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# MOUNT POLLEY MINING CORPORATION
# MOUNT POLLEY MINE
# TAILINGS STORAGE FACILITY

## 1998 ANNUAL INSPECTION REPORT
## (REF. NO. 10162/9-5)

**JUNE 26, 1998**

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## TABLE OF CONTENTS

| | | | PAGE |
|---|---|---|---|
| SECTION 1.0 | INTRODUCTION | | 1 |
| | 1.1 | PROJECT DESCRIPTION | 1 |
| | 1.2 | RECENT HISTORY | 3 |
| | 1.3 | SCOPE OF REPORT | 4 |
| SECTION 2.0 | TAILINGS STORAGE FACILITY | | 5 |
| | 2.1 | EMBANKMENT CONSTRUCTION | 5 |
| | 2.2 | INSPECTION OF TAILINGS STORAGE FACILITY | 5 |
| | 2.3 | EMBANKMENT PERFORMANCE | 9 |
| | 2.3.1 | Piezometric Data | 9 |
| | 2.3.2 | Drain Flow Data | 14 |
| | 2.3.3 | Settlement and Movement Data | 15 |
| | 2.3.4 | Stability | 16 |
| | 2.3.5 | Seepage | 16 |
| | 2.4 | WATER MANAGEMENT | 17 |
| | 2.4.1 | Water Balance | 17 |
| | 2.4.2 | Freeboard | 18 |
| | 2.5 | WATER QUALITY MONITORING | 19 |
| SECTION 3.0 | ANCILLARY WORKS | | 20 |
| | 3.1 | GENERAL | 20 |
| | 3.2 | TAILINGS AND RECLAIM PIPELINE SYSTEMS | 20 |
| | 3.2.1 | General | 20 |
| | 3.2.2 | Pipeline Containment Channel | 20 |

| | | | |
|---|---|---|---|
| | 3.2.3 | Tailings Pipeline System | 22 |
| | 3.2.4 | Reclaim Pipeline System | 24 |
| 3.3 | SOUTHEAST SEDIMENT POND | | 25 |
| 3.4 | POLLEY LAKE PUMPING SYSTEM | | 27 |
| 3.5 | MILLSITE SUMP | | 28 |
| 3.6 | SOUTH BOOTJACK DAM | | 29 |
| SECTION 4.0 | CONCLUSIONS AND RECOMMENDATIONS | | 31 |
| 4.1 | GENERAL | | 31 |
| 4.2 | TAILINGS STORAGE FACILITY | | 31 |
| 4.3 | ANCILLARY WORKS | | 33 |

## TABLES

| | |
|---|---|
| Table 2.1 | Stage 2A Construction - Quality Assurance Testing Schedule |
| Table 2.2 | Summary of Recent Piezometer Readings |
| Table 2.3 | Comparison of Pre-Construction to Current Pore Pressures |
| Table 2.4 | Summary of Drain Flow Data |
| Table 2.5 | Survey Monument Co-ordinates - Record of Displacements |

## FIGURES

| | |
|---|---|
| Figure 1.1 | Project Location and Access Plan |
| Figure 2.1 | Piezometer Summary Plot - Plane A |
| Figure 2.2 | Piezometer Summary Plot - Plane B |
| Figure 2.3 | Piezometer Summary Plot - Plane C |
| Figure 2.4 | Piezometer Summary Plot - Plane D |
| Figure 2.5 | Foundation Piezometer Plot - A2-PE2-01 |
| Figure 2.6 | Foundation Piezometer Plot - A2-PE2-02 |
| Figure 2.7 | Foundation Piezometer Plot - B2-PE2-01 |
| Figure 2.8 | Foundation Piezometer Plot - B2-PE2-02 |
| Figure 2.9 | Foundation Piezometer Plot - C2-PE2-01 |

| | |
|---|---|
| Figure 2.10 | Foundation Piezometer Plot - C2-PE2-02 |
| Figure 2.11 | Main Embankment Foundation Drain Flows |
| Figure 2.12 | Depth/Area/Capacity Curve for Tailings Storage Facility |
| Figure 2.13 | Filling Schedule and Staged Construction (Years 1 to 14) |
| Figure 2.14 | Filling Schedule and Staged Construction (Years 1 to 4) |

## DRAWINGS

| | |
|---|---|
| 10162-9-100 Rev. 1 | Overall Site Plan Showing Stage 2C Tailings Embankment |
| 10162-9-110 Rev. 1 | Stage 2A Main Embankment - Plan |
| 10162-9-111 Rev. 1 | Stage 2A Main Embankment - Sections |
| 10162-9-120 Rev. 2 | Stage 2A Perimeter Embankment - Plan |
| 10162-9-121 Rev. 1 | Stage 2A Perimeter Embankment - Sections |
| 10162-9-150 Rev. 1 | Stage 2 Expansion - Main Embankment Instrumentation - Plan |
| 10162-9-151 Rev. 1 | Stage 2 Expansion - Perimeter Embankment Instrumentation - Plan |
| 10162-9-152 Rev. 1 | Stage 2 Expansion - Instrumentation - Sections - Sheet 1 of 2 |
| 10162-9-153 Rev. 1 | Stage 2 Expansion - Instrumentation - Sections - Sheet 2 of 2 |
| 10162-9-154 Rev. 1 | Stage 2 Expansion - Instrumentation - Details |
| 10162-9-155 Rev. 1 | Stage 2 Expansion - Main Embankment Pressure Relief Details |

## APPENDICES

Appendix A Photographs

# MOUNT POLLEY MINING CORPORATION
# MOUNT POLLEY MINE
# TAILINGS STORAGE FACILITY

## 1998 ANNUAL INSPECTION REPORT
## (REF. NO. 10162/9-5)

## SECTION 1.0 - INTRODUCTION

### 1.1 PROJECT DESCRIPTION

The Mount Polley gold and copper mine is owned and operated by Mount Polley Mining Corporation. It is located in central British Columbia, 56 kilometres north-east of Williams Lake, as shown on Figure 1.1.

The Mount Polley mine has been in production since June 13, 1997. Ore is crushed and processed by selective flotation to produce a copper-gold concentrate at a rate of approximately 17,800 tonnes per day (6.5 million tonnes per year).

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

Knight Piésold Ltd. were originally engaged by Imperial Metals Corporation to provide engineering services for the design of the Open Pit, Waste Dumps and Tailings Storage Facility in 1989 and 1990. In the period since, the following services have been provided by Knight Piésold:

- Detailed Design of the Tailings Storage Facility and Ancillary Works, completed in 1995 and 1996.

- Prepare contract documents and technical specifications for construction of Stage 1 (El. 934 m) of the Tailings Storage Facility.

- Construction supervision and quality assurance/quality control (QA/QC) for construction of Stage 1 of the Tailings Storage Facility and Ancillary Works, from May 1996 to March 1997.

- Consulting services provided to the mine on all aspects of the operation and monitoring of the Tailings Storage Facility since 1996.

In early 1998, the tailings embankments were raised to Stage 2A (El. 936 m). Work carried out by Knight Piésold over the past year (to May 31, 1998) and since the last inspection report (issued June 3, 1997) includes the following:

- Update design of Tailings Storage Facility.

- Finalize operations manual.

- Issue construction drawings for 1998 embankment raise.

- Prepare contract documents and Technical Specifications for the 1998 Stage 2A construction program.

- Construction supervision and quality assurance/quality control (QA/QC) for construction of Stage 2A (El. 936 m) of the Tailings Storage Facility.

- Continue to review and evaluate operating and monitoring data.

The following reports were issued by Knight Piésold over the past year (to May 31, 1998) and since the last inspection report (issued June 3, 1997):

- Updated Design Report, June 6, 1997 (Ref. No. 1627/2).

- Operation, Maintenance and Surveillance Manual for Stage 1B Embankment (El. 934 m), November 24, 1997 (Ref. No. 10162/7-3).

- Report on Stage 1A/1B Construction, August 14, 1997 (Ref. No. 10162/7-5).

- Tender Documents for Stage 2A Tailings Facility Construction, November 11, 1997 (Ref. No. 10162/9-1).

- Stage 2A Tailings Facility Construction - Selected Excerpts from Reference Information, November 6, 1997 (Ref. No. 10162/9-2).

- Report on On-Going Construction Requirements, December 2, 1997 (Ref. No. 10162/9-3).

- Contract Documents for Stage 2A Tailings Facility Construction, January 29, 1997 (Ref. No. 10162/9-4).

Work currently being completed includes installing additional instrumentation, site investigations for borrow materials to be used in future construction programs and writing the Stage 2A construction report.

## 1.2 RECENT HISTORY

A chronology of significant events for the Tailings Storage Facility and Ancillary Works since the last inspection report (issued June 3, 1997) includes:

- June 13, 1997 — Milling of ore commenced.
- January 6, 1998 — Start construction Stage 2A embankment raise.
- May 15, 1998 — Finish construction Stage 2A embankment raise.

Tailings have regularly been discharged into the Tailings Storage Facility since mill start-up. The facility is now being filled at a rate that is close to the design and the required freeboard for storm and wave run-up have been maintained at all times.

## 1.3 SCOPE OF REPORT

This annual inspection report has been prepared to meet the guidelines of the Ministry of Energy and Mines. This report is based on observations made during site visits by Mr. Ken Embree, P. Eng. from May 10 to 15, 1998, and on information contained in the above mentioned reports. A review of all operating and monitoring data used to evaluate the performance of the Tailings Storage Facility is also included in this report, along with selected construction drawings. Updated as-built drawings will be included with the Stage 2A construction report.

# SECTION 2.0 - TAILINGS STORAGE FACILITY

## 2.1 EMBANKMENT CONSTRUCTION

At the time of the inspection, construction of the first modified centreline raise of the tailings embankment was nearing completion. The Stage 2A construction period extended from January 6 to May 15, 1998 and included the following:

- Removing the tailings pipelines before construction (continue tailings discharge through the M1A dump valve).
- Raising the Main and Perimeter Embankments from El. 934 to El. 936 m.
- Installing and monitoring new instrumentation in the embankments.
- Constructing the Stage 2B haul road on the downstream side of the Main and Perimeter embankments, as well as between the embankments. This work included construction of one additional foundation drain (FD-5) with three new Pressure Relief Trenches and six new Pressure Relief Wells.
- Relocate the tailings pipelines on the embankments after construction was completed.

Details of the Stage 2A embankment construction program, including all quality assurance/quality control records, monitoring results and as-built drawings will be included in the Stage 2A construction report. A summary of the quality assurance testing for Stage 2A construction is included on Table 2.1.

## 2.2 INSPECTION OF TAILINGS STORAGE FACILITY

At the time of inspection, the tailings pond was at El. 930.0 m. The tailings pipeline had been disconnected and removed from the embankments to facilitate the construction program and no tailings beach was exposed at the Main Embankment. Tailings were being discharged from the M1A dump valve, located near the north-

west corner of the facility. Some beach development was occurring near the left abutment of the Perimeter Embankment as a result of this.

Prior to starting Stage 2A construction, the tailings beach at the Main Embankment was approximately 25 to 30 m wide over most of its length. There was only one small area where exposed beach was not present, approximately 50 m from Ch. 22.20 to Ch. 22+70. This beach width was adequate for construction and placement of the Coarse Bearing Layer on exposed tailings progressed very well.

The level of the tailings surfaces (above and below the pond at El. 929.73 m) was surveyed by Mount Polley April 10, 1998. At the time of the survey, a total of 3,736,060 dry tonnes of tailings had been deposited into the facility. The survey indicated that the in-situ tailings dry density was 1.477 tonnes/cubic metre. However, it is likely that some of the looser tailings slimes were not identified by the survey and this number is probably too high. A tailings dry density of 1.35 tonnes/cubic metre has therefore been used in the water balance. This value accurately predicts the tailings pond level in the water balance. It is also higher than the values used in the design of the facility (1.1 tonnes/cubic metre for Year 1 and 1.2 tonnes/cubic metre for year 2), indicating that the tailings are settling at a higher density than originally predicted. The amount of water in the facility (above the tailings) was estimated to be 2.4 million cubic metres at the time of inspection. The average throughput for 1998 is reported to be about 16,000 tonnes/day, however the design throughput of 17,800 tonnes/day has recently been achieved.

Other observations made at the Tailings Storage Facility:

- The fill slopes for the Main and Perimeter Embankments, including the new Stage 2A upstream slope and existing Stage 1B/2A downstream slope, look very good and do not exhibit any signs of instability. No cracks were observed on the crest at the time of inspection. However, during a subsequent inspection, small (less than 50 mm wide) tension cracks had developed in isolated areas along the upstream portion of the Main Embankment, especially from Ch. 22+20 to Ch. 22+70. There was no appreciable vertical displacement across the cracks. The cracks were likely

caused by differential settlement of finer tailings deposited between spigots. The cracks are of little significance to the design and performance of the embankment and have been infilled with fine grained material to prevent water from infiltrating the embankment fill. The areas where the cracks have occurred must be regularly inspected.

- A significant amount of wood debris accumulated along the face of the Main Embankment. This debris will be covered by tailings after deposition from the embankment recommences and could decompose over time, possibly causing differential settlement and cracking in fill materials placed above the tailings in future stages. Although some debris was present before Stage 2A construction started, this problem has been compounded by the continued discharge of tailings from the M1A dump valve, which has pushed the pond against the embankment in the absence of tailings beach development. The wood should be removed and must be kept a minimum of 15 m away from the embankment in the future. The wood can be disposed of by burying in selected locations, such as the borrow areas.

- The downstream areas of the Main and Perimeter Embankments were cleaned up and improved drainage control was added during Stage 2A construction. Topsoil and sub-excavated materials from the Stage 2A foundations at the Main Embankment have been pushed past the Stage 2A toe and must be removed before downstream embankment expansions.

- The Seepage Collection Ponds for the Main and Perimeter Embankments are in good condition, with no significant erosion or other damage evident. The pond levels were higher than normal at the time of inspection because the Seepage Recycle Pipelines were disconnected to facilitate construction on the embankments. The pipelines have since been reconnected and the water levels have been drawn down to normal operating levels. The maximum pond levels did not encroach on the overflow culverts and no water was discharged from the ponds.

- The outlets for the Main Embankment Foundation Drains (FD-1 to FD-4) were submerged at the time of inspection because of the high water levels in the Seepage Collection Pond and the drain flows could not be measured. Flow monitoring has resumed since the pond was lowered, including the new foundation drain (FD-5). The flows have not increased significantly over baseline levels and are much lower than the predicted design flows, as discussed in Section 2.3.2.

- The Main Embankment Outlet Drains are seeping slightly (estimated to be less than 1 l/min), but the flows have not yet been measured. The Perimeter Embankment Outlet Drains have been installed but do not yet require monitoring, as discussed in Section 2.3.2.

- The Stage 2B haul road, constructed from Zone T (transition zone) material, was in very good condition and now provides good access to all areas of the embankments.

- The exposed basin liner was inspected and was found to be in good condition, with no significant damage from erosion observed.

- All ditches around the facility were unobstructed.

The following 1998 work items for the Tailings Storage Facility were outstanding at the time of inspection:

- Installation of Pressure Relief Wells and connection to foundation drain FD-5. This work has since been completed.

- Installation of additional vibrating wire piezometers. This work is currently underway.

- Borrow area investigations for future construction programs. This work is currently underway.

- Basin Liner investigations for future construction programs. This work is currently underway.

In summary, the Tailings Storage Facility is in good condition. Selected photos of the Tailings Storage Facility are included on pages A-1 to A-3, in Appendix A.

## 2.3 EMBANKMENT PERFORMANCE

### 2.3.1 Piezometric Data

To date, 31 vibrating wire piezometers have been installed in the embankment foundation soils, fill zones (including drains) and in the tailings beaches at 4 main instrumentation planes (A, B, C, and D). Of these, 29 are still operational. At the time of writing, an additional 16 piezometers were being installed and a new fifth instrumentation plane (E) was being added.

The most recent weekly piezometer readings, taken June 16, 1998, are summarized on Table 2.2. A comparison of the pre-construction pore pressures to the current pore pressures is presented on Table 2.3. Summary plots for each of instrumentation plane A, B, C and D are shown on Figures 2.1 to 2.4. Individual plots for the foundation piezometers, complete with ground, tip, and trigger levels, are shown on Figures 2.5 to 2.10.

The piezometers typically show minor weekly fluctuations. Larger fluctuations were observed in some piezometers during construction, when the additional fill loading resulted in a pore pressure response. A detailed discussion of the vibrating wire piezometer monitoring results is presented below. The piezometers are categorized by the zone or area that they monitor.

FOUNDATION PIEZOMETERS

Six foundation piezometers (A2-PE2-01/A2-PE2-02, B2-PE2-01/B2-PE2-02, and C2-PE2-01/C2-PE2-02) were installed in July, 1996, during construction of the Main Embankment. Five of the six piezometers are still operational, with C2-PE2-01 not working. Trigger levels of 6.0 m artesian pressure

(relative to original ground) were established for the foundation piezometers. The trigger levels are based on embankment stability analyses. These values, if exceeded, require that investigations and contingency or remedial actions be taken.

Plane A (Ch. 20+00, original ground El. 912.67)

- A2-PE2-01 is 9.0 m below ground (El. 903.68 m). The recorded pore pressure was 9.51 m after installation (El. 913.19 m), artesian by 0.51 m. The pore pressure has slowly and steadily increased by 2.2 m. The current pore pressure is 11.78 m (El. 915.46 m) and is therefore artesian (relative to original ground) by 2.79 m.

- A2-PE2-02 is 2.9 m below ground (El. 909.77 m). The recorded pore pressure was 1.95 m after installation (El. 911.72). The current pore pressure is 2.03 m (El. 911.80 m). Only minor fluctuations have been observed and no artesian pore pressures have developed.

- A2-PE2-06, 07, and 08 will soon be installed in drillholes.

Plane B (Ch. 22+40, original ground El. 916.98 m)

- B2-PE2-01 is 15.0 m below ground (El. 901.98 m). The recorded pore pressure was 11.49 m after installation (El. 913.47 m). The current pore pressure is 14.73 m (El. 916.71 m). The pore pressure has slowly and steadily increased by 3.24 m and no artesian pore pressures have developed.

- B2-PE2-02 is 7.9 m below ground (El. 909.51 m). The recorded pore pressure was 4.97 m after installation (El. 914.48 m). The current pore pressure is 8.73 m (El. 918.24 m) and is therefore artesian (relative to original ground) by 1.26 m. The pore pressure has slowly and steadily increased by 3.76 m.

- B2-PE2-06 will soon be installed in a drillhole.

Plane C (Ch. 18+50, original ground El. 915.71 m)

- C2-PE2-01 is 8.2 m below ground (El. 907.48 m). The recorded pore pressure was 10.59 m after installation (El. 918.07 m), artesian by 2.36 m. The pore pressure slowly and steadily increased by about 2.23 m to an artesian condition of 4.60 m before the piezometer stopped working.

- C2-PE2-02 is 5.2 m below ground (El. 910.53 m). The recorded pore pressure was 5.56 m after installation (El. 916.09 m), artesian by 0.38 m. The pore pressure has increased by 0.63 m to 6.19 m (El. 916.72 m) and is now artesian (relative to original ground) by 1.00 m.

- C2-PE2-06, 07 and 08 will soon be installed in drillholes.

Plane D (Ch. 39+86, original ground approx. El 930.5 m)

- D2-PE2-02 will soon be installed in a drillhole.

Plane E (Ch. 39+86, original ground approx. El. 917.0 m)

- A new instrumentation plane will be added at the Main Embankment, near the right abutment where artesian pore pressures from glaciofluvial/glaciolacustrine sediments have been identified.

- E2-PE2-01 and E2-PE2-02 will soon be installed in a drillhole.

The foundation pore pressures have been carefully monitored since initial construction. In general, foundation pore pressures have increased by up to 4 m in some piezometers (Plane C) at the right abutment of the Main Embankment. These pore pressures are most likely increasing due to seepage caused by the accreting tailings pond. Additional Pressure Relief Trenches and Wells were installed in the foundation to control and/or dissipate these excess pore pressures. Monitoring results indicate that the foundation pore pressures dropped at Planes A and C by as much as 0.2 m after the Pressure Relief Trenches were installed. The pressures dropped again by as much as 0.1 m

after installation of the Pressure Relief Wells.

DRAIN PIEZOMETERS

Ten drain piezometers have been installed to date, including A1-PE1-01/A1-PE1-02, B1-PE1-01/B1-PE1-02, and C1-PE1-01/C1-PE1-04 in the Main Embankment foundation drains. Piezometers installed in one of the Chimney Drain Components include A1-PE1-03, B1-PE1-03, C1-PE1-02 and D1-PE1-02. All ten piezometers are operational and are showing pore pressures that are below zero, indicating that the drains are unimpeded and draining freely.

FILL PIEZOMETERS

Nine fill piezometers have been installed to date, including A2-PE2-03, A2-PE2-04, A2-PE2-05, B2-PE2-03, B2-PE2-04, B2-PE2-05, C2-PE2-03, C2-PE2-05 and D2-PE2-01. Eight piezometers are still operational. A2-PE2-04 only functioned for a short period after it was installed in February, 1997.

Plane A

- All piezometers showed significant pore pressure increases during fill placement. A2-PE2-03 is located upstream of the chimney drain. It recorded a pore pressure as high as 16.85 m and slowly dissipated to 6.93 m pore pressure. The pore pressure recently increased by about 2 m in response to the placement of Stage 2A fill and is now dissipating again. A2-PE2-04 no longer functions, as discussed above. A2-PE2-05 is located downstream of the chimney drain and is fully dissipated with no excess pore pressure, indicating that the surrounding soil is not saturated.

Plane B

- All piezometers showed significant pore pressure increases during fill placement. B2-PE2-03 and B2-PE2-04 are located upstream of the chimney drain. Pore pressures in these piezometers increased dramatically after installation and fill placement. B2-PE2-03 recorded a

pore pressure as high as 16.26 m after installation (with no dissipation) and increased by an additional 3.1 m to 19.14 m in response to the placement of Stage 2A fill. B2-PE2-04 recorded a pressure as high as 15.03 m after fill placement and dissipated to 3.77 m pore pressure. It increased by 2.4 m to 6.2 m in response to the placement of Stage 2A fill. B2-PE2-05 is located downstream of the chimney drain and is fully dissipated with no excess pore pressure, indicating that the surrounding soil is not saturated.

Plane C

- All piezometers showed significant pore pressure increases during fill placement. C2-PE2-03 and C2-PE2-05 are both located upstream of the chimney drain. C2-PE2-03 increased dramatically after installation and was almost fully dissipated when it increased by 0.4 m due to the placement of Stage 2A fill. The pore pressure is currently 0.38 m. C2-PE2-05 had slowly increased to 2.0 m when a 1.8 m response from the placement of Stage 2A fill was recorded.

Plane D

- D2-PE2-01 is fully dissipated, with zero excess pore pressure.

As described above, embankment fill piezometers responded quickly to the placement of fill materials. Most of the high pore pressures were slowly dissipating, illustrating the low permeability if the surrounding fill materials. Some high pressures were observed because of the piezometer installation method, where the saturated tips were immersed in a loose slurry in a small hole and were then quickly loaded by subsequent fill placement in the overlying lifts. These pore pressures may not be indicative of general pore pressure conditions in the embankment fill, and may only provide an indication of the confined slurry pressure at the piezometer tip. Also, the dense, compacted nature of the well graded glacial till fill materials results in a dilatant material. Therefore, the excess pore pressures recorded during fill placement are not anticipated to adversely affect the stability of the embankment during construction.

Tailings Piezometers

Six tailings piezometers were installed in the sandy tailings beaches during Stage 2A construction. Pore pressures increased during placement of 1.0 to 1.5 m of the Coarse Bearing Layer, but dissipated fully within about 8 hours following fill placement as expected (most of the increased pore pressures had dissipated within 2 hours of fill placement). The current readings are roughly consistent with the level of the tailings pond.

### 2.3.2 Drain Flow Data

A total of four foundation drains were installed in the foundation soils at the Main Embankment during Stage 1A construction (FD-1, 2, 3 and 4). A fifth foundation drain (FD-5) was added during Stage 2A construction. The foundation drain flows are normally recorded weekly. However, the flows could not be recorded when the water level in the Main Embankment Seepage Collection Pond increased above the level of the outlet pipes in the Drain Monitoring Sump. This happened during Stage 2A construction, when the seepage recycle pipeline was moved to facilitate fill placement on the embankment. The seepage recycle pipeline has recently been reconnected and regular monitoring of the foundation drain flows has resumed, including the recently installed FD-5.

The foundation drain flow rates were last recorded June 16, 1998, after the installation of six Pressure Relief Wells in FD-5. A summary of the flow rates to date is presented on Table 2.4 and is shown graphically on Figure 2.11. The total flow rate is currently about 0.50 l/sec (30 l/min), an increase of about 0.14 l/sec (8.4 l/min) since FD-5 was installed. It should be noted that the flow rates were increasing from the time that the Stage 1B embankment was completed until August 1997, when tailings discharge from the Main Embankment was well established and the basin was being blanketed with tailings. It should also be noted that the flow rates from FD-5 increased by about 1.5 l/min when the 1998 Pressure Relief Wells were installed.
The flows have consistently been clear, indicating that no solids are being transported. The flow rates have not significantly changed from baseline levels

and are well below the predicted flow rate of 1.1 l/sec (not including baseline flows), as determined by seepage analyses for the Main Embankment foundation drains (see "Report on On-Going Construction Requirements, Ref. No. 10162/9-3).

To date, no data has been collected from the Outlet Drains at the Main Embankment. A trace of seepage has been observed from the drains, on the downstream face of the Stage 1B embankment. This is not unexpected because the longitudinal drain is set in foundation soils along the left abutment and therefore also acts as a foundation drain in this area. Mount Polley is currently establishing a method to monitor the Main Embankment Outlet Drain flows and regular weekly monitoring is to be included with the Foundation Drains. Only the Outlet Drains have been constructed at the Perimeter Embankment and monitoring will commence after the Longitudinal and Chimney Drains are constructed.

In order to evaluate how any seepage from the Tailings Storage Facility may be impacting the surrounding area, regular water quality testing should be conducted on samples from the Foundation Drains.

### 2.3.3 Settlement and Movement Data

The survey monuments installed on the Stage 1B Main Embankment at Planes A, B and C were surveyed August 21, 1997, and March 20, 1998, prior to raising the embankments. The total displacements that were recorded varied from 0.079 m to 0.154 m. The settlements (elevation changes only) were slightly less, varying from 0.075 m to 0.141 m. These values are slightly less than the predicted settlements, which were estimated to be about 0.2 to 0.4 m. A record of the survey data and displacements is presented on Table 2.5.

At the completion of Stage 2A construction, new survey monuments were established on both the upstream and downstream shoulders of the Main Embankment at Planes A, B and C. As-built data for these monuments has been provided and they will be surveyed quarterly so that displacements and settlements can be calculated more frequently.

A total of five survey points were established along the upstream edge of the Coarse Bearing Layer at the Main Embankment during Stage 2A construction. These points were used to measure the settlement of the tailings during placement of the overlying fill materials. The results of surveys of these points have shown that the average vertical settlement on the tailings beaches was approximately 8 to 12 cm, while horizontal displacements of up to 20 cm were recorded during Stage 2A construction.

### 2.3.4 Stability

The stability of the Stage 2 and 3 embankments was reviewed during the course of the Stage 2A construction. This review was conducted after the embankment staging was modified. All material parameters used in the analyses were reviewed, and updated incorporating additional information obtained during Stage 2A construction (such as foundation soil strengths, amount of soft material subexcavated, artesian pore pressures in foundation soils, revised embankment geometry, etc.).

The stability analyses showed that the Factors of Safety for the short term cases (during operations) were greater than the minimum requirement of 1.3.

### 2.3.5 Seepage

As discussed in Section 2.3.3, no unexpected seepage was observed during the annual inspection carried out May 10 to 15, 1998. Foundation seepage at the Main Embankment is collected by the foundation drains. The flow rates have been not changed significantly since operations commenced, and have decreased slightly.

No uncontrolled seepage through the embankments was observed. A trace amount of seepage (estimated less than 1 l/min) was observed from Main Embankment Outlet Drains. The Longitudinal Drain is set in foundation soils above El. 919 m along the left abutment and therefore acts as a foundation drain in this area. Mount Polley is currently preparing weirs that will allow the

flow rates from the Main Embankment Outlet Drains to be measured. The flow rates from the Outlet Drains are expected to increase slightly as the water level rises and as the steady state phreatic surface develops in the embankment.

An updated estimate of seepage from the tailings basin can not be made at this time. One method of evaluating seepage from the tailings basin is by groundwater quality monitoring, which is regularly conducted by Mount Polley. To date, the limited data suggests that minor seepage is likely influencing the groundwater chemistry at monitoring well GW-2. Initial seepage modelling conducted during design and permitting suggested that up to 1.8 litres/second may seep from the tailings basin during operations. As indicated in Section 2.3.3, regular water quality testing should also be conducted on samples from the Foundation Drains.

