DELOITTE AND TOUCHE INC.

FARO PIT PLUG DAM

CONCEPTUAL DESIGN
REPORT NO. 2

(DRAFT)

PROJECT NO.: 0257-027-02
DATE: NOVEMBER 2004

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Project No. 0257-019-01
Date: November 17, 2004

Mr. Douglas Sedgwick
Deloitte & Touche Inc.
Suite 1900, TD Centre
79 Wellington Street West
Toronto, Ontario
M5K 1B9

Re: Faro Pit Plug Dam- Conceptual Design Report No. 2

Dear Doug:

The above referenced draft report has been uploaded to the Deloitte & Touche Inc. e-room. This report presents our revised conceptual design for the Faro Pit Plug Dam. The conceptual design has been revised on the basis of new site specific information that has been gathered in 2004. The new information includes the results of a preliminary field investigation for borrow material and drilling at the Plug Dam site and the Faro Creek site. This draft report has been issued for your comment and review as part of the next phase of Faro Mine closure planning. Once your, and the regulatory reviewers, comments are received the report will be issued in final form.

We trust that this information meets with your requirements at this time. Should you have any questions or comments, please do not hesitate to contact me at the number listed above.

Yours truly,
BGC Engineering Inc.
per:

Gerry Ferris, M.Sc., P.Eng.
Geotechnical Engineer

GWF/slf

Attached: Draft Report

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LIMITATIONS OF REPORT

This report was prepared by BGC Engineering Inc. (BGC) for the account of Deloitte and Touche Inc., Interim Receiver for Anvil Range Mining Corporation. The material in it reflects the judgement of BGC staff in light of the information available to BGC at the time of report preparation. Any use which a Third Party makes of this report, or any reliance on decisions to be based on it are the responsibility of such Third Parties. BGC Engineering Inc. accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

As a mutual protection to our client, the public, and ourselves, all reports and drawings are submitted for the confidential information of our client for a specific project and authorization for use and / or publication of data, statements, conclusions or abstracts from or regarding our reports and drawings is reserved pending our written approval.

1.0 INTRODUCTION

1.1 Background and Study Objective

Previously a conceptual design report for the in-pit plug dam (the "Plug Dam") was prepared by BGC Engineering Inc. (BGC 2004). That report was prepared on the basis of existing information combined with a visual inspection of the Plug Dam abutment areas. This "Conceptual Design Report No. 2" describes data collection in the area of the Plug Dam and the former Faro Creek channel. The results of this investigation have been used to update the conceptual design of the Plug Dam.

The Plug Dam may be necessary as part of mine closure, however a final decision has not yet been made. The purpose of the Plug Dam would be to retain pit water (and possibly tailings solids and/or waste rock) within the main open pit and prevent overflow and/or seepage from entering the adjacent Zone II Pit, located to the south. Currently no definition of the required additional storage volume in the Faro Pit has been provided. Therefore the conceptual design of the Plug Dam has been prepared on the basis of maximizing the water level in the Faro pit, and maintaining "reasonable" costs for construction. Once storage requirements for the pit are better defined the Plug Dam concept should be reassessed. Closure planning meetings are planned for the beginning of 2005 where decisions related to storage requirements and overall closure concepts will be made.

When the water elevation in the Zone II Pit rises above about 1094 m amsl it flows through the waste rock towards the north fork of Rose Creek. At lower water elevations seepage through the rock occurs. The water level within the Zone II Pit is controlled by pumping the water that collects in its base back to the main pit. The Zone II pump is operated in the range of 1074 to 1079 m amsl so the water level is maintained below these elevations.

During the closure-planning workshop of February, 2004 in Vancouver, it was recognized that the conceptual design prepared for the Plug Dam was not based on site specific information and preliminary investigations should be performed to test the conceptual design. As a result, Deloitte and Touche Inc. (Deloitte) and the Type II Mine Management team requested that BGC Engineering Inc. (BGC) undertake a preliminary investigation and prepare an updated conceptual design and cost estimate.

This report presents the updated conceptual design for the Plug Dam. Since the first conceptual design report (BGC 2004) presented a detailed summary of the key information available at that time the reader will be referred to the previous report as appropriate.

1.2 Scope of Work and Authorization to Proceed

The agreed upon scope of work developed by BGC was presented in a proposal dated August 4, 2004 to Deloitte. Authorization to proceed was provided by Mr. Doug Sedgwick of Deloitte on August 10, 2004.

The program of work undertaken by BGC included the following major tasks, at the Plug Dam location:

- Bedrock core drilling and water pressure testing to assess rock mass quality and hydraulic conductivity in the abutments and middle of the dam foundation. This was performed to confirm the depth and extent of the grout curtain.
- Geophysical surveys to delineate the bedrock surface under the cover of surficial materials in the pillar area between the Faro Pit and the Zone II Pit.
- Test pitting to assess the quality of overburden materials on top of the left abutment for potential use as core material.

Other investigation activities were performed outside of the direct Plug Dam construction area, these included:

- ODEX drilling to assess the overburden stratigraphy within the former Faro Creek valley on the west side of the Faro pit, including falling head water tests to estimate the hydraulic conductivity within the potential outlet from the Faro Pit.
- Survey of the exposed bedrock elevations on the rim of the Faro Pit between the Faro creek channel and the Plug Dam location.
- Surface sampling and test pitting to assess the quality of the overburden materials exposed on the Northeast Waste Dump.

In addition to the above investigation activities, a review of relevant information that has become available since preparation of the 2004 conceptual design report was undertaken.

This draft report presents the updated conceptual design for the Plug Dam based on the information that is now available. Following receipt of review comments a final report will be prepared.

1.3 Site Survey Datum

Within the mine site area, topographic elevations may be referenced to various datum levels. Unless noted otherwise, all drawings in this report are based on the 1927 North American Grid system (NAD27) and geodetic datum, with elevations given in metres above mean sea level (m amsl). Older mine drawings may be based on “Mine Datum” or “Down Valley Project Datum” and may be in feet. The approximate conversion factors for these data are as follows (Robertson 1997):

- To convert Mine Datum to m amsl, subtract 33.3 m or 109.2 feet.
- To convert Down Valley Project Datum to m amsl, subtract 32.3 m or 106 feet.

2.0 BACKGROUND INFORMATION

2.1 Location

The Faro Mine is located about 20 km north-northwest of Faro, Yukon, in the Anvil Range Mountains, about 190 km northeast of Whitehorse. Access to the mine is via a 23 km long mine access road from the Town of Faro, as shown in Figure 1.

Figure 2 shows an overview of the current site conditions, indicating the locations of interest. The Faro open pit straddles the Faro Creek valley. Figure 3 shows the topographic features of the Faro Pit area in more detail. The drainage of Faro Creek was diverted around the northeast side of the pit to allow mining of the open pit. The pit was mined in three zones. Zones I and III are located within the main pit boundary. The Zone II Pit was located south of the Main Pit, as shown in Figure 3 and was subsequently completely filled in with waste rock.

Waste rock piles from the open pit mine are draped over the valley slopes of Rose Creek, along the southeast sides of the pit. The original Faro Creek drainage course forms a notch into the pit wall crests on the west and north sides. The pit is currently filled with water to about elevation 1142 m. The notch along the former Faro Creek channel has been partially filled in with waste rock, with the lowest topographical point now being at elevation 1181.59 m (on waste rock) at the top of the access road to the pump barge, as shown in Figure 2. A bedrock low, at elevation 1158.2 m occurs in this area (SRK 1991). The location of this topographic and bedrock low is indicated on Figure 2. The drilling performed at borehole BGC04-01 indicated that the bedrock elevation was 1055.3 m, and the elevation of the exposed bedrock in the area is at an elevation of about 1160 m.

On the southeast corner of the pit, a haul road ramp forms a narrow slot through the Faro Pit crest. This road was previously used to connect the main Pit to the Zone II Pit and was abandoned during mining of the Zone III ore body. The maximum bedrock elevation in the base of the haul road is about elevation 1158.9 m amsl (SRK, 1991). This elevation tentatively represents another bedrock low on the rim of the Faro Pit. The bedrock around the Zone II Pit has been covered by waste rock dumps, which have a maximum elevation of about 1254 m amsl on the southeast side, between Faro Pit and Rose Creek. The minimum saddle elevation on the haul road out of the main pit, located on rockfill cover over the former Zone II pit area, is 1174.57 m, as shown in Figures 2 and 3.

2.2 Geology

The conceptual design report presented a detailed summary of the geology of the Faro Pit, concentrating on the Plug Dam and Zone II Pit. The geology was compiled from various archival reports and references, augmented by limited site reconnaissance observations. The reader is referred to that previous report for a detailed discussion. As the conceptual design report was being completed, additional archival geotechnical data concerning the Plug Dam area was found by SRK. This section provides a brief outline of the previous detailed review and updates to the available information and the current investigation.

The Anvil Range ore bodies occur at the contact between the Mt. Mye Formation and the Vangorda Formation. Both of these formations have been encountered in the vicinity of the Plug Dam site area, with the Vangorda Formation on the right abutment and the Mt. Mye Formation on the left abutment. Figure 4 presents an updated geological plan of the Plug Dam area.

Figure 5 shows a geological plan of the Faro Creek area. This geological plan was created on the basis of airphoto interpretation and previous geological mapping. Site reconnaissance will be required in this area to provide additional details. Based on the mapping of the Faro Pit, no known faults dissect the Faro Creek area.

During the 1994 investigation of the Zone II pit seepage (SRK 1994) a borehole, BH94-16 was drilled within about 500 m downstream of the plug dam site. At this location, shown on Figures 3 and 6, an upper sequence of Carbonaceous Phyllite, Quartz Sericite Schist, Biotite Schist about 20 m thick was encountered. Within this upper sequence, drill core recoveries ranged between 50% and 95%, with RQD less than 20%. Below about 20 m depth the rock consisted of a Chloritic Biotite Schist with better total core recovery and RQD values.

Three packer tests were performed during drilling of borehole BH94-16, using a single packer. The hydraulic conductivities measured for the following zones; 4.6 to 15.2m, 15.5 to 24.4m and 58.6 to 68.3m were respectively 2.1×10^{-8} m/s, 8.9×10^{-9} m/s and 6.1×10^{-8} m/s. The ground surface at this borehole was 1160 m amsl (SRK 1994) making the upper hydraulic conductivity test between elevation 1155.4 m and 1144.8 m. Three piezometers were installed in this borehole using very large screen zones. The upper piezometer installation was not completed (no sand pack was installed, and the piezometer pipe was attached to the middle piezometer) due to frozen conditions. In 1994 following drilling the measured groundwater level was at 6.1 m below grade, elevation 1153.9 m. In September 2004 the measured water level (all three piezometers) was between 4.8 m and 5.2 m below grade, elevation 1155.2 to 1154.2 m.

3.0 FIELD INVESTIGATION

3.1 General

The field program undertaken for this investigation was performed in stages between August and September of 2004. The field work involved site reconnaissance, test pitting, drilling, hydraulic conductivity testing and geophysics. The investigation tasks were conducted at a number of locations around the Faro Pit and the Waste rock dumps.

The conceptual design report recommended a detailed program of additional site investigations required to advance the plug dam to a preliminary design stage. The 2004 program undertook some of these investigations in order to gather some site specific information at a few key locations. It is expected that if the design for the Plug Dam is to proceed beyond conceptual design a detailed investigation program will need to be performed at the Plug Dam and Faro Creek locations, similar to those recommended (BGC 2004).

