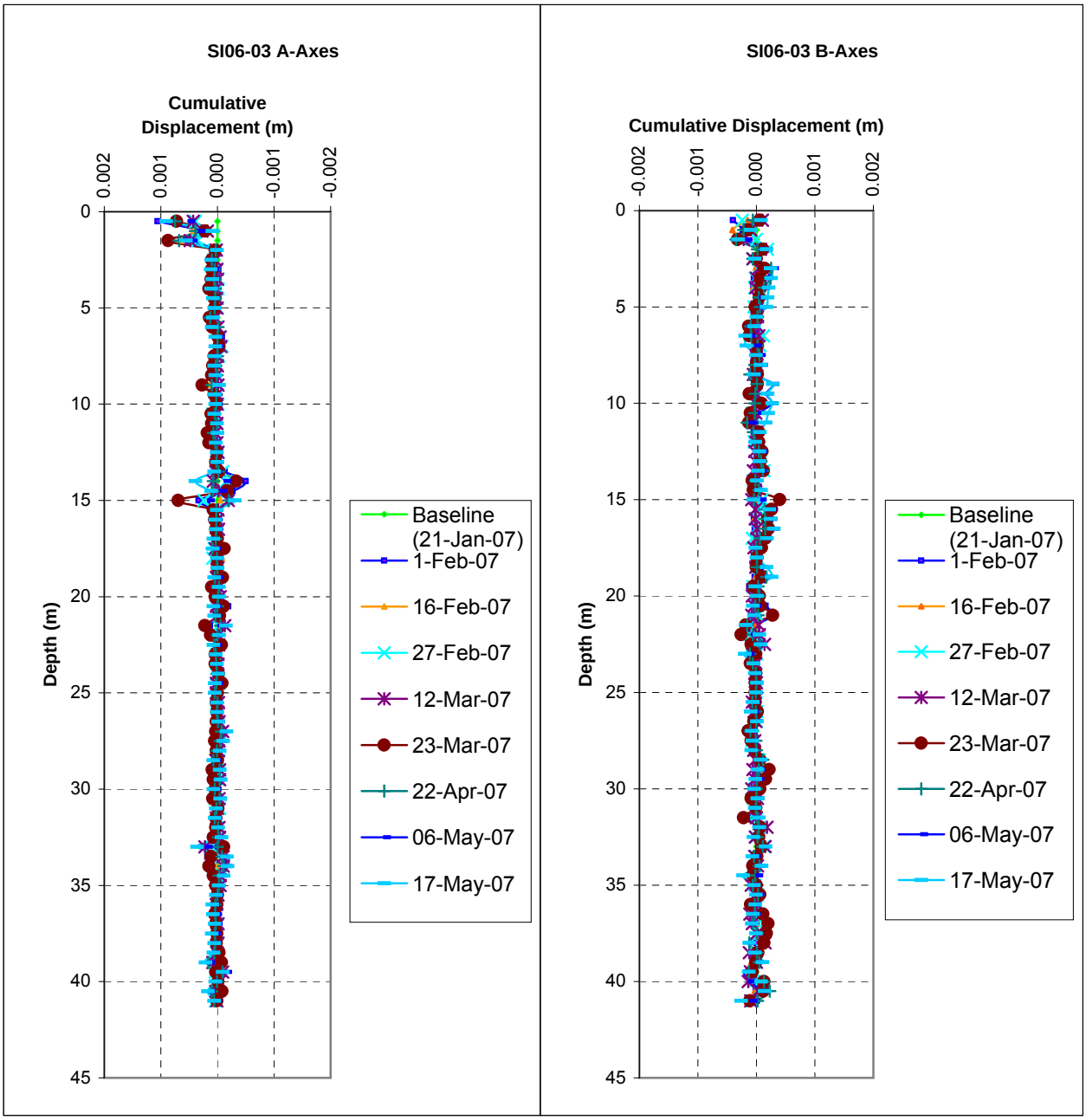
PROJECT / ASSIGNMENT NO.	REF NO.
VA101-1/18	1

FIGURE B-10

REV. 0

Rev 0 - Issued with Stage 6 Design Report



Notes:
1) Displacement is calculated based on the initial data set.
2) New data started in Feb., 2007 as a new probe was purchased.