## 2.4 WATER MANAGEMENT

### 2.4.1 Water Balance

The original water balance developed for the site has been modified by Mount Polley Mining Corporation to include additional site specific information. The updated water balance is managed by very capable Mount Polley staff, who add temperature, precipitation, evaporation, snowpack, ice cover and other relevant data as it becomes available. Mount Polley staff also conduct soundings of the tailings surface (above and below the supernatant pond) to confirm the tailings dry density. All of this information is used to predict the amount of water which will be available for recycle and the amount of water required from the Polley Lake Pumping System (discussed in Section 3.4). Knight Piésold provide input and review of the water balance on an annual basis, or as required by Mount Polley. A copy of the water balance is not included in this report. Details are presented in the Mount Polley report "1998 Water Management Plan", which has been submitted to the appropriate agencies (Ministry of Environment, Lands and Parks and Ministry of Energy and Mines).

The updated water balance is in close agreement with the original. It has been used to revise the filling schedule and staged construction curve shown on Figures 2.13 and 2.14. In general, the Tailings Storage Facility has been operated in accordance with the objectives of the water balance to date. This includes providing approximately 2.1 million cubic metres of water in the impoundment prior to start-up and maintaining 2 to 2.5 million cubic metres of water in the pond for reclaim, including any water from the Polley Lake Pumping System.

### 2.4.2 Freeboard

The design of the Tailings Storage Facility includes a provision for live storage of the 24 hour PMP (probable maximum precipitation) volume of 679,000 cubic metres. The filling schedule has been updated for actual precipitation data. The 24 hour PMP freeboard allowance is in addition to regular inflows due to precipitation runoff, including the spring freshet. The tailings impoundment incorporates an additional allowance of 1 m of freeboard as an extra contingency for wave run-up.

The Tailings Storage Facility has thus far been in accordance with the requirements for freeboard as described above. The projected tailings and supernatant pond levels shown on Figures 2.13 and 2.14 are based on the design throughput rate of 17,800 tonnes/day. The Tailings Storage Facility will be closely monitored and the next embankment raise will be scheduled so that adequate freeboard is always maintained. Adjustments to the embankment construction schedule will be made as required (if Mount Polley produces tailings at throughput rate which is significantly different than 17,800 tonnes/day or if the precipitation varies from that used in the water balance).

## 2.5 WATER QUALITY MONITORING

Water quality monitoring is regularly conducted on site by Mount Polley staff. Monitoring includes surface water quality from ditches, streams, creeks and lakes, as well as groundwater quality from monitoring wells. In addition, the water quality of the supernatant water in the Tailings Storage Facility is regularly checked. The results of the monitoring have been reported by Mount Polley in the report "1997 Annual Environmental Report, Effluent Permit 11678". This report has been submitted to the appropriate agencies (Ministry of Environment, Lands and Parks and Ministry of Energy and Mines). Conclusions from this report are summarized below.

### Surface Water Quality (including tailings water)

Water quality monitoring has indicated that most surface water samples have levels of Total Aluminum, Total Copper and Total Iron that exceed the criteria set out by the B.C. 1995 Approval and Working Criteria for Water Quality (AWCWQ) and the 1995 Canadian Council of Ministers of the Environment (CCME).

Testing of the tailings water from the supernatant pond indicated that this water has Total Aluminium and Total Iron values which exceed the Provincial Discharge Objectives (PDO) criteria. These results do not affect current operations because there is no discharge of water from the Tailings Storage Facility.

### Groundwater Quality

Water quality monitoring has indicated that most groundwater samples from the Tailings Storage Facility area have relatively high alkalinity. However, the alkalinity has not changed significantly from the levels recorded in the December, 1996 baseline samples. Some samples have shown a very slight increase in Total Copper concentration. Additional monitoring is required to determine whether any trends are developing and should include testing on samples the Foundation Drains.

# SECTION 3.0 - ANCILLARY WORKS

## 3.1 GENERAL

Other items which were inspected and are termed "ancillary works" for this report include the tailings and reclaim pipeline systems, Southeast Sediment Pond, Polley Lake Pumping System, Millsite Sump and South Bootjack Dam. These items are discussed separately in the following sections.

## 3.2 TAILINGS AND RECLAIM PIPELINE SYSTEMS

### 3.2.1 General

The tailings and reclaim pipelines are the main components of the Tailings Storage Facility pipeworks. The tailings pipeline system conveys tailings slurry via gravity from the Millsite to the Tailings Storage Facility. The reclaim pipeline system pumps water from the Tailings Storage Facility to the mill for re-use in processing the ore.

### 3.2.2 Pipeline Containment Channel

The tailings and reclaim pipelines are located in a pipe containment channel adjacent to the tailings access road. This channel provides extra spill containment by directing flows into the T2 Dropbox or into the Tailings Storage Facility.

The pipe containment channel is generally intact, without major blockages and seems to function well. The tailings and reclaim pipelines have been moved into the runoff ditch from the Millsite to the sharp curve above the T2 Dropbox because Mount Polley is considering widening the road over this area. Mount Polley has reported that the inlets for the existing cross drain culverts were plugged with -3/4 inch crushed rock and that the ditch was bedded with filter sand. These measures should ensure that all flows are directed down the ditch and not out the cross drain culverts. Because of these

revisions, both runoff from the ditch and any potential tailings spill flows will enter the T2 Dropbox through the annulus between the pipe and the CSP culvert on the uphill side of the dropbox. The function of the pipe containment channel over this section will be re-evaluated based on Mount Polley's plans to widen the road.

The channel section from the T2 Dropbox to the Tailings Storage Facility is in good condition. The pipelines are sleeved in 900 mm corrugated steel pipe (CSP) culverts within the pipeline containment channel at the Bootjack Creek Crossing. The sleeves provide backup spill containment over this area. An inspection of the pipelines and sleeves at the Bootjack Creek Crossing indicated that tailings have previously reached the sleeves, as a small amount of tailings is present in the upstream side of the culverts. This was caused by tailings backing up at the T2 Dropbox, flowing into the T2 Overflow Pond and then travelling down the pipeline containment channel. No solids escaped from the pipe containment channel. Since the modifications to the Dropbox in October, 1997 no backups have occurred. In the event that tailings do reach the Bootjack Creek Crossing in the future, the CSP sleeves must be flushed to ensure that there is a clear pathway for tailings to get past the crossing, without spilling into Bootjack Creek.

As an additional contingency measure to ensure that tailings from an overflow at the T2 Dropbox or from a pipeline rupture do not flow into Bootjack Creek, it is recommended that small compacted glacial till berms be constructed on the edges of the road fill over Bootjack Creek. The berms will need to be slightly longer than the CSP culverts. If tailings block off the CSP sleeves, the berms will direct tailings down the road to the Tailings Storage Facility and away from Bootjack Creek.

The fill slopes at the Bootjack Creek Crossing appear stable, with no signs of cracking or slumping. The water flowing in Bootjack Creek was clear at the time of viewing. The ditch on the north side of the road approaching Bootjack Creek was lined with rock to minimize erosion. A silt fence installed on the downstream side of the crossing during construction is still in place and

may be removed. The pipe arch culvert appears to be in good condition, with no significant deflections observed.

Selected photos of the pipeline containment channel are included on pages A-4 and A-5, in Appendix A.

### 3.2.3 Tailings Pipeline System

The tailings pipeline system is comprised of a single 7,000 m long HDPE pipe that extends from the Millsite to the Main Embankment. A concrete dropbox (T2) allows water from the Southeast Sediment Pond and overflow from the reclaim booster pump station to be added to the system. The T2 dropbox was modified by Mount Polley to resolve problems with tailings backing up into the dropbox, as mentioned above. The tailings pipeline now bypasses the dropbox. The dropbox provides pressure relief and surge protection for the pipeline through a bifurcation located downslope of the dropbox. It still provides overflow control and inlets for surface runoff from the Southeast Sediment Pond. In addition, the vent on the tailings line was replaced by a larger pipe and was extended higher to minimize the potential for surging out of the vent. At the time of inspection, the water level in the T2 Dropbox was very low as there were no flows from the Southeast Sediment Pond or the Reclaim Booster Pumpstation and the tailings were not backing up in the pipeline. In addition, there were no signs of recent tailings spillage around the T2 Dropbox, although there was minor erosion of fill between the Dropbox and the Reclaim Booster Pumpstation overflow pipes which has not impacted operations. This area could be re-graded with granular fill material.

All pipe connections around the T2 Dropbox appeared to be in good condition. The T2 Dropbox was designed so that if it fills up, tailings will flow to the T2 Overflow Pond. As mentioned above, tailings have reached the Bootjack Creek Crossing via this pond. It has therefore filled up with tailings in the past and has since been cleaned out. At the time of inspection, the pond was full of water and it was not apparent if any tailings were present. The

spillway was in good condition, but some rock piles at the base of the spillway (at the entrance to the pipeline containment channel) should be removed. The T2 Overflow Pond should be kept free of tailings at all times and must be cleaned out immediately after any tailings overflow events.

At the Tailings Storage Facility, tailings are discharged from up to six valved offtakes, or spigots, on a movable discharge section. Initial tailings deposition was concentrated at the Main Embankment to cover the basin liners and to fill the lowest area of the tailings basin. The movable discharge section was periodically relocated to establish the tailings beach over the length of the embankment. After the beach was established, tailings were occasionally discharged through the dump valves while relocating the movable discharge section and while the pipeline was steam cleaned (some freezing problems were encountered in the winter). Approximately 2 months prior to starting Stage 2A construction, tailings were discharged through the main pipeline at the left abutment, to expand the beach in this area. During Stage 2A construction, tailings were discharged from the M1A dump valve at the top of the facility. In general, beach development prior to construction was very good, with only isolated pockets of water present against the embankment.

Other comments on the tailings pipeline system are summarized below.

- Daily inspections of the tailings pipeline system are conducted by Mount Polley staff. Observations are recorded on a daily inspection sheet.

- One of the stems for the M1A knife gate valves is broken and should be repaired.

- The Robar couplers for the tailings spigots were not rubber lined and were wearing out quickly. Mount Polley is now lining them as per the original design.

- Occasional problems with tailings discharge has resulted in sections of

the pipeline which are partially sanded. The M4 end of pipeline discharge point was not constructed and the pipeline cannot be properly flushed out. Consideration should be given to installing the M4 end of pipeline discharge so that the pipeline can be thoroughly flushed after any shutdowns, and to help remove the sanding that exists.

- The tailings pond now reaches the Perimeter Embankment. As a result, tailings beaches must be established to facilitate modified centreline fill placement at both the Main and Perimeter embankments. This means that movable discharge section will have to be relocated more frequently than in the past. One of the major goals for operating the tailings discharge system should therefore be to establish tailings beaches that are a minimum of 15 m wide along the full length of the Main and Perimeter Embankments.

- Mount Polley is planning to implement a trial program for cycloning tailings. A large cyclone will be attached to the tailings pipeline and will be operated as a trial to accelerate beach development.

Selected photos of the tailings pipeline system are included on page A-6, in Appendix A.

### 3.2.4 Reclaim Pipeline System

The reclaim pipeline system is comprised of a single 5,400 m long HDPE pipe that extends from the Reclaim Pump Barge to the Millsite. The pipeline has two sections with varying pressure ratings. The first section extends from the Pump Barge to the Booster Pumpstation and includes steel pipe connected to the barge. The remainder consists of HDPE pipe which decreases in thickness (pressure rating) as the Booster Pumpstation is approached. The second section extends from the booster Pumpstation to the Millsite. It is similar to the first section, but does not have any steel pipe sections. Nominal

24 inch (610 mm) HDPE pipe with varying pressure ratings was installed to provide the required water transfer capacity.

Daily inspections of the reclaim pipeline system are conducted by Mount Polley staff and observations are recorded on a daily inspection sheet. The reclaim pipeline system is working well and there have been no comments about problems with the system to date. The barge has been moved at least twice since start-up. The overall configuration has been slightly modified by Mount Polley for ease of construction. The modifications include the addition on a 35 degree bend after the first length of steel pipe. It should be noted that the sections of steel pipe removed during the barge moves were not added to the high end of the steel section, as instructed in the Operation, Maintenance and Surveillance Manual. This is not believed to be a risk as long as the typical operating line pressures of 140 psi at the barge are not exceeded. Mount Polley should consider re-establishing the full 300 meters of steel reclaim pipe during the next scheduled barge move.

Other comments on the reclaim pipeline system are summarized below.

- Pipeline connections at the barge and the Reclaim Booster Pumpstation appeared to be in good condition.

- The reclaim barge access road was in good condition, with no signs of instability. Remedial work to stabilize the road crest was previously completed by Mount Polley.

Selected photos of the reclaim pipeline system are included on page A-7, in Appendix A.

## 3.3 SOUTHEAST SEDIMENT POND

The Southeast Sediment Pond collects runoff from Southeast Waste Dump. Runoff flows in a ditch along the base of the dump to the pond, where it is decanted through a manhole with five valved inlet pipes. The fifth inlet pipe was added by

Mount Polley prior to the 1998 spring freshet. The valved inlet pipes are used to control the water level in the pond. The normal maximum operating level is El. 1054.5 m. The water level must be maintained below 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 or into the T2 Dropbox.

At the time of inspection, the water was at the normal operating level, with no flow to the Reclaim Booster Sump. Reports from Mount Polley indicate that the pond did not fill up this year (it did in 1997). Total flow directed through the Southeast Sediment Pond for spring 1998 was estimated to be approximately 24,000 cubic metres. The seeps observed in 1997 at the north-west corner of the pond fill were not present and the soils in the area were dry and hard. The lack of seeps is probably the result of the low pond level, as there was no recharge around the back of the partial till liner.

Other observations made at the Southeast Sediment Pond and Southeast Waste Dump runoff ditch:

- Water flowing in the ditch is clear and the ditch is unobstructed.
- The overflow culvert for the pond is clear of obstructions.
- Pipeline connections to the Reclaim Booster Sump and T2 Dropbox appeared to be in good condition.
- The embankment fill slopes (inside and outside) look very good, with no signs of instability. No cracks were observed on the crest. No seepage or slumping of the slopes was observed.
- Re-vegetated areas are growing well.

- The area beyond the toe of the embankment fill is unchanged since the last inspection. The waste material and topsoil is still slumping, although it appeared to be drier (it has probably drained).

- The patch of filter fabric placed at the north-west corner of the fill should be removed so that vegetation can be re-established.

- Daily inspections of the Southeast Sediment Pond are conducted by Mount Polley staff. Observations are recorded on a daily inspection sheet. The pond is inspected more frequently during the spring freshet or after heavy rainfall.

Selected photos of the Southeast Waste Dump Ditch and Southeast Sediment Pond are included on pages A-8 and A-9, in Appendix A.

## 3.4 POLLEY LAKE PUMPING SYSTEM

The mine is permitted to annually extract up to one million cubic meters of water from Polley Lake during high runoff periods (the spring freshet and possibly late fall) using the Polley Lake Pumping System. The system includes a submerged intake connected to an on-shore diesel pump. Water is pumped to the Tailings Storage Facility in an HDPE pipeline, which has varying pressure (DR) ratings. The maximum pumping capacity of the system is approximately 5,500 US gpm. The pipeline is laid on grade on the access road. Water exits the pipeline through an open end discharge onto natural ground in the Tailings Storage Facility. A riprap lined outlet channel to reduce erosion has not been required.

At the time of inspection, the pumping system was not in operation. All pipe connections at the intake and pump area at the shoreline appeared to be in good condition, as there were no signs of leaks and subsequent erosion. However, the area is a bit messy and should be cleaned up. No oil or fuel leaks were observed from the pump, fuel tanks or the lined oil/fuel containment area. No signs of leakage were observed along the pipeline route. In 1997, a total of 670,000 cubic metres of water was pumped intermittently over a 2 month period. To date in 1998, 374,000 cubic metres of water has been pumped intermittently to the Tailings

Storage Facility over a 2 month period Daily inspections of the Polley Lake Pumping System are conducted by Mount Polley staff while the system is operating. Observations are recorded on a daily inspection sheet.

Selected photos of the Polley Lake Pumping System are included on page A-10, in Appendix A.

## 3.5 MILLSITE SUMP

The Millsite area is graded so that all runoff is directed to the Millsite Sump. The normal maximum operating level of the Millsite Sump is the invert of the bottom inlet at the manhole, El. 1102.7 m. The pond is kept at this low level so that storage capacity for the design storm event is available in the sump. A Manhole with a series of inlet pipes was installed to allow water to be conveyed to the tailings line by gravity in an 8 inch (200 mm) HDPE pipeline. This pipeline has not been installed and water is currently being pumped into the 30 inch tailings line immediately adjacent to the Millsite Sump. Mount Polley may install the 8 inch (200 mm) HDPE pipeline in the future.

At the time of inspection, the water was at the normal operating level and no water was being pumped to the tailings pipeline. Total flow directed through the Millsite Sump for the spring 1998 runoff was estimated to be approximately 9,000 cubic metres.

Other observations made at the Millsite Sump are:

- The embankment fill slopes (outside) look very good, with no signs of instability. There is local erosion of the inside slope on the west side of the sump. This is near the fence and should be repaired if the fence is jeopardized.

- No cracks were observed on the crest of the fills.

- No seepage or slumping of the slopes was observed. The ground to the immediate south of the sump is hard and dry, indicating little to no recharge through the foundation.

- The overflow culvert for the pond is clear of obstructions.

- Re-vegetated areas are growing well.

- Flows into the sump appear to be unobstructed (local runoff from a series of small pipes).

- Some of the downspouts (elbows) on the manhole inlet pipes are loose and should be reattached.

- The end of the discharge (outlet) pipe for the manhole is partially covered by rockfill. This should be cleaned out.

- In the event of a backup in the tailings line (above the T2 Dropbox), tailings could flow into the Millsite Sump through the pipeline used to pump out the sump. There is a very low chance of this happening.

- If power was lost during a storm event, the Millsite Sump could fill up. The sump would drain into the tailings pipeline by gravity through the high level HDPE pipe which conveys the pumped water.

Selected photos of the Millsite Sump are included on page A-11, in Appendix A.

## 3.6 SOUTH BOOTJACK DAM

The South Bootjack Dam was constructed downstream of the original Bootjack Lake earthfill dam in late 1996. The South Bootjack Dam was in good condition at the time of inspection. Water from local runoff was ponded between the new dam and the original dam and was seeping back into Bootjack Lake, through the notch in the original dam. A steady state level (Bootjack Lake level) will eventually be

reached as the notch continues to slowly erode. A minor amount of water was ponding on the downstream side of the dam, This is also most likely from local runoff. Other observations made at the South Bootjack Dam are:

- The embankment fill slopes looked very good, with no signs of instability.
- No cracks were observed on the dam crest and no seepage or slumping of the fill slopes was observed.
- The spillway was dry and is unobstructed.
- The re-vegetation is growing well.

Selected photos of the South Bootjack Dam are included on page A-12, in Appendix A.

# SECTION 4.0 - CONCLUSIONS AND RECOMMENDATIONS

## 4.1 GENERAL

This annual inspection report has been prepared to meet the guidelines of the Ministry of Energy and Mines. This report is based on observations made during a May 10 to 15, 1998 site visit by Mr. Ken Embree, P. Eng. and includes the Tailings Storage Facility and Ancillary Works. A review of all operating and monitoring data for the Tailings Storage Facility is also included in this report.

## 4.2 TAILINGS STORAGE FACILITY

Significant conclusions reached in this annual report are summarized below:

- Construction of the first modified centreline raise of the tailings embankments (Stage 2A) was successfully completed January through May, 1998. The embankments were raised from El. 934 m to El. 936 m.

- The Tailings Storage Facility embankments were generally in good condition. Some minor cracking has been repaired and no unexpected seepage or slumping was observed.

- The Seepage Collection Ponds are operating normally, after completion of Stage 2A construction.

- The Main Embankment Outlet Drains are seeping slightly and the flows need to be monitored.

- Piezometric data indicate that the embankments are performing as designed with the Foundation and Chimney Drains operating, resulting in a stable downstream zone (Zone B).

- Foundation Drain flows are clear and have decreased slightly since tailings deposition commenced. This indicates that the tailings basin is effectively being blanketed with tailings.

- Embankment settlements are within predicted design tolerances.

- The embankment stability has been confirmed using updated geometry and material parameters.

- The site water balance has been updated by Mount Polley and is capable of accurately predicting the tailings and reclaim water volumes using an in-situ tailings dry density of 1.35 tonnes/cubic metre.

- The facility is operating in accordance with the design requirements and the specified freeboard for the design storm and wave run-up have been maintained.

Recommendations for on-going operations of the Tailings Storage Facility are summarized below:

- Continue to closely monitor the filling rate and water balance.

- Continue regular weekly monitoring of the vibrating wire piezometers and drain flows (Foundation Drains and Outlet Drains).

- Continue regular monitoring of water quality and levels for groundwater wells. Include water quality monitoring for the foundation drains.

The above recommendations are currently being implemented by Mount Polley Mine staff.

## 4.3 ANCILLARY WORKS

For the Ancillary Works, significant conclusions and recommendations presented in this annual report are summarized below:

Pipe Containment Channel

- The reclaim and tailings pipelines have been moved into the runoff ditch from the Millsite to the sharp curve above the T2 Dropbox because of plans to widen the road. Existing cross drain culvert inlets were plugged with -3/4 inch material so that flow would be directed down the ditch.

- The pipe containment channel is in good condition and is clear of major obstructions.

- Tailings from the T2 Overflow Pond reached the Bootjack Creek Crossing where they settled out in the culvert sleeves. The area of the Bootjack Creek Crossing must be closely monitored.

- Berms should be constructed along the edges of the road at the Bootjack Creek Crossing to direct flows past Bootjack Creek and to the Tailings Storage Facility.

Tailings Pipeline System

- After initial problems with the tailings pipeline system, the T2 Dropbox was revised and now acts as a pressure relief point for the pipeline. The system is now functioning satisfactorily.

- A tailings beach was present over most of the Main Embankment prior to Stage 2A construction. Cracking of the fill occurred in the only area where a good beach did not exist. All efforts should be made to establish an exposed tailings beach over the entire length of both the Main and Perimeter

Embankments as soon as the pipeline is reconnected on the embankment crests.

- Occasional problems with tailings discharge has resulted in sections of the pipeline which are partially sanded. The M4 end of pipeline discharge point was not constructed and the pipeline cannot be properly flushed out. Consideration should be given to installing the M4 end of pipeline discharge point so that the pipeline can be thoroughly flushed after any shutdowns, and to help remove the sanding that currently exists.

- Tailings beaches with a minimum width of 15 m must be established at both the Main and Perimeter embankments. This means that movable discharge section will have to be relocated more frequently than in the past.

- Mount Polley is planning to implement a trial program for cycloning tailings. A large cyclone will be attached to the tailings pipeline and will be operated as a trial to accelerate beach development.

Reclaim Pipeline System

- The reclaim pipeline system has functioned satisfactorily.

- The steel section of the reclaim pipeline has not been relocated with the barge moves. This is acceptable as long as the line pressures are maintained below 140 psi.

Southeast Sediment Pond

- The pond level was low, at the normal operating level.

- A fifth inlet pipe was added to the manhole, enabling the system to more quickly pass water to the Tailings Storage Facility.

- The pond did not fill to the high levels seen in the spring of 1997, most likely due to a smaller snowpack.

- No seepage was observed at the north-west corner of the pond fill, a result of the pond not filling up above the partial till liner.

- The pond fill slopes were in good condition, with no signs of instability.

- The runoff collection ditch was clear and free of obstructions.

Polley Lake Pumping System

- The system performed well in 1997, when 670,000 cubic metres of water were pumped.

- The system performed well in 1998, but only 374,000 cubic metres were pumped in the Spring of 1998 because of minimum flow requirements for Hazeltine Creek.

- There is some scrap construction material at the intake area that should be cleaned up.

Millsite Sump

- The pond level was low, at the normal operating level.

- The pond is still being lowered by pumping. A higher level gravity discharge to the tailings pipeline control the pond level in the event of a power failure.

- Some erosion is present on the west cut slope. This should be repaired if it causes the fence to be damaged. Other fill slopes were in good condition, including the south slope

South Bootjack Dam

- The dam is in good condition and the spillway is clear of any obstructions.
- Ponded water is now seeping back into Bootjack Lake.

The above recommendations are currently being implemented by Mount Polley staff.

PROFESSIONAL
PROVINCE OF
K. D. K. EMBREE
ENGINEER
COLUMBIA

Ken D. Embree, P. Eng.
Senior Engineer

**Knight Piésold Ltd.**
CONSULTING ENGINEERS

TABLE 2.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
TAILINGS STORAGE FACILITY

STAGE 2A CONSTRUCTION - QUALITY ASSURANCE TESTING SCHEDULE

J:\JOB\DATA\10162-9\MISC\QAQCSCH.XLS 6/26/98

| EMBANKMENT ZONE (Material) | FILL QUANTITY[1] ($m^3$) | | | CONTROL TESTS | | | | | | | | RECORD TESTS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | C2 | | C3 | | C4 | | C6 | | R1 | | R2 | | R3 | | R4 | | R7 | |
| | Main | Perimeter | Total | 1 per | No. | 1 per | No. | 1 per | No. | 1 per | No. | 1 per | No. | 1 per | No. | 1 per | No. | 1 per | No. | 1 per | No. |
| ZONE CBL[2] - Coarse Bearing Layer (Processed Rock) | 9,000 | - | 9,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ZONE B[3] (Glacial Till, Glaciolacustrine or Granular Material) | 35,700 | 22,200 | 57,900 | 20,000 | 3 | 20,000 | 3 | 20,000 | 3 | 20,000 | 3 | 10,000 | 6 | 10,000 | 6 | 10,000 | 6 | 10,000 | 6 | 10,000 | 6 |
| ZONE S[3] (Glacial Till) | 32,700 | 14,400 | 47,100 | 3,000 | 16 | 3,000 | 16 | 3,000 | 16 | 3,000 | 16 | 4,000 | 12 | 4,000 | 12 | 4,000 | 12 | 4,000 | 12 | 4,000 | 12 |
| ZONE F[4] - Outlet Drains/Pressure Relief Wells (Filter Sand) | - | 800 | 800 | -- | -- | 150 | 5 | -- | -- | -- | -- | -- | -- | -- | -- | 150 | 5 | -- | -- | -- | -- |
| ZONE G - Foundation and Outlet Drains (Drain Gravel) | 200 | 200 | 400 | -- | -- | 80 | 5 | -- | -- | -- | -- | -- | -- | -- | -- | 70 | 6 | -- | -- | -- | -- |
| ZONE T - Main and Perimeter Embankment (Transition Zone Rockfill) | 23,400 | 28,600 | 52,000 | -- | -- | 9,000 | 6 | -- | -- | -- | -- | -- | -- | -- | -- | 4,500 | 12 | -- | -- | -- | -- |
| Totals | 101,000 | 66,200 | 167,200 | | 19 | | 35 | | 19 | | 19 | | 18 | | 18 | | 41 | | 18 | | 18 |
| | | | | | | | | | | | 92 | | | | | | | | | | 113 |

Control Tests:
C2 Moisture Content (ASTM D2216)
C3 Particle Size Distribution (ASTM D422)
C4 Laboratory Compaction (ASTM D1557)
C6 Specific Gravity (ASTM D854)

Record Tests:
R1 Atterberg Limits (ASTM D4318)
R2 Moisture Content (ASTM D2216)
R3 Particle Size Distribution (ASTM D422)
R4 Laboratory Compaction (ASTM D1557)
R7 Density by Nuclear Methods (ASTM D2922)

Notes:

1) Quantities are based neat line measurements from revised embankment design drawings.
2) No testing required for Coarse Bearing Layer.
3) Control tests for Zones S and B combined because glacial till used for both zones.
4) Abundant Zone F control tests completed during production of the material in Stage 1A/1B construction.