One standpipe piezometer, BGC04-01 was installed in the Faro Creek area. Monitoring of the water levels can be performed at this location and it will likely be used as part of future detailed investigations at this location. Packer tests were performed at various depths in the bedrock of the Plug Dam foundation and abutments to provide an estimate of the field hydraulic conductivity. Falling head tests were performed throughout drilling of the overburden soils at the Faro Creek location to estimate the hydraulic conductivity at that location. Test pitting and surface sampling was performed to determine the properties of overburden soils on the left abutment of the Plug dam. This investigation was used to determine the suitability of nearby deposits as construction materials in the Plug Dam.

The following sections discuss the methods of field investigation and provides the results of those investigations. In Section 4 the conceptual design of the Plug Dam is revisited and revised on the basis of the results of the investigation.

3.2 Site Reconnaissance

The site reconnaissance consisted of a walking inspection of the Plug Dam area and the Faro Creek area. Photograph 1a, on Drawing No. 1 in the photograph section, shows a view of the Plug Dam site. Marked on this photograph are the positions of the boreholes drilled and the approximate location of the proposed pit water level when raised to elevation 1168 m. Photograph 1b shows a similar view of the former Faro Creek channel area.

Two different views of the right abutment of the Plug Dam are shown in Drawing No. 2 (photograph section). Photo 2a shows the pillar of rock between the main pit and Zone II pit. This area was previously mapped as having a number of faults dissecting the pillar (BGC 2004) the approximate position of these faults is shown on Figure 4. Photo 2b shows a view looking from the left abutment at the right abutment, looking along the alignment of the proposed Plug Dam.

An overview of the left abutment is shown in Photograph 3 (Drawing No. 3 in the photograph section). Included on this photo is the position of borehole BGC04-04 and the approximate water elevation when raised to elevation 1168 m.

During the site reconnaissance 36 different exposed bedrock locations were marked along the edge of the Faro Pit. The location and elevation of these bedrock exposures are shown as BE#1 through BE#36 on Figures 3, 6 and 7.

3.3 Drilling

3.3.1 ODEX Drilling

The drilling was performed using a track mounted Prospector Drill using 171 cm (6.34 inch) O.D. (152 cm, or 6 inch I.D.) casing. The drill was provided and operated by Midnight Sun Drilling Ltd. (Midnight Sun) from Whitehorse, Yukon. Mr. Mike McCrank, EIT of BGC was on site during the investigation of this area. Drilling was completed between August 9 and 14, 2004 (almost three days of downtime were experienced). The location of this borehole is shown on Figures 3 and 7.

The borehole log for BGC04-01 is attached in Appendix I. Three different materials were encountered; a waste rock/road fill, in-situ till and colluvial soils. These units are underlain by a schistose bedrock.

An attempt was made to convert this ODEX rig to diamond drilling so that the program could continue immediately following drilling of BGC04-01. This conversion proved to be unsuccessful and was abandoned. Following demobilization of the BGC inspector the ODEX drill was used to set casing (117 cm O.D.) at each of the three diamond drill hole locations at the Plug Dam site. Further discussion is provided in Section 3.3.2.

3.3.2 Diamond Drilling

The drilling was performed using a truck mounted JQS 300 drill. The drill rig was supplied and operated by Midnight Sun from Whitehorse, Yukon. Drilling was completed between August 31 and September 9, 2004. A total of three boreholes were completed, the locations of the boreholes are shown on Figures 3 and 6. The drilling was performed under the full time supervision of Mr. Gerry Ferris, P.Eng. of BGC.

At each borehole, HW casing was set prior to initiation of core drilling. At BGC04-02, an ODEX casing had been set to a depth of 4.26 m (14 feet) as noted above. The HW casing was installed in the center of this ODEX casing to a depth of 5.33 m (17.5 feet). At BGC04-03 and BGC04-04 the ODEX casing had only been inserted to depths of approximately 1.2 m (4 feet). Rather than set the HW casing inside this short length of ODEX casing the HW casing was installed adjacent to it. The base of the HW casing was set to a depth of 1.2 m (4 feet). The boreholes were then cored in five foot core runs to the desired depth with a thick walled NQ3 diamond rotary bit, resulting in 44.96 mm diameter core. Water was used as the drilling fluid for all the holes. All boreholes were drilled vertically. Drilling proceeded extremely rapidly, a 5 foot core run was completed in about 10 minutes (drilling rate of 6 inches per minute).

Initial geotechnical logging was performed at the drill site as the core was brought out of the ground. Given the speed of drilling, core logging was completed after the core had been transported to the guard house. The core logging information collected included:

- Total core recovery (TCR),
- Solid core recovery (SCR),
- Rock Quality Designation (RQD),
- Strength index,
- Weathering and alteration,
- Bedrock lithology,
- Joint shape and roughness, joint alteration and/or infill, joint aperture,
- Discontinuity inclination with respect to the core axis, and
- Occurrence of broken core.

The borehole logs created based on drilling are attached in Appendix I. Each joint, fracture and drill break was inspected with respect to type, roughness, infilling and aperture. A summary of the core fractures, minus the drill breaks, is included immediately following the appropriate borehole log.

An attempt was made to estimate the degree of joint aperture in-situ, based on an examination of the joint surface characteristics in the core samples. Joint aperture was logged as “tight” T, “Partially open” P and “Open” O and is included on the summary of the core fractures. The tight aperture condition was usually associated with fractures along foliation, and had no staining. These fractures were difficult to distinguish from drill-induced fractures. Partially open and open fractures frequently displayed surface staining; weathering or some degree of wall rock mismatch.

A photo of the core collected from BGC04-02 is shown in Drawing No. 4 in the photo section. A photo of the core collected from BGC04-03 is shown in Drawing No. 5 in the photo section. A photo of the core collected from BGC04-04 is shown in Drawing No. 6 in the photo section. As can be seen in these photos the core was highly fractured with many more fractures than shown in the borehole logs and summary of core fractures. As noted above an attempt was made to distinguish between the natural fractures and core breaks, and the borehole log and fracture

sheets represent only the natural fractures. It is thought that the large amount of core fracturing experienced is due to the speed of drilling and the weakness along the foliation. During core logging examination, the core could be broken by hand along the weak foliation planes.

Often the core was so highly broken up and fractured by drilling that logging of distinct fractures was difficult. Quartz zones were encountered during drilling (as indicated on the logs) and it was thought that occasionally fragments of quartz become stuck in the core catcher, resulting in the softer schistose rock being ground out of the way by the quartz. This may be reason for very low core recoveries in certain sections.

3.4 Hydraulic Conductivity Testing

3.4.1 Rising/Falling Head tests

Hydraulic conductivity tests, known as rising or falling head tests depending on whether water was removed or added to the standpipe, were performed at borehole BGC04-01.

Falling head tests were performed as part of the drilling of the borehole. This was accomplished by advancing the ODEX drill string to the desired depth, then pulling back the string by 3.05 m (10 feet). This exposed a 3.05 m section of soil/rock, which was then tested by filling the upper part of the casing with water. The casing was filled until the water level in the casing was equal to the ground surface level. The rate at which the water level dropped, once water was no longer added, in the casing was plotted versus time. The resultant data was used to calculate the horizontal hydraulic conductivity of the soil adjacent to the test interval. These calculations are attached in Appendix II.

Following installation of the 50 mm I.D PVC piezometer (installation details included on the borehole log) a falling head test was performed in the piezometer. The falling head test was performed using the same methodology as the falling head tests performed during drilling. The calculations performed to determine the horizontal hydraulic conductivity are attached in Appendix II. This falling head test was performed immediately following installation, prior to development of the well.

The well was developed by removing three times the volume of water contained in the PVC piezometer. Following well development a slug test was performed in the piezometer. The water level in the piezometer was allowed to stabilize after the development activities and a datalogger was inserted into the well prior to dropping the “slug” into the casing. The “slug” consisted of a metal bar attached to a rope. The data logger recorded the water level increase as slug was dropped into the casing, and then the time required for the water level to drop back to the initial level. The datalogger was then was used to measure the water level rise after the slug was removed from the casing. This data was then used to calculate the horizontal hydraulic conductivity, shown in Appendix II. The slug test was performed by Mr. Dan Mackie of SRK Consulting Inc. and the raw data was provided to BGC.

The calculations, along with a summary of the results are included in Appendix II. The hydraulic conductivity calculation was performed according to the methodology outlined by Hvorslev (1951).

3.4.2 Packer Tests

Packer tests were carried out in the bedrock portion of the diamond drill holes. The top of the upper test zone was limited by the base of the cased zone. The casing depth at BGC04-02 was set by the base of the larger diameter casing set using the ODEX drill rig.

Following drilling of each borehole to its final depth, the borehole was flushed with clean water and the drill rods were removed. Water pressure testing was carried out in the "open" borehole to determine the hydraulic conductivity profile of the surrounding bedrock.

Double inflatable (pneumatic) packers, manufactured by RST Instruments of Vancouver, B.C. were supplied by Midnight Sun. The packers were capable of isolating either 2.22 m or 3.75 m intervals using perforated steel pipe between the packers. The packers were inflated using nitrogen gas to at least three times the maximum test pressure. Water was pumped into the test section under constant pressure. The flow was measured at BGC04-02 using a digital totalizing flow meter. This flow meter supplied by Midnight Sun was oversized for the testing equipment and was later revealed to require flow rates above about 5 lgal/min to register correctly. For the packer testing performed in the remaining boreholes an analog "Neptune" flow meter was used to measure the total flow during a test. The Neptune flow meter had an estimated minimum measurable flow of 0.01 lgal, which is equal to a flow rate of 0.4 l/min for a 5 minute test.

For most of the water pressure tests, the injection pressure was increased in three increments and then decreased for two decrements while the flow was measured continuously. The sequential pressures utilized were approximately equivalent to 1/3P, 2/3P, 3/3P, 2/3P and 1/3P. P was equal to 1 psi per foot of depth, at the top of the test interval. Each increment and decrement of pressure was maintained until stabilized pressure/flow conditions were achieved within the test section. The test was conducted for a minimum of 15 min. Some of the water pressure tests were conducted with a reduced amount of pressure increments due to time/budget restrictions. In these cases the 3/3P pressure was used for the test.

The results of the water pressure testing are summarized in Table 1 and presented graphically on the geotechnical logs included in Appendix I. Hydraulic conductivities were calculated based on the results of each water pressure test using the analysis method presented in Hvorslev (1951) a copy of these calculations are included in Appendix II.