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MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
INCLINOMETER SI06-03
DEPTH VS CUMULATIVE DISPLACEMENT

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PROJECT / ASSIGNMENT NO.	REF NO.
VA101-1/18	1

FIGURE B-11

REV. 0

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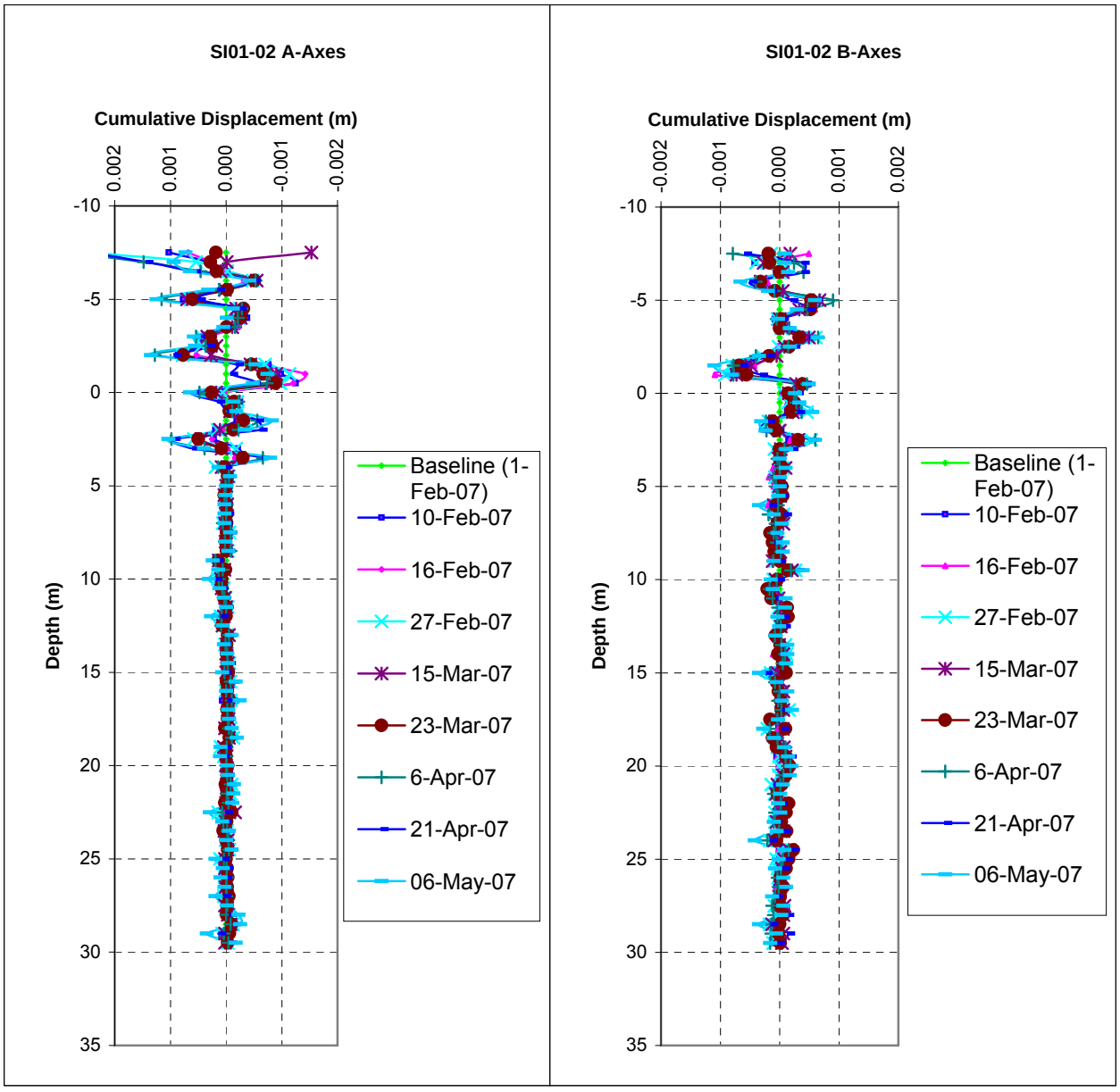