**Knight Piésold Ltd.**
CONSULTING ENGINEERS

# TABLE 2.2

## MOUNT POLLEY MINING CORPORATION
## MOUNT POLLEY MINE
## TAILINGS STORAGE FACILITY

### SUMMARY OF RECENT PIEZOMETER READINGS (To June 16, 1998)

J:\JOB\DATA\10162-9\SITE_2B\POLLEY-2\PIEZOS\PIEZ-NEW.XLS 6/26/98 8:41

| PIEZOMETER NO. | PRESSURE (m $H_2O$) | | | | COMMENTS |
|---|---|---|---|---|---|
| | Previous Two Weeks 3-Jun-98 | Previous Week 10-Jun-98 | Current Reading 16-Jun-98 | Change from Previous Reading | |
| A0-PE2-01 | 2.09 | 2.07 | 2.25 | 0.18 | Tailings Piezometer, El. 928.03. |
| A0-PE2-02 | 1.91 | 1.90 | 2.07 | 0.17 | Tailings Piezometer, El. 927.87. |
| A1-PE1-01 | -0.47 | -0.41 | -0.47 | -0.06 | Foundation Drain piezometer, El. 913.00. |
| A1-PE1-02 | -0.57 | -0.54 | -0.57 | -0.02 | Foundation Drain piezometer, El. 912.10. |
| A1-PE1-03 | -0.54 | -0.54 | -0.52 | 0.02 | Chimney Drain piezometer, El. 917.20. |
| A2-PE2-01 | 11.85 | 11.74 | 11.78 | 0.04 | Foundation Piezometer depth approx. 9.0m. (El. 903.68) |
| A2-PE2-02 | 2.03 | 2.01 | 2.03 | 0.02 | Foundation Piezometer depth approx. 2.9m. (El. 909.77) |
| A2-PE2-03 | 8.41 | 8.27 | 8.13 | -0.14 | Fill piezometer El. 919.43. |
| (A2-PE2-04) | -- | -- | -- | --- | Fill piezometer El. 926.07. |
| A2-PE2-05 | -0.35 | -0.30 | -0.34 | -0.05 | Fill piezometer El. 921.87. |
| B0-PE2-01 | 2.89 | 2.75 | 2.94 | 0.19 | Tailings Piezometer, El. 927.30. |
| B0-PE2-02 | 2.77 | 2.67 | 2.86 | 0.19 | Tailings Piezometer, El. 927.18. |
| B1-PE1-01 | -0.61 | -0.61 | -0.58 | 0.03 | Foundation Drain piezometer, El. 917.30. |
| B1-PE1-02 | -0.70 | -0.71 | -0.69 | 0.01 | Foundation Drain piezometer, El. 915.95. |
| B1-PE1-03 | -0.61 | -0.62 | -0.60 | 0.02 | Chimney Drain piezometer, El. 918.70. |
| B2-PE2-01 | 14.71 | 14.71 | 14.73 | 0.02 | Foundation Piezometer depth approx. 15.0m (El. 901.98) |
| B2-PE2-02 | 8.70 | 8.75 | 8.73 | -0.02 | Foundation Piezometer depth approx. 7.9m (El. 909.51) |
| B2-PE2-03 | 19.11 | 19.14 | 19.11 | -0.03 | Fill piezometer El. 921.00. |
| B2-PE2-04 | 5.30 | 5.06 | 4.85 | -0.21 | Fill piezometer El. 921.00. |
| B2-PE2-05 | -0.13 | -0.10 | -0.15 | -0.05 | Fill piezometer El. 921.66. |
| C0-PE2-01 | 2.22 | 2.16 | 2.35 | 0.19 | Tailings Piezometer, El. 927.48. |
| C0-PE2-02 | 2.58 | 2.55 | 2.73 | 0.18 | Tailings Piezometer, El. 927.48. |
| C1-PE1-01 | -0.17 | -0.11 | -0.17 | -0.06 | Foundation Drain piezometer, El. 914.70. |
| C1-PE1-02 | -0.58 | -0.58 | -0.55 | 0.03 | Chimney Drain piezometer, El. 916.60. |
| C1-PE1-04 | -0.20 | -0.29 | -0.13 | 0.16 | Foundation Drain Piezometer, El. 914.30. |
| (C2-PE2-01) | --- | --- | --- | --- | Foundation Piezometer depth approx. 8.2m (El. 907.48) |
| C2-PE2-02 | 6.26 | 6.18 | 6.19 | 0.01 | Foundation Piezometer depth approx. 5.2m (El. 910.53) |
| C2-PE2-03 | 0.45 | 0.44 | 0.38 | -0.06 | Fill piezometer El. 921.00. |
| C2-PE2-05 | 3.48 | 3.47 | 3.40 | -0.07 | Fill piezometer El. 924.80. |
| D1-PE1-02 | -0.59 | -0.58 | -0.57 | 0.02 | Outlet Drain piezometer, El. 928.76. |
| D2-PE2-01 | -0.22 | -0.33 | -0.25 | 0.08 | Fill piezometer El. 931.00. |

**Notes:**

1. **Piezometers A2-PE2-04 and C2-PE2-01 not functional.**

**Knight Piésold Ltd.**
CONSULTING ENGINEERS

# TABLE 2.3

## MOUNT POLLEY MINING CORPORATION
## MOUNT POLLEY MINE
## TAILINGS STORAGE FACILITY

### COMPARISON OF PRE-CONSTRUCTION TO CURRENT PORE PRESSURES (Current Readings Taken June 16, 1998)

J:\JOB\DATA\10162-9\SITE_2B\POLLEY-2\PIEZOS\PIEZ-NEW.XLS 26-Jun-98

| Piezometer No. | Tip El. (m) | Ground El. (m) | Initial Readings | | Current Readings | | Change | Artesian | Comments | Location |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | El. (m) | Head (m) | El. (m) | Head (m) | | | | |
| A0-PE2-01 | 928.03 | 929.43 | 928.87 | 0.84 | 930.28 | 2.25 | 1.41 | | Emankment crest complete to El. 936. Pond El. 930.39. | Tailings Piezometer. |
| A0-PE2-02 | 927.87 | 929.27 | 928.80 | 0.93 | 929.94 | 2.07 | 1.14 | | Emankment crest complete to El. 936. Pond El. 930.39. | Tailings Piezometer. |
| A1-PE1-01 | 913.00 | | 912.22 | -0.78 | 912.53 | -0.47 | 0.31 | | Negative (no pressure). | Foundation Drain FD-3. |
| A1-PE1-02 | 912.10 | | 911.42 | -0.68 | 911.53 | -0.57 | 0.11 | | Negative (no pressure), minor fluctuations. | Foundation Drain FD-4. |
| A1-PE1-03 | 917.20 | | 916.65 | -0.55 | 916.68 | -0.52 | 0.04 | | Negative (no pressure), minor fluctuations. | Chimney Drain. |
| A2-PE2-01 | 903.68 | 912.67 | 913.19 | 9.51 | 915.46 | 11.78 | 2.27 | **2.79** | **Artesian** 2.79 m, since start, increased **2.27 m.** | Foundation, depth approx. 9.0m. |
| A2-PE2-02 | 909.77 | 912.67 | 911.72 | 1.95 | 911.80 | 2.03 | 0.08 | **-0.87** | **Not artesian**, increased **0.08 m**, minor fluctuations. | Foundation , depth approx. 2.9m. |
| A2-PE2-03 | 919.43 | | 919.66 | 0.23 | 927.56 | 8.13 | 7.91 | | Dissipating after initial fill placement, then dissipating after response to Stage 2A fill. | Fill piezometer. |
| (A2-PE2-04) | 926.07 | | 925.67 | -0.40 | --- | --- | --- | | Large increase during initial fill placement, dissipating then stopped working. | Fill piezometer. |
| A2-PE2-05 | 921.87 | | 921.17 | -0.70 | 921.53 | -0.34 | 0.35 | | Increase during initial fill placement, finished dissipating. | Fill piezometer. |
| B0-PE2-01 | 927.30 | 928.70 | 928.08 | 0.78 | 930.24 | 2.94 | 2.16 | | Emankment crest complete to El. 936. Pond El. 930.39. | Tailings Piezometer. |
| B0-PE2-02 | 927.18 | 928.58 | 928.29 | 1.11 | 930.04 | 2.86 | 1.75 | | Emankment crest complete to El. 936. Pond El. 930.39. | Tailings Piezometer. |
| B1-PE1-01 | 917.30 | | 917.00 | -0.30 | 916.72 | -0.58 | -0.28 | | Negative (no pressure), minor fluctuations. | Foundation Drain FD-1. |
| B1-PE1-02 | 915.95 | | 915.14 | -0.81 | 915.26 | -0.69 | 0.11 | | Negative (no pressure), minor fluctuations. | Foundation Drain FD-2. |
| B1-PE1-03 | 918.70 | | 918.09 | -0.61 | 918.10 | -0.60 | 0.01 | | Negative (no pressure), minor fluctuations. | Chimney Drain. |
| B2-PE2-01 | 901.98 | 916.98 | 913.47 | 11.49 | 916.71 | 14.73 | 3.24 | **-0.27** | **Not artesian**, increased **3.24 m**, minor fluctuations. | Foundation, depth approx. 15.0m. |
| B2-PE2-02 | 909.51 | 916.98 | 914.48 | 4.97 | 918.24 | 8.73 | 3.76 | **1.26** | **Artesian 1.26 m**, not artesian at start, increased **3.76 m.** | Foundation, depth approx. 7.9m. |
| B2-PE2-03 | 921.00 | | 920.41 | -0.59 | 940.11 | 19.11 | 19.70 | | Dissipating after initial fill placement. Response to Stage 2A fill. | Fill piezometer. |
| B2-PE2-04 | 921.00 | | 920.45 | -0.55 | 925.85 | 4.85 | 5.40 | | Dissipating after initial fill placement, then dissipating after response to Stage 2A fill. | Fill piezometer. |
| B2-PE2-05 | 921.66 | | 922.78 | 1.12 | 921.51 | -0.15 | -1.27 | | Increase during initial fill placement, finished dissipating. | Fill piezometer. |
| C0-PE2-01 | 927.80 | 928.88 | 928.44 | 0.64 | 930.15 | 2.35 | 1.72 | | Emankment crest complete to El. 936. Pond El. 930.39. | Tailings Piezometer. |
| C0-PE2-02 | 927.48 | 928.88 | 928.64 | 1.16 | 930.21 | 2.73 | 1.57 | | Emankment crest complete to El. 936. Pond El. 930.39. | Tailings Piezometer. |
| C1-PE1-01 | 914.70 | | 914.45 | -0.25 | 914.53 | -0.17 | 0.08 | | Negative (no pressure), minor fluctuations. | Foundation Drain FD-1. |
| C1-PE1-02 | 916.60 | | 916.02 | -0.58 | 916.05 | -0.55 | 0.02 | | Negative (no pressure), minor fluctuations. | Chimney Drain. |
| C1-PE1-04 | 914.30 | | 914.13 | -0.17 | 914.17 | -0.13 | 0.04 | | Negative (no pressure). | Foundation Drain FD-5. |
| (C2-PE2-01) | 907.48 | 915.71 | 918.07 | 10.59 | --- | --- | --- | **4.60** | **Artesian 4.60m**, increased **2.23 m** then stopped working. | Foundation, depth approx. 8.2m. |
| C2-PE2-02 | 910.53 | 915.71 | 916.09 | 5.56 | 916.72 | 6.19 | 0.63 | **1.01** | **Artesian 1.01 m**, since start, increased **0.63 m.** | Foundation, depth approx. 5.2m. |
| C2-PE2-03 | 921.00 | | 925.50 | 4.50 | 921.38 | 0.38 | -4.12 | | Increase during initial fill placement, finished dissipating. | Fill piezometer. |
| C2-PE2-05 | 924.80 | | 921.69 | -3.11 | 928.20 | 3.40 | 6.51 | | Large increase during initial fill placement, no dissipation. Response to Stage 2A fill. | Fill piezometer. |
| D1-PE1-02 | 928.76 | | 928.24 | -0.52 | 928.19 | -0.57 | -0.04 | | Negative (no pressure). | Outlet Drain OD-4. |
| D2-PE2-01 | 931.00 | | 931.00 | 0.00 | 930.75 | -0.25 | -0.24 | | Negative (no pressure), minor fluctuations. | Fill piezometer. |

Notes:

1. **Piezometers A2-PE2-04 and C2-PE2-01 not functional.**

**Knight Piésold Ltd.**
CONSULTING ENGINEERS

## TABLE 2.4

## MOUNT POLLEY MINING CORPORATION
## MOUNT POLLEY MINE
## TAILINGS STORAGE FACILITY

### SUMMARY OF DRAIN FLOW DATA

FILENAME: J:\JOB\DATA\10162-9\SITE_2B\POLLEY-2\DRAINS\FD-MON.XLS

June 26, 1998

| DATE | FD-1 | | | FD-2 | | | FD-3 | | | FD-4 | | | FD-5 | | | Total Flow | | | Pond El (m) | GW96-9 (GW Well) Elev. Above Top of Casing (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flow Rate | | Comments | Flow Rate | | Comments | Flow Rate | | Comments | Flow Rate | | Comments | Flow Rate | | Comments | Flow Rate | | Comments | | |
| | (l/min) | (l/sec) | | (l/min) | (l/sec) | | (l/min) | (l/sec) | | (l/min) | (l/sec) | | (l/min) | (l/sec) | | (l/min) | (l/sec) | | | |
| 28-Aug-96 | 4.62 | 0.08 | Clear | 0.49 | 0.01 | Clear | 5.37 | 0.09 | Clear | 1.77 | 0.03 | Tr. cloudy | - | - | - | 12.25 | 0.20 | FD-3, FD-4 incomplete | | |
| 1-Sep-96 | 3.55 | 0.06 | Clear | 0.82 | 0.01 | Clear | 6.56 | 0.11 | Cloudy | 1.25 | 0.02 | V. Cloudy | - | - | - | 12.18 | 0.20 | FD-3, FD-4 incomplete | | |
| 5-Sep-96 | 2.60 | 0.04 | Clear | 0.62 | 0.01 | Clear | 2.71 | 0.05 | Clear | 0.93 | 0.02 | Cloudy | - | - | - | 6.86 | 0.11 | FD-3, FD-4 incomplete | | |
| 10-Sep-96 | 2.04 | 0.03 | Clear | 0.66 | 0.01 | Clear | 2.17 | 0.04 | Clear | 0.81 | 0.01 | Clear | - | - | - | 5.68 | 0.09 | FD-3, FD-4 incomplete | | |
| 27-Sep-96 | 3.10 | 0.05 | Clear | 0.70 | 0.01 | Clear | 3.10 | 0.05 | Clear | 1.00 | 0.02 | Clear | - | - | - | 7.90 | 0.13 | FD-3, FD-4 incomplete | | |
| 5-Oct-96 | 4.94 | 0.08 | Clear | 0.77 | 0.01 | Clear | 4.33 | 0.07 | Tr. cloudy | 6.16 | 0.10 | Tr. cloudy | - | - | - | 16.20 | 0.27 | FD-3, FD-4 incomplete | | |
| 12-Oct-96 | 3.90 | 0.07 | Clear | 1.00 | 0.02 | Clear | 3.50 | 0.06 | Clear | 1.80 | 0.03 | Clear | - | - | - | 10.20 | 0.17 | FD-3, FD-4 incomplete | 915.20 | |
| 13-Oct-96 | 4.20 | 0.07 | Clear | 0.90 | 0.02 | Clear | 13.50 | 0.23 | Clear | 1.70 | 0.03 | Clear | - | - | - | 20.30 | 0.34 | FD-3 complete, FD-4 incomplete | 915.50 | |
| 14-Oct-96 | 3.80 | 0.06 | Clear | 1.00 | 0.02 | Clear | 15.00 | 0.25 | Clear | 5.40 | 0.09 | Clear | - | - | - | 25.20 | 0.42 | FD-3 complete, FD-4 complete | 915.23 | |
| 17-Oct-96 | 5.90 | 0.10 | Clear | 0.80 | 0.01 | Clear | 16.60 | 0.28 | Clear | 5.40 | 0.09 | Clear | - | - | - | 28.70 | 0.48 | | 915.44 | |
| 18-Oct-96 | 9.80 | 0.16 | Clear | 1.00 | 0.02 | Clear | 26.10 | 0.44 | Clear | 9.00 | 0.15 | Clear | - | - | - | 45.90 | 0.77 | | 915.50 | |
| 22-Oct-96 | 6.20 | 0.10 | Clear | 0.80 | 0.01 | Clear | 20.40 | 0.34 | Clear | 5.90 | 0.10 | Clear | - | - | - | 33.30 | 0.56 | | 915.63 | |
| 27-Oct-96 | 6.00 | 0.10 | Clear | 1.50 | 0.03 | Clear | 24.20 | 0.40 | Clear | 6.40 | 0.11 | Clear | - | - | - | 38.10 | 0.64 | | 916.00 | |
| | | | | | | | | | | | | | | | | | | | | |
| 15-Mar-97 | 3.89 | 0.06 | Clear | 1.35 | 0.02 | Clear | 8.91 | 0.15 | Clear | 3.19 | 0.05 | Clear | - | - | - | 17.34 | 0.29 | pig installed, sump pumped out | 918.00 | |
| 16-Mar-97 | 3.48 | 0.06 | Clear | 1.15 | 0.02 | Clear | 8.37 | 0.14 | Clear | 2.87 | 0.05 | Clear | - | - | - | 15.88 | 0.26 | pig installed, sump pumped out | 918.20 | |
| 2-Apr-97 | 2.10 | 0.04 | Clear | 1.12 | 0.02 | Clear | 8.40 | 0.14 | Clear | 3.46 | 0.06 | Clear | - | - | - | 15.08 | 0.25 | pig installed, sump pumped out | 920.27 | |
| 23-Apr-97 | 4.14 | 0.07 | Clear | 0.94 | 0.02 | Clear | 11.56 | 0.19 | Clear | 2.35 | 0.04 | Clear | - | - | - | 18.99 | 0.32 | pig installed, sump pumped out | 923.70 | |
| 24-Apr-97 | 3.16 | 0.05 | Clear | 0.84 | 0.01 | Clear | 12.73 | 0.21 | Clear | 2.05 | 0.03 | Clear | - | - | - | 18.78 | 0.31 | pig installed, sump pumped out | 923.75 | |
| 29-Apr-97 | 2.90 | 0.05 | Clear | 0.59 | 0.01 | Clear | 10.32 | 0.17 | Clear | 1.71 | 0.03 | Clear | - | - | - | 15.52 | 0.26 | pig installed, sump pumped out | 924.81 | |
| 8-May-97 | 3.60 | 0.06 | Clear | 0.76 | 0.01 | Clear | 14.15 | 0.24 | Clear | 1.92 | 0.03 | Clear | - | - | - | 20.43 | 0.34 | pig out, pumped down | 925.86 | |
| 13-May-97 | 4.04 | 0.07 | Clear | 0.79 | 0.01 | Clear | 14.85 | 0.25 | Clear | 1.95 | 0.03 | Clear | - | - | - | 21.63 | 0.36 | pig out, pumped down | 926.43 | |
| 20-May-97 | 4.11 | 0.07 | Clear | 0.77 | 0.01 | Clear | 17.09 | 0.28 | Clear | 1.85 | 0.03 | Clear | - | - | - | 23.82 | 0.40 | pig out, pumped down | 926.20 | |
| 28-May-97 | 3.99 | 0.07 | Clear | 0.80 | 0.01 | Clear | 15.71 | 0.26 | Clear | 1.87 | 0.03 | Clear | - | - | - | 22.37 | 0.37 | pig out, pumped down | 926.25 | |
| 10-Jun-97 | 4.15 | 0.07 | Clear | 0.82 | 0.01 | Clear | 18.35 | 0.31 | Clear | 1.89 | 0.03 | Clear | - | - | - | 25.21 | 0.42 | pig out, pumped down | 926.34 | |
| 17-Jun-97 | 4.10 | 0.07 | Clear | 0.78 | 0.01 | Clear | 19.93 | 0.33 | Clear | 1.85 | 0.03 | Clear | - | - | - | 26.66 | 0.44 | pig out, pumped down | 926.40 | |
| 24-Jun-97 | 3.97 | 0.07 | Clear | 0.84 | 0.01 | Clear | 17.24 | 0.29 | Clear | 1.83 | 0.03 | Clear | - | - | - | 23.88 | 0.40 | pig out, pumped down | 926.39 | |
| 1-Jul-97 | 3.93 | 0.07 | Clear | 0.69 | 0.01 | Clear | 14.72 | 0.25 | Clear | 1.73 | 0.03 | Clear | - | - | - | 21.07 | 0.35 | pig out, pumped down | 926.38 | |
| 8-Jul-97 | 4.05 | 0.07 | Clear | 0.72 | 0.01 | Clear | 18.07 | 0.30 | Clear | 1.88 | 0.03 | Clear | - | - | - | 24.72 | 0.41 | pig out, pumped down | 926.39 | |
| 15-Jul-97 | 4.11 | 0.07 | Clear | 0.88 | 0.01 | Clear | 15.38 | 0.26 | Clear | 2.24 | 0.04 | Clear | - | - | - | 22.61 | 0.38 | pig out, pumped down | 926.57 | |
| 22-Jul-97 | 4.06 | 0.07 | Clear | 0.91 | 0.02 | Clear | 15.83 | 0.26 | Clear | 2.05 | 0.03 | Clear | - | - | - | 22.85 | 0.38 | pig out, pumped down | 926.66 | |
| 29-Jul-97 | 4.40 | 0.07 | Clear | 0.85 | 0.01 | Clear | 20.48 | 0.34 | Clear | 2.11 | 0.04 | Clear | - | - | - | 27.84 | 0.46 | pig out, pumped down | 926.73 | |
| 5-Aug-97 | 4.13 | 0.07 | Clear | 0.79 | 0.01 | Clear | 18.35 | 0.31 | Clear | 1.97 | 0.03 | Clear | - | - | - | 25.24 | 0.42 | pig out, pumped down | 926.75 | |
| 13-Aug-97 | 4.12 | 0.07 | Clear | 0.78 | 0.01 | Clear | 24.19 | 0.40 | Clear | 2.02 | 0.03 | Clear | - | - | - | 31.11 | 0.52 | pig out, pumped down | 926.82 | |
| 20-Aug-97 | 4.13 | 0.07 | Clear | 0.76 | 0.01 | Clear | 15.95 | 0.27 | Clear | 1.80 | 0.03 | Clear | - | - | - | 22.64 | 0.38 | pig out, pumped down | 926.75 | |
| 26-Aug-97 | 4.62 | 0.08 | Clear | 0.76 | 0.01 | Clear | 18.75 | 0.31 | Clear | 1.92 | 0.03 | Clear | - | - | - | 26.05 | 0.43 | pig out, pumped down | 926.86 | |
| 3-Sep-97 | 4.48 | 0.07 | Clear | 0.76 | 0.01 | Clear | 16.95 | 0.28 | Clear | 1.76 | 0.03 | Clear | - | - | - | 23.95 | 0.40 | pig out, pumped down | 926.93 | |
| 9-Sep-97 | 4.57 | 0.08 | Clear | 0.75 | 0.01 | Clear | 16.04 | 0.27 | Clear | 1.81 | 0.03 | Clear | - | - | - | 23.17 | 0.39 | pig out, pumped down | 926.71 | |
| 17-Sep-97 | 4.62 | 0.08 | Clear | 0.77 | 0.01 | Clear | 16.71 | 0.28 | Clear | 1.78 | 0.03 | Clear | - | - | - | 23.88 | 0.40 | pig out, pumped down | 926.88 | |
| 23-Sep-97 | 4.64 | 0.08 | Clear | 0.78 | 0.01 | Clear | 17.75 | 0.30 | Clear | 1.83 | 0.03 | Clear | - | - | - | 25.00 | 0.42 | pig out, pumped down | 926.85 | |

**Knight Piésold Ltd.**
CONSULTING ENGINEERS

**TABLE 2.4**

**MOUNT POLLEY MINING CORPORATION**
**MOUNT POLLEY MINE**
**TAILINGS STORAGE FACILITY**

**SUMMARY OF DRAIN FLOW DATA**

FILENAME: J:\JOB\DATA\10162-9\SITE_2B\POLLEY-2\DRAINS\FD-MON.XLS

June 26, 1998

| DATE | FD-1 | | | FD-2 | | | FD-3 | | | FD-4 | | | FD-5 | | | Total Flow | | | Pond El (m) | GW96-9 (GW Well) Elev. Above Top of Casing (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flow Rate | | Comments | Flow Rate | | Comments | Flow Rate | | Comments | Flow Rate | | Comments | Flow Rate | | Comments | Flow Rate | | Comments | | |
| | (l/min) | (l/sec) | | (l/min) | (l/sec) | | (l/min) | (l/sec) | | (l/min) | (l/sec) | | (l/min) | (l/sec) | | (l/min) | (l/sec) | | | |
| 2-Oct-97 | 4.78 | 0.08 | Clear | 0.82 | 0.01 | Clear | 16.76 | 0.28 | Clear | 1.86 | 0.03 | Clear | - | - | - | 24.22 | 0.40 | pig out, pumped down | 926.92 | 0.055 |
| 8-Oct-97 | 4.69 | 0.08 | Clear | 0.81 | 0.01 | Clear | 16.01 | 0.27 | Clear | 1.95 | 0.03 | Clear | - | - | - | 23.46 | 0.39 | pig out, pumped down | 926.97 | 0.065 |
| 16-Oct-97 | 5.14 | 0.09 | Clear | 1.11 | 0.02 | Clear | 17.86 | 0.30 | Clear | 2.31 | 0.04 | Clear | - | - | - | 26.42 | 0.44 | pig out, pumped down | 927.06 | 0.095 |
| 24-Oct-97 | 5.13 | 0.09 | Clear | 0.92 | 0.02 | Clear | 16.23 | 0.27 | Clear | 1.98 | 0.03 | Clear | - | - | - | 24.26 | 0.40 | pig out, pumped down | 927.23 | 0.095 |
| 6-Nov-97 | 5.51 | 0.09 | Clear | 1.20 | 0.02 | Clear | 17.70 | 0.30 | Clear | 2.39 | 0.04 | Clear | - | - | - | 26.80 | 0.45 | pig out, pumped down | 927.51 | Frozen |
| 13-Nov-97 | 4.90 | 0.08 | Clear | 0.65 | 0.01 | Clear | 18.58 | 0.31 | Clear | 1.87 | 0.03 | Clear | - | - | - | 26.00 | 0.43 | pig out, pumped down | 927.60 | Frozen |
| 21-Nov-97 | 4.37 | 0.07 | Clear | 0.76 | 0.01 | Clear | 17.91 | 0.30 | Clear | 1.79 | 0.03 | Clear | - | - | - | 24.83 | 0.41 | pig out, pumped down | 927.63 | Frozen |
| 28-Nov-97 | 4.14 | 0.07 | Clear | 0.77 | 0.01 | Clear | 18.18 | 0.30 | Clear | 1.85 | 0.03 | Clear | - | - | - | 24.94 | 0.42 | pig out, pumped down | 927.65 | Frozen |
| 4-Dec-97 | 4.03 | 0.07 | Clear | 0.85 | 0.01 | Clear | 17.67 | 0.29 | Clear | 1.78 | 0.03 | Clear | - | - | - | 24.33 | 0.41 | pig out, pumped down | 927.75 | Frozen |
| 2-Jan-98 | 3.81 | 0.06 | Clear | 0.74 | 0.01 | Clear | 16.30 | 0.27 | Clear | 1.73 | 0.03 | Clear | - | - | - | 22.58 | 0.38 | pig out, pumped down | 928.10 | Frozen |
| 14-Jan-98 | 3.85 | 0.06 | Clear | 0.80 | 0.01 | Clear | 16.57 | 0.28 | Clear | 1.77 | 0.03 | Clear | - | - | - | 22.99 | 0.38 | pig out, needs pumping | 928.25 | Frozen |
| 21-Jan-98 | 3.57 | 0.06 | Clear | 0.74 | 0.01 | Clear | 16.42 | 0.27 | Clear | 1.82 | 0.03 | Clear | - | - | - | 22.55 | 0.38 | pig out, needs pumping | 928.30 | Frozen |
| 8-Apr-98 | 3.84 | 0.06 | Clear | 0.67 | 0.01 | Clear | 15.54 | 0.26 | Clear | 1.52 | 0.03 | Clear | - | - | - | 21.57 | 0.36 | pig out, pond pumped down | 929.70 | - |
| 17-Apr-98 | 3.82 | 0.06 | Clear | 0.69 | 0.01 | Clear | 15.58 | 0.26 | Clear | 1.37 | 0.02 | Clear | 6.33 | 0.11 | Clear | 27.79 | 0.46 | pig out, pond pumped down | 929.85 | - |
| 25-May-98 | 3.82 | 0.06 | Clear | 0.69 | 0.01 | Clear | 15.58 | 0.26 | Clear | 1.37 | 0.02 | Clear | 6.33 | 0.11 | Clear | 27.79 | 0.46 | pig out, pond pumped down | 930.10 | - |
| 2-Jun-98 | 3.52 | 0.06 | Clear | 0.78 | 0.01 | Clear | 15.58 | 0.26 | Clear | 1.42 | 0.02 | Clear | 6.80 | 0.11 | Clear | 28.10 | 0.47 | pig out, pond pumped down | 930.36 | - |
| 10-Jun-98 | 3.83 | 0.06 | Clear | 0.79 | 0.01 | Clear | 14.60 | 0.24 | Clear | 1.44 | 0.02 | Clear | 7.51 | 0.13 | Clear | 28.17 | 0.47 | pig out, pond pumped down | 930.39 | - |
| 16-Jun-98 | 3.77 | 0.06 | Clear | 0.78 | 0.01 | Clear | 16.35 | 0.27 | Clear | 1.41 | 0.02 | Clear | 7.93 | 0.13 | Clear | 30.24 | 0.50 | pig out, pond pumped down | 930.42 | - |