Table 1 Hydraulic Conductivity Data

Borehole	Test No.	Date Tested	Test Interval (m)	Hydraulic Conductivity (m/sec)	Comments
BGC04-02	1	Sept 1/04	8.45 – 10.67	$>1.0 \times 10^{-4}$	Note 1
BGC04-02	2	Sept 1/04	9.71 – 11.93	$>1.0 \times 10^{-4}$	Note 1
BGC04-02	3	Sept 1/04	13.06 – 15.28	3.6×10^{-6}	Note 2
BGC04-02	4	Sept 1/04	15.81 – 18.03	3.1×10^{-6}	Note 2
BGC04-03	1	Sept 5/04	3.01 – 5.23	5.1×10^{-6}	
BGC04-03	2	Sept 5/04	5.75 – 7.97	1.2×10^{-7}	
BGC04-03	3	Sept 5/04	8.49 – 10.71	$<2.7 \times 10^{-9}$	Note 3
BGC04-03	4	Sept 5/04	11.24 – 13.46	$<2.6 \times 10^{-9}$	Note 3
BGC04-03	5	Sept 5/04	13.98 – 16.20	$<2.2 \times 10^{-9}$	Note 3
BGC04-03	6	Sept 5/04	16.72 – 18.94	$<2.0 \times 10^{-9}$	Note 3
BGC04-03	7	Sept 5/04	19.46 – 21.68	1.2×10^{-9}	
BGC04-03	8	Sept 5/04	21.90 – 24.12	4.1×10^{-7}	
BGC04-04	1	Sept 8/04	2.79 – 5.79	1.0×10^{-6}	
BGC04-04	2	Sept 9/04	3.61 – 7.36	4.3×10^{-7}	
BGC04-04	3	Sept 9/04	7.27 – 11.02	7.2×10^{-9}	
BGC04-04	4	Sept 9/04	10.92 – 14.67	7.3×10^{-9}	
BGC04-04	5	Sept 9/04	14.58 – 18.33	1.8×10^{-8}	
BGC04-04	6	Sept 9/04	18.24 – 21.99	1.1×10^{-7}	
BGC04-04	7	Sept 9/04	21.90 – 25.65	1.3×10^{-7}	
BGC04-04	8	Sept 9/04	25.56 – 29.30	$<9.4 \times 10^{-10}$	Note 3
BGC04-04	9	Sept 9/04	29.78 – 33.53	$<7.8 \times 10^{-10}$	Note 3
BGC04-04	10	Sept 9/04	32.57 – 36.32	3.1×10^{-8}	

Notes:

1 – Pumping water at the maximum pump capacity. Pressure beyond the system compliance could not be generated. Hydraulic conductivity was calculated based on the pumping rate and the assumption that the water level feeding the packer was equal to the ground surface. The actual hydraulic conductivity is higher than the stated value.

2 – Digital flow meter could not measure low flows properly, hydraulic conductivity calculated based on a flow rate of 20 l/min which was determined to be the lower working limit of the flow meter. An analog flow meter was used for the remaining boreholes. The actual hydraulic conductivity is likely lower than this calculated value.

3 – Take of zero measured, hydraulic conductivity calculated based on the lowest flow rate considered measurable by the equipment.

3.5 Test pit Investigation

3.5.1 Test pit Excavation

Six test pits were excavated in the overburden soils on the left abutment area to investigate the potential use of this material as Zone 1 (core) fill for the Plug Dam. The test pits were excavated on September 14, 2004 using the Anvil Range Caterpillar 235 tracked excavator. The test pits were excavated and sampled under the supervision of Mr. Gerry Ferris, P.Eng. of BGC. The location of these six test pits are shown on Figures 3 and 6.

A copy of the test pit logs created based on this investigation is included in Appendix I. Photographs of the test pits excavated on the left abutment area are included on Drawings No 7 through 12 in the photos section. In general, the soil encountered consists of silty sand with some gravel to silty, gravely sand. The liquid limit of the portion of the samples finer than the No. 40 sieve varied from 17 to 25. The plastic limit varied from 8 to 15. The natural water content of the samples was less than the plastic limit. A copy of the laboratory testing completed on samples from the test pits is included in Appendix III. The broadly graded nature of this material resembles a till, which has sufficient fines content to be suitable as a core material for the dam. The sand and gravel content will provide a high degree of shearing resistance when placed in compacted lifts in the dam.

Three test pits were excavated at the crest of Northeast waste dump. Anecdotal information suggested that this area had been used as a waste dump for till that was removed during overburden stripping. The position of these test pits is shown on Figure 8. A copy of the test pit logs based on this investigation is included in Appendix I. These three test pits were excavated to determine the amount of natural Quaternary soils present in the area for use as Zone I fill. The test pitting program found no undisturbed Quaternary materials, nor was any material encountered to indicate that this was a “till dump” from overburden stripping. At both BGCTP04-07 and -09 only waste rock was encountered to the maximum reach of the excavator. At BGCTP04-08 a 0.5 m thick disturbed mix of Quaternary material was encountered at the base of the excavation. This led to the conclusion that the material exposed on the face of the dump is likely disturbed and dumped material, mixed with waste rock, rather than part of a natural deposit or indicative of a “till dump” that could be exploited as a borrow area for dam core material.

The results of the laboratory testing program performed on samples taken from test pits on the left abutment are included on the borehole logs, in Appendix I and in Appendix III.

3.5.2 Surface Sampling

Surface samples were collected at a number of locations on the Northeast waste dump. This surface sampling program was intended to supplement the test pitting. The location of the surface samples are shown on Figure 8. The surface samples were collected by Mr. Gerry Ferris, P.Eng. either on September 13 or 15, 2004. Photographs taken during the collection of these surface samples are included in Drawings 13 through 20 in the photograph section. These locations are denoted by the name of the sample collected at each location.

Surface samples GWF22 through GWF27 were collected at the base of “till dumps” as shown in Figure 7. The soil encountered at these locations varied from sandy gravel with some cobbles to gravely sand with some cobbles. Moisture contents of these samples were measured and the results are included in Appendix III. Given the test pit program performed and visual inspection of the crest of the dumps it was concluded, that none to little Zone I core material would be available from these locations. Based on this review, the material exposed in this area may be more suitable, after processing as Zone 2 filter material. It is considered unlikely however, that this area represents a significant resource in terms of volume of material available.

Surface samples GWF28 and GWF29 were collected from a sand and gravel dump located on the crest of the Northeast waste dump, as shown in Figure 8. The soil encountered at these two surface sampling locations consisted of sandy gravel with some cobble to gravely sand with some cobble. A summary of the laboratory testing results for these samples are attached in Appendix III. This material potentially could be used, following processing as Zone 2 filter material.

3.6 Geophysics

Geophysical surveys were performed at the Faro Mine site for programs undertaken by both BGC and SRK in 2004. The geophysical contractor, Aurora Geophysics Ltd. (Aurora) from Whitehorse Yukon was on site from October 7 to 18, 2004 for all the programs. The work conducted for the Plug Dam project consisted of three seismic refraction lines in the right abutment/pillar zone. The locations of the three lines are shown on Figures 3 and 6. The purpose of these geophysics lines was to determine the bedrock contact elevation and to confirm the dimensions of the rock pillar between the Main Pit and Zone II pit.

The location of each of the three geophysics lines was laid out in accordance with the requirements of BGC prior to Aurora’s arrival at site. The survey information along each line was provided to Aurora. The methodology for performing the geophysical survey and preliminary results are included in Appendix IV.

The preliminary results from the Line 1 survey indicate the interpreted top of bedrock (based on seismic wave velocities) varies between elevation 1163 and 1176 m. The results from the Line 2 survey indicate that the interpreted bedrock surface decreases in elevation from 1170 m near the rim of the Faro pit, to about elevation 1167 m about 40 m from the edge of the exposed rock wall. Then the bedrock elevation increases to about 1176 m. The results from the Line 3 survey indicated that the interpreted bedrock surface elevation varies between elevation 1171 and 1173 m.

3.7 Discussion of Findings

3.7.1 Maximum Reservoir Elevation

In original conceptual design report the maximum water elevation for the raised Faro Pit was 1173 m. The design water elevation was selected based on assumptions regarding the quality of rock in the pillar between the Main pit and Zone II pit.

At the Faro Creek valley location the measured bedrock elevation at the edge of the Faro pit is about 1160 m, marked as BE#7 through BE#15 on Figure 4 and on Figure 10. These measurements were made at the edge of the pit. At Borehole BGC04-01 the top of bedrock was encountered at elevation 1155.3 m, this borehole was located within the bedrock low of the former creek channel.

At the Plug Dam site, the geophysics (seismic refraction) performed in the pillar area between the Main pit and the Zone II pit indicated intact bedrock is at a lower elevation than originally thought. The exposed bedrock on the pit wall is at an elevation of about 1180 m. The previous assessment was that the upper 4 to 6 m of the rock would be highly weathered and require a seepage cut-off. However, the seismic assessment indicated that the transition from a velocity of about 1000 m/s to 4500 m/s (intact rock) was between 1167 to 1171 m. Additional investigation will be required in this area (as indicated in the original conceptual design report) to confirm the intact, tight bedrock elevation for tie in of the cut-off. The results of the preliminary geophysics assessment indicates that the upper 9 to 13 m of bedrock is badly fractured. This is likely due, in a large part to blast damage from mining activities in the Zone II and Main Pit, adjacent to the pillar area.

To maintain the previous maximum reservoir level of Elevation 1173 m amsl the pillar area would require fairly extensive treatment (ranging from removal and replacement, consolidation grouting to extension of the core placement on this rock face). In light of this result, it is recommended that the maximum reservoir elevation be reduced to 1168 m. Under this scenario, seepage would still be possible through the materials filling the Faro Creek valley area on the west side of Faro pit.

Constructing the Plug Dam so that a water level of 1168 is retained in the Faro pit it will create about 16,300,000 m^3 of additional storage in the pit, as shown in Figure 11.

If seepage out of the Faro Creek area is not acceptable then a seepage cut-off will be required in this area or an even lower maximum water level could be considered. Additional investigation in this area will be required to determine the requirements for seepage cut-off or the elevation of low permeability rock. The preliminary investigation performed in this area encountered bedrock with a hydraulic conductivity of about $5x10^{-6}$ m/s to an elevation of 1150 m.

3.7.2 Hydraulic Conductivity – Plug Dam Area

The hydraulic conductivity in the right and left abutments were within the range previously estimated. At the right abutment (BGC04-03) the permeability is below $1x10^{-7}$ m/s (the approximate limit of grout ability) at elevation 1150 m. On the left abutment (BGC04-04) rock with this low hydraulic conductivity is reached at elevation 1165 m.

The hydraulic conductivity below the base of the road, BGC04-02 however was significantly different than expected. The borehole was collared at elevation of 1152.6 m. The estimated top of bedrock is 1149 m (this elevation is based on third party reports from the ODEX drilling of the casing). The hydraulic conductivity of the rock was higher than could be measured using the available equipment, interpreted to have hydraulic conductivity greater than $1x10^{-4}$ m/s. This zone of high hydraulic conductivity extends down to about elevation 1139 m. Given the inaccuracies of the flow meter used at BGC04-02 it is not conclusive but it appears that intact, tight (i.e. hydraulic conductivity less than $1x10^{-7}$ m/s) bedrock would be located at about elevation 1136 m.

3.7.3 Hydraulic Conductivity – Faro Creek Area

Previous assessments have assumed that the unconsolidated overburden sediments within the bedrock low defining the Faro Creek had a hydraulic conductivity, in the range of $1x10^{-6}$ m/s. Based on the testing to date this estimate has proven to be fairly accurate. The bedrock immediately beneath these sediments however was found to be more permeable, with a hydraulic conductivity of about $5x10^{-6}$ m/s. The drilling performed did not extend to depth to find the elevation where the rock permeability reduced, as this was not the purpose of the investigation. The results indicate that the underlying rock will extend the seepage area acting as a conduit for water flow from the Faro Pit. Indeed, given this result it is thought possible that a seepage zone could extend along the entire pit perimeter. Inflow to the pit would come mainly from the north and east sides of the pit and outflow through the south and west sides.

An assessment of the overall seepage from the pit would be a requirement of the next stage of investigation in the Plug Dam. The starting point for this assessment would be a water balance of the existing Faro Pit, which BGC understands is being prepared this year.