Notes:
1) Displacement is calculated based on the initial data set
2) New data started in Feb., 2007 as a new probe was purchased.

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
INCLINOMETER SI01-02
DEPTH VS CUMULATIVE DISPLACEMENT

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PROJECT / ASSIGNMENT NO.	REF NO.
VA101-1/18	1

FIGURE B-12

REV. 0

Rev 0 - Issued with Stage 6 Design Report

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APPENDIX C

UPSTREAM TOE DRAIN SEEPAGE ESTIMATION

(Pages C1 to C7)

Knight Piésold
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Our Reference: VA101-1/14-A.01
Continuity Nbr.: VA07-00362

March 14, 2007

Mr. Ron Martel
Mount Polley Mining Corp.
P.O. Box 12
Likely, B.C. V0L 1N0

Dear Ron,

Re: Mt. Polley Mine - Upstream Toe Drain Seepage Estimations

The Tailings Storage Facility (TSF) at Mount Polley Mine includes the Perimeter, Main, and South Embankments. The TSF embankments consist of zoned, earthfill structures that are progressively raised during operations using the modified centreline construction method. Embankment drainage provisions have been incorporated into the design of the TSF to facilitate drainage of the tailings mass, dewater the foundation soils, and to control the phreatic surface within the embankments. The components of the drainage systems consist of foundation drains, chimney drains, longitudinal drains, outlet drains, and upstream toe drains. The TSF currently has two upstream toe drains installed in the TSF embankments; one located in the Main Embankment at elevation 936 m, and one located in the Perimeter Embankment at elevation 945 m. A third toe drain may be installed on the South Embankment during Stage 6 construction program. The purpose of the upstream toe drains is to drain and consolidate the tailings mass near the embankments. The upstream toe drains also remove a certain amount of filtered water from the impoundment that is currently being recycled back into the TSF but may be a potential source of water available for discharge should the water quality objectives be met. The location of the upstream toe drains currently installed along the Main and Perimeter embankments are shown on Figure 1.

The Mount Polley Mine Site is currently operating in a water surplus condition with the excess water being stored in the TSF. Mount Polley Mining Corporation (MPMC) has requested that Knight Piésold review the current flow data from the upstream toe drain at the Main Embankment (the Perimeter Embankment upstream toe drain that was installed during the Stage 5 construction program has not yet started to flow) and provide future flow estimates from the upstream toe drains installed at each of the embankments.

UPSTREAM TOE DRAIN FLOW RATES

The upstream toe drain at the Main Embankment flows into the sump at the Main Embankment Seepage Collection Pond where the flows are measured. The flow rates have been measured since July 2000; however the flow rates from the drains were not monitored during the Care and Maintenance Period as the drain outlets were submerged within the sump. This condition was anticipated during the Care and Maintenance Period, as flow monitoring is only possible during operations when the seepage pond level has been pumped down. The seepage pond was pumped down in December 2005 and flow measurements were taken. The monitored flows were consistent with the flows measured in 2000. The flows from the Main Embankment upstream toe drain have increased since 2005, with the current flows ranging from 9 to over 12 l/s. The flow rates for the Main Embankment upstream toe drain are shown on Figure 2.