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## TABLE 2.5

## MOUNT POLLEY MINING CORPORATION
## MOUNT POLLEY MINE
## TAILINGS STORAGE FACILITY

## SURVEY MONUMENT COORDINATES - RECORD OF DISPLACEMENTS

I:\JOB\DATA\10162-9\SITE_2B\POLLEY-2\SURV-MON\SURV-MON.XLS 6/26/98 8:46

| Monitoring and Survey Data | | | | | | | Displacements Between Readings (m) | | | | | Total Displacements (m) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monument | Hub No. | Date | Comments | $N_n$ | $E_n$ | $El_n$ | ΔN | ΔE | ΔEl | $D_{xy}$ | $D_{xyz}$ | ΔN | ΔE | ΔEl | $D_{xy\text{-total}}$ | $D_{xyz\text{-total}}$ |
| A2-SM-02 | | 21-Aug-97 | Stage 1B - Initial Survey | 5818484.664 | 595600.941 | 934.210 | - | - | - | - | - | - | - | - | - | - |
| B2-SM-01 | | 21-Aug-97 | Stage 1B - Initial Survey | 5818631.996 | 595796.816 | 934.107 | - | - | - | - | - | - | - | - | - | - |
| C2-SM-03 | | 21-Aug-97 | Stage 1B - Initial Survey | 5818397.426 | 595485.086 | 934.036 | - | - | - | - | - | - | - | - | - | - |
| A2-SM-02 | | 20-Mar-98 | Stage 1B - Final Survey | 5818484.693 | 595600.940 | 934.095 | 0.029 | -0.001 | -0.115 | 0.029 | 0.119 | 0.029 | -0.001 | -0.115 | 0.029 | 0.119 |
| B2-SM-01 | | 20-Mar-98 | Stage 1B - Final Survey | 5818631.977 | 595796.831 | 934.032 | -0.019 | 0.015 | -0.075 | 0.024 | 0.079 | -0.019 | 0.015 | -0.075 | 0.024 | 0.079 |
| C2-SM-03 | | 20-Mar-98 | Stage 1B - Final Survey | 5818397.485 | 595485.065 | 933.895 | 0.059 | -0.021 | -0.141 | 0.063 | 0.154 | 0.059 | -0.021 | -0.141 | 0.063 | 0.154 |
| A2-SM-01 | 091 (U/S) | 11-Jun-98 | Stage 2A - Initial Survey | 5818496.322 | 595589.736 | 935.802 | - | - | - | - | - | - | - | - | - | - |
| A2-SM-02 | 092 (D/S) | 11-Jun-98 | Stage 2A - Initial Survey | 5818486.754 | 595597.265 | 935.965 | - | - | - | - | - | - | - | - | - | - |
| B2-SM-01 | 093 (U/S) | 11-Jun-98 | Stage 2A - Initial Survey | 5818637.375 | 595776.540 | 935.755 | - | - | - | - | - | - | - | - | - | - |
| B2-SM-02 | 094 (D/S) | 11-Jun-98 | Stage 2A - Initial Survey | 5818627.127 | 595783.715 | 936.238 | - | - | - | - | - | - | - | - | - | - |
| C2-SM-01 | 095 (U/S) | 11-Jun-98 | Stage 2A - Initial Survey | 5818407.912 | 595472.445 | 936.042 | - | - | - | - | - | - | - | - | - | - |
| C2-SM-02 | 096 (D/S) | 11-Jun-98 | Stage 2A - Initial Survey | 5818398.806 | 595479.259 | 936.529 | - | - | - | - | - | - | - | - | - | - |
| | 097 (U/S) | 11-Jun-98 | Stage 2A - Initial Survey | 5818681.655 | 595835.527 | 936.021 | - | - | - | - | - | - | - | - | - | - |
| | 098 (D/S) | 11-Jun-98 | Stage 2A - Initial Survey | 5818672.076 | 595842.154 | 936.410 | - | - | - | - | - | - | - | - | - | - |
| A2-SM-01 | 091 (U/S) | | | | | | | | | | | | | | | |
| A2-SM-02 | 092 (D/S) | | | | | | | | | | | | | | | |
| B2-SM-01 | 093 (U/S) | | | | | | | | | | | | | | | |
| B2-SM-02 | 094 (D/S) | | | | | | | | | | | | | | | |
| C2-SM-01 | 095 (U/S) | | | | | | | | | | | | | | | |
| C2-SM-02 | 096 (D/S) | | | | | | | | | | | | | | | |
| E2-SM-01 | 097 (U/S) | | | | | | | | | | | | | | | |
| E2-SM-02 | 098 (D/S) | | | | | | | | | | | | | | | |

**Notes:**

1. Calculate displacements as follows:

Total Displacements from initial survey

$\Delta N = N_n - N_o$

$\Delta E = E_n - E_o$

$\Delta El = El_n - El_o$

$D_{xy\text{-total}} = (\Delta N^2 + \Delta E^2)^{1/2}$

$D_{xyz\text{-total}} = (\Delta N^2 + \Delta E^2 + \Delta El^2)^{1/2}$

Displacements between readings

$\Delta N = N_{(n+1)} - N_n$

$\Delta E = E_{(n+1)} - E_n$

$\Delta El = El_{(n+1)} - El_n$

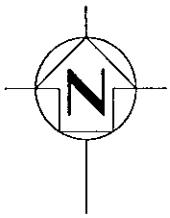
$D_{xy} = (\Delta N^2 + \Delta E^2)^{1/2}$

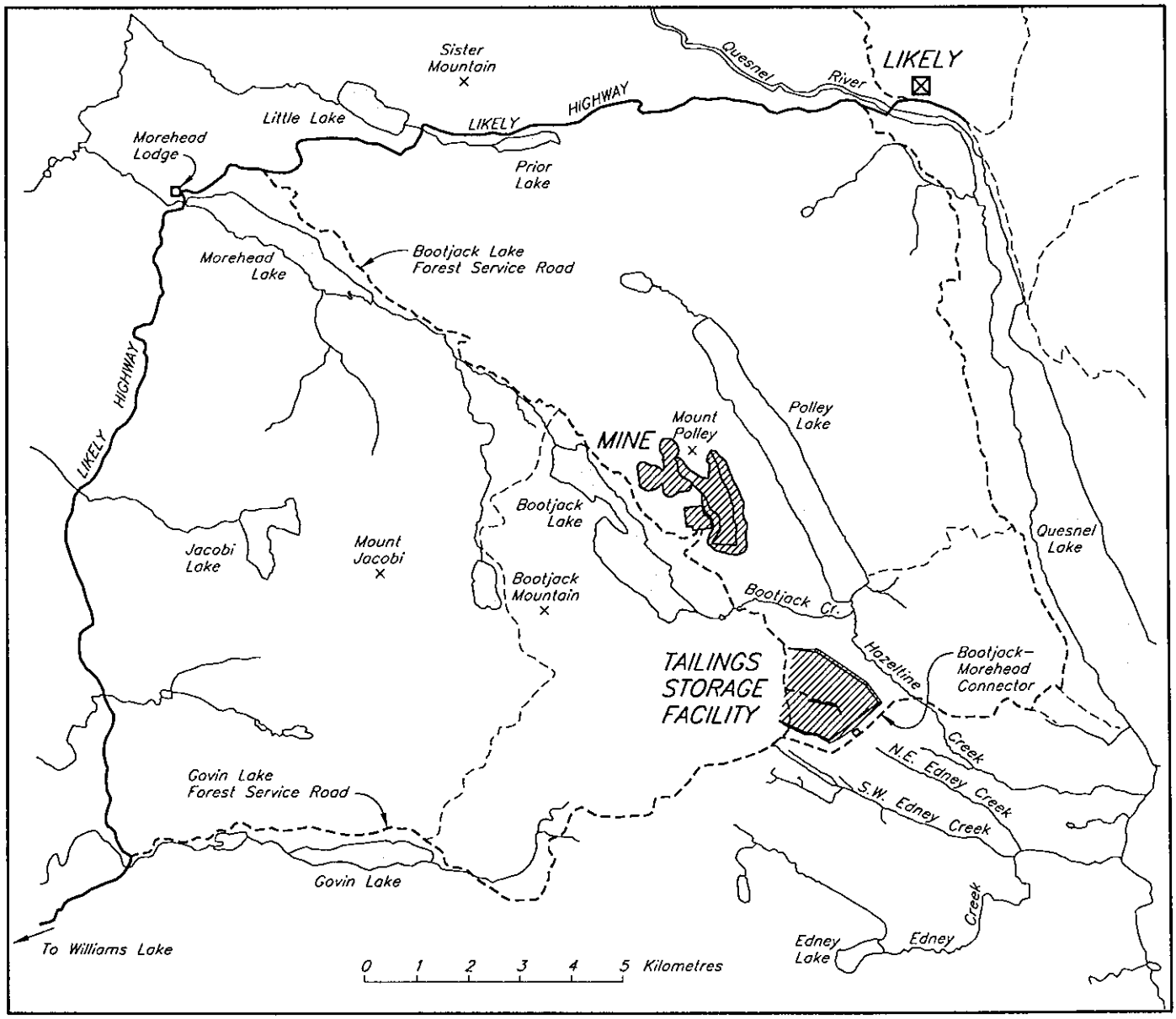
$D_{xyz} = (\Delta N^2 + \Delta E^2 + \Delta El^2)^{1/2}$

Comments on calculations

1. Coordinate system is (Easting, Northing, Elevation) = f(x,y,z).
2. Coordinate system is as shown on Drawings.

# MOUNT POLLEY MINING CORPORATION
# MOUNT POLLEY MINE
## PROJECT LOCATION AND ACCESS PLAN




Jun. 26, 1998

KNIGHT PIESOLD LTD.
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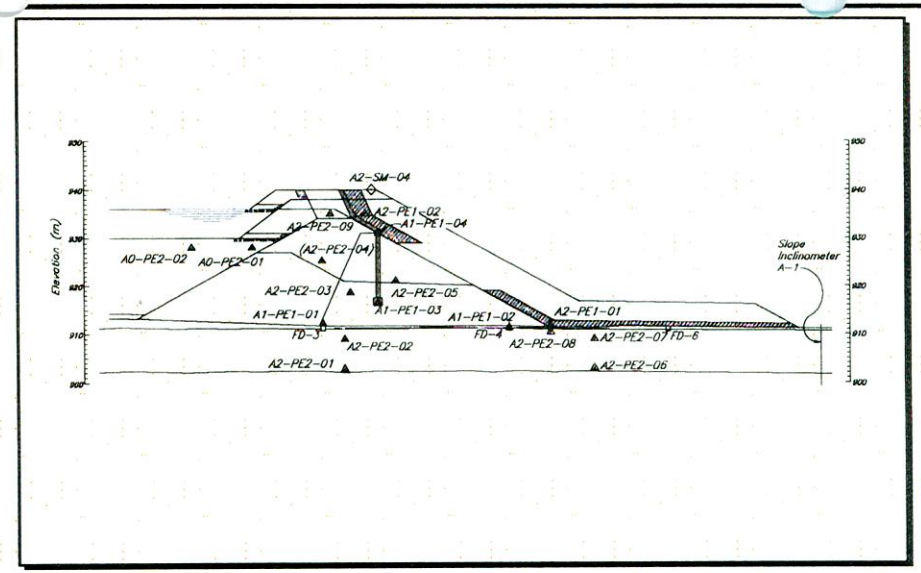
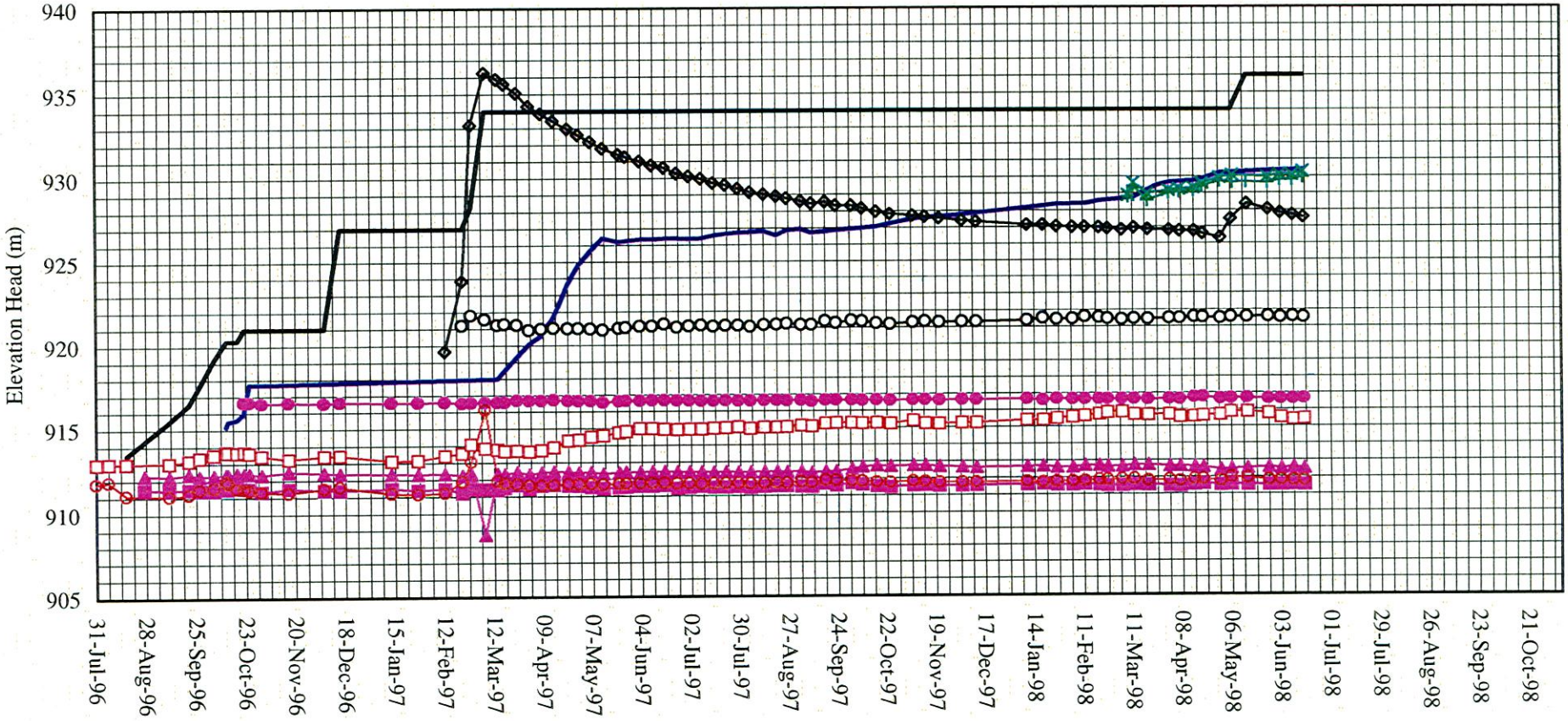
LOCATION MAP

FIGURE 1.1

CAD FILE: \10162 1:125,000 Plot 1=125

# MOUNT POLLEY MINING CORP0RATION
# MOUNT POLLEY PROJECT
# TAILINGS STORAGE FACILITY
# SUMMARY PLOT PIEZOMETER PLANE A

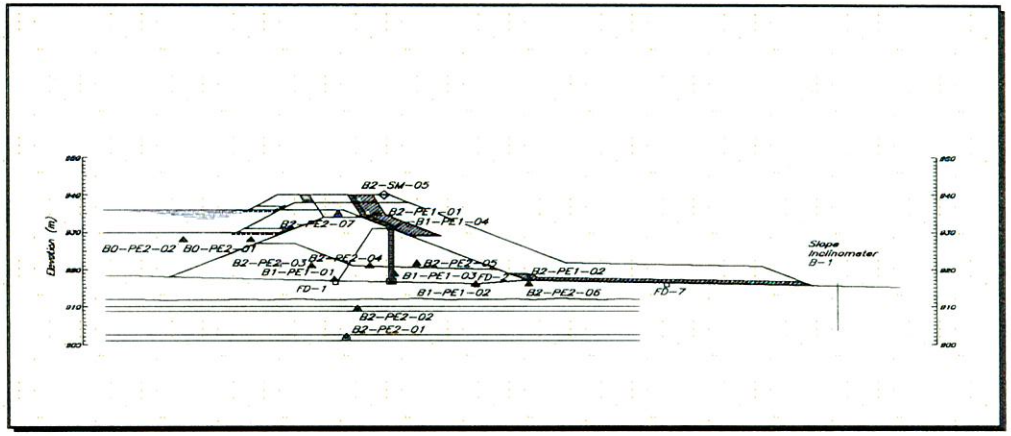


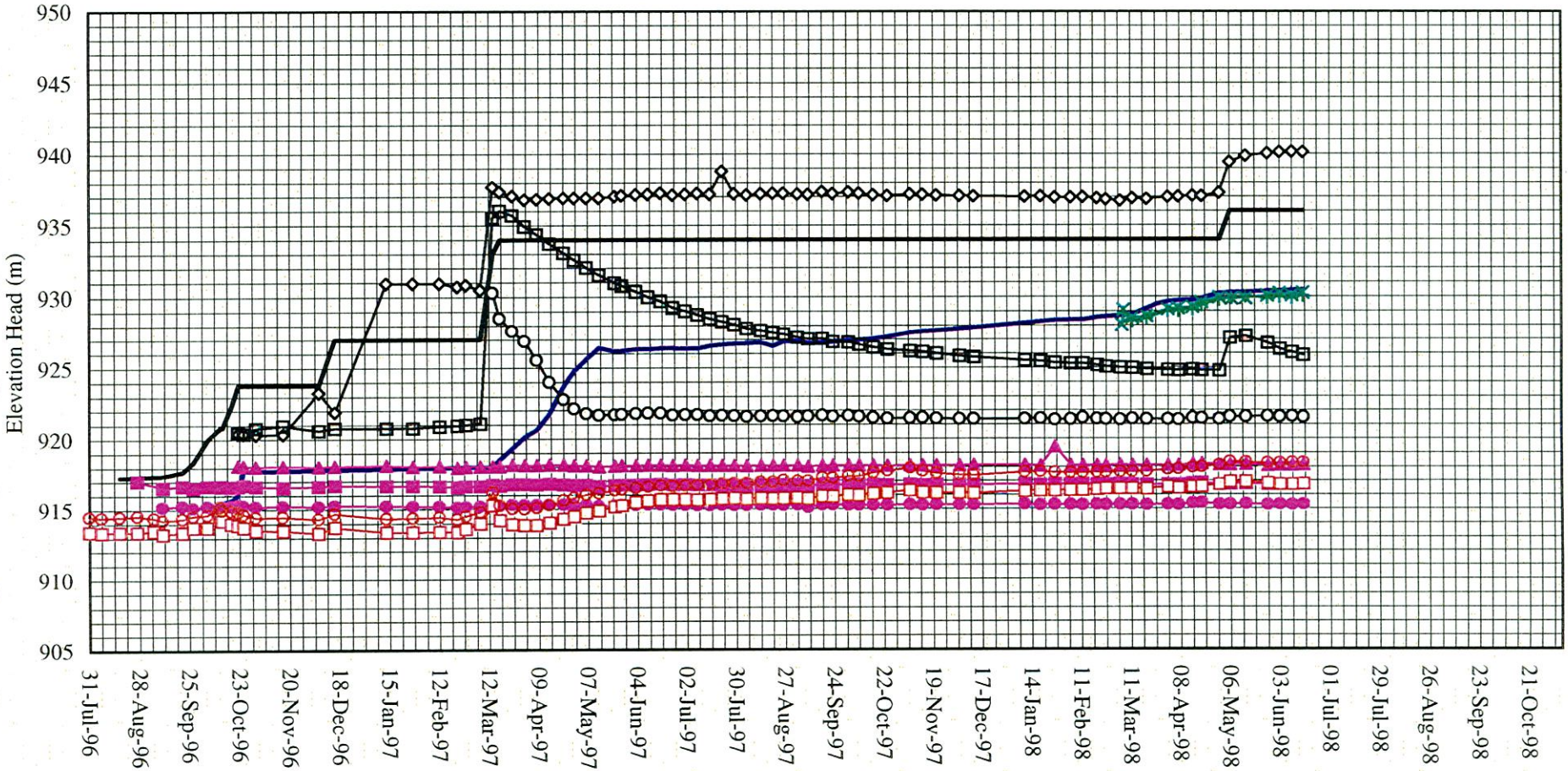




KNIGHT PIESOLD LTD.
CONSULTING ENGINEERS

FIGURE 2.1

# MOUNT POLLEY MINING CORP0RATION
# MOUNT POLLEY PROJECT
# TAILINGS STORAGE FACILITY
# SUMMARY PLOT PIEZOMETER PLANE B




KNIGHT PIESOLD LTD.
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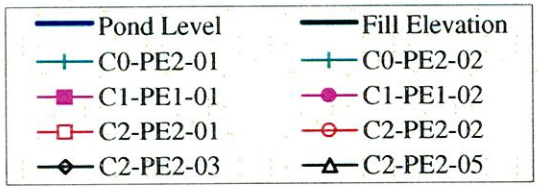
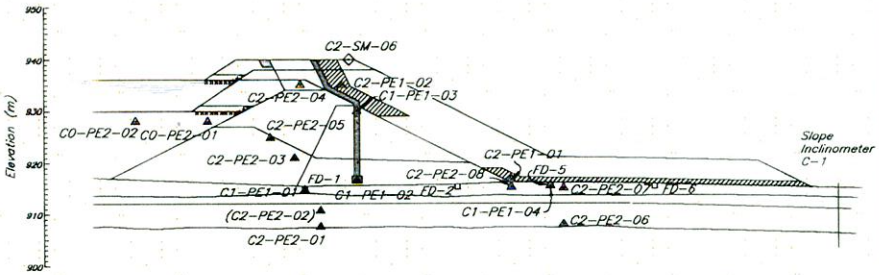
FIGURE 2.2

# MOUNT POLLEY MINING CORP0RATION
# MOUNT POLLEY PROJECT
# TAILINGS STORAGE FACILITY
# SUMMARY PLOT PIEZOMETER PLANE C



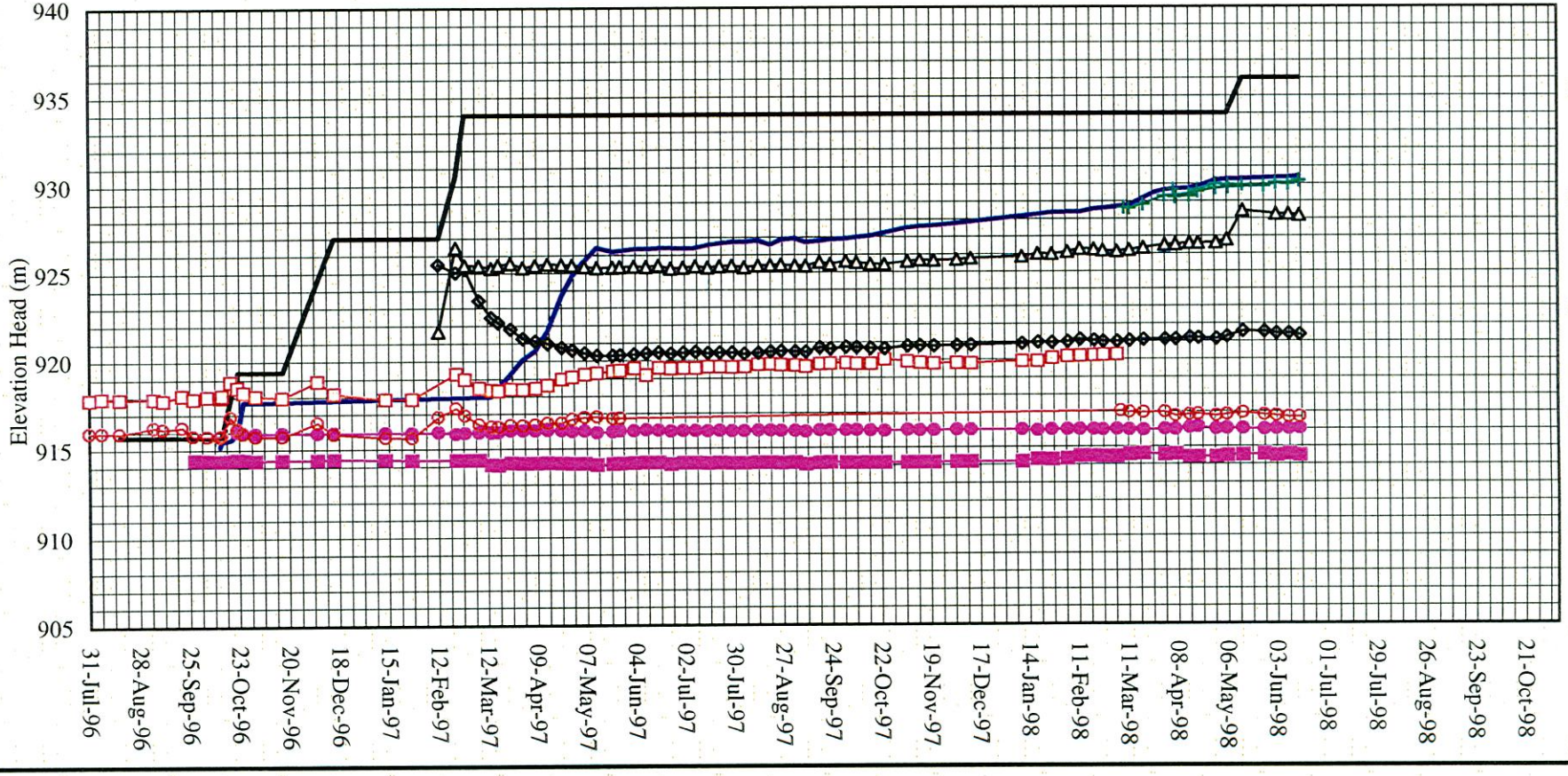




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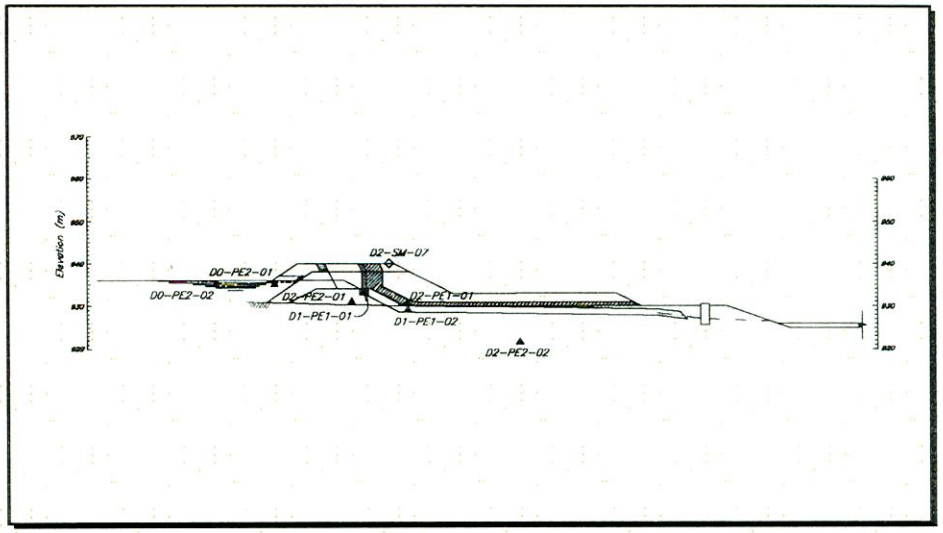
FIGURE 2.3

KNIGHT PIESOLD LTD.
CONSULTING ENGINEERS

# MOUNT POLLEY MINING CORP0RATION
# MOUNT POLLEY PROJECT
# TAILINGS STORAGE FACILITY
# SUMMARY PLOT PIEZOMETER PLANE D



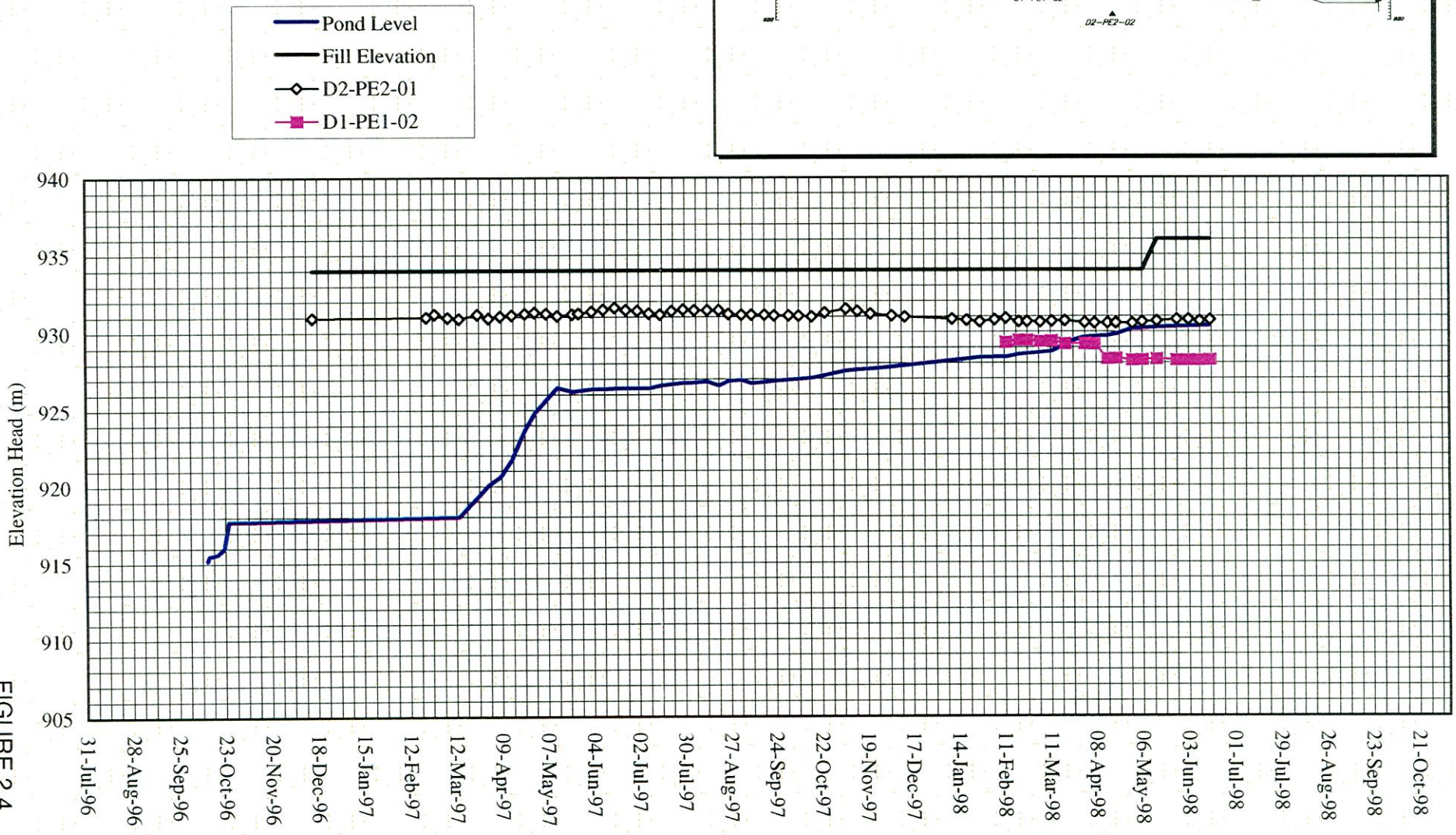




FIGURE 2.4

KNIGHT PIESOLD LTD.
CONSULTING ENGINEERS

# MOUNT POLLEY MINING CORPORATION.
## MOUNT POLLEY PROJECT
## TAILINGS STORAGE FACILITY
## FOUNDATION PIEZOMETER - A2-PE2-01