4.0 REVISED CONCEPTUAL DESIGN

4.1 General

The following section discusses the conceptual design for the Plug dam, with consideration of the results of the investigation performed.

The Plug Dam section chosen in the initial conceptual design was a zoned rockfill dam with a central core of relatively impervious material, upstream and downstream filter and transition zones. The key difference in the revised conceptual design, based on the 2004 drilling results is the need to deepen the seepage cut-off below the dam foundation and conduct an extensive consolidation grouting program of the core contact foundation. The 2004 drilling program failed to provide details of the upper 5 m of the dam foundation in the center of the access road. Casing was installed by the driller through what was believed to be overburden or road fill prior to BGC being on site. As a result, the 3 m depth of the core trench needs to be confirmed in a subsequent program of drilling or test pitting. Consolidation grouting will be required to elevation 1139 m in the highly permeable upper portion of rock. It should be noted that a deep core trench that extends to an elevation of 1139 m could be considered, however investigation will be required prior to this determination.

Typically, such a deep core trench proves to be the more expensive option, due to the volume of material that must be excavated and the volume of core material that must be placed into the core trench. Future investigations will be required to determine the depth at which suitable conditions for core placement on rock are found. It is important to note that the central impervious core dam section shown for the Plug Dam assumes that suitable foundation conditions for the placement of core materials can be found within a reasonable depth. If this is not the case, alternative dam sections may have to be considered due to the need to integrate the impervious element of the embankment with the seepage cut-off in the foundation. Alternative seepage cut-off methods may include a slurry trench cut-off utilizing soil-bentonite mixtures or plastic concrete that extends through the embankment and into the bedrock. In the extreme case, alternative dam alignments may have to be identified to avoid unfavourable foundation conditions.

In view of the need to treat a potentially extensive zone of fractured bedrock below the core trench, the grout curtain in the foundation has been expanded from a single line shown in the 2003 conceptual design report to a three line grout curtain extending to elevation 1130 m. The grout curtain for the abutment area is planned to consist of a two line curtain, leaving a possibility for a middle line, to be grouted as necessary. A schematic showing this concept is shown on Figure 12. This conceptual design was chosen based on the following considerations:

- Simple design that can be constructed using readily available construction equipment, with a minimal amount of technical supervision in a short construction season.
- Construction materials include waste rock, till and sand and gravel, which are readily

available at the site.

- The rockfill side slopes can readily be flattened or steepened to accommodate any type of material. Previous design concepts allowed for the use of sulphide bearing waste in the upstream shell, below the minimum water level elevation.
- Minimal abutment foundation preparation required, which can be done over the late winter- early spring before the summer construction season.
- The high hydraulic conductivity measured in the upper portions of the foundation area.
- Grout curtain to seal potential water transmitting fractures in the bedrock above elevation 1130 m.

Prior to fill placement, the entire footprint of the dam will be stripped of colluvial debris and scaled of loose rock. The road base covering the foundation will be removed under the entire dam footprint. To minimize disturbance to the rock in the dam foundation, the core trench will not be blasted. Minor rock excavation will, however be required in the right abutment to shape the core contact area. Ideally, the impervious fill should be placed on a slope no greater than 45^{o} from the horizontal to ensure that during compaction, the lowermost lifts in contact with rock are adequately compacted. Steeper rock slopes will be trimmed or concrete fillets placed in order to create smooth transitions on the core contact surface. The core contact area will be hand scaled and blown clean with compressed air prior to fill placement. Dental concrete and slush grouting of open surface cracks may be required, especially in the right abutment area.

During construction of the Plug Dam, three additional items of work will be required:

- Relocation of the water discharge pipeline from the Zone II pump well, which passes through the dam footprint along the toe of the left abutment.
- Removal and reconfiguration of the water diversion ditch on the 1173 bench on the left abutment.
- System to collect seepage water from the downstream toe of the dam.

Relocation and re-arrangement of the first two facilities should be done with mine site staff input and may be done under a separate contract or work activity by Deloitte. The seepage collection system along the downstream toe will be installed during dam construction and may involve a collection pond with a pumping system to return the seepage water over the Plug Dam into the Faro Pit.

The design criteria outlined in the conceptual design report have not been altered, and the reader is referred to that report (BGC 2004) for a review of the criteria.

4.2 Embankment Section and Construction

4.2.1 Zone 1 Impervious Earth Fill

The investigation of the glacial/colluvial material on the left abutment revealed that the material consisted of a low plasticity broadly graded silty to gravely sand. This material is suitable for use as zone 1 material. Final recommendation to use this material as opposed to a more uniformed fine grained material from the Vangorda Plateau will be made during a later design phase. An economic evaluation of the requirements for Zone 2 filter material will dictate the final selection.

It was assumed that prior to construction, further investigations will be carried out to identify potential borrow areas for dam construction materials, both in terms of the quality and quantities of materials available. Later detailed designs of the dam will need to consider minimization of processing to keep the cost of the construction down.

The core will be placed in lifts and compacted at optimum moisture content to a dry density equal to or greater than the maximum dry density obtained in the Standard Proctor Test. The bedrock contact zone will be placed at slightly wet of optimum moisture content, to ensure that the till is squeezed into the surface irregularities of the bedrock, without voids or areas of low compaction.

4.2.2 Zone 2 Filter

The gradation and number of filters will depend on the distribution of grain size curves obtained for the Zone 1 impervious core material and the gradation of the Zone 3 rockfill. Processed sand and gravel will be used to provide a material that meets the filter gradations. Granular borrow sources are located within 6 km of the dam site, on the crest of the Northeast dump and the Faro creek borrow area. It has been assumed that appropriate quality and quantities of material will be available from these two sources. Processing is expected prior to the used of materials from these borrow areas prior to use within the dam.

The filter zones were generously sized in order to facilitate placement and compaction. Filter materials will be placed in lifts as the impervious core and rockfill shells are raised, and compacted to a dry density between 95% and 98% of the maximum dry density. The 2 m depth of cover of granular materials over the impervious core was intended to offer thermal protection for the core and will be augmented by rigid soil insulation and a road base for traffic if required. The material details depth of thermal cover protection must be assessed in future design studies by conducting thermal modelling using site-specific climatic factors and soil properties.

4.2.3 Zone 3 Rockfill

It was assumed that sufficient rockfill would be obtained from the adjacent Faro waste rock dumps. Some of this material contains potentially acid generating (PAG) rock units, such as pyrite bearing quartzites, massive sulphide ores or disseminated sulphides. The SRK plug dam options considered using PAG material in the upstream shell, below the water line. This is still a valid option, as long as the future water levels in the pit do not change. Further consideration of the location of PAG materials within the dam section will be dependent on the final operational conditions for the Faro Pit water level. For the purposes of this study, it was assumed that the rockfill used in the dam will be clean, non-PAG rock.

Rockfill will consist of metamorphic rock units such as phyllite, schist, gneiss and minor volcanics or calc-silicate. Since the waste rocks have been exposed to weathering for a period of time, it should be possible to selectively excavate materials that are strong, durable and not subject to chemical or physical breakdown due to weathering. Maximum particle size will be 300 mm. The rockfill will be placed in lifts, with nominal compaction by the bulldozer or spreading equipment. The rockfill will be raised in lifts concurrent with the filters and till core.

No rip rap has been included in the dam section. It was assumed that the rockfill used in the upstream shell would satisfy erosion protection requirements for the dam. This assumption will be checked in future detailed design for the Plug Dam.

4.3 Seepage Assessment

Upon installation of the Plug Dam it is expected that there would two areas of potential seepage loss in bedrock low areas around the perimeter of the Faro Pit:

- The south corner of the pit, adjacent to the Zone II Pit and including the Plug Dam foundation;
- The southwest wall, also related to the former Faro Creek valley sediments and disturbance; and,

In addition to the seepage from these two bedrock low areas general seepage from the Faro Pit is to be expected. BGC understands that a water balance for the Faro Pit has been prepared in 2004, this study would provide a summary of the current seepage from the pit. Based on the drilling/testing programs the hydraulic conductivity increases with increasing elevation. Therefore, general seepage losses from the pit will increase as the water level in the pit is increased. As described in the following two sub-sections, the total estimated seepage losses from the two areas mentioned above ranges between approximately 234 m^3/day and 890 m^3/day.

South Corner and Plug Dam Foundation

The Zone II Pit will act as a local groundwater sink along the south perimeter of the Faro Pit (or below the right abutment and central portion of the proposed plug dam). The water elevation in the Zone II pit pumping well has fluctuated between approximately 1106 m and 1116 m amsl, between March 14, 1997 and September 30, 2003 (BGC 2004)

Estimates of seepage losses from the Faro Pit into the Zone II Pit have been carried out based on information obtained from the 1991 and 1993 SRK reports and this program. These results and field observations used in performing the estimate include:

- Below 1143 m (BH16), wall rocks are predominantly schists and phyllites, do not maintain open fractures to any great depth and have a hydraulic conductivity less than 1 x 10^{-8} m/s (or are essentially impervious).
- Along the southern pit perimeter (BGC04-03), above 1150 m, wall rocks are comprised of a highly fractured, blast damaged rock mass. Hydraulic conductivity above 1150 m ranges between approximately 1x10^{-5} m/s and 1 x 10^{-6} m/s.
- An average hydraulic conductivity of about 1 x10^{-7} m/s was determined for left abutment area between 1147 and 1154, with hydraulic conductivity about 1 x10^{-8} m/s above this zone and 1 x10^{-9} m/s below.

For the purposes of estimating seepage losses through the southern perimeter, we have assumed the following:

- Because of the impervious rock mass below 1143 m, the majority of seepage losses will occur through the blast damaged upper wall rocks.
- As the observed range of water of water levels in the Zone II Pit is well below 1143 m, a free flowing water face will develop in the blast damaged wall rocks of the Zone II pit, above 1143 m.
- Very little flow will occur below the left abutment, through wall rocks along the eastern perimeter of the Faro Pit.

A series of simple, hand drawn flow nets, were constructed using Cross Section B-B' from Drawing 9, to estimate seepage losses in this area. Based on the assumption that a free flowing water surface develops on the upper wall of the Zone II pit, the hydraulic gradient along this cross section was calculated to be approximately 0.2. The approximate seepage loss per metre length was calculated to range between approximately 0.3 m^3/day and 3 m^3/day. Assuming seepage occurs over a perpendicular distance of approximately 240 m, measured from the toe of the left abutment, the resulting estimated total seepage quantity is approximately 72 m^3/day to 720 m^3/day.

Southwest Wall (former Faro Creek Valley)

As discussed previously the overburden soils have a hydraulic conductivity of about $1x10^{-6}$ m/s and the underlying bedrock has a hydraulic conductivity of $5x10^{-6}$ m/s. The upper portion of the bedrock has a hydraulic conductivity about ½ of an order of magnitude than the valley fill sediments. For this preliminary assessment we have assumed that the seepage will occurred through a 25 m thick zone have a width of 150 m. Applying Darcy's Law and with assumed representative values for hydraulic conductivity and gradient of 5 x 10^{-6} m/s and 0.1, respectively, the estimated seepage through this zone was calculated to be about 162 m^3/day.

These sediments are overlain by at least another 8 m of waste rock (to el. 1181±). The hydraulic conductivity of the waste rock is expected to be at least two orders of magnitude higher than the in situ sediments. Seepage through the rockfill is not an issue if the pit pond water level is maintained below Elevation 1168 m amsl. Additional investigation will need to be performed in the former Faro Creek area to determine the need for a seepage cut off.