The flow rates were also modelled with the finite element computer program SEEP/W. The results of the modelling indicate that the flow rates for the upstream toe drain at the Main Embankment are impacted by the tailings beach profile along the embankment, the distance the supernatant pond is from the embankment, the location of tailings discharge point or points, and the degree of tailings consolidation above the toe drain. The most significant factors contributing to the flow rates in the upstream toe drain are the size of the tailings beach and the distance of the supernatant pond from the embankment. The tailings beach and pond location for October 31, 2006 are shown on Figure 3.

Stage 4 construction of the TSF embankments included using compact tailings sand as construction material in the upstream Zone U shell zone. This was accomplished by developing sand cells upstream of the core zone and discharging tailings into the cells. The coarse tailings settled out into the sand cells with the finer tailings exiting the cells via culverts installed in the upstream confining berms. This proved to be a successful construction technique for building Zone U but the prolonged discharging of tailings at the Perimeter Embankment resulted in the migration of the supernatant pond towards the Main Embankment, with the pond coming into direct contact with the Main Embankment at certain locations. This has resulted in higher flow rates for the upstream toe drain at the Main Embankment.

MPMC is currently in the process of procuring the HDPE pipe required to expand the tailings discharge pipeline around the entire facility. Evenly discharging the tailings from around the facility optimizes the development of tailings beaches and keeps the supernatant pond clear of the embankments, thereby increasing seepage paths and reducing seepage rates at the upstream toe drains. Beached tailings, when left to drain and consolidate, form the competent foundation needed for the modified centreline construction of embankment raises. The current flow rates from the Main Embankment upstream toe drain are considered to be elevated based on the proximity of the supernatant pond and will likely decrease, possibly by as much as 50%, with the development of a tailings beach in this area.

The estimated upstream toe drain flow rates for the Main, Perimeter, and South Embankments are shown on Figure 4. The flow estimates for the Perimeter and South Embankment upstream toe drains have been based on extrapolating the current measured flows in the Main Embankment upstream toe drain over the differential length of their drains. The figure also shows the estimated upper and lower flow boundaries (+/- 50%) for all three drains. The lower bound value is the conservative flow value and should be the value used in site water balance calculations. The upper bound value is a conservative flow value for the design of the settling ponds and associated pipe works. The lower bound values for the three upstream toe drains are as follows:

- Main Embankment 6 l/s (500 m^3/day);
- Perimeter Embankment 7 l/s (640 m^3/day);
- South Embankment 4 l/s (360 m^3/day);
- The total lower bound flow rate assuming all drains in operation is estimated to be: 17 l/s (1500 m^3/day).

The upper bound values for the three upstream toe drains are as follows:

- Main Embankment 17 l/s (1500 m^3/day);
- Perimeter Embankment 22 l /s (1920 m^3/day);
- South Embankment 13 l/s (1080 m^3/day);
- The total upper bound flow rate assuming all drains in operation is estimated to be: 52 l/s (4500 m^3/day).

The estimated flow rates from the upstream toe drains assume that all three are in operation and working effectively. The time line for the flow rates also assumes that the flows will appear in the Perimeter Embankment drain in April or May 2007 pending pumping of the Cariboo Pit water and that the upstream toe drain planned for the South Embankment during Stage 6 will be producing water in August 2008.

The upstream toe drain flow rates will vary at each embankment depending on the location of the supernatant pond. However, the overall flow rates from the TSF upstream toe drains are likely to remain fairly constant as increased flow rates resulting from the tailings pond having moved closer to one embankment will likely be offset by the reduction in flow rates from the opposite embankment that the tailings pond has subsequently moved away from.

It is important to reiterate that the main purpose of the upstream toe drains is to drain and consolidate the tailings mass near the embankments, not to remove large quantities of water from the TSF. It is therefore very important to continue measuring the flow rates from the upstream toe drains at regular intervals, along with the location of the supernatant pond, to determine whether the flow rates are significant enough or if other sources of water for discharge need to be considered.