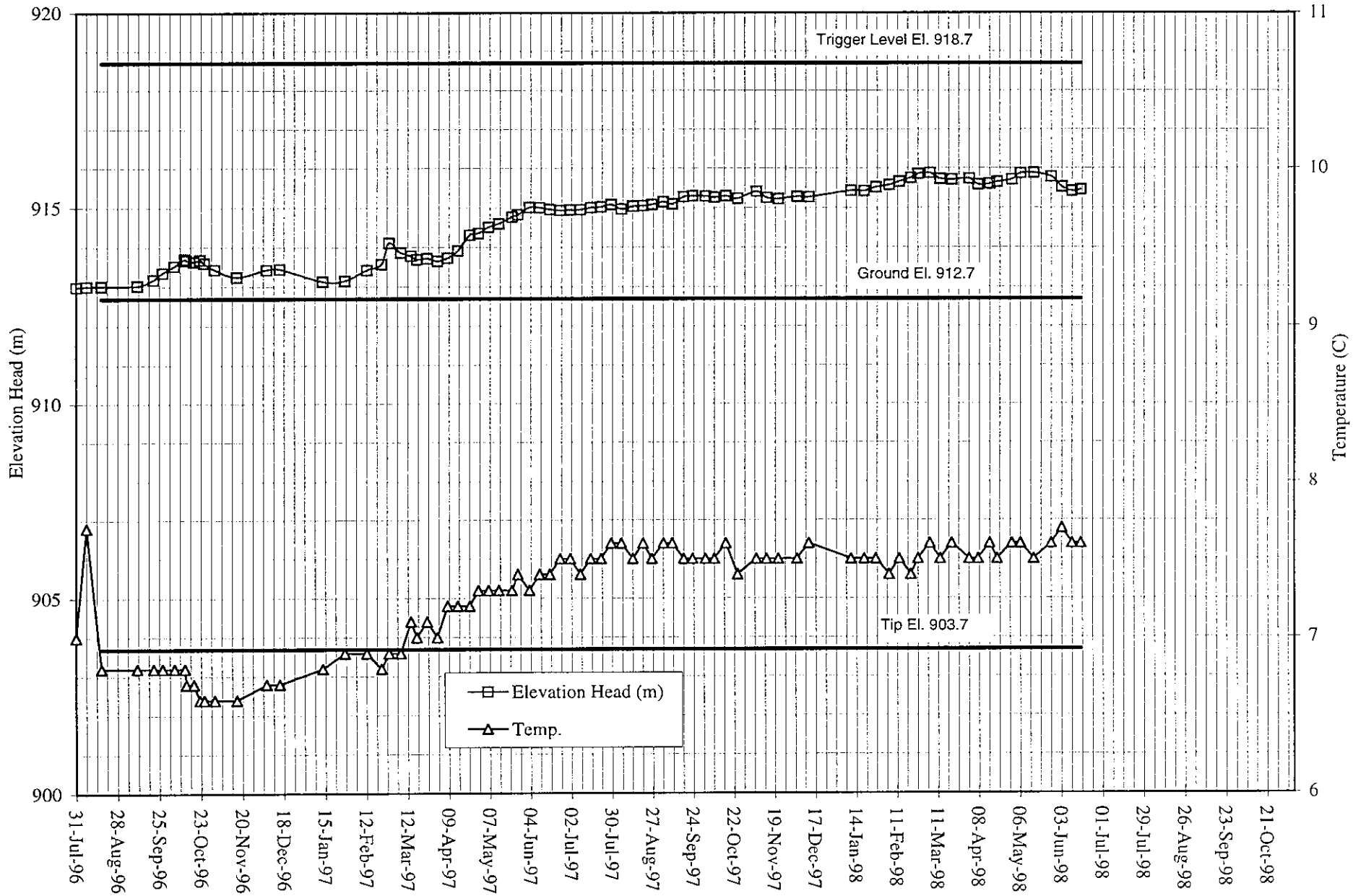



FIGURE 2.5

KNIGHT PIESOLD LTD.
CONSULTING ENGINEERS

# MOUNT POLLEY MINING CORPORATION.
## MOUNT POLLEY PROJECT
## TAILINGS STORAGE FACILITY
## FOUNDATION PIEZOMETER - A2-PE2-02

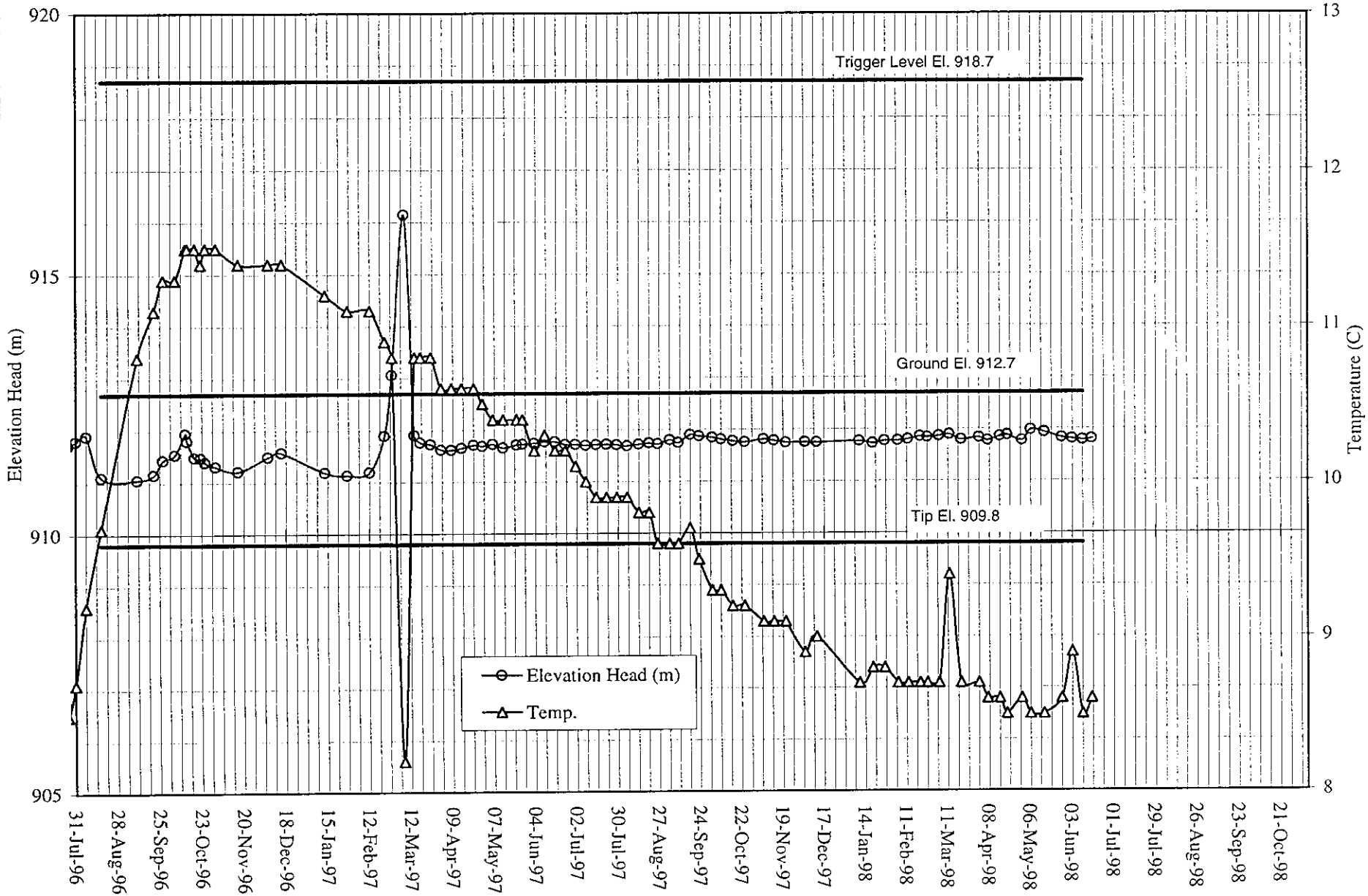



FIGURE 2.6

KNIGHT PIESOLD LTD.
CONSULTING ENGINEERS

**MOUNT POLLEY MINING CORPORATION.**
**MOUNT POLLEY PROJECT**
**TAILINGS STORAGE FACILITY**
**FOUNDATION PIEZOMETER - B2-PE2-01**

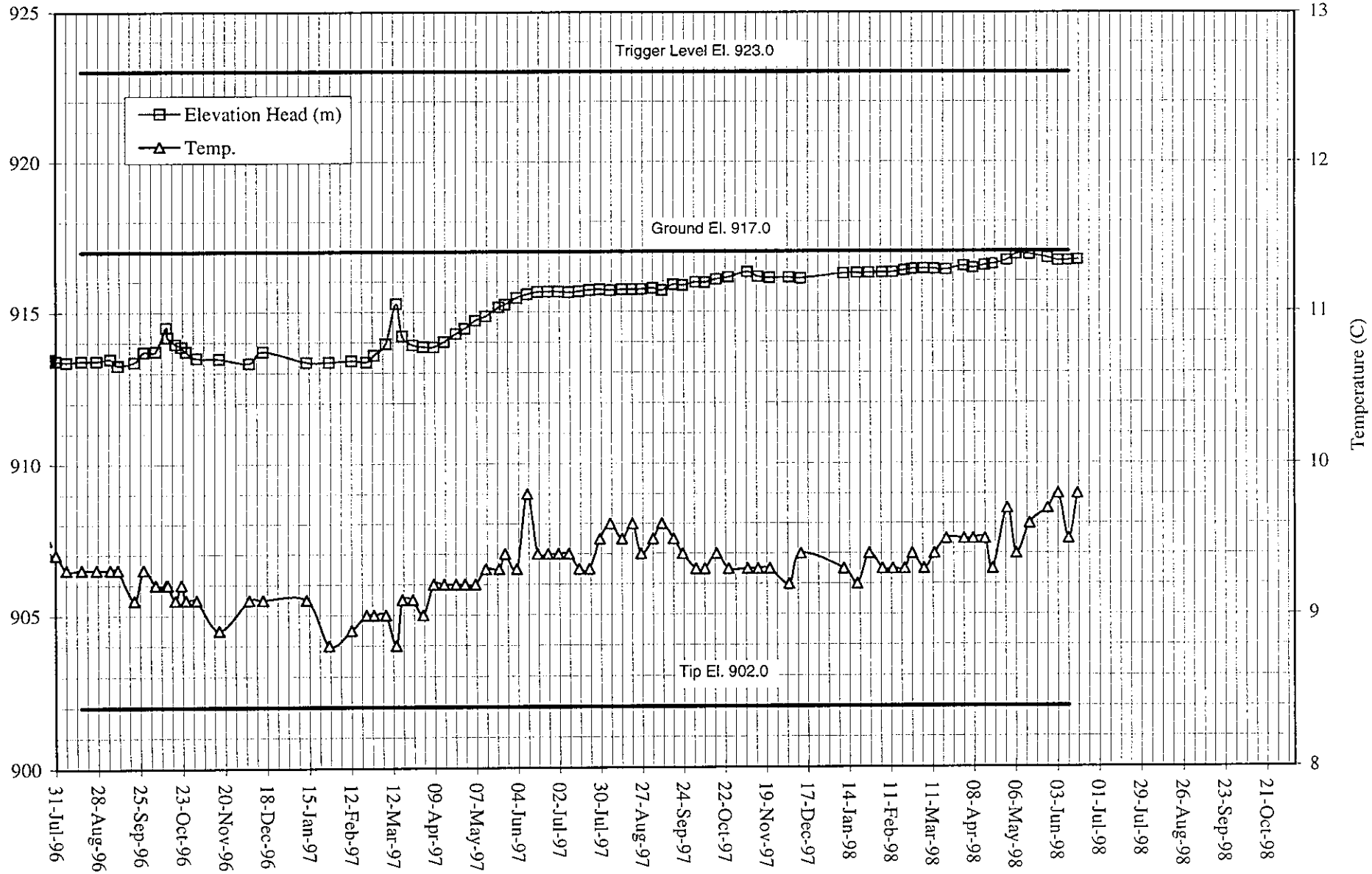



FIGURE 2.7

KNIGHT PIESOLD LTD.
CONSULTING ENGINEERS

**MOUNT POLLEY MINING CORPORATION.**
**MOUNT POLLEY PROJECT**
**TAILINGS STORAGE FACILITY**
**FOUNDATION PIEZOMETER - B2-PE2-02**

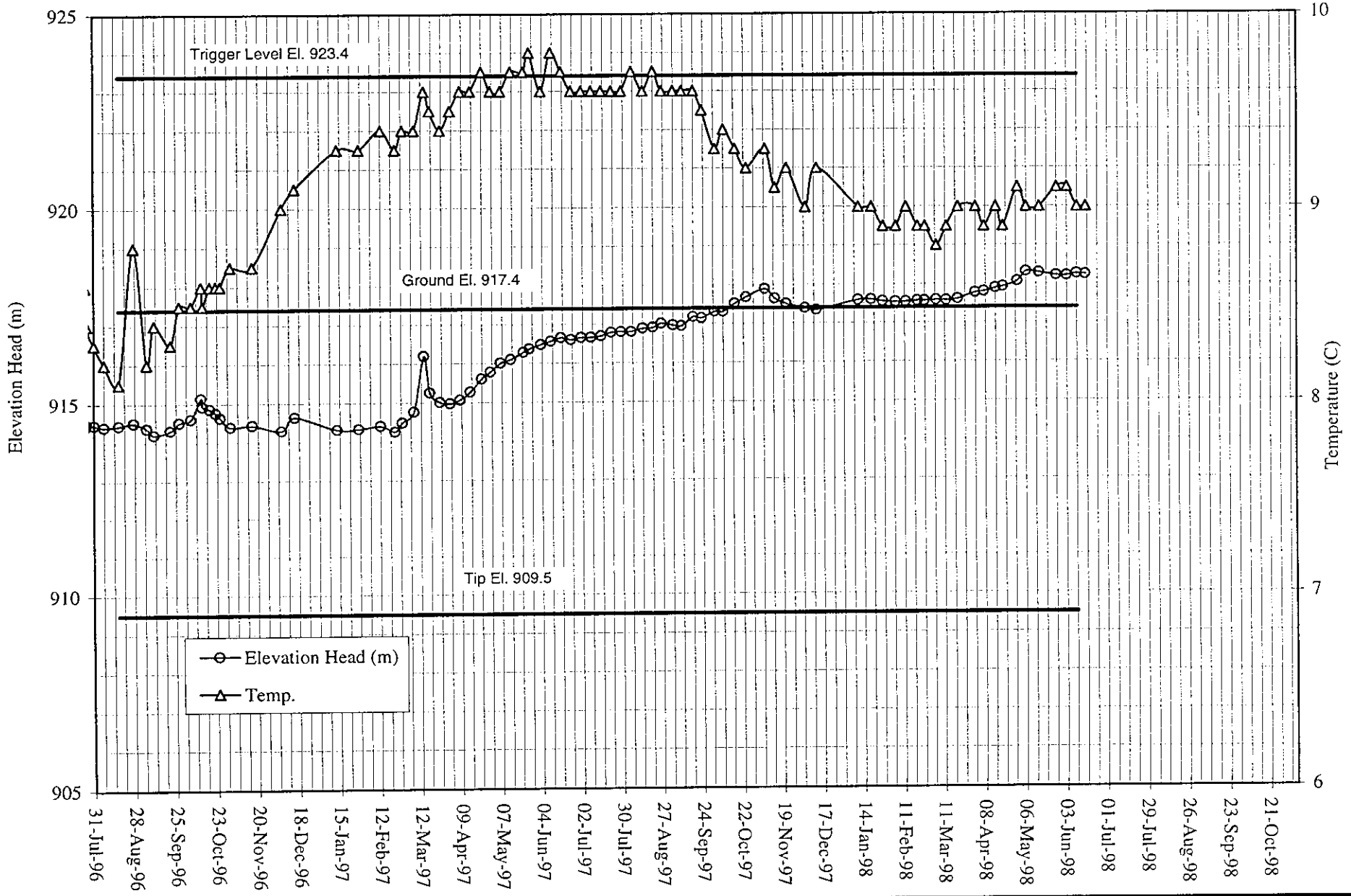



FIGURE 2.8

KNIGHT PIESOLD LTD.
CONSULTING ENGINEERS

# MOUNT POLLEY MINING CORPORATION.
## MOUNT POLLEY PROJECT
## TAILINGS STORAGE FACILITY
## FOUNDATION PIEZOMETER - C2-PE2-01

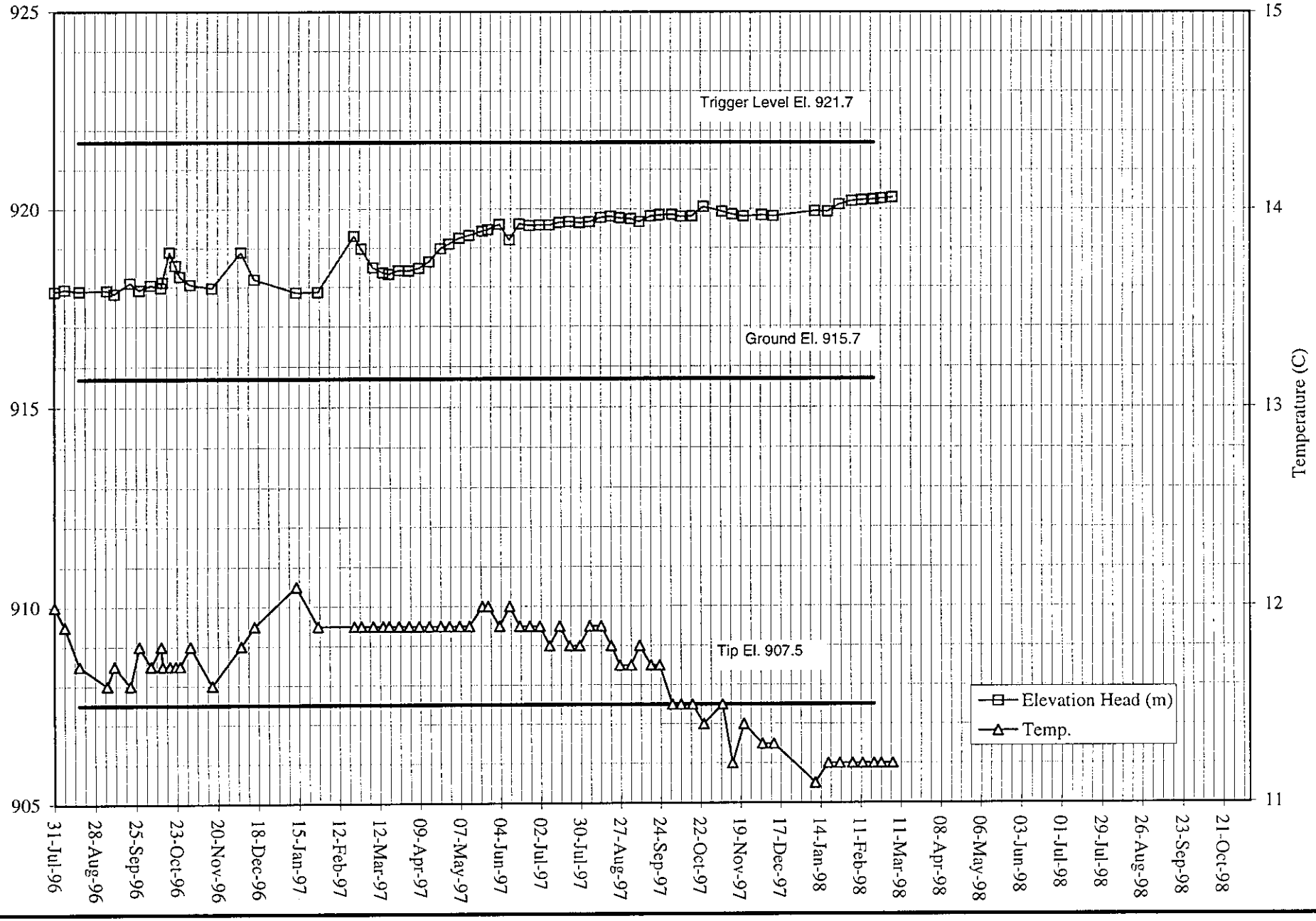



FIGURE 2.9

KNIGHT PIESOLD LTD.
CONSULTING ENGINEERS

# MOUNT POLLEY MINING CORPORATION.
## MOUNT POLLEY PROJECT
## TAILINGS STORAGE FACILITY
## FOUNDATION PIEZOMETER - C2-PE2-02

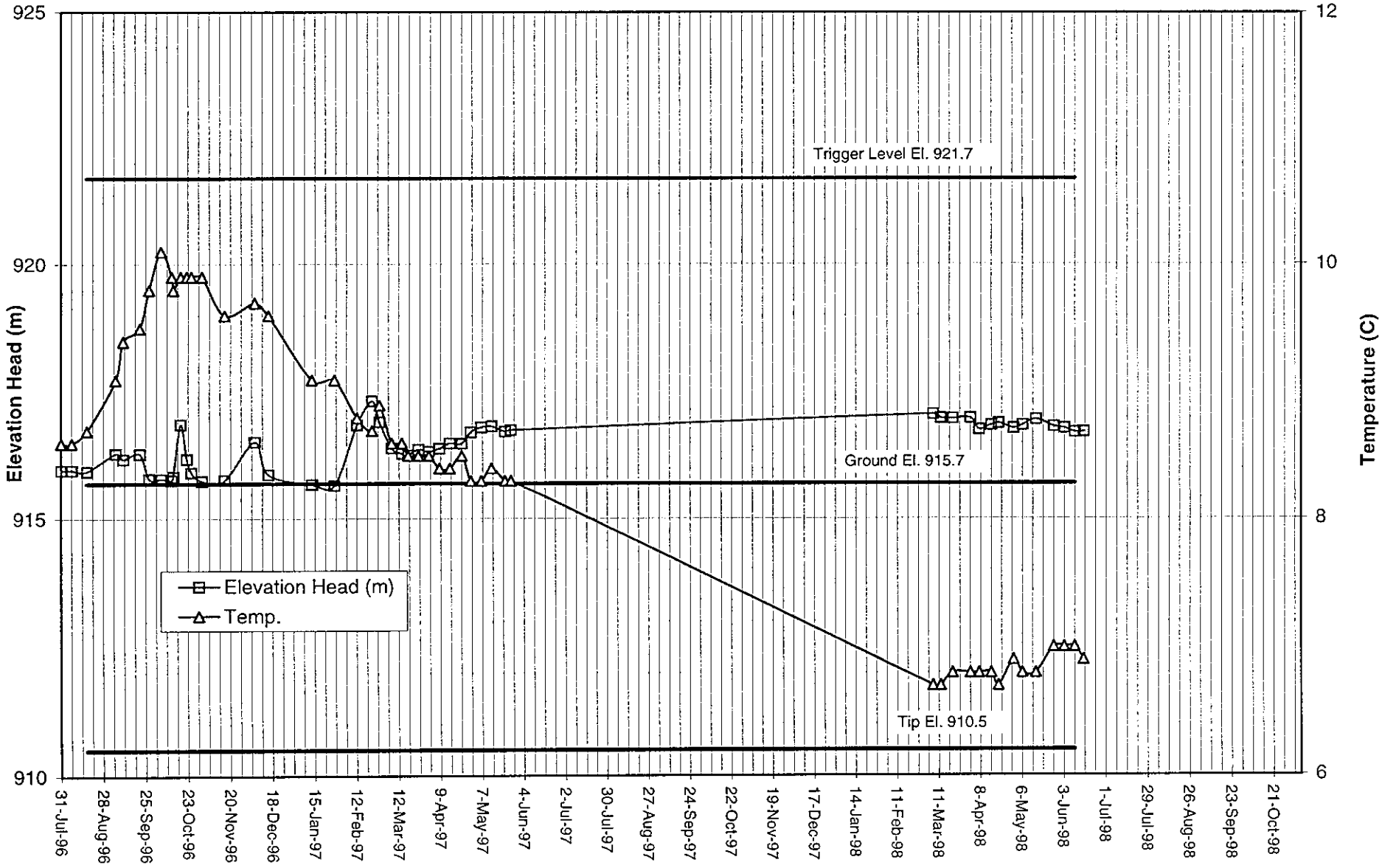



FIGURE 2.10

KNIGHT PIESOLD LTD.
CONSULTING ENGINEERS

# MOUNT POLLEY MINING CORPORATION
## MOUNT POLLEY MINE
## TAILINGS STORAGE FACILITY
## MAIN EMBANKMENT FOUNDATION DRAIN FLOWS (latest readings - June 16, 1998)