4.4.2 Seepage Cut-off Elements

Two different grout curtains are proposed; a triple line beneath the dam and a double line in the abutment areas extending for 120 m along the right abutment (Figure 4). Beneath the Zone 1 core material consolidation grouting is proposed to an elevation of 1139 m. The rock mass is characterized by at least five joint sets, generally inclined from the vertical to varying degrees. Therefore, the proposed orientation of the grout holes is vertical, which will result in the grout holes intersecting all fracture systems. In general, a rock mass having a hydraulic conductivity of about 1 $X10^{-7}$ m/s or greater is considered "groutable" with Portland cement-based grouts.

The rock mass below the foundation area, under the current road, is highly permeable with hydraulic conductivity greater than $1x10^{-4}$ m/s. Consolidation grouting, with final spacing of 0.5 m is proposed to seal the highly fractured rock. It has been assumed that at least 3 m of stripping will be required in the core trench to reach bedrock in the foundation that is intact enough to benefit from consolidation grouting. The need for this grouting and core trench is based on the drilling and hydraulic testing performed at BGC04-02. The purpose of the consolidation grouting is to strengthen the rock mass under the core contact area and to fill the voids with grout, thereby creating a grout sealed cap through which the grout curtain can be constructed.

The triple line grout curtain for the foundation area was selected based on the results of drilling and hydraulic conductivity testing at BGC04-02. These results combined with the low seismic velocities measured in the right abutment pillar area indicate highly fractured rock in many areas. The double line of grouting proposed for the abutments will be performed similar to the triple line, leaving the center line un-grouted initially and then testing the need to extend the double line to a triple.

The grout curtain will tie in to the zone of relatively impermeable rock expected to be located below Elevation 1136 m. The bottom of the grout curtain has been set at Elevation 1130 m in the foundation area beneath the road. This will provide at least 6 m of overlap into the lower impervious rock mass. In the left abutment area the base of the grout curtain can be tentatively set at elevation 1159 m. In the right abutment the grout curtain should extend to elevation 1143 m (as assumed in the original conceptual design). Additional drilling and water pressure testing must be performed to finalize the grout curtain details.

The grout curtain is expected to decrease seepage losses into the Zone II Pit by one to two orders of magnitude (0.7 m^3/day to 72 m^3/day). Detailed seepage analyses should be undertaken at later design stages to confirm the expected seepage quantities.

5.0 QUANTITIES AND COST ESTIMATE

Table 2 presents a summary of the estimated quantities, unit prices and costs for the plug dam and grout curtain, based on the central impervious core section shown in Drawing 12.

The unit rates used for the various items are based on rates, which have been used for previous estimates at the site. As a starting point, the following rates were used by BGC for Faro earthworks in the past:

- Unit prices assume use of large-scale equipment.
- Excavate and load soil- \$1.50/m^3.
- Haul- \$0.18/tonne-km
- Dump and spread- \$0.50/m^3
- Compact- \$0.50/m^3
- Excavate and load rockfill- same as for soil, assuming no blasting

After an initial unit rate was derived based on the above factors, further adjustments were made on the basis of recent bid prices for the breach of the Fresh Water Supply Dam Breach Project done in late 2003 and other cost estimates provided for various Faro Mine site closure tasks.

In summary, the estimated cost is \$4.1 million, which includes a 25% contingency. Major items that are not included in this estimate are:

- Site investigations and engineering.
- Permits and regulatory approvals.
- Detailed access for work.
- Resident engineering and construction quality control and quality assurance.
- Surveying.
- Dam Instrumentation.
- Escalation and extra work allowances.

A lump sum allowance of $60,000 was included to cover the cost of relocating the discharge pipeline from the Zone II pit and the diversion ditch on the left abutment. This work could be done in advance under a separate contract or by mine site staff. The following sections summarize each of the items in more detail.

A lump sum allowance of $90,000 was included for mobilization of equipment.

5.1.1 Excavation

Excavation includes bulk overburden excavation and stripping and core trench rock excavation.

5.1.1.1 Bulk Overburden Excavation and Stripping.

Bulk overburden excavation and stripping includes removal of the mine haul road base under the dam footprint, removal of the left bank diversion ditch berm and liner as well as the accumulated colluvial debris and loose rock on the abutment slopes. An average thickness of 0.5 m was assumed over the entire dam footprint. The excavated material would be hauled to a designated waste dump site assumed to be on the existing waste rock dumps, within 1 km of the dam site. This also includes excavation of the 3 m deep core trench, assuming all the excavation will be of overburden material.

5.1.1.2 Core Trench Rock Excavation

This includes bedrock trimming required on the right abutment in order to prepare the bedrock slopes for placement of the Zone 1 impervious core material. This excavation is expected to involve a very limited amount of blasting. The excavated material will be hauled to the designated waste site, assumed to be within 1 km of the dam.

5.1.2 Foundation Preparation

Foundation preparation includes all the work required to prepare the contact area prior to placement of the impervious fill. This includes scaling and cleaning, followed by slush grouting and dental concrete as required.

Scaling and cleaning involves a lot of hand labour to remove loosened pieces of rock and debris after the completion of the rock excavation in the core contact area. Any cracks or voids filled with unconsolidated materials must be cleaned out, at least to a depth equal to three times their width. The open cracks are then backfilled with dental concrete or slush grout depending on their width. In areas where steep side “steps” of rock remain, concrete fillets must be placed to achieve a 1:1 slope.

Prior to placement of impervious fill, the core contact area must be blown clean of loose debris using compressed air.

This item also includes lump sum allowances for relocating the pipeline from the Zone II pumping well and re-directing the left abutment runoff diversion ditch. Currently, the diversion ditch is breached in the vicinity of the dam site and water is flowing over the left abutment rock slope, across the dam foundation and into the Faro pit. Water in the diversion ditch comes from the waste dumps and slopes south of the dam. It may be possible to widen the bench at the crest of the dam and have the water flow directly into the Faro pit with the increased water level behind the plug dam. The pump well discharge could then be routed across the waste dump material and discharge into the diversion ditch. Discussion with mine site staff will be required to further assess these issues.

5.1.3 Foundation Grouting

The proposed foundation grouting consists of two components; consolidation grouting beneath the core and curtain grouting that extends from the left abutment, across the base of the road and up to the crest of the right abutment. The centreline of the grout curtain is centered on the upstream one-third point of the core contact, Figure 12. From the right abutment crest, the grout curtain extends for another 110-120 m to the west, along the rock pillar between the main pit and the Zone II Pit, (Drawing 5). The grout holes will be collared on an excavated bedrock surface. Some rock removal in this area may be done during construction, which may require realignment of the grout curtain to suit site conditions.

5.1.3.1 Consolidation Grouting

Consolidation grouting will be carried out immediately following bulk excavation and stripping is completed in the dam foundation area. Grouting involves a progressive sequence of drilling and grouting. A primary spacing of 3 m was assumed. In the consolidation grouting it was assumed that a round of drilling of secondary holes, spaced at 1.5 m centers would be required. High taking secondary holes will require at least one more split spaced hole (tertiary) to be drilled and grouted. For estimating purposes, it was assumed that all primary holes (3 m c-c) and all secondary holes (1.5m c-c) will be drilled and grouted. One-half (50%) of the tertiary holes will be drilled and grouted and 25% of the quaternary holes will be drilled and grouted.

Cement takes in the primary holes were assumed to be “High” (225 kg/m). Takes in the secondaries was assumed to be “High” (225 kg/m), with “moderately high” takes (110 kg/m) in the tertiary holes, and “low” (15 kg/m) in the quaternary holes. The use of sulphate resistant cement is recommended due to the presence of sulphides in the dam foundation rocks.

5.1.3.2 Curtain Grouting

Foundation grouting will be carried out soon after the bulk excavation and stripping is completed and following final foundation preparation. Curtain grouting in the foundation area will be performed following completion of the consolidation grouting. The curtain grouting involves a progressive sequence of drilling and grouting. A primary hole spacing of 3 m was assumed. It was assumed that a split spacing closure sequence would be followed, in which holes are initially drilled at a wider spacing, say 12 m c-c, then grouted. Next, holes are drilled halfway in between the first set of holes and grouted. The process is repeated until all the holes are at a 3 m c-c primary spacing. Depending on the grout takes in this stage of holes, additional (secondary) holes spaced 1.5 m from high taking primary holes will be drilled and grouted as required. High taking secondary holes will require at least one more split spaced hole (tertiary) to be drilled and grouted. For estimating purposes, it was assumed that all primary holes (3 m c-c) will be drilled and grouted. One-half (50%) of the secondary holes will be drilled and grouted and 25% of the tertiary holes (0.75 m c-c) will be drilled and grouted.

Cement takes in the primary holes were assumed to be “Moderate” (75 kg/m). Takes in the secondaries was assumed to be “Moderately Low” (37 kg/m), with “low” takes (15 kg/m) in the tertiary holes. The use of sulphate resistant cement is recommended due to the presence of sulphides in the dam foundation rocks.

Drill holes are expected to be 75 mm diameter rotary drilled vertical holes up to about 40 m deep. In the left abutment and dam foundation, it was assumed that the entire hole would be drilled to the bottom, then grouted from the bottom of the hole to the top in 3 m stages. Vertically drilled holes are expected to intersect all of the discontinuities in the rock mass, and will help to maintained stable hole conditions. It is expected that drilling of inclined grout holes will be problematical, especially in the right abutment.

In the right abutment, the upper 10 m of hole are expected to be in poor rock conditions. Therefore, top down grouting was assumed in this section of the hole. In this method, the hole is only drilled to a depth of one grout stage (3 m), then, grouted. When the grout has set, the hole is re-drilled to the bottom of the first stage and deepened by another 3 m. The lower 3 m stage is then grouted. Below 10 m, it is expected that ground conditions will improve to allow drilling to the bottom of the grout curtain. The rest of the hole is then grouted from the bottom up in 3 m stages, as proposed for the left abutment and dam foundation grout holes.

As an option, drilling and grouting of the right bank holes in the pillar area, to the right of the dam crest, can be done after the dam is constructed, but before water is allowed to rise behind the dam. Access to the top of the right abutment can then be provided over the top of the completed dam. Otherwise, a temporary access road will be required from the top of the right abutment down to the grout curtain centreline.

Prior to grouting, each grout hole will be water pressure tested in 3 m intervals. This will serve as a check on rock mass permeability and the effects of closure as grouting progresses.

5.1.4 Embankment Materials

The unit prices for the dam embankment materials were derived from the assumptions listed at the beginning of this section.

The Zone 1 impervious core material is assumed to be obtained from on top of the left abutment. Unit prices reflect a short one-way haul distance, moisture conditioning plus the price for excavating, loading, hauling, placing and compacting the fill.

The Zone 2a and 2b fine and coarse filters are assumed to come from existing granular borrow areas located adjacent to the North Fork Rose Creek or on top of the Northeast waste dump, both of these sites are within 3 km of the dam. The unit price covers bulk excavation of the granular material, processing (washing and screening), loading, hauling, placing, spreading and compacting.

The Zone 3 rockfill assumes clean, non-acid generating rockfill to be obtained from the waste rock dumps around the Faro Pit within a 2 km one way haul distance. The price includes excavation, loading, hauling, placement and compaction. No costs have been included for environmental testing and monitoring of the rockfill material, assuming that a clean, acceptable source has been identified prior to construction.