We trust that the estimated flow rates from the upstream toe drains meets your current needs for updating the site water balance and sizing the settling ponds and associated pipe works. Please feel free to contact us if you have any questions.

Yours truly,

KNIGHT PIESOLD LTD.

Eric Coffin
Staff Engineer

Ken Brouwer, P.Eng.
Managing Director

Encl:
	Figure 1 Rev 0	Upstream Toe Drain Locations
	Figure 2 Rev 0	Main Embankment Upstream Toe Drain Flows
	Figure 3 Rev 0	Tailings Beach Profile
	Figure 4 Rev 0	Long Term Upstream Toe Drain Flow Estimations

/ec

5 820 000 N

5 819 000 N

596 000 E

596 000 E

Perimeter Embankment
Seepage Collection Pond

Perimeter Embankment
Existing Upstream Toe Drain

Main Embankment Existing
Upstream Toe Drain

South Embankment Proposed
Upstream Toe Drain

Main Embankment
Seepage Collection Pond

Ch. 46+00
Ch. 45+00
Ch. 44+00
Ch. 43+00
Ch. 42+00
Ch. 41+00
Ch. 40+00
Ch. 39+00
Ch. 38+00
Ch. 37+00
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Scale 50 0 50 100 150 200 250 m

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VANCOUVER B.C.

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REV.	DATE	ISSUED
0	14MAR'07	ISSUED WITH LETTER VA07-00362

MOUNT POLLEY MINE CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
UPSTREAM TOE DRAIN LOCATIONS

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-1/14	VA07-00362

FIGURE 1 REV. 0

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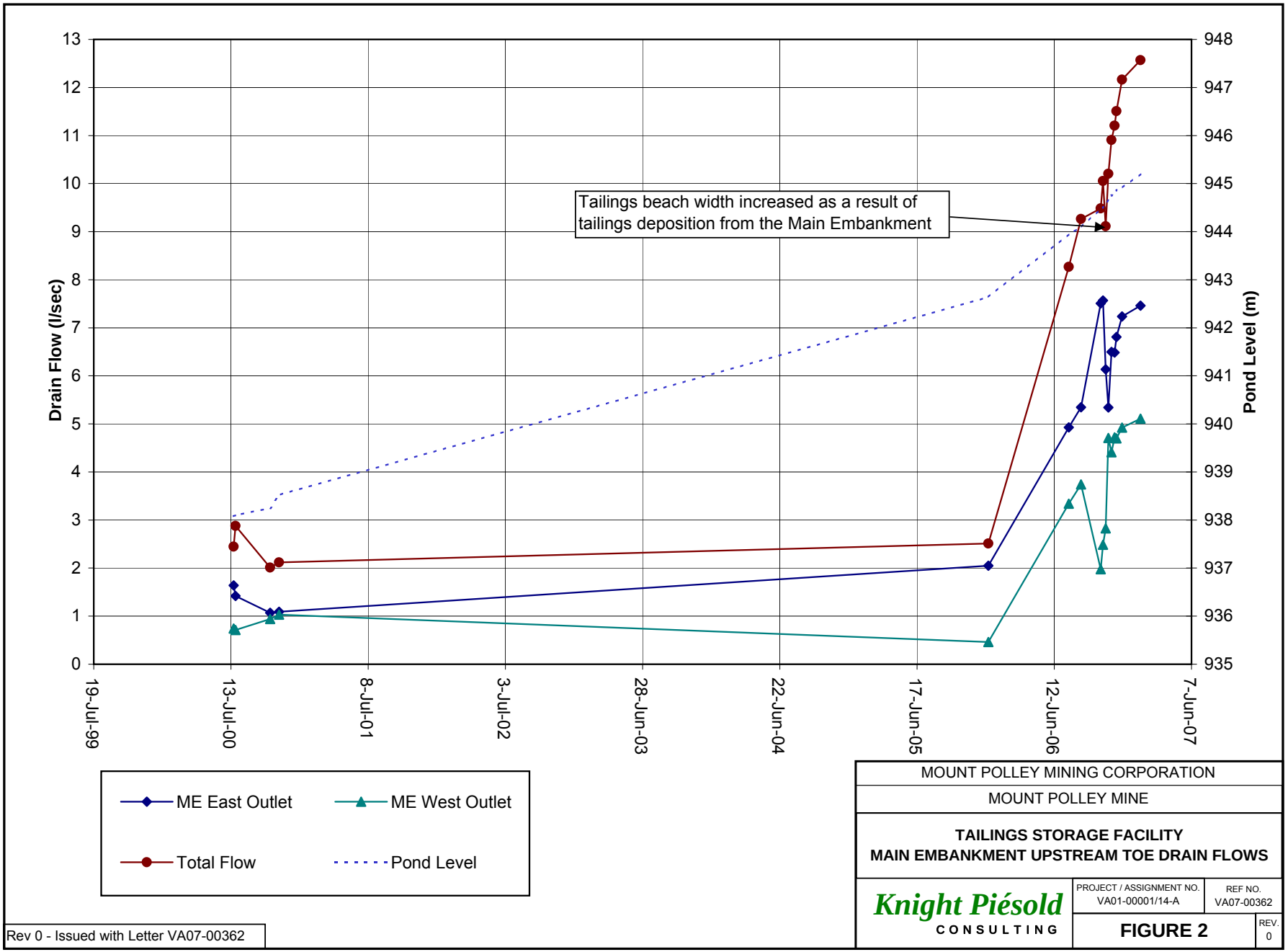
Print:3/14/2007
Rev: 14-Mar-2007



MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
MAIN EMBANKMENT UPSTREAM TOE DRAIN FLOWS

Knight Piésold CONSULTING

PROJECT / ASSIGNMENT NO. VA01-00001/14-A

REF NO. VA07-00362

FIGURE 2

REV. 0

Rev 0 - Issued with Letter VA07-00362

AMEC010461_0127

Notes:
1) Beach distances determined using a range finder.

MOUNT POLLEY MINING CORPORATION		
MOUNT POLLEY MINE		
TAILINGS STORAGE FACILITY **TAILINGS BEACH PROFILE**		
Knight Piésold CONSULTING	PROJECT / ASSIGNMENT NO. VA01-00001/14-A	REF NO. VA07-00362
	FIGURE 3	REV. 0

Rev 0 - Issued with Letter VA07-00362

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Print: 3/14/2007
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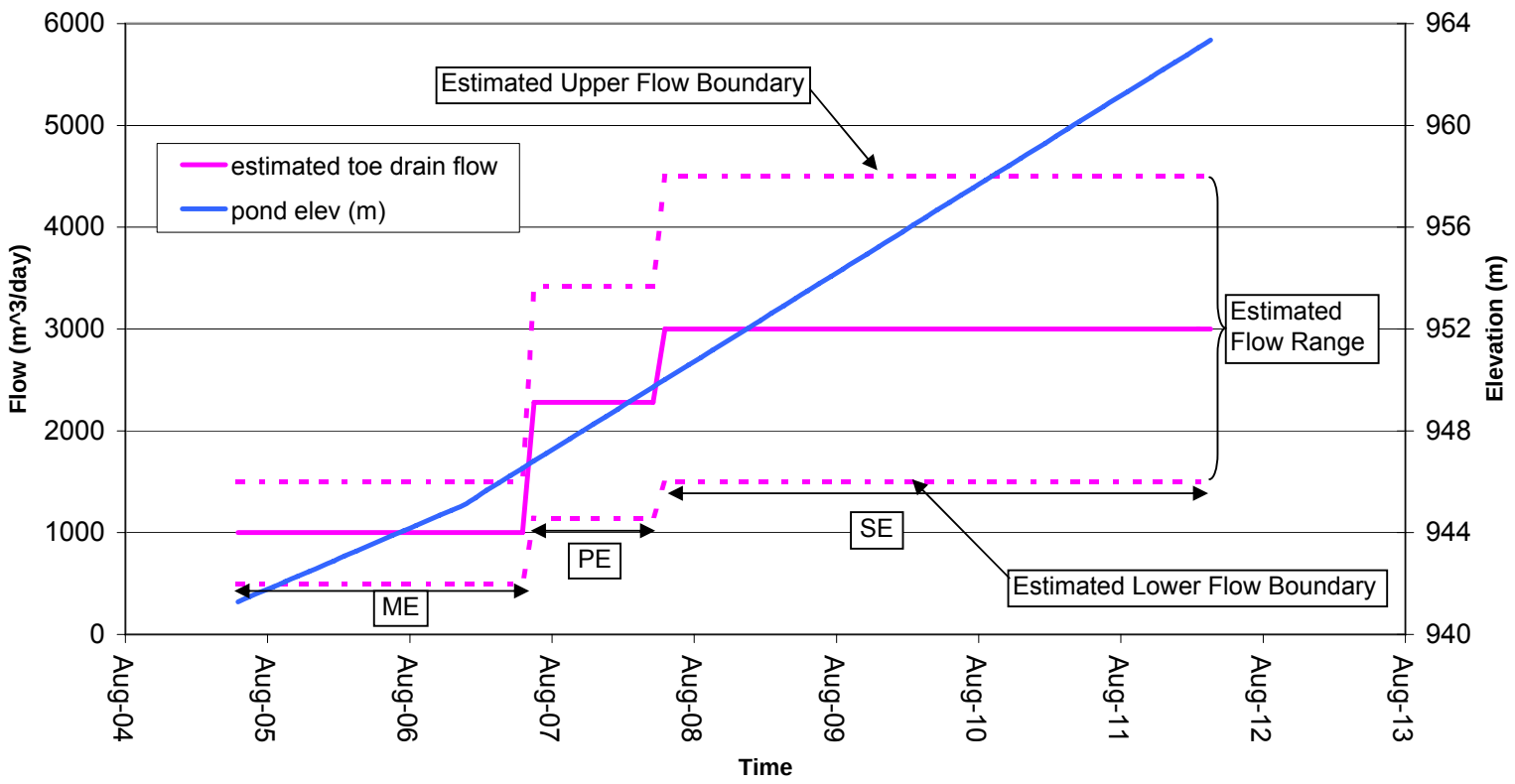

Notes:
1) Estimated upper flow assumes a 50% increase from the estimated flow
2) Estimated lower flow assumes a 50% decrease from the estimated flow

MOUNT POLLEY MINING CORPORATION			
MOUNT POLLEY MINE			
TAILINGS STORAGE FACILITY **LONG TERM UPSTREAM TOE DRAIN FLOW ESTIMATES**			
Knight Piésold CONSULTING	PROJECT / ASSIGNMENT NO. VA01-00001/14-A	REF NO. VA07-00362	
	FIGURE 4	REV. 0	

Rev 0 - Issued with Letter VA07-00362

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MOUNT POLLEY MINE
STANDARD PROCEDURE

SUBJECT:	PROCEDURE NO:
Operation of Valves on Tailings Line	**Mill Procedures M35**
EFFECTIVE DATE:	**REVISION DATE:**

OBJECTIVES:

To maintain continuous planned production, provide environmental protection, establish lines of communication and levels of awareness, when opening and closing valves on the tailings line.

COMMUNICATION:

- Contact Mill shifter & Dam Construction supervisor before operating any valves, other than the sand cell skid valves.
- 2-4 people will be required for the opening and closing of tailings valves, depending on the distance of discharge. Only 1 person is required when operating the valves on the sand cell skid.
- Each person will require a radio for communication.
- Dam crew will be responsible for only opening & closing the valves on the sand cell skids.
- Mill Maintenance crew will direct the opening & closing of all other valves on the tailings line.
- Valves & tailings line extending from valves must be inspected for leaks once a shift. Any leaks or abnormalities shall be reported to the supervisor immediately.