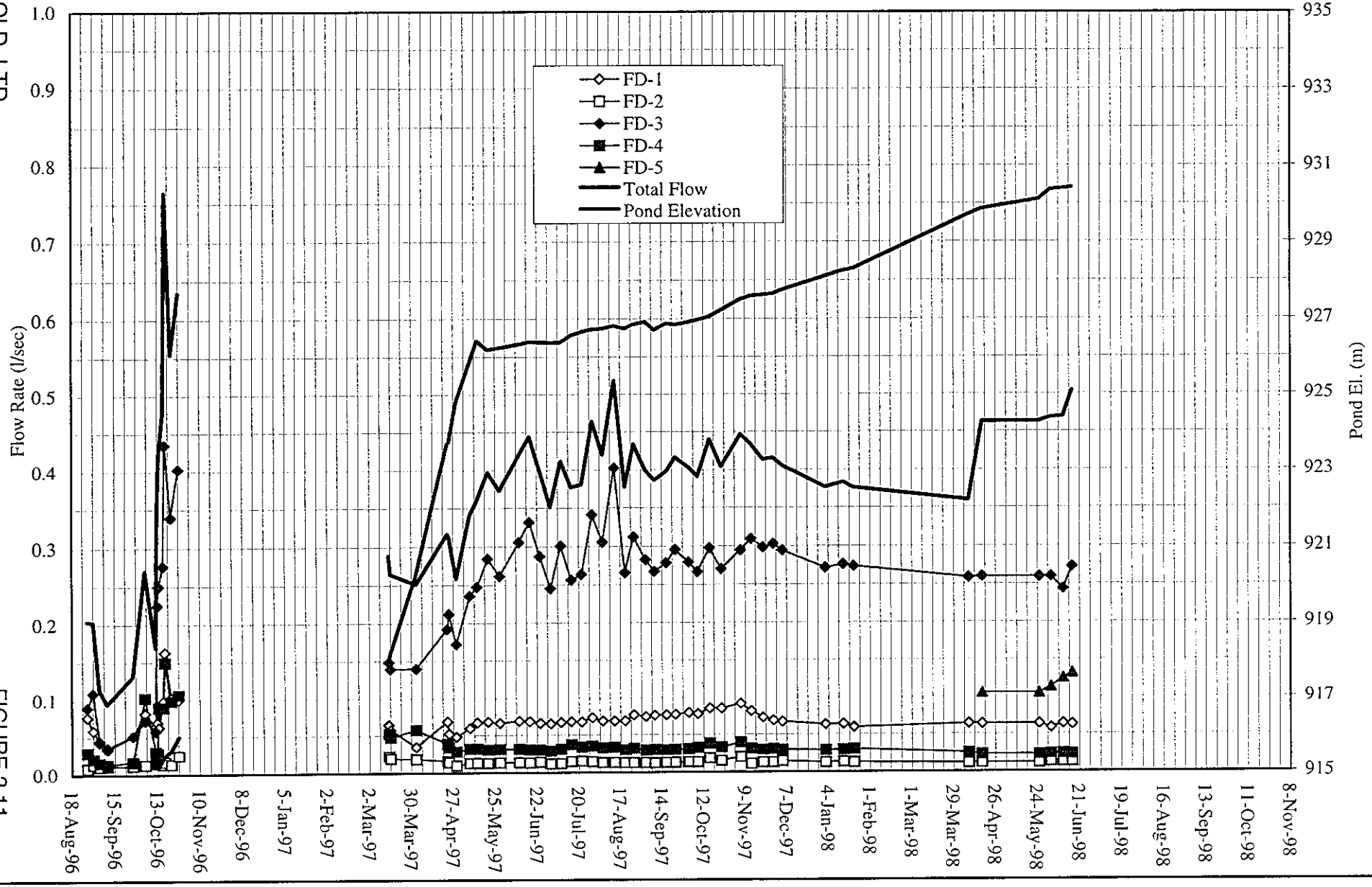
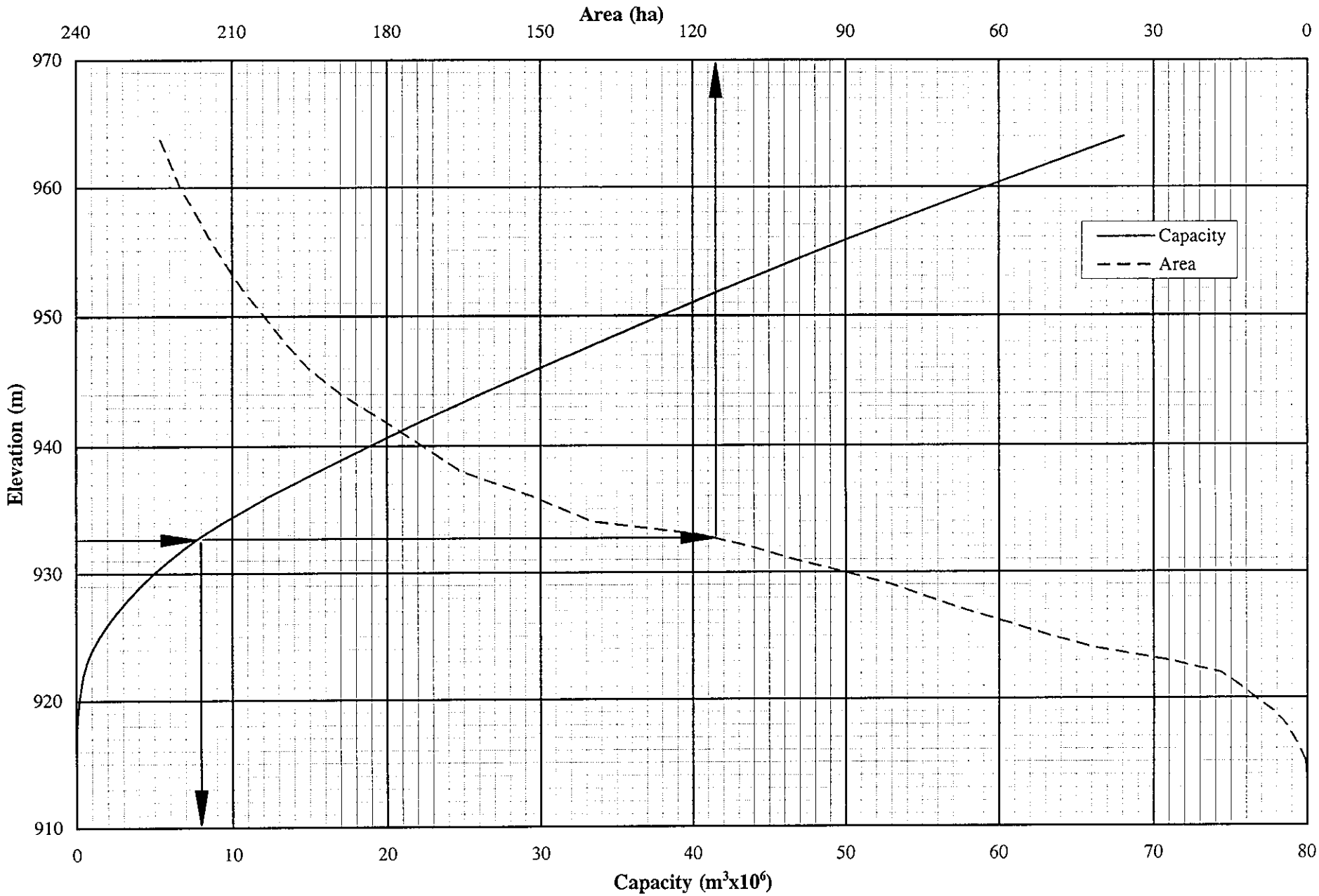



FIGURE 2.11

# MOUNT POLLEY MINING CORPORATION
## MOUNT POLLEY MINE
## TAILINGS STORAGE FACILITY
## DEPTH/AREA/CAPACITY CURVE FOR TAILINGS STORAGE FACILITY




KNIGHT PIESOLD LTD.
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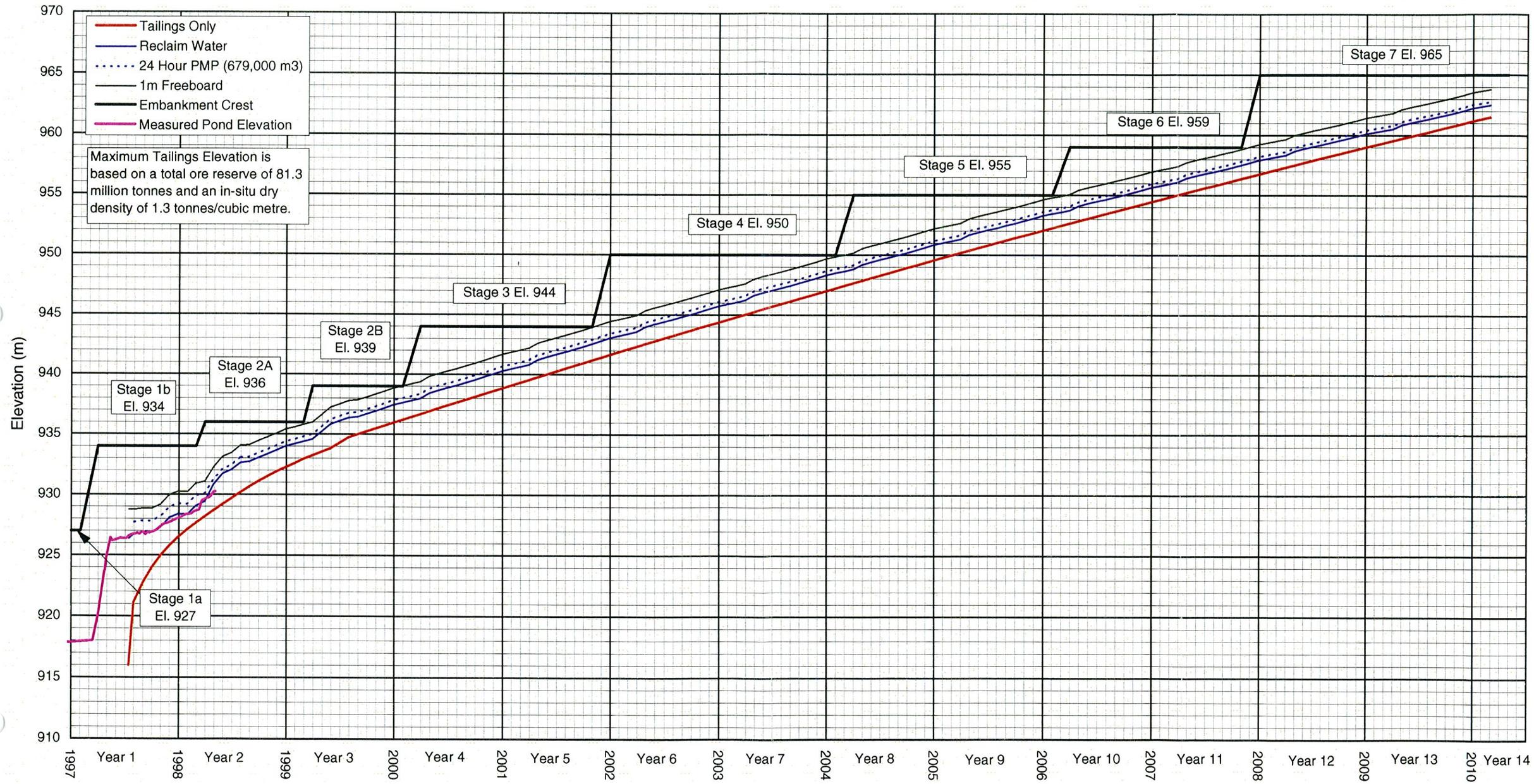
FIGURE 2.12

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY PROJECT
TAILINGS STORAGE FACILITY
FILLING SCHEDULE AND STAGED CONSTRUCTION (Years 1 TO 14)

Updated : May 22, 1998




KNIGHT PIESOLD LTD.
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FIGURE 2.13

J:\JOB\DATA\10162/7\misc\DACMAY98.XLS(fillsch (2)) 6/26/98

KNIGHT PIESOLD LTD.
CONSULTING ENGINEERS

# MOUNT POLLEY MINING CORPORATION
## MOUNT POLLEY MINE
## TAILINGS STORAGE FACILITY
## FILLING SCHEDULE AND STAGED CONSTRUCTION (Years 1 to 4)

Updated : May 22, 1998

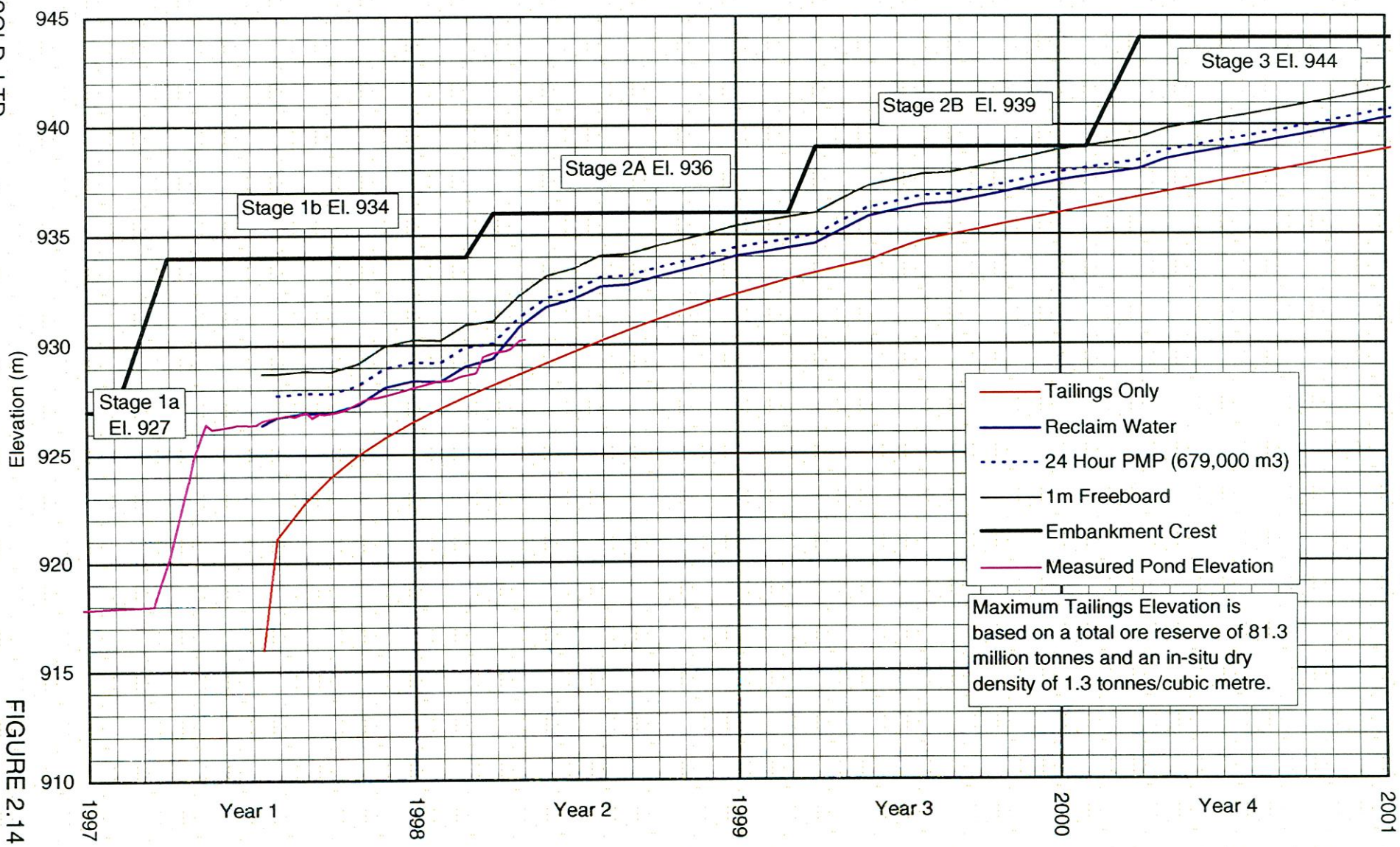
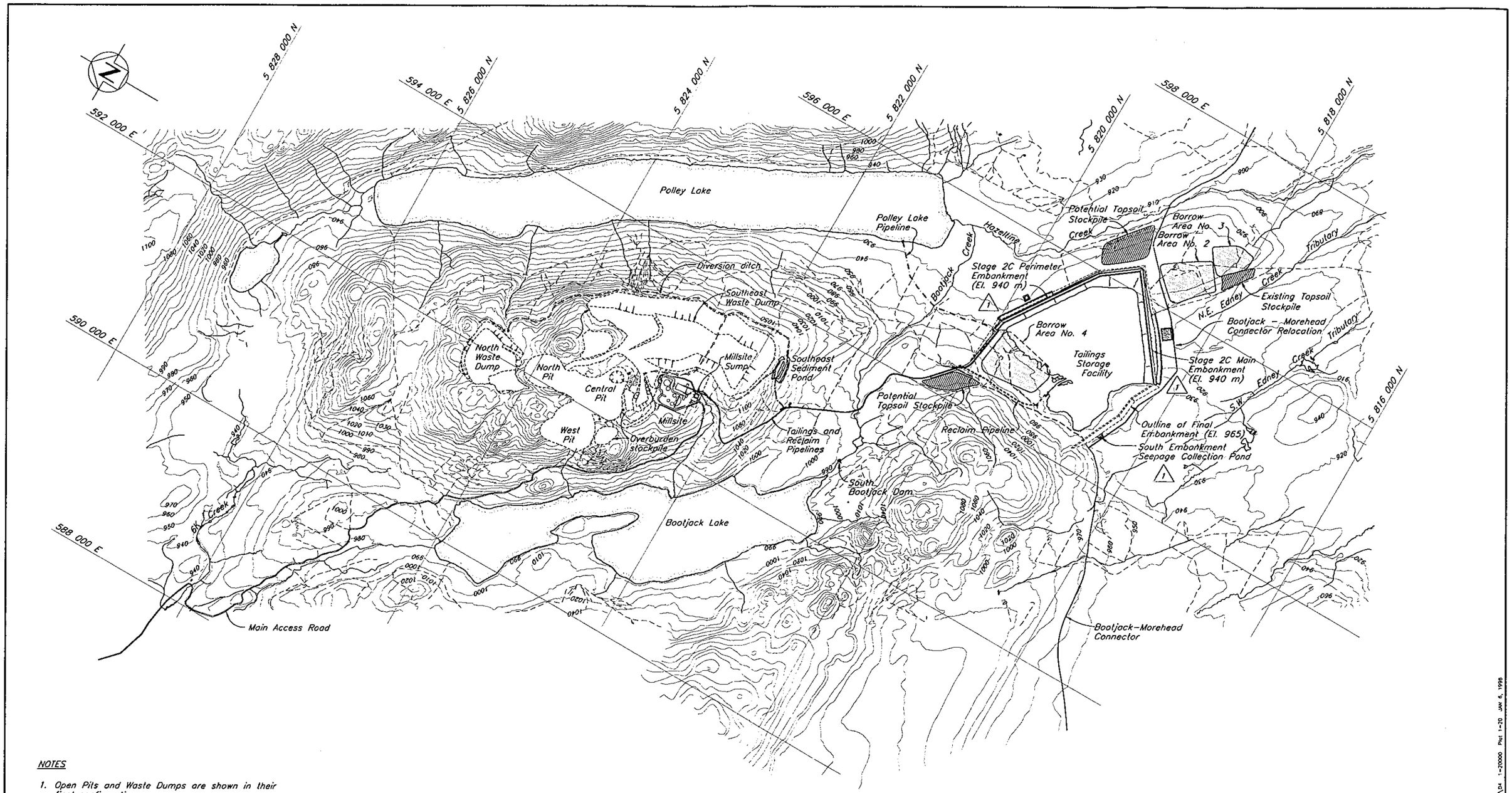



FIGURE 2.14




NOTES

1. Open Pits and Waste Dumps are shown in their final configurations.
2. Pond level in Tailings Storage Facility projected at El. 936 ( July 1999 ).
3. Topography has not been updated from 1997 Flyover.

CAD FILE:\10162\9\DWG\04 1=20000 Plot 1=20 JAN 6, 1998

| DRG. NO. | DESCRIPTION | REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|---|---|
| REFERENCE DRAWINGS | | REVISIONS | | | |

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 1 | JAN 6/98 | ISSUED FOR CONSTRUCTION | JMA |
| 0 | NOV 10/97 | ISSUED FOR TENDER | |
| REVISIONS | | | |

KNIGHT PIESOLD LIMITED
CONSULTING ENGINEERS -- VANCOUVER, B.C.

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — K. D. K. EMBREE

| | |
|---|---|
| DESIGNED | KDE/KJB |
| DRAWN | NSD/MAR |
| CHECKED | |
| APPROVED | |

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

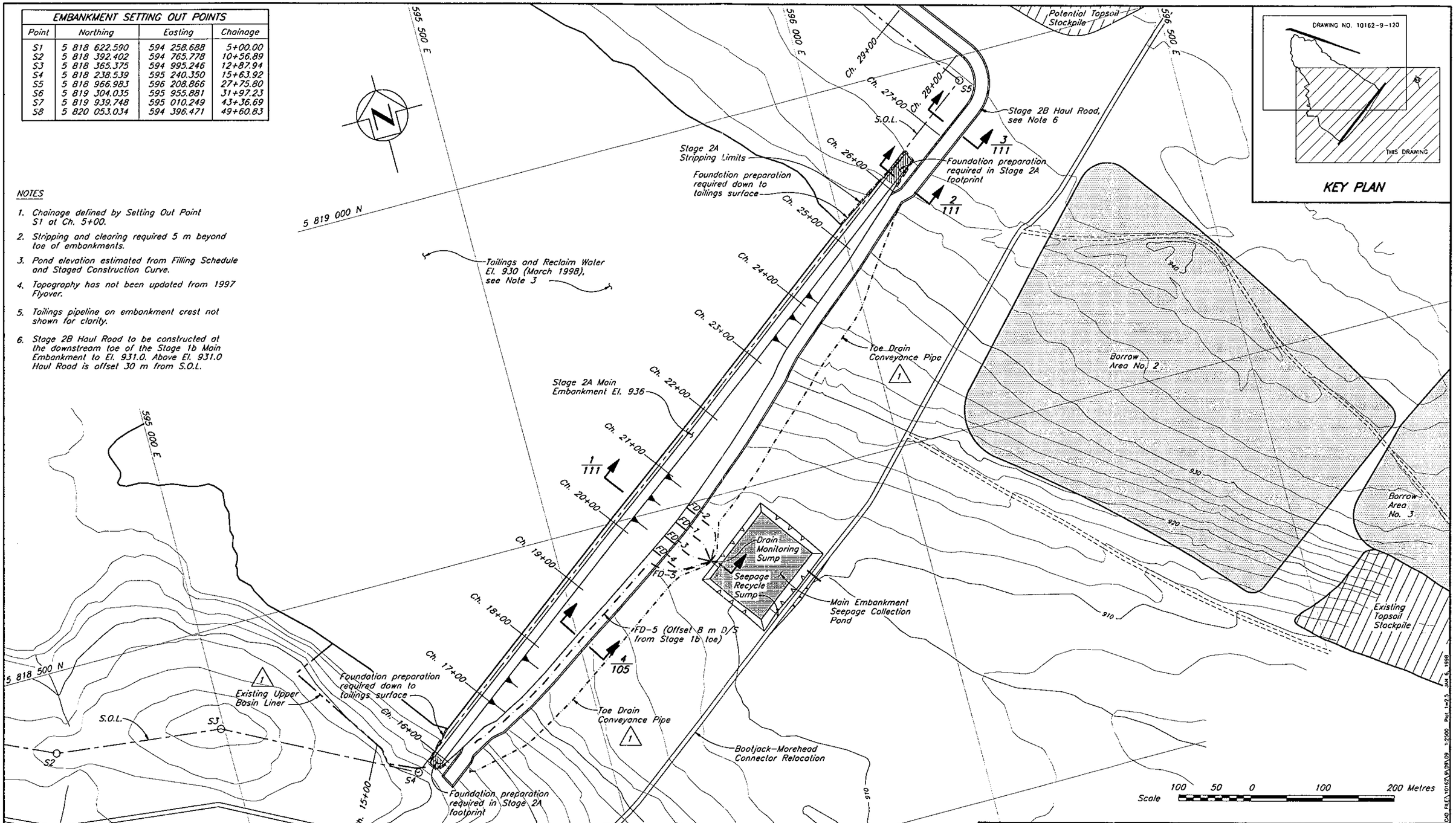
OVERALL SITE PLAN
SHOWING STAGE 2C TAILINGS EMBANKMENT

| DATE | SCALE | DRG. NO. | REV. |
|---|---|---|---|
| NOV. 10, 1997 | AS SHOWN | 10162-9-100 | 1 |

| EMBANKMENT SETTING OUT POINTS | | | |
|---|---|---|---|
| Point | Northing | Easting | Chainage |
| S1 | 5 818 622.590 | 594 258.688 | 5+00.00 |
| S2 | 5 818 392.402 | 594 765.778 | 10+56.89 |
| S3 | 5 818 365.375 | 594 995.246 | 12+87.94 |
| S4 | 5 818 238.539 | 595 240.350 | 15+63.92 |
| 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. Chainage defined by Setting Out Point S1 at Ch. 5+00.
2. Stripping and clearing required 5 m beyond toe of embankments.
3. Pond elevation estimated from Filling Schedule and Staged Construction Curve.
4. Topography has not been updated from 1997 Flyover.
5. Tailings pipeline on embankment crest not shown for clarity.
6. Stage 2B Haul Road to be constructed at the downstream toe of the Stage 1b Main Embankment to El. 931.0. Above El. 931.0 Haul Road is offset 30 m from S.O.L.




| DRG. NO. | DESCRIPTION |
|---|---|
| 105 | TSF – STAGE 2 EXPANSION – FOUNDATION PREPARATION – SECTIONS & DETAILS |
| 111 | TSF – STAGE 2A MAIN EMBANKMENT – SECTIONS |

REFERENCE DRAWINGS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| | | | |

REVISIONS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 1 | JAN 6/98 | ISSUED FOR CONSTRUCTION | |
| 0 | NOV 10/97 | ISSUED FOR TENDER | |

REVISIONS

KNIGHT PIESOLD LIMITED
CONSULTING ENGINEERS – VANCOUVER, B.C.

PROFESSIONAL ENGINEER – PROVINCE OF BRITISH COLUMBIA – K. D. K. EMBREE

DESIGNED KDE
DRAWN TAM/NSD
CHECKED
APPROVED

MOUNT POLLEY MINING CORPORATION

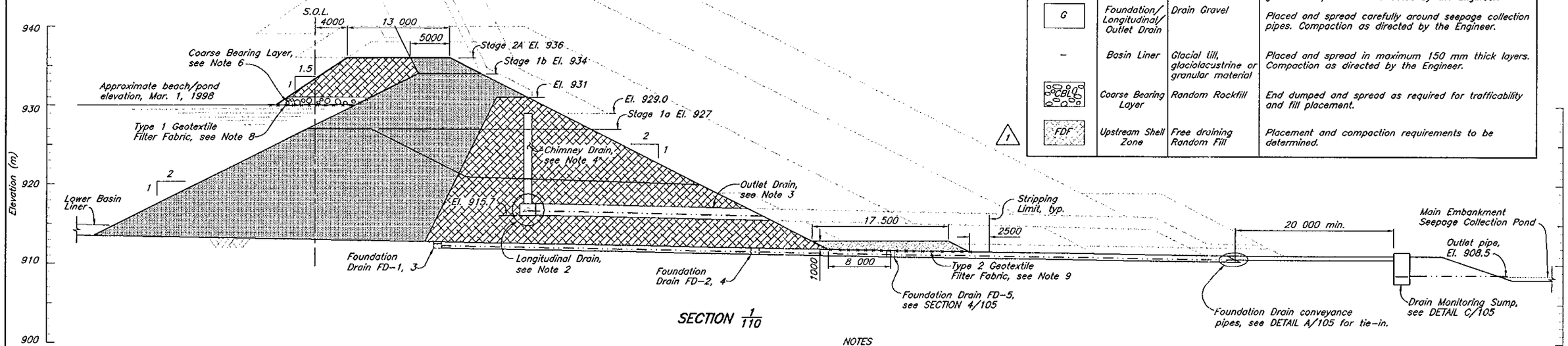
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 2A MAIN EMBANKMENT
PLAN

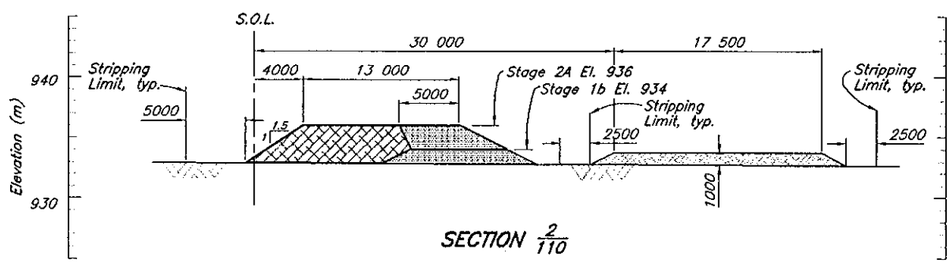
DATE NOV. 10, 1997 | SCALE AS SHOWN | DRG. NO. 10162-9-110 | REV. 1

CAD FILE: \10162\9\09\09 1:2500 Plot 1=2.5 JAN 5, 1998

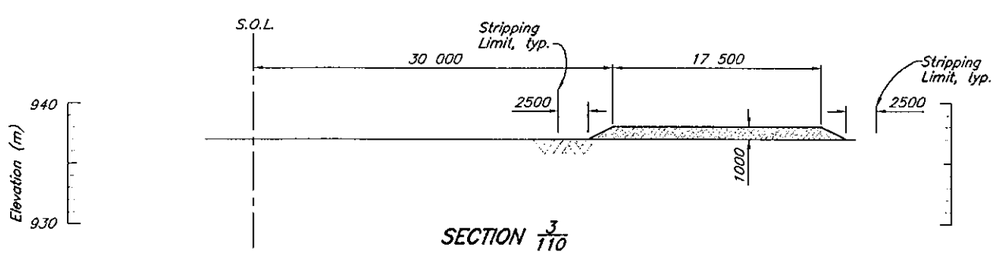
| ZONE | LOCATION | MATERIAL TYPE | PLACEMENT AND COMPACTION REQUIREMENTS |
|---|---|---|---|
| S | Core Zone | Glacial till | Placed, moisture conditioned and spread in maximum 300 mm thick layers (after compaction). Vibratory compaction to 98% of Standard Proctor maximum dry density or as approved by the Engineer. |
| B | Fill Zone | Glacial till, glaciolacustrine or granular material | Placed, moisture conditioned and spread in maximum 1000 mm thick layers (after compaction). Vibratory compaction to 92% of Standard Proctor maximum dry density or as approved by the Engineer. |
| T | Transition Zone | Mine Rock | Placed and spread in maximum 600 mm thick layers. Compaction as directed by the Engineer. |
| C | Shell Zone | Mine Rock | Placed and spread in maximum 1000 mm thick layers. Four passes with a specified vibratory roller. |
| F | Chimney Drain | Filter sand | Placed and spread in maximum 600 mm thick layers. Compaction as directed by the Engineer. |
| F | Longitudinal/ Outlet Drain | Filter Sand | Placed and spread carefully around filter fabric/drain gravel. Compaction as directed by the Engineer. |
| G | Foundation/ Longitudinal/ Outlet Drain | Drain Gravel | Placed and spread carefully around seepage collection pipes. Compaction as directed by the Engineer. |
| – | Basin Liner | Glacial till, glaciolacustrine or granular material | Placed and spread in maximum 150 mm thick layers. Compaction as directed by the Engineer. |
| CBL | Coarse Bearing Layer | Random Rockfill | End dumped and spread as required for trafficability and fill placement. |
| FDF | Upstream Shell Zone | Free draining Random Fill | Placement and compaction requirements to be determined. |




SECTION $\frac{1}{110}$




SECTION $\frac{2}{110}$




SECTION $\frac{3}{110}$

NOTES

1. Pond elevations estimated from Filling Schedule and Staged Construction Curve.
2. Longitudinal Drain to be extended from invert El. 929 (Stage 1b) to El. 938.5 in original ground during Stage 2B .
3. Outlet Drains to be extended to Drain Monitoring Sump during Stage 2B.
4. Chimney Drain to be extended during Stages 2B and 2C.
5. Fill placement rates to be monitored by the Engineer. Placement rates to be modified if excess pore pressures observed in fill or foundation piezometers.
6. Coarse Bearing Layer required on tailings. To be added on ground as required to provide a firm bearing layer for fill placement.
7. All dimensions in millimetres and elevations in metres, unless noted otherwise.
8. (1) Type 1 Geotextile Filter Fabric required on tailings. Specification is provided in Tender Documents (12 oz/sq. yd).
9. (1) Type 2 Geotextile Filter Fabric required from the right abutment (approx. Ch. 15+75) to El. 920.0 m on the left abutment (approx. Ch. 23+00). Specification is provided in Tender Documents (8 oz/sq. yd).
10. All Foundation Drains are not intersected on this cross-section.