Table 2 Faro Pit Plug Dam Construction Cost Estimate

6.0 CONCLUSIONS AND RECOMMENDATIONS

A conceptual design for the Plug Dam was developed on the basis of a preliminary geotechnical investigation. The proposed concept is an earth and rockfill dam with a central impervious core, founded on bedrock. A significant amount of consolidation grouting will be required underneath the foundation to fill in the highly broken rock. A grout curtain will be required beneath the dam foundation to tie-in to low permeability rock below Elevation 1136 m.

The right abutment is a critical element of the design due to the proximity of the Zone II Pit. The pillar of rock between the Faro Pit and the Zone II Pit is traversed by several fault zones, which were mapped in the open pit. The rock mass is expected to be of poor quality due to the presence of these faults and the fact that the pit walls on both sides of the pillar are affected by blast damage.

The proposed design of the dam utilizes locally obtainable materials, and is relatively easy to construct within one construction season. The estimated capital cost of this alternative is $4.1 million, excluding mobilization, demobilization, escalation and extra work allowances.

Further investigation of the Plug Dam and the Faro Creek areas is required to advance the design beyond the conceptual level. Such a program was outlined in the original conceptual design report. A critical component of the next phase of investigation is to determine the depth of the core trench cut-off required and to confirm the type of seepage control required for the dam and foundation. This aspect will be required to confirm the eventual configuration of the dam section, as well as the best alignment of the structure to avoid potentially costly foundation treatment measures.

7.0 CLOSURE

We trust that this information will meet with your requirements at this time. Should you have any questions or require any additional information, please do not hesitate to contact the undersigned.

Yours truly,

BGC Engineering Inc.
Per

Gerry Ferris, M.Sc., P.Eng.
Geotechnical Engineer

Reviewed by:

Holger Hartmaier, M.Eng., P.Eng.
Senior Geotechnical Engineer

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Robertson GeoConsultants Inc., (1997), Anvil Range Mining Complex- Integrated Comprehensive Abandonment Plan (ICAP), prepared for Anvil Range Mining Corporation, RGC Report No. 033001/3, Appendix F, January, 1997.

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Steffen, Robertson & Kirsten (B.C.) Inc. (SRK), (1993), "Groundwater Investigation, North Fork of Rose Creek, Faro Mine, Yukon Territory", Prepared for Anvil Range Mining Corporation, December, 1993.

PHOTOGRAPHS

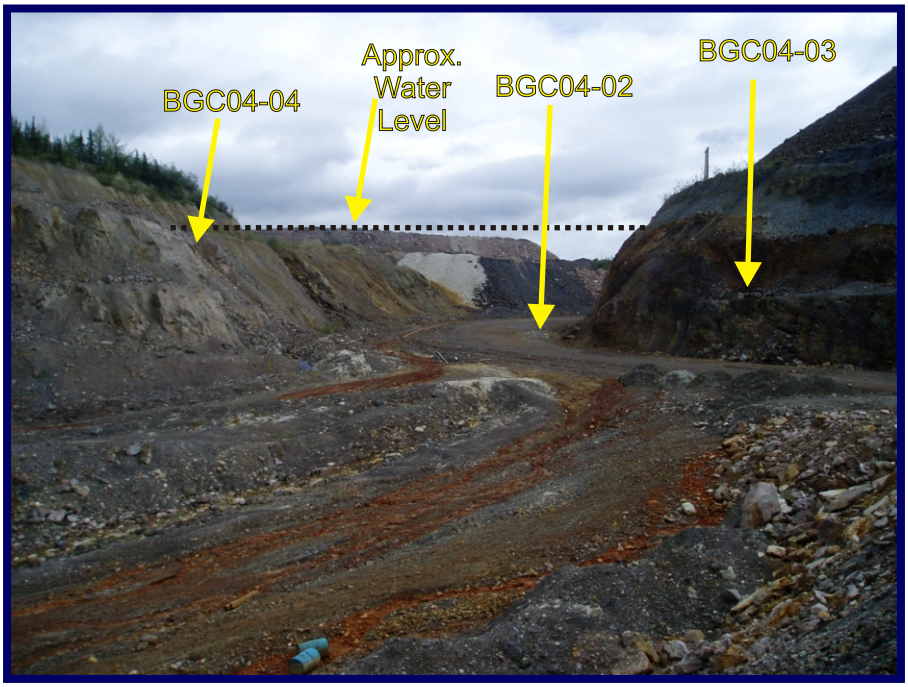

Photo 1a looking downstream at Plug Dam location.

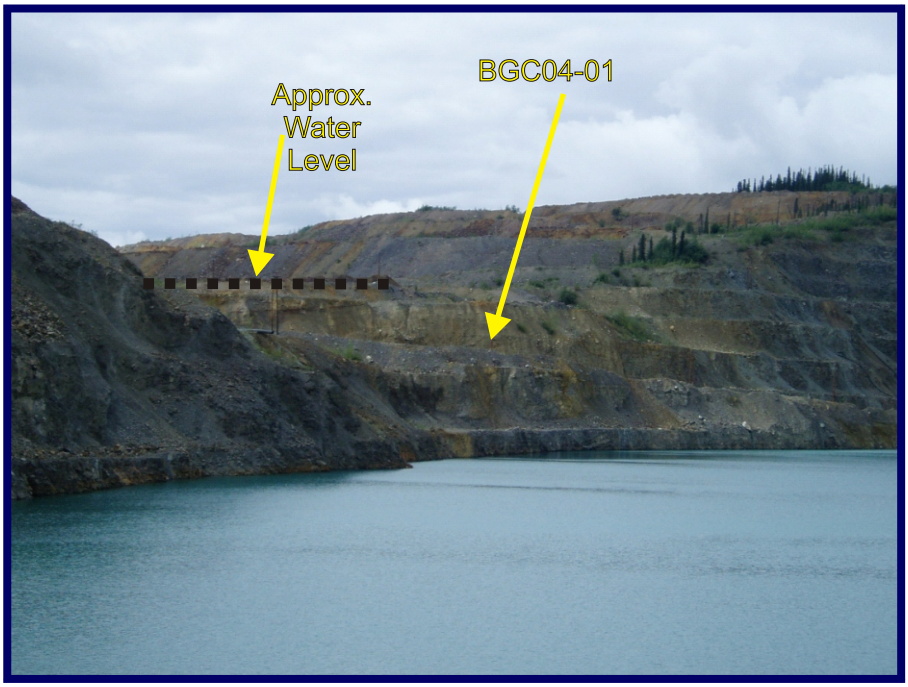

Photo 1b looking towards Faro Creek location.

SCALE:	N/A	DESIGNED:	GWF
DATE:	OCTOBER 2004	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	

CLIENT: Deloitte & Touche

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary, Alberta. Phone: (403) 250-5185

PROJECT
PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE
PLUG DAM & FARO CREEK

PROJECT No.	DWG. No.	REV.
0257-027-02	1	0

Photo 2a overview of the right abutment and “pillar” area between Faro Main Pit and Zone II Pit.

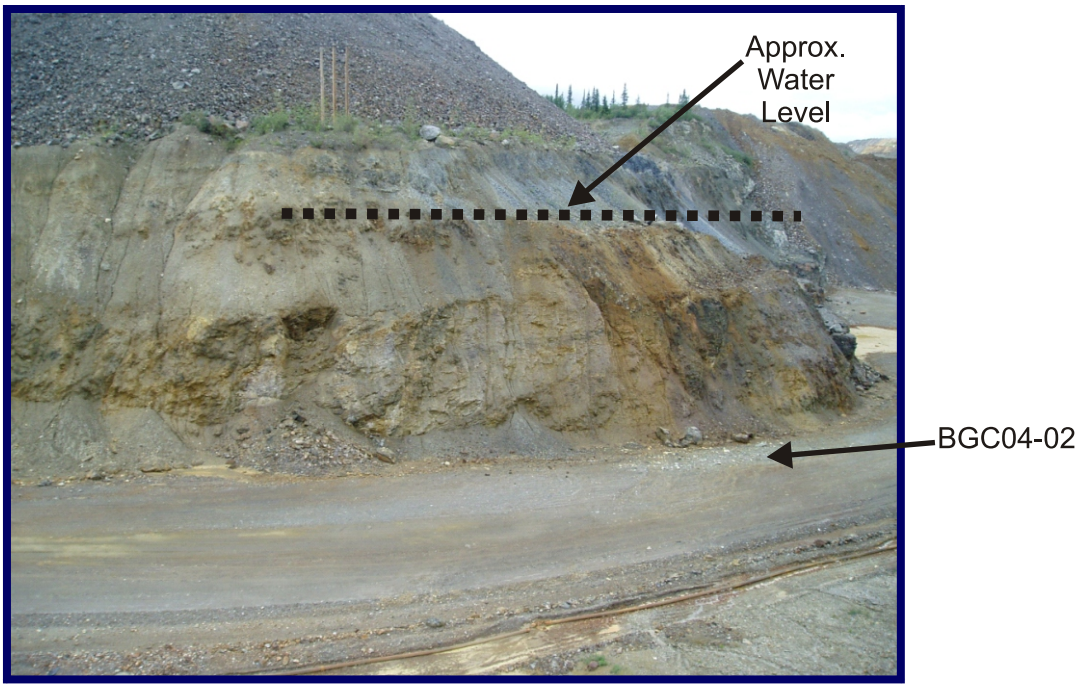

Photo 2b looking at right abutment from crest of left abutment.

SCALE:	N/A	DESIGNED:	GWF
DATE:	OCTOBER 2004	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	

CLIENT: Deloitte & Touche

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PROJECT: PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE: RIGHT ABUTMENT

PROJECT No.	DWG. No.	REV.
0257-027-02	2	0

Photo 3 overview of left abutment.

DATE: OCT 2004	DRAWN SLF	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY Calgary, Alberta Phone: (403) 250-5185	PROJECT PLUG DAM CONCEPTUAL DESIGN NO. 2		
REFERENCED DRAWING DESCRIPTION			TITLE LEFT ABUTMENT		
AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.		CLIENT Deloitte & Touche	PROJECT No. 0257-027-02	DWG. No. 3	REV. 0

Photo 4 core collected from BGC04-02.

DATE: OCT 2004	DRAWN SLF	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY Calgary, Alberta Phone: (403) 250-5185	PROJECT PLUG DAM CONCEPTUAL DESIGN NO. 2		
REFERENCED DRAWING DESCRIPTION			TITLE BGC04-02		
AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.		CLIENT Deloitte & Touche	PROJECT No. 0257-027-02	DWG. No. 4	REV. 0

Photo 5 core collected from BGC04-03.