Valve Switching:

Bypass valve to dam should be open & valve to sand cell should be closed on skid, when sand cell not in operation.

If no tailings flow at skid:

This procedure will require 2-4 people, depending on the length/distance of discharging, and will be directed by Mill Maintenance crew.

1) Position #1 person at valve assembly with flow to be diverted.
2) Position #2 person at sand cell skid valve assembly.
3) Position #3 & #4 person, if required, equally spaced along tailings line at flanges.
4) #1 person opens valve ¼ way to divert tailings to sand cell skid.
5) #3 & #4 persons listen for flow & communicate with #1 & #2 persons.

6) #2 person checks for flow at discharge valve to dam & relays that information back to #1 person.
7) Repeat steps 4-6 until valve open fully.
8) If good flow is established #1 person will slowly close the bypass valve.
9) If no flow is established #1 person will slowly close off valve diverting tailings to sand cell skid & call Mill supervisor.

To discharge tails into sand cell:

Only requires 1 person

1) Open valve to sand cell.
2) Check for flow into cell.
3) Once a good flow is established slowly close bypass valve discharging into dam.

To discharge tails from sand cell back to dam:

Only requires 1 person

1) Open bypass valve to dam.
2) Check for flow into dam.
3) Once a good flow is established slowly close valve discharging into cell.

TRAINING:

The Mill Maintenance Superintendent shall ensure that all personnel involved in the operations of tailings line valves, are trained in this procedure.

Signs will be posted at each valve assembly with proper operating procedures written on them. Instruction will be given on the sign to " Do not operate, Authorized personnel only, (call Mill Operations Shift Supervisor)".

MOUNT POLLEY MINE
STANDARD PROCEDURE

SUBJECT: **Communication while Constructing Sand Cells**	**PROCEDURE NO:**
EFFECTIVE DATE: January 15, 2007 **REVISION DATE:**	

OBJECTIVES:

- Ensure the safety of all personnel working at the dam constructing sand cells.
- Establish lines of communication for all personnel working at the dam constructing sand cells.
- Establish a level of awareness for the sand cell operators.

COMMUNICATION:

- At the start of the shift, the pit shifter shall communicate with the mill shifters to determine anticipated mill tonnage rate for the shift.
- If the mill tonnage is (or anticipated to be) less than 650 TPH for ½ a shift or longer, the mill shifter shall inform the pit shifter who will inform the sand cell operator.
- If the mill tonnage is (or anticipated to be) less than 650 TPH for ½ a shift or longer, sand cell will be discontinued. Tailings will be deposited at the bypass located on tailings skid.
- If the tailings density or other parameters which may affect the characteristics of the tailings discharge change over a half shift period, the mill shifter shall inform the pit shifter who will inform the sand cell operator. (i.e., solids density, coarseness)
- If the mill has an unplanned shutdown of 1 hour or more, the mill shifter shall inform the pit shifter who will inform the sand cell operator. Tailings will then be deposited at the bypass located on tailings skid.
- The pit shifter (nightshift) is to check on the sand cell operator (nightshift) at least every two (2) hours.
- All equipment must be equipped with a two-way radio.

CRITICAL SAFETY ITEMS:

- Always do a job safety assessment before commencing any task.
- Under no circumstances shall a piece of equipment be used to deflect or direct the discharge flow from the tailings pipeline.
- A pickup shall be positioned beside/near the equipment working in the sand cells at all times, during night shift operation.
- Under no circumstances shall a piece of equipment with a safety cage on the cab, work in the sand cells.
- A life preserver equipped with 100'of rope, shall be fastened to the light plant at the sand cells.
- All equipment working in the sand cells or working near any open water shall be equipped with a life vest (PFD).