Scale 10 5 0 10 20 Metres

CAD FILE\10162\9\011\011 1:250 PM1 1=0.25 JAN 6, 1998

| DRG. NO. | DESCRIPTION |
|---|---|
| 110 | TSF – STAGE 2A MAIN EMBANKMENT – PLAN |
| 105 | TSF – STAGE 2 EXPANSION – FOUNDATION PREPARATION – SECTIONS & DETAILS |

REFERENCE DRAWINGS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| | | | |

REVISIONS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 1 | JAN 6/98 | ISSUED FOR CONSTRUCTION | |
| 0 | NOV 10/97 | ISSUED FOR TENDER | |

REVISIONS

KNIGHT PIESOLD LIMITED
CONSULTING ENGINEERS – VANCOUVER, B.C.

PROFESSIONAL ENGINEER – PROVINCE OF BRITISH COLUMBIA – K. D. K. EMBREE

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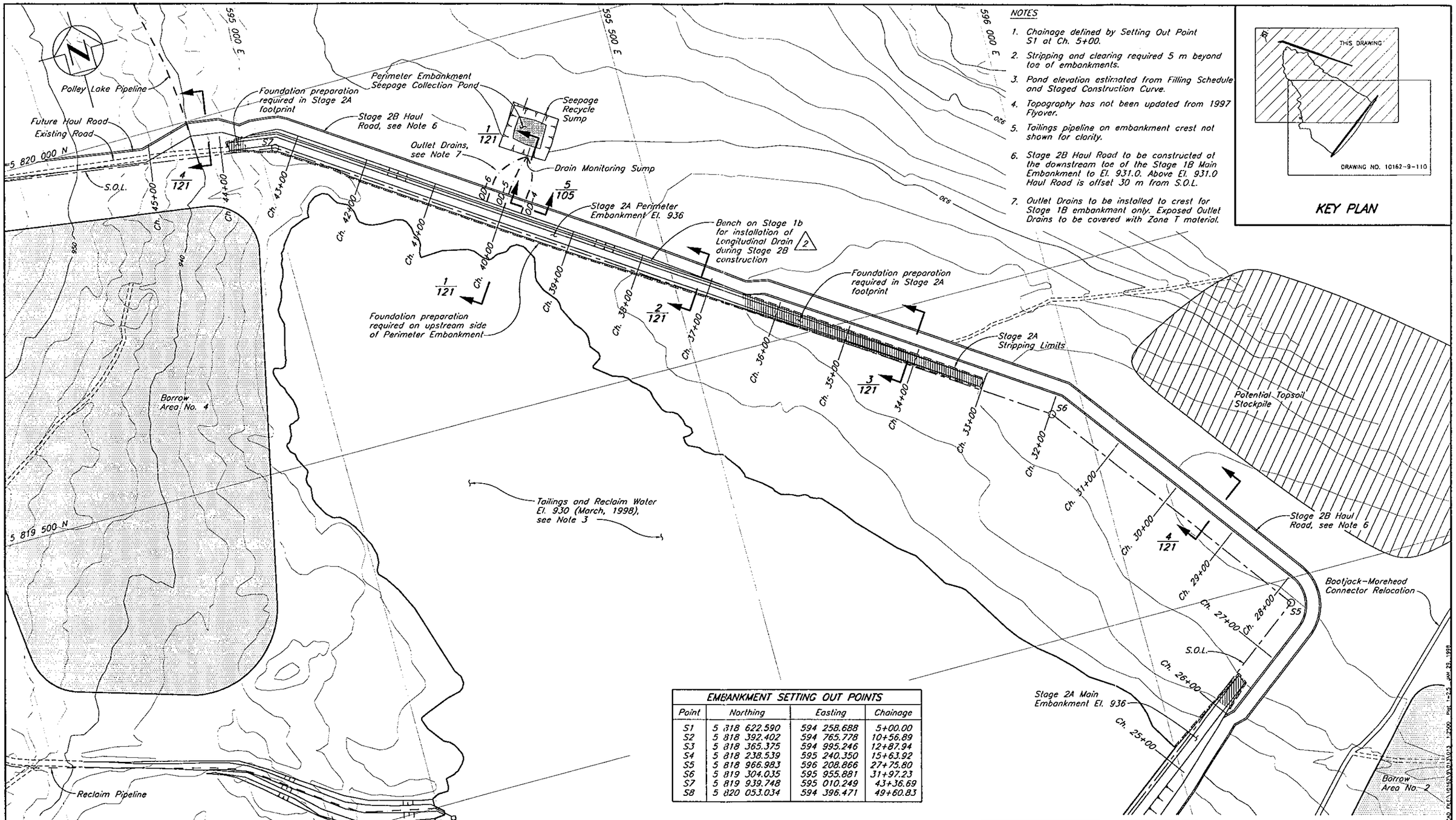
| DESIGNED | KDE |
| DRAWN | WAL/DHS |
| CHECKED | |
| APPROVED | |

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 2A MAIN EMBANKMENT
SECTIONS

| DATE | SCALE | DRG. NO. | REV. |
|---|---|---|---|
| NOV. 10, 1997 | AS SHOWN | 10162-9-111 | 1 |




NOTES

1. Chainage defined by Setting Out Point S1 at Ch. 5+00.
2. Stripping and clearing required 5 m beyond toe of embankments.
3. Pond elevation estimated from Filling Schedule and Staged Construction Curve.
4. Topography has not been updated from 1997 Flyover.
5. Tailings pipeline on embankment crest not shown for clarity.
6. Stage 2B Haul Road to be constructed at the downstream toe of the Stage 1B Main Embankment to El. 931.0. Above El. 931.0 Haul Road is offset 30 m from S.O.L.
7. Outlet Drains to be installed to crest for Stage 1B embankment only. Exposed Outlet Drains to be covered with Zone T material.




EMBANKMENT SETTING OUT POINTS

| Point | Northing | Easting | Chainage |
|---|---|---|---|
| S1 | 5 818 622.590 | 594 258.688 | 5+00.00 |
| S2 | 5 818 392.402 | 594 765.778 | 10+56.89 |
| S3 | 5 818 365.375 | 594 995.246 | 12+87.94 |
| S4 | 5 818 238.539 | 595 240.350 | 15+63.92 |
| 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 |

| DRG. NO. | DESCRIPTION |
|---|---|
| 105 | TSF – STAGE 2 EXPANSION – FOUNDATION PREPARATION – SECTIONS & DETAILS |
| 121 | TSF – STAGE 2A PERIMETER EMBANKMENT – SECTIONS |

REFERENCE DRAWINGS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| | | | |

REVISIONS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 2 | JAN 28/98 | UPDATED BENCH ON STAGE 1b CREST | KDB |
| 1 | JAN 6/98 | ISSUED FOR CONSTRUCTION | |
| 0 | NOV 10/97 | ISSUED FOR TENDER | |

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KNIGHT PIESOLD LIMITED
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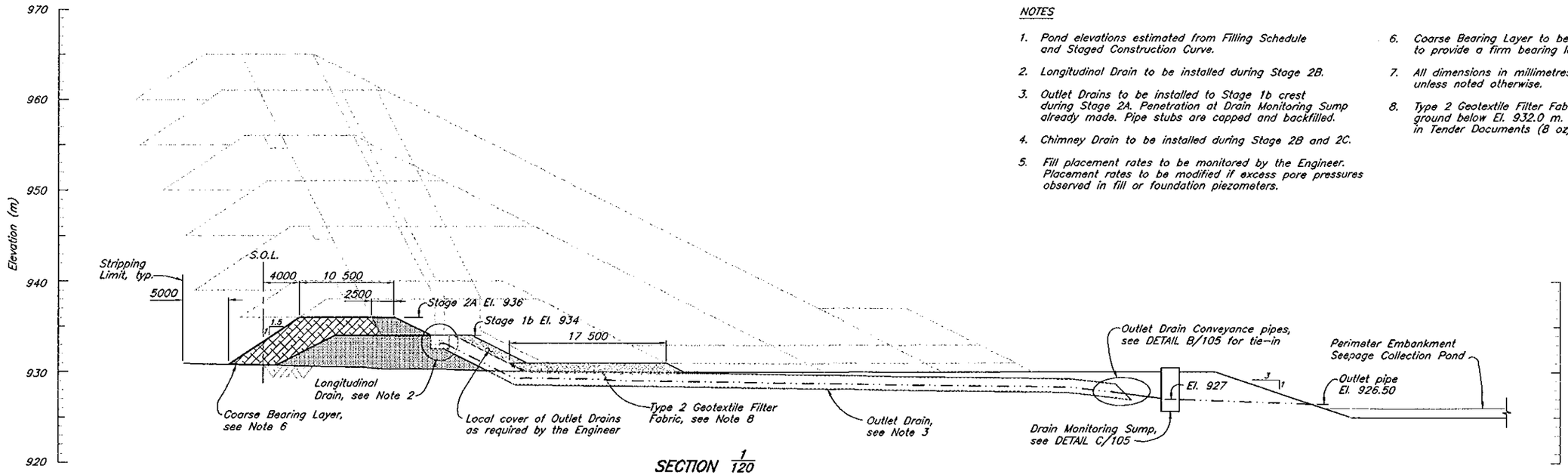
|---|---|
| DESIGNED | KDE |
| DRAWN | TAM/NSO |
| CHECKED | |
| APPROVED | KDB |

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 2A PERIMETER EMBANKMENT
PLAN

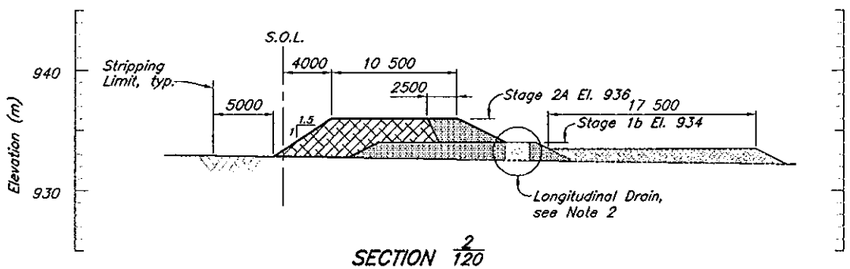
DATE NOV. 10, 1997 | SCALE AS SHOWN | DRG. NO. 10162-9-120 | REV. 2



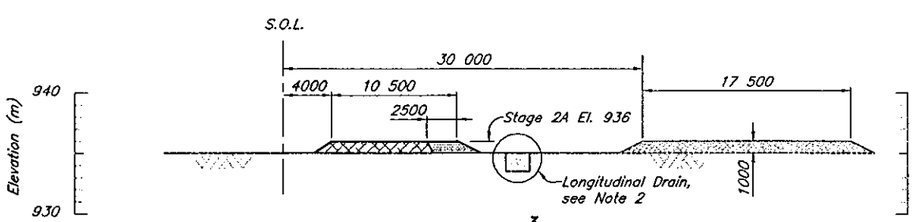

SECTION $\frac{1}{120}$

NOTES

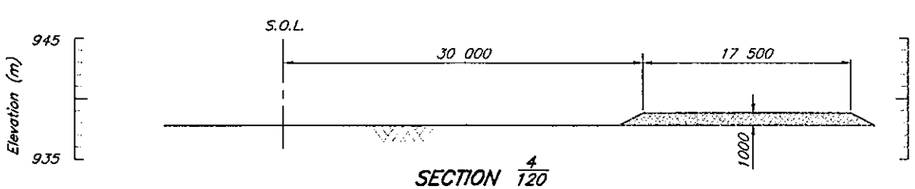
1. Pond elevations estimated from Filling Schedule and Staged Construction Curve.
2. Longitudinal Drain to be installed during Stage 2B.
3. Outlet Drains to be installed to Stage 1b crest during Stage 2A. Penetration at Drain Monitoring Sump already made. Pipe stubs are capped and backfilled.
4. Chimney Drain to be installed during Stage 2B and 2C.
5. Fill placement rates to be monitored by the Engineer. Placement rates to be modified if excess pore pressures observed in fill or foundation piezometers.
6. Coarse Bearing Layer to be added on ground as required to provide a firm bearing layer for fill placement.
7. All dimensions in millimetres with elevations in metres, unless noted otherwise.
8. Type 2 Geotextile Filter Fabric only required on prepared ground below El. 932.0 m. The specification is provided in Tender Documents (8 oz/sq. yd).




SECTION $\frac{2}{120}$




SECTION $\frac{3}{120}$




SECTION $\frac{4}{120}$

| ZONE | LOCATION | MATERIAL TYPE | PLACEMENT AND COMPACTION REQUIREMENTS |
|---|---|---|---|
| S | Core Zone | Glacial till | Placed, moisture conditioned and spread in maximum 300 mm thick layers (after compaction). Vibratory compaction to 98% of Standard Proctor maximum dry density or as approved by the Engineer. |
| B | Fill Zone | Glacial till, glaciolacustrine or granular material | Placed, moisture conditioned and spread in maximum 1000 mm thick layers (after compaction). Vibratory compaction to 92% of Standard Proctor maximum dry density or as approved by the Engineer. |
| T | Transition Zone | Mine Rock | Placed and spread in maximum 600 mm thick layers. Compaction as directed by the Engineer. |
| C | Shell Zone | Mine Rock | Placed and spread in maximum 1000 mm thick layers. Four passes with a specified vibratory roller. |
| F | Chimney Drain | Filter sand | Placed and spread in maximum 600 mm thick layers. Compaction as directed by the Engineer. |
| F | Longitudinal/ Outlet Drain | Filter Sand | Placed and spread carefully around filter fabric/drain gravel. Compaction as directed by the Engineer. |
| G | Foundation/ Longitudinal/ Outlet Drain | Drain Gravel | Placed and spread carefully around seepage collection pipes. Compaction as directed by the Engineer. |
| – | Basin Liner | Glacial till, glaciolacustrine or granular material | Placed and spread in maximum 150 mm thick layers. Compaction as directed by the Engineer. |
| CBL | Coarse Bearing Layer | Random Rockfill | End dumped and spread as required for trafficability and fill placement. |
| FDF | Upstream Shell Zone | Free draining Random Fill | Placement and compaction requirements to be determined. |

1

Scale 10 5 0 10 20 Metres

CAD FILE: \10162\9\012\012 1:250 Plot 1=0.25 JAN 6, 1998

| DRG. NO. | DESCRIPTION |
|---|---|
| 105 | TSF – STAGE 2 EXPANSION–FOUNDATION PREPARATION–SECTIONS & DETAILS |
| 120 | TSF – STAGE 2A PARIMETER EMBANKMENT – PLAN |

REFERENCE DRAWINGS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| | | | |

REVISIONS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 1 | JAN 6/98 | ISSUED FOR CONSTRUCTION | |
| 0 | NOV 10/97 | ISSUED FOR TENDER | |

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KNIGHT PIESOLD LIMITED
CONSULTING ENGINEERS – VANCOUVER, B.C.

PROFESSIONAL ENGINEER – PROVINCE OF – K. D. K. EMBREE

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| DRAWN | DHS |
| CHECKED | |
| APPROVED | |

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 2A PERIMETER EMBANKMENT
SECTIONS

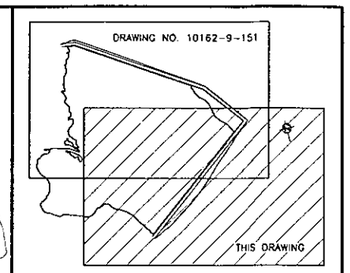
| DATE | SCALE | DRG. NO. | REV. |
|---|---|---|---|
| NOV. 10, 1997 | SCALE AS SHOWN | 10162–9–121 | 1 |

LEGEND 1

- ▲ A1-PE1-01 Previously installed piezometer
- △ A2-PE2-06 New Stage 2 piezometer
- ◇ A2-SM-01 Embankment survey monument
- ⊙ A-1 Slope Inclinometer
- ⊗ Groundwater Monitoring Well

PLANE A
PLANE B
PLANE C
PLANE E
PLANE B/152 (Ch. 22 + 40)
PLANE C/152 (Ch. 18 + 50)
PLANE A/152 (Ch. 20 + 00)
PLANE E/153 (Ch. 17 + 60)

Stage 2B Haul Road
Potential Topsoil Stockpile
Stage 2C Main Embankment El. 940
S.O.L.
Toe Drain Conveyance Pipe
Borrow Area No. 2
Borrow Area No. 3
Existing Topsoil Stockpile
Drain Monitoring Sump
Seepage Recycle Sump
Main Embankment Seepage Collection Pond
Tailings and Reclaim Water El. 936 ( July 1999 )
Upper Basin Liner
Bootjack-Morehead Connector Relocation
596 000 E
596 500 E
595 500 E
595 000 E
5 819 000 N
5 818 500 N
5 818 000 N
Ch. 29+00
Ch. 28+00
Ch. 27+00
Ch. 26+00
Ch. 25+00
Ch. 24+00
Ch. 23+00
Ch. 22+00
Ch. 21+00
Ch. 20+00
Ch. 19+00
Ch. 18+00
Ch. 17+00
Ch. 16+00
Ch. 15+00



KEY PLAN

NOTES

1. Chainage defined by Setting Out Point S1 at Ch. 5+00.
2. Topography has not been updated from 1997 Flyover.
3. Chimney Drain components not shown for clarity.

Scale 100 50 0 100 200 Metres

CAD FILE: \10162\9\026.076 1:2500 Plot 1=2.5 JAN 16, 1998

| DRG. NO. | DESCRIPTION |
|---|---|
| 153 | TSF – STAGE 2 EXPANSION – INSTRUMENTATION SECTIONS – SHEET 2 OF 2 |
| 152 | TSF – STAGE 2 EXPANSION – INSTRUMENTATION SECTIONS – SHEET 1 OF 2 |
| 151 | TSF – STAGE 2 EXPANSION – PERIMETER EMBANKMENT INSTRUMENTATION – PLAN |

REFERENCE DRAWINGS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| | | | |

REVISIONS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 1 | JAN 16/98 | ISSUED FOR STAGE 2A INSTRUMENTATION INSTALLATION | KJB |
| 0 | DEC 1/97 | ISSUED FOR DESIGN REPORT | |

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PROFESSIONAL ENGINEER – PROVINCE OF BRITISH COLUMBIA – K. D. K. EMBREE

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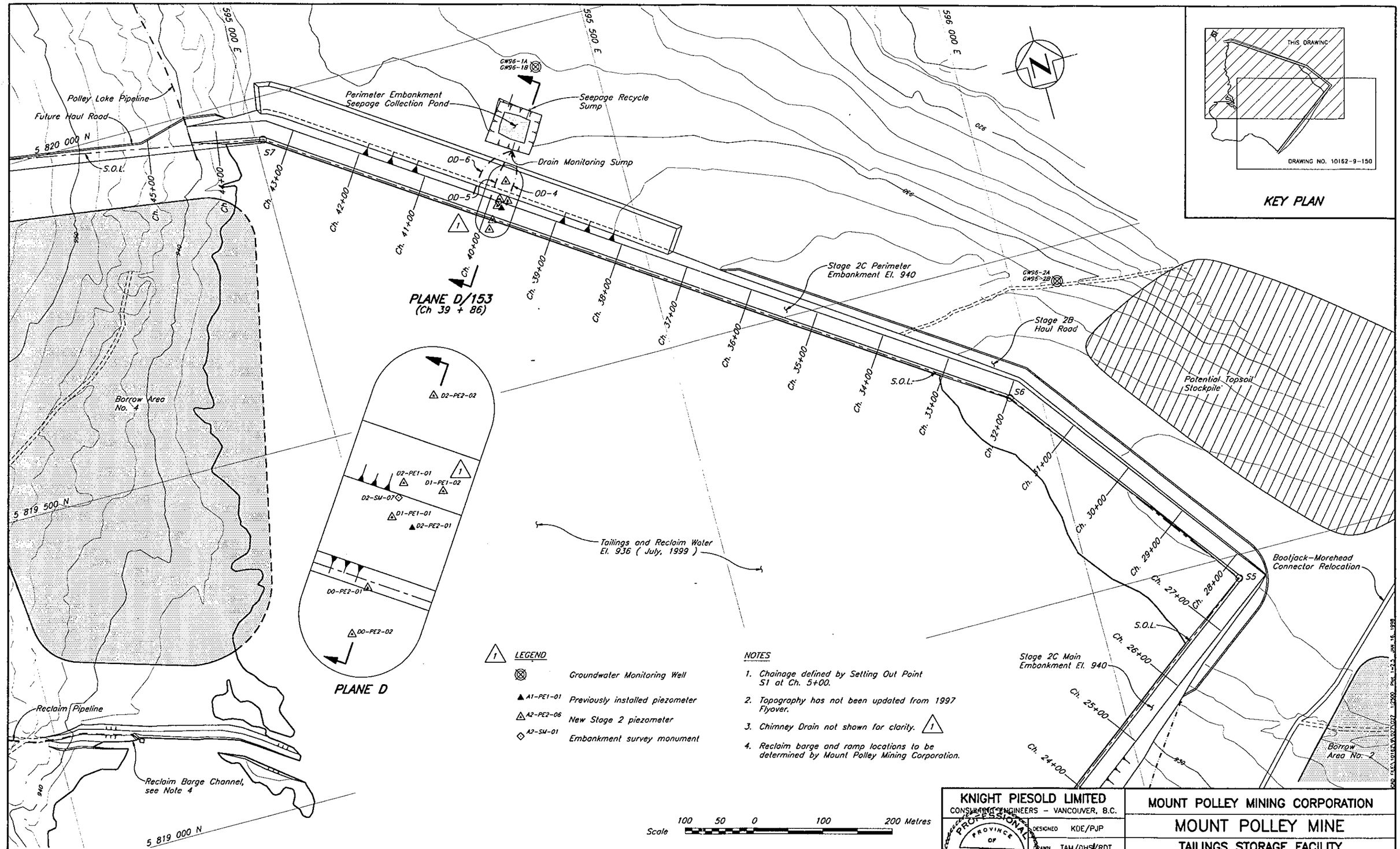
| DESIGNED | KDE/PJP |
| DRAWN | TAM/DHS/RDT |
| CHECKED | |
| APPROVED | KJB |

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 2 EXPANSION
MAIN EMBANKMENT
INSTRUMENTATION PLAN

| DATE | SCALE | DRG. NO. | REV. |
|---|---|---|---|
| DEC. 1, 1997 | AS SHOWN | 10162-9-150 | 1 |




| DRG. NO. | DESCRIPTION |
|---|---|
| 153 | TSF – STAGE 2 EXPANSION – INSTRUMENTATION – SECTIONS – SHEET 2 OF 2 |
| 152 | TSF – STAGE 2 EXPANSION – INSTRUMENTATION – SECTIONS – SHEET 1 OF 2 |
| 150 | TSF – STAGE 2 EXPANSION – MAIN EMBANKMENT INSTRUMENTATION – PLAN |

REFERENCE DRAWINGS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| | | | |

REVISIONS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 1 | JAN 16/98 | ISSUED FOR STAGE 2A INSTRUMENTATION INSTALLATION | KDB |
| 0 | DEC 1/97 | ISSUED FOR DESIGN REPORT | |

REVISIONS

KNIGHT PIESOLD LIMITED
CONSULTING ENGINEERS – VANCOUVER, B.C.