DATE: OCT 2004	DRAWN SLF	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY Calgary, Alberta Phone: (403) 250-5185	PROJECT PLUG DAM CONCEPTUAL DESIGN NO. 2		
REFERENCED DRAWING DESCRIPTION			TITLE BGC04-03		
CLIENT Deloitte & Touche			PROJECT No. 0257-027-02	DWG. No. 5	REV. 0

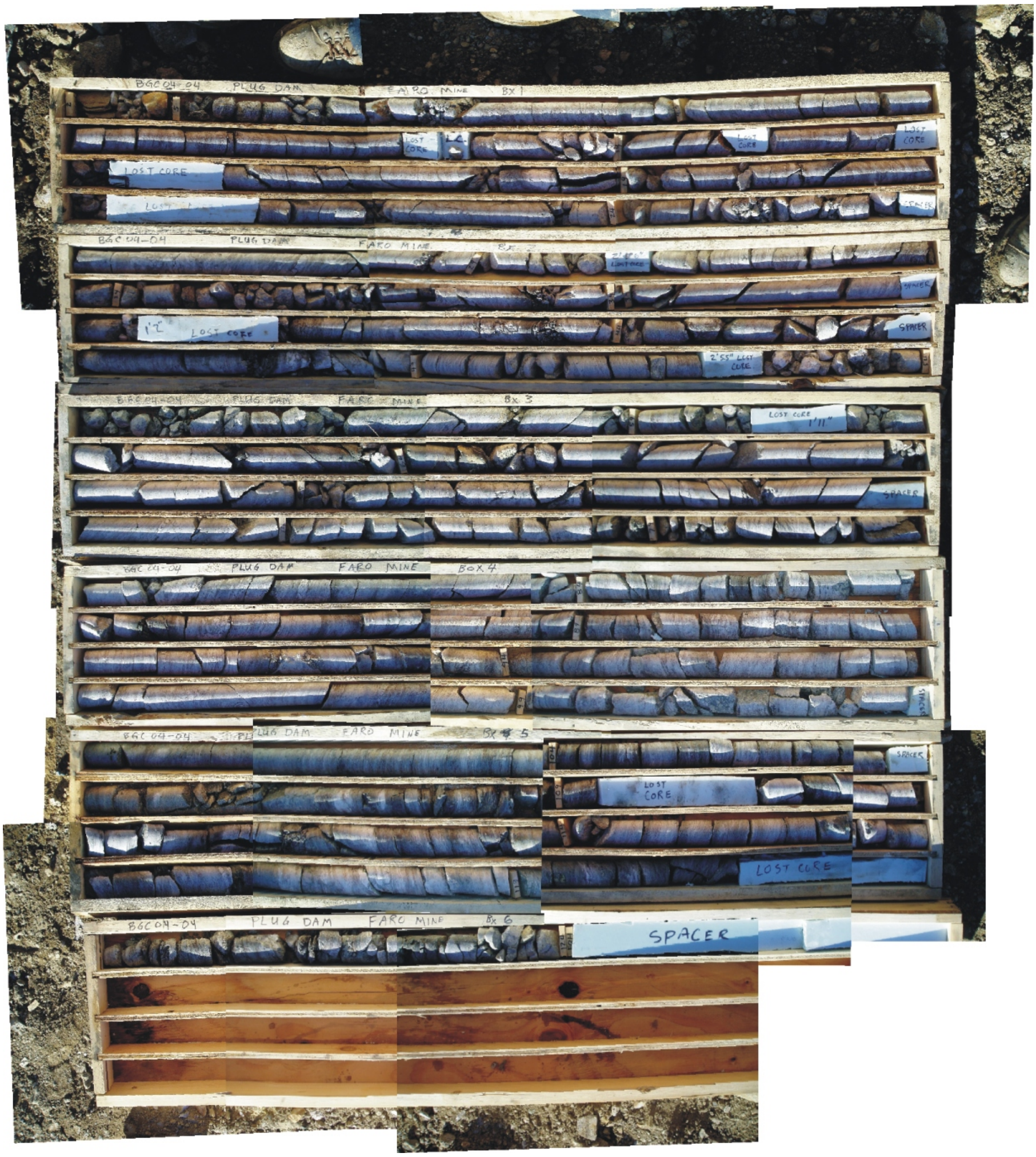

Photo 6 core collected from BGC04-04

SCALE:	N/A	DESIGNED:	GWF
DATE:	OCTOBER 2004	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	

CLIENT: Deloitte & Touche

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PROJECT: **PLUG DAM CONCEPTUAL DESIGN NO. 2**

TITLE: **BGC04-04**

PROJECT No.	DWG. No.	REV.
0257-027-02	6	0

Photo 7a waste rock and upper part of organics.

Photo 7b view of wall of test pit, showing waste rock, organics and the lower silty sand.

Photo 7c base of test pit.

CLIENT:

Deloitte & Touche

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
.	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	OCTOBER 2004
DRAWN:	SLF
DESIGNED:	GWF
CHECKED:	GWF
APPROVED:	

PROJECT

PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE

BGCTP04-01

PROJECT No.	DWG. No.	REV.
0257-027-02	**7**	0

BGC

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Calgary Alberta

Phone: (403) 250-5185

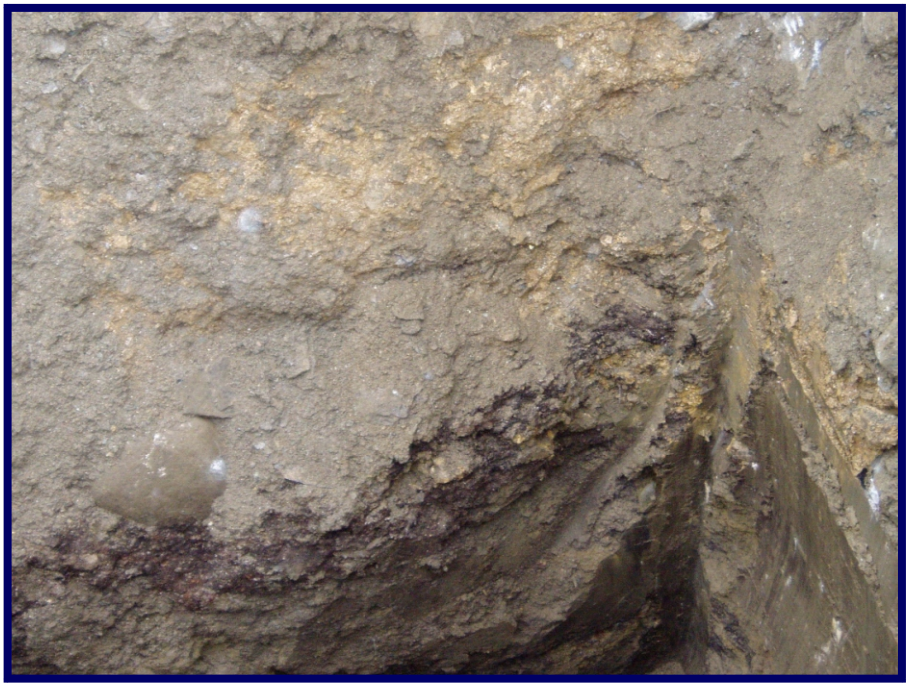

Photo 8a transition from waste rock, organics to silty sand.

Photo 8b view of base of pit, note sloughing of waste rock.

SCALE:	N/A	DESIGNED:	GWF
DATE:	OCTOBER 2004	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	

CLIENT: Deloitte & Touche

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PROJECT
PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE
BGCTP04-02

PROJECT No.	DWG. No.	REV.
0257-027-02	8	0

Photo 8a upper part of test pit.

Photo 8b base of test pit.

SCALE:	N/A	DESIGNED:	GWF
DATE:	OCTOBER 2004	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	

CLIENT: Deloitte & Touche

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PROJECT: PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE: BGCTP04-03

PROJECT No.	DWG. No.	REV.
0257-027-02	9	0

Photo 10a upper part of test pit.

Photo 10b upper soil, just below the organics.

Photo 10c base to test pit.

CLIENT:

Deloitte & Touche

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
.	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	OCTOBER 2004
DRAWN:	SLF
DESIGNED:	GWF
CHECKED:	GWF
APPROVED:	

PROJECT

PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE

BGCTP04-04

PROJECT No.	DWG. No.	REV.
0257-027-02	**10**	0

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Photo 11a upper part of test pit.

Photo 11b lower part of test pit.

SCALE:	N/A	DESIGNED:	GWF
DATE:	OCTOBER 2004	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	

CLIENT: Deloitte & Touche

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PROJECT: PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE: BGCTP04-05

PROJECT No.	DWG. No.	REV.
0257-027-02	11	0

Photo 12a showing the organic soil.

Photo 12b upper portion of soil deposit.

Photo 12c base of test pit.

CLIENT:

Deloitte & Touche

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
.	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	OCTOBER 2004
DRAWN:	SLF
DESIGNED:	GWF
CHECKED:	GWF
APPROVED:	

PROJECT
PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE
BGCTP04-06

PROJECT No.	DWG. No.	REV.
0257-027-02	**12**	0

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Photo 13, till dump sample location. Soil sample GWF 22 collected from here.

SCALE:	N/A	DESIGNED:	GWF
DATE:	OCTOBER 2004	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	

CLIENT: Deloitte & Touche

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PROJECT
PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE
SURFACE SAMPLE GWF22

PROJECT No.	DWG. No.	REV.
0257-027-02	13	0

Photo 14a, photo of till dump prior to sample collection.

Photo 14b, sample GWP 23 collected.

SCALE:	N/A	DESIGNED:	GWF
DATE:	OCTOBER 2004	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	

CLIENT: Deloitte & Touche

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PROJECT
PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE
SURFACE SAMPLE GWF23

PROJECT No.	DWG. No.	REV.
0257-027-02	14	0

Photo 15a dump face prior to sampling.

Photo 15b, Soil sample GWF24 collected

SCALE:	N/A	DESIGNED:	GWF
DATE:	OCTOBER 2004	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	

CLIENT: Deloitte & Touche

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PROJECT
PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE
SURFACE SAMPLE GWF24

PROJECT No.	DWG. No.	REV.
0257-027-02	15	0

Photo 16a, surface prior to sampling.

Photo 16b, following collection of sample GWF 25.

SCALE:	N/A	DESIGNED:	GWF
DATE:	OCTOBER 2004	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	

CLIENT: Deloitte & Touche

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PROJECT
PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE
SURFACE SAMPLE GWF25

PROJECT No.	DWG. No.	REV.
0257-027-02	16	0

Photo 17a, prior to disturbance.

Photo 17b, following collection of sample GWF 26.

SCALE:	N/A	DESIGNED:	GWF
DATE:	OCTOBER 2004	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	

CLIENT: Deloitte & Touche

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PROJECT
PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE
SURFACE SAMPLE GWF26

PROJECT No.	DWG. No.	REV.
0257-027-02	17	0

Photo 18a, prior to disturbance.

Photo 18b, following collection of GWF 27.

SCALE:	N/A	DESIGNED:	GWF
DATE:	OCTOBER 2004	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	

CLIENT: Deloitte & Touche

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PROJECT
PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE
SURFACE SAMPLE GWF27

PROJECT No.	DWG. No.	REV.
0257-027-02	18	0

Photo 19a, prior to sampling.

Photo 19b, following collection of sample GWF 28.

SCALE:	N/A	DESIGNED:	GWF
DATE:	OCTOBER 2004	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	

CLIENT: Deloitte & Touche

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PROJECT
PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE
SURFACE SAMPLE GWF28

PROJECT No.	DWG. No.	REV.
0257-027-02	19	0

Photo 120a, face of dump prior to disturbance.

Photo 20b, collection of sample GWF 29.