PROFESSIONAL ENGINEER – PROVINCE OF BRITISH COLUMBIA – K. D. K. EMBREE

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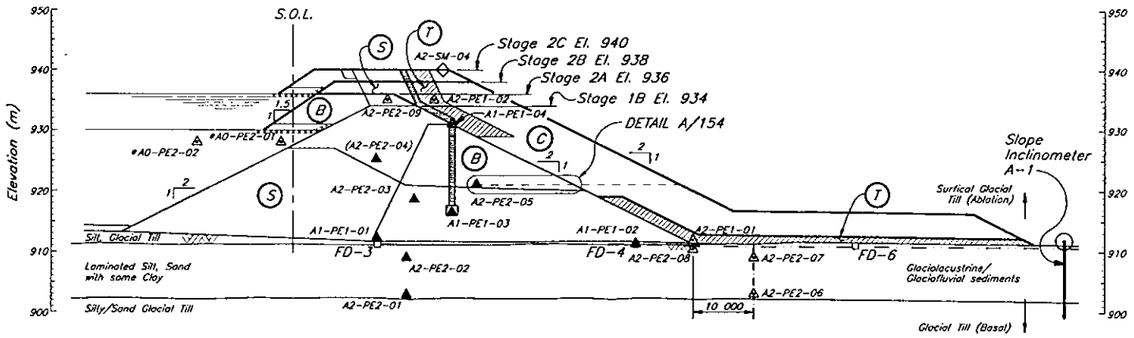
MOUNT POLLEY MINING CORPORATION

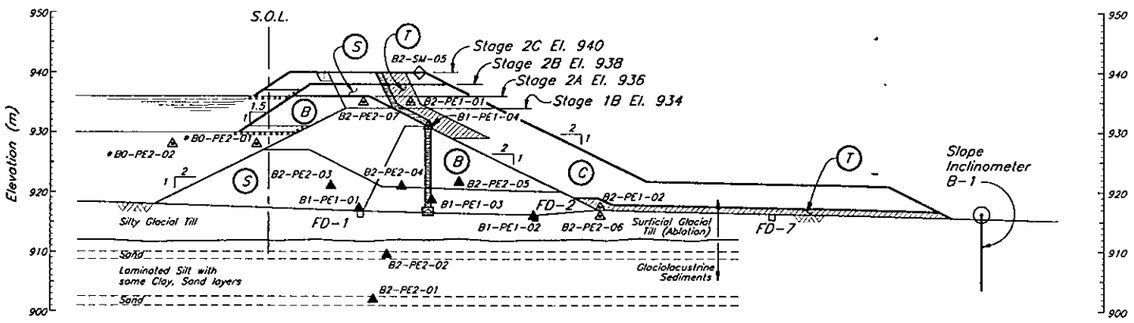
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 2 EXPANSION
PERIMETER EMBANKMENT
INSTRUMENTATION PLAN

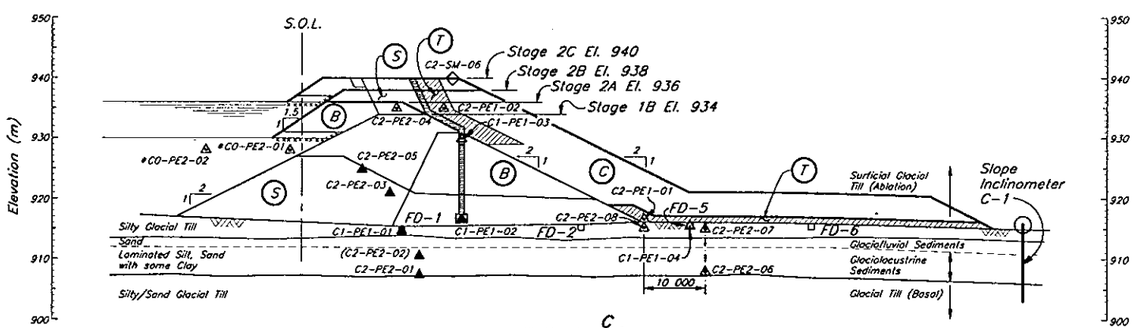
DATE DEC. 1, 1997 | SCALE AS SHOWN | DRG. NO. 10162-9-151 | REV. 1




PLANE A/150
CH. 20+00




PLANE B/150
CH. 22+40




PLANE C/150
CH. 18+50

1

SUMMARY OF INSTRUMENTATION INSTALLATIONS

| PIEZOMETER ID | LEAD LENGTH (m) | NORTHING | EASTING | ELEV. | DATE INSTALLED |
|---|---|---|---|---|---|
| * A0-PE2-01 | 75 | | | 928 | |
| * A0-PE2-02 | 75 | | | 928 | |
| A1-PE1-01 | 175 | 5 818 486.650 | 595 595.060 | 912.99 | 27/08/96 |
| A1-PE1-02 | 150 | 5 818 456.420 | 595 626.250 | 912.14 | 27/08/96 |
| A1-PE1-03 | 200 | 5 818 476.822 | 595 602.380 | 917.17 | 22/10/96 |
| ** A1-PE1-04 | | | | 931 | |
| ** A2-PE1-01 | | | | 912 | |
| ** A2-PE1-02 | | | | 935 | |
| A2-PE2-01 | 200 | 5 818 482.710 | 595 598.140 | 903.7 | 25/07/96 |
| A2-PE2-02 | 200 | 5 818 482.710 | 595 598.140 | 909.8 | 25/07/96 |
| A2-PE2-03 | 175 | 5 818 484.196 | 595 598.140 | 919.43 | 12/02/97 |
| (A2-PE2-04) | 200 | 5 818 487.510 | 595 595.995 | 926.07 | 22/02/97 |
| A2-PE2-05 | 175 | 5 818 475.061 | 595 607.560 | 921.87 | 22/02/97 |
| * A2-PE2-06 | 100 | | | 903 | |
| * A2-PE2-07 | 100 | | | 909 | |
| * A2-PE2-08 | 100 | | | 910 | |
| ** A2-PE2-09 | | | | 935 | |
| ** A-1 | | | | | |
| * B0-PE2-01 | 75 | | | 928 | |
| * B0-PE2-02 | 75 | | | 928 | |
| B1-PE1-01 | 300 | 5 818 632.550 | 595 787.910 | 917.27 | 10/09/96 |
| B1-PE1-02 | 275 | 5 818 609.040 | 595 806.770 | 915.95 | 10/09/96 |
| B1-PE1-03 | 305 | 5 818 622.780 | 595 797.260 | 918.69 | 22/10/96 |
| ** B1-PE1-04 | | | | 931 | |
| ** B2-PE1-01 | | | | 935 | |
| ** B2-PE1-02 | | | | 917.5 | |
| B2-PE2-01 | 325 | 5 818 628.270 | 595 787.880 | 902.00 | 25/07/96 |
| B2-PE2-02 | 325 | 5 818 627.470 | 595 790.660 | 909.50 | 25/07/96 |
| B2-PE2-03 | 325 | 5 818 636.530 | 595 786.970 | 921.00 | 22/10/96 |
| B2-PE2-04 | 330 | 5 818 626.940 | 595 794.190 | 921.00 | 22/10/96 |
| B2-PE2-05 | 325 | 5 818 619.014 | 595 799.804 | 921.70 | 14/03/97 |
| * B2-PE2-06 | 100 | | | 916 | |
| ** B2-PE2-07 | | | | 935 | |
| ** B-1 | | | | | |
| * C0-PE2-01 | 75 | | | 928 | |
| * C0-PE2-02 | 75 | | | 928 | |
| C1-PE1-01 | 325 | 5 818 410.500 | 595 496.070 | 914.70 | 28/09/96 |
| C1-PE1-02 | 330 | 5 818 410.500 | 595 496.070 | 916.60 | 22/10/96 |
| ** C1-PE1-03 | | | | 930 | |
| * C1-PE1-04 | 100 | | | 915 | |
| ** C2-PE1-01 | | | | 917 | |
| ** C2-PE1-02 | | | | 935 | |
| C2-PE2-01 | 350 | 5 818 392.410 | 595 478.240 | 907.50 | 25/07/96 |
| (C2-PE2-02) | 350 | 5 818 392.410 | 595 478.240 | 910.50 | 25/07/96 |
| C2-PE2-03 | 325 | 5 818 399.106 | 595 478.824 | 920.97 | 12/02/97 |
| ** C2-PE2-04 | | | | 908 | |
| C2-PE2-05 | 325 | 5 818 402.343 | 595 475.326 | 924.84 | 12/02/97 |
| * C2-PE2-06 | 100 | | | 913 | |
| * C2-PE2-07 | 100 | | | 915 | |
| * C2-PE2-08 | 100 | | | 935 | |
| ** C-1 | | | | | |
| *** D0-PE2-01 | | | | 935 | |
| *** D0-PE2-02 | | | | 935 | |
| ** D1-PE1-01 | | | | 933 | |
| * D1-PE1-02 | 100 | | | 929 | |
| ** D2-PE1-01 | | | | 930 | |
| D2-PE2-01 | 85 | 5 819 756.360 | 595 316.210 | 931.00 | 15/12/96 |
| * D2-PE2-02 | 75 | | | 922 | |
| * E2-PE2-01 | 100 | | | 908 | |
| * E2-PE2-02 | 100 | | | 913 | |

* To be installed during Stage 2A construction.
** To be installed during Stage 2B construction.
*** To be installed during Stage 2C construction.
( ) Piezometer no longer functioning.

1

NOTES

1. Piezometers are vibrating wire type, SINCA Model 52611030 with a pressure rating of 100 psi or equivalent, connected to a readout panel via standard non-vented model 50613524 direct burial cable.
2. Piezometer leads are to be extended as directed by the Engineer.
3. Future survey monuments not shown. A minimum of 2 monuments will be installed for each embankment raise.
4. Installation details for borehole piezometers as shown on Drg. No. 10162-9-154.

1

LEGEND

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

A1-PE1-01 ▲ Previously installed piezometer

A2-PE2-06 △ New Stage 2 piezometer

A2-SM-01 ◇ Embankment survey monument

C-1 ⊙ Slope Inclinometer

(B) Zone B

(C) Zone C

(S) Zone S

(T) Zone T

Scale 10 0 10 20 30 40 50 m

CAD FILE: 10162\9\D14\D14 1:500 Plot 1-0.5 JAN 16, 1998

| DRG. NO. | DESCRIPTION |
|---|---|
| 154 | TSF - STAGE 2 EXPANSION - INSTRUMENTATION - DETAILS |
| 153 | TSF - STAGE 2 EXPANSION - INSTRUMENTATION - SECTIONS - SHEET 2 OF 2 |
| 150 | TSF - STAGE 2 EXPANSION - MAIN EMBANKMENT INSTRUMENTATION - PLAN |

REFERENCE DRAWINGS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| | | | |

REVISIONS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 1 | JAN 16/98 | ISSUED FOR STAGE 2A INSTRUMENTATION INSTALLATION | KJB |
| 0 | DEC 1/97 | ISSUED FOR DESIGN REPORT | |

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PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — K. D. K. EMBRE

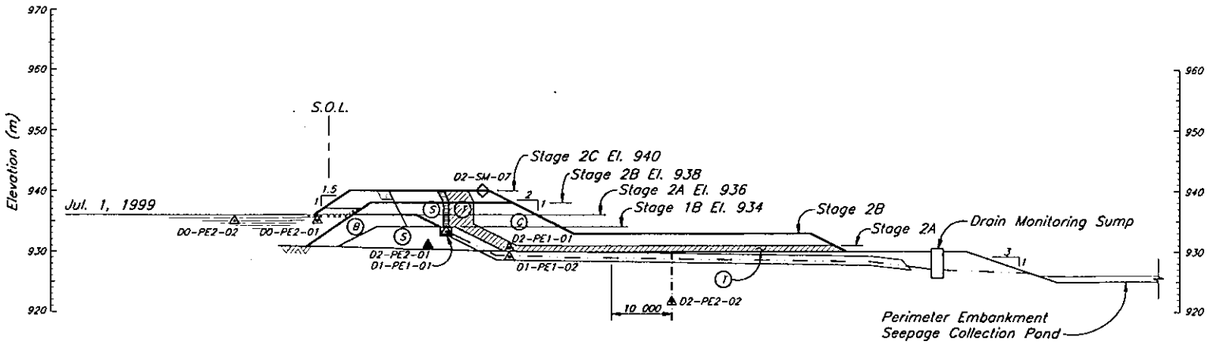
DESIGNED KDE/PJP
DRAWN NSD/DHS/RDT
CHECKED
APPROVED

MOUNT POLLEY MINING CORPORATION

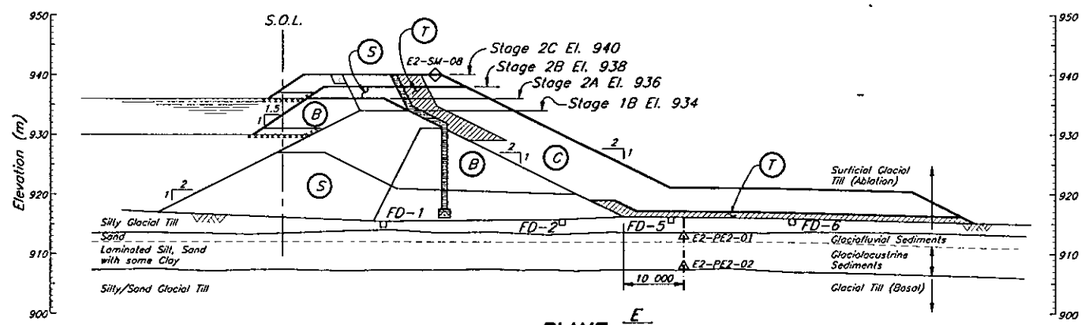
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 2 EXPANSION
INSTRUMENTATION SECTIONS
SHEET 1 OF 2

DATE DEC. 1, 1997 | SCALE AS SHOWN | DRG. NO. 10162-9-152 | REV. 1




PLANE $\frac{D}{151}$
CH. 39+86




PLANE $\frac{E}{150}$
CH. 17+60

NOTES

1. Piezometers are vibrating wire type, SINCA Model 52611030 with a pressure rating of 100 psi or equivalent, connected to a readout panel via standard non-vented model 50613524 direct burial cable.
2. Piezometer leads are to be extended as directed by the Engineer.
3. Future survey monuments not shown. A minimum of 2 monuments will be installed for each embankment raise.
4. Installation details for borehole piezometers as shown on Drg. No. 10162-9-154.
5. See Drg. No. 10162-9-152 for Summary of Instrumentation Installations.

LEGEND

D0-PE1-01
- Plane I.D. (A, B etc.)
- Area (0-Tailings, 1-Drain, 2-Embankment)
- Number I.D.
- Pressure Rating (1-Low, 2-High)
- Type of Instrumentation (PE-Piezometer electric, SM-Survey Monument)

D1-PE1-01 ▲ Previously installed piezometer

D2-PE2-02 △ New Stage 2 piezometer

D2-SM-07 ◇ Embankment survey monument

C-1 ⊙ Slope Inclinometer

(B) Zone B

(C) Zone C

(S) Zone S

(T) Zone T

Scale 10 0 10 20 30 40 50 m

CAD FILE: \10162\9\D16\D16 1:500 Plot 1=0.5 JAN 16, 1998

| ORG. NO. | DESCRIPTION |
|---|---|
| 154 | TSF - STAGE 2 EXPANSION - INSTRUMENTATION - DETAILS |
| 152 | TSF - STAGE 2 EXPANSION - INSTRUMENTATION - SECTIONS - SHEET 1 OF 2 |
| 151 | TSF - STAGE 2 EXPANSION - PERIMETER EMBANKMENT INSTRUMENTATION - PLAN |
| 150 | TSF - STAGE 2 EXPANSION - MAIN EMBANKMENT INSTRUMENTATION - PLAN |

REFERENCE DRAWINGS

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| | | | |

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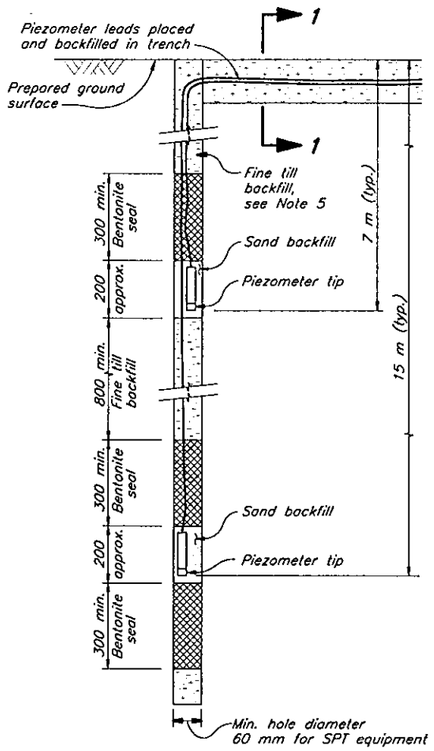
MOUNT POLLEY MINING CORPORATION

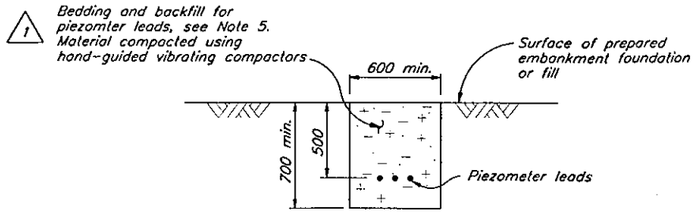
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 2 EXPANSION
INSTRUMENTATION SECTIONS
SHEET 2 OF 2

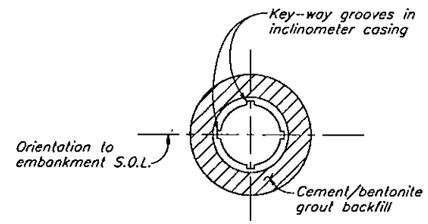
DATE DEC. 1, 1997 | SCALE AS SHOWN | DRG. NO. 10162-9-153 | REV. 1



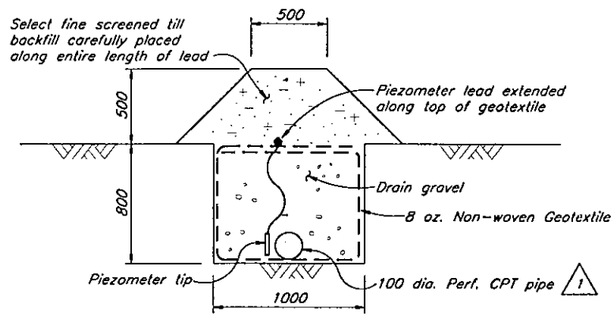

TYPICAL INSTALLATION OF PIEZOMETERS IN BOREHOLES
NTS



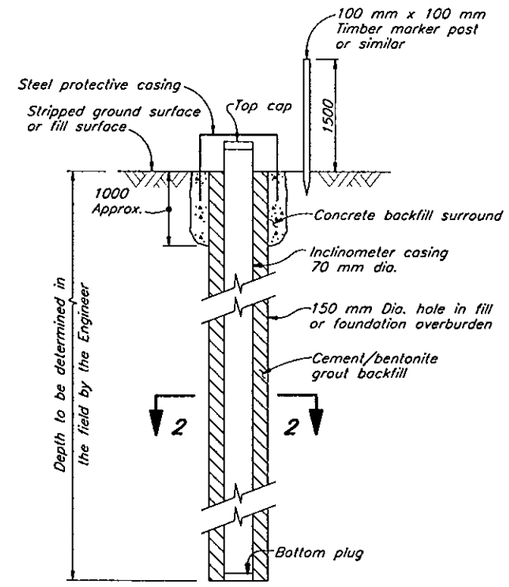

SECTION 1
TYPICAL SECTION THROUGH PIEZOMETER LEAD TRENCH IN PREPARED EMBANKMENT FOUNDATION OR FILL
Scale A




SECTION 2
NTS



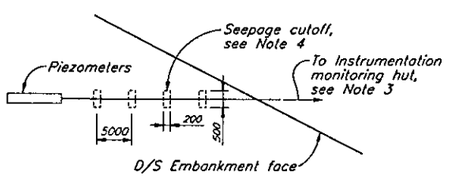

TYPICAL PIEZOMETER INSTALLATION IN EMBANKMENT FOUNDATION DRAIN OR TOE DRAIN
Scale A



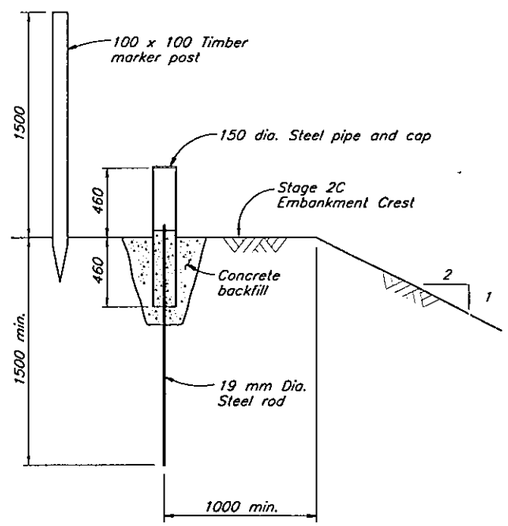

DETAIL C
TYPICAL INCLINOMETER INSTALLATION IN BOREHOLE
NTS

NOTES

1. Dimensions are in millimeters unless otherwise noted.
2. (1) Tailings piezometers to be installed during future investigation programs.
3. Piezometer leads are to be extended as directed by the Engineer.
4. Seepage cutoffs placed at 5 m intervals with 10% bentonite added to fine grained till backfill.
5. (1) Fine grained till backfill must have all particles exceeding 25 mm removed.




DETAIL A/140
TYPICAL DETAIL OF SEEPAGE CUTOFF FOR PIEZOMETER LEADS IN GLACIAL TILL
NTS




DETAIL OF SURFACE MOVEMENT MONUMENT
Scale A

Scale 1000 500 0 1000 2000 mm

| DRG. NO. | DESCRIPTION |
|---|---|
| 153 | TSF – STAGE 2 EXPANSION – INSTRUMENTATION – SECTIONS – SHEET 2 OF 2 |
| 152 | TSF – STAGE 2 EXPANSION – INSTRUMENTATION – SECTIONS – SHEET 1 OF 2 |
| 151 | TSF – STAGE 2 EXPANSION – PERIMETER EMBANKMENT INSTRUMENTATION – PLAN |
| 150 | TSF – STAGE 2 EXPANSION – MAIN EMBANKMENT INSTRUMENTATION – PLAN |

REFERENCE DRAWINGS

| REV. | DATE | DESCRIPTION | APPROVED |
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|---|---|
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| DRAWN | NSD/DHS/RDT |
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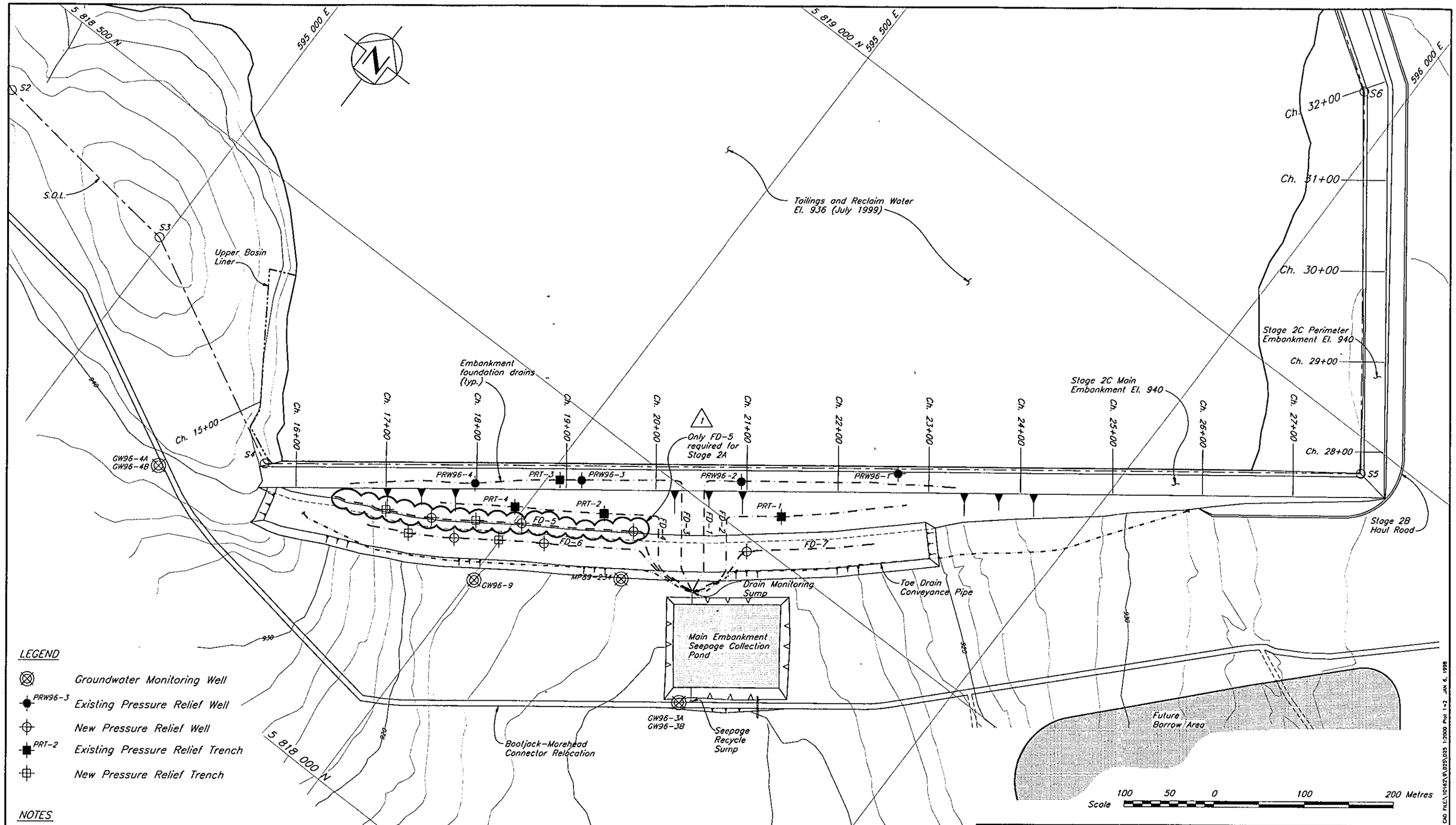
MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 2 EXPANSION INSTRUMENTATION DETAILS

DATE DEC. 1, 1997 | SCALE AS SHOWN | DRG. NO. 10162-9-154 | REV. 1

CAD FILE: \10162\FIG\018\018 1:20 Plot 1=0.02 JAN 16, 1998




CAD FILE:\10162\9\025\025 1:2000 Plot 1=2 JAN 6, 1998

## LEGEND

- Groundwater Monitoring Well
- PRW96-3 Existing Pressure Relief Well
- New Pressure Relief Well
- PRT-2 Existing Pressure Relief Trench
- New Pressure Relief Trench

## NOTES

1. Final locations of new Pressure Relief Wells and Trenches will be determined in the field.

| DRG. NO. | DESCRIPTION |
|---|---|
| REFERENCE DRAWINGS | |

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| REVISIONS | | | |

| REV. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 1 | JAN 6/98 | ISSUED FOR STAGE 2A PRESSURE RELIEF CONSTRUCTION | |
| 0 | DEC 1/97 | ISSUED FOR DESIGN REPORT | |
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| | |
|---|---|
| DESIGNED | KOE |
| DRAWN | DHS/RDT |
| CHECKED | |
| APPROVED | |

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 2 EXPANSION
MAIN EMBANKMENT
PRESSURE RELIEF DETAILS

DATE DEC. 1, 1997 | SCALE AS SHOWN | DRG. NO. 10162-9-155 | REV. 1

# APPENDIX A

# PHOTOGRAPHS

Main Embankment. View looking north, from Bootjack - Morehead Connector Road east of the Seepage Collection Pond. Photo taken near end of construction and only outstanding work is dressing of downstream slope. Note Seepage Collection Pond on left. Zone T material now provides good access to entire Tailings Storage Facility.

Main Embankment View looking east, from right abutment. Note Zone T material with filter fabric extending up to Stage 2A crest at right abutment.

Main Embankment View looking west from left abutment. Final dressing of downstream slope.

Perimeter Embankment from Left Abutment, end of Stage 2A Construction. Tailings discharge is through M1A dump valve. Note tailings beach development.

Perimeter Embankment from near right abutment. Note bench left on downstream side for construction of Longitudinal Drain in Stage 2B Construction.

Perimeter Embankment. Looking upstream from access road on east side on Seepage Collection Pond. Note Outlet Drains going up face of embankment.

Perimeter Embankment. Looking downstream to Seepage Collection Pond. Note grading of area. Zone T platform was extended to final downstream toe.

Pipeline Containment Channel. Upstream end of pipeline sleeves at Bootjack Creek Crossing. Note tailings at bottom of sleeves.

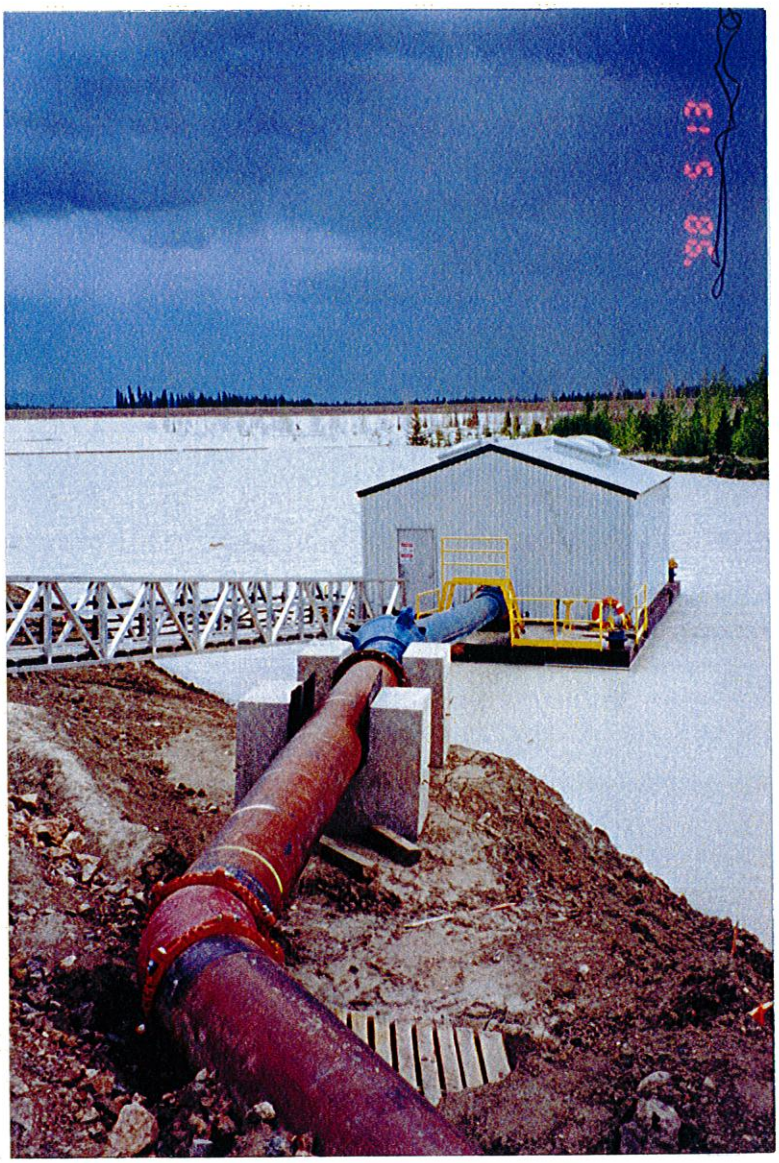
Pipeline Containment Channel. Downstream end of pipeline sleeves at Bootjack Creek Crossing. Note minor amount of tailings at bottom of sleeves.

Bootjack Creek Culvert. Upstream side.

Bootjack Creek Culvert. Downstream side.

Tailings Pipeline System. Revised T2 Dropbox. Tailings Pipeline now extends all the way from the Mill to the Tailings Storage Facility. T2 Dropbox provides surge protection and is connected to the pipeline by a bifurcation.

Tailings Pipeline System. Full T2 Overflow Pond (water).




Reclaim Pipeline System. Reclaim Barge and Channel. Note 35 degree elbow added and barge alignment changed.

Southeast Sediment Pond - Runoff collection ditch, looking north. Note Mine waste dump to left and Polley Lake to right. Ditch is clear of obstructions.

Southeast Sediment Pond - Runoff collection ditch, looking south. Ditch is clear of obstructions.

Southeast Sediment Pond. Looking west, from end of runoff collection ditch to the manhole sump. Note low water level and overflow culvert in foreground.

Southeast Sediment Pond. Downstream fill slope looking east. Note dry stable slope and well established re-vegetation.

Polley Lake Pumping System. Intake Area. Note float on Polley Lake. Float is attached to the intake.

Millsite Sump. Note low water level and stable inner slopes.

Millsite Sump. View of south slope, looking west. Slope was repaired and is stable. No seepage observed.

Southeast Bootjack Dam. View of upstream face of embankment, looking southwest. Ponded water is now seeping through old dam back into Bootjack Lake.

South Bootjack Dam. View of downstream face of embankment, looking northeast. Spillway in foreground is clear of obstructions.