SCALE:	N/A	DESIGNED:	GWF
DATE:	OCTOBER 2004	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	

CLIENT: Deloitte & Touche

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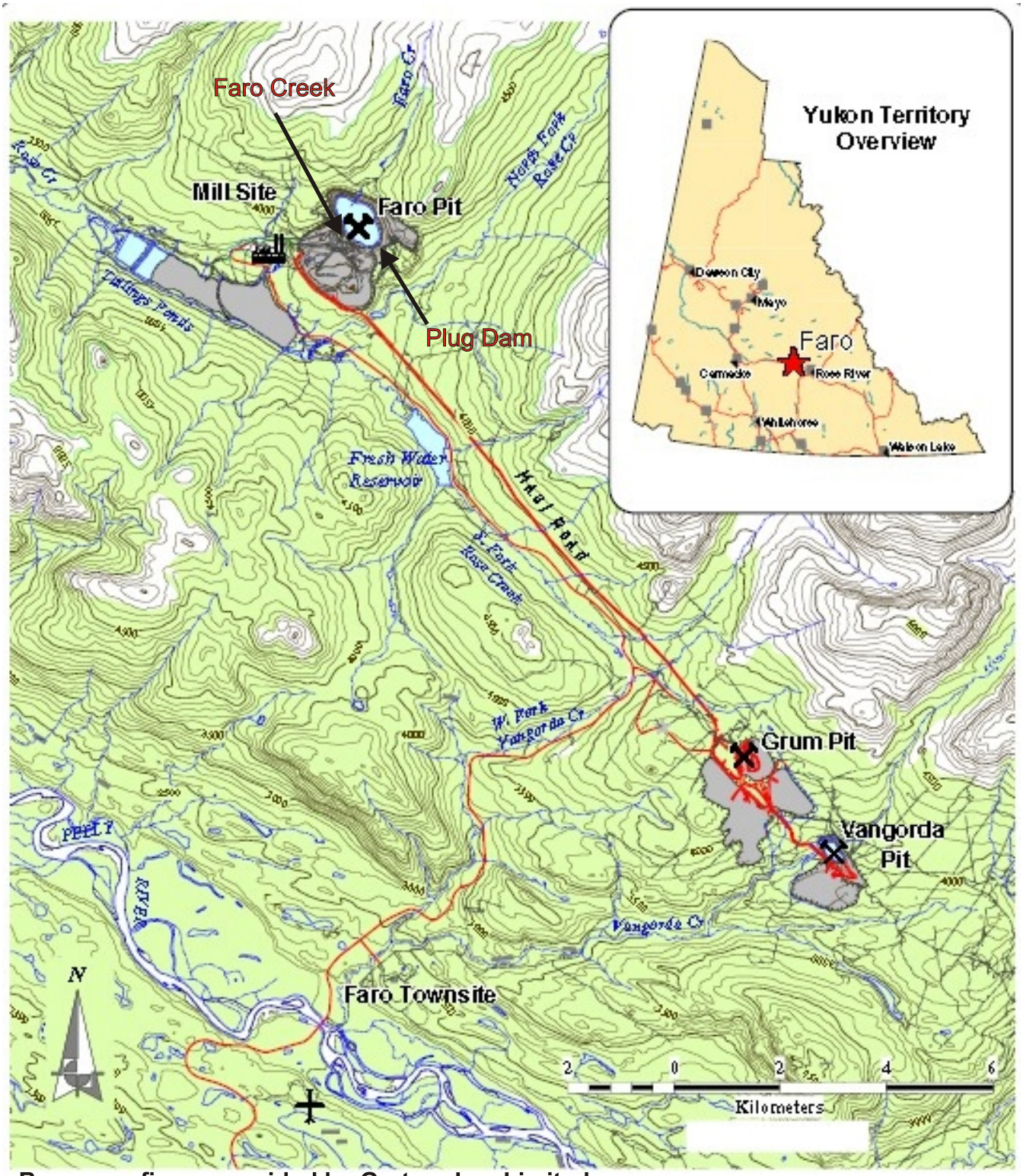
PROJECT
PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE
SURFACE SAMPLE GWF29

PROJECT No.	DWG. No.	REV.
0257-027-02	20	0

FIGURES



Note: Base map figure provided by Gartner Lee Limited.

SCALE:	As Shown	DESIGNED:	GWF
DATE:	November 2004	CHECKED:	HHH
DRAWN:	JMS	APPROVED:	

CLIENT: Deloitte & Touche

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PROJECT
PLUG DAM - CONCEPTUAL DESIGN NO. 2

TITLE
SITE LOCATION PLAN

PROJECT No.	FIGURE No.	REV.
0257-027-02	1	0

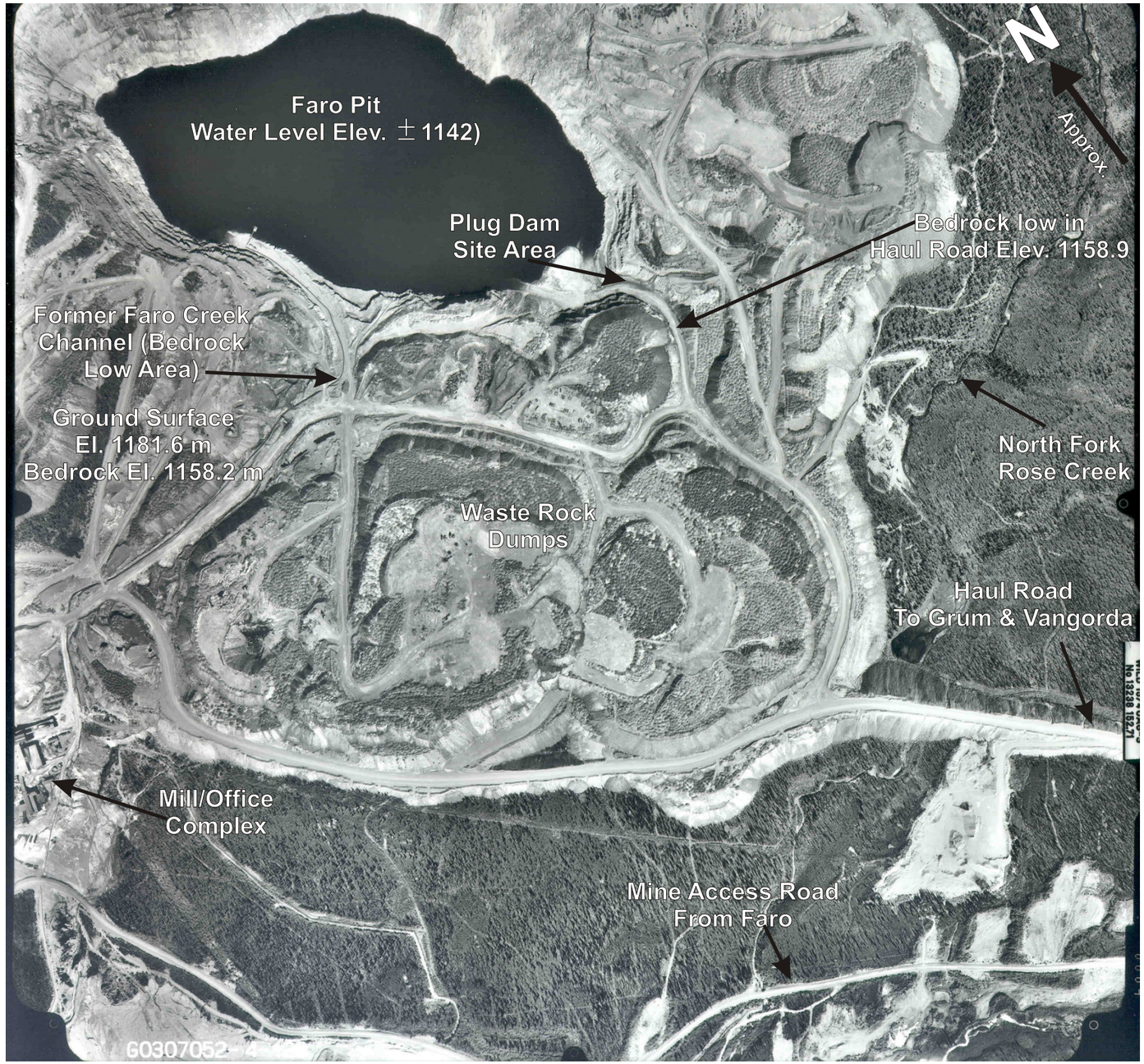

Photo Data:
Date: July 25, 2003
Scale: 1:11,800 Approx.

CLIENT:

Deloitte & Touche

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	As Shown
DATE:	NOVEMBER 2004
DRAWN:	SLF
DESIGNED:	GWF
CHECKED:	HHH
APPROVED:	

PROJECT
PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE
AERIAL PHOTOGRAPH SHOWING
CURRENT SITE CONDITIONS

PROJECT No.	FIGURE No.	REV.
0257-027-02	2	0

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FARO PIT

AREA OF BEDROCK LOW IN FORMER FARO CREEK VALLEY (el. 1158.2m).

POINT OF MAXIMUM SADDLE ELEVATION IN FORMER FARO CREEK VALLEY (ON WASTE ROCK)

WATER LEVEL 1141m +/- (20 SEPTEMBER 2003)

ACCESS ROAD TO FARO CREEK DIVERSION CHANNEL

FARO CREEK DIVERSION CHANNEL

EXISTING WATER DIVERSION DITCH (TO BE RELOCATED)

APPROXIMATE LOCATION OF DISCHARGE PIPE FROM ZONE II PIT PUMPING WELL

POINT OF MAXIMUM BEDROCK ELEVATION IN HAUL ROAD (1168.9m)

ELEVATION CONTOURS OF ZONE II PIT (SEE TABLE FOR CONVERTED BENCH LEVEL ELEVATIONS)

APPROXIMATE LOCATION OF ZONE II PIT PUMPING WELL

POINT OF MAXIMUM ELEVATION ON HAUL ROAD (ON WASTE ROCK)

HAUL ROAD TO GRUM AND VANGORDA PITS

NORTH FORK ROSE CREEK

NOTES:
1. SITE TOPOGRAPHY BASED ON 1:20,000 SCALE PHOTOGRAPHY DATED JULY 25, 2003, COMPILED BY ORTHOSHOP CALGARY, SEPTEMBER 2003.
2. SURVEY CONTROL BASED ON UTM PROJECTION, NAD27.
3. ELEVATION CONTOURS FOR ZONE II PIT WERE OBTAINED FROM SRK REPORT 81703, 'TAILINGS DISPOSAL IN FARO PIT, MAY 1991, FIGURE 4.2'.

ELEVATIONS IN ZONE II PIT

NOTE: BENCH LEVELS ARE GIVEN IN FEET BASED ON SRK 1991. (SEE NOTE 3).

BENCH LEVEL (FEET AMSL)	BENCH LEVEL (MASL)
3802	1158.85
3761	1146.35
3736	1138.73
3722	1134.47
3697	1126.85
3682	1122.27
3642	1110.18
3640	1109.47
3590	1094.23
3618	1102.77
3633	1107.34
3679	1121.36
3786	1153.97

60m 0 60m 120m 180m
Scale = 1:3,000

CLIENT: Deloitte & Touche

LEGEND:
- BOREHOLE
- TESTPIT
- BEDROCK EXPOSURE
- SURFACE SAMPLE

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED

SCALE: AS SHOWN
DATE: NOV 2004
DRAWN: CJT/DCB
DESIGNED: GWF
CHECKED: HHH
APPROVED:

DRAFT

PROJECT: PLUG DAM CONCEPTUAL DESIGN NO. 2
TITLE: GENERAL SITE PLAN

PROJECT No.	FIGURE No.	REV.
0257-027-02	3	0

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AN APPLIED EARTH SCIENCES COMPANY
Calgary, AB Phone: (403) 250 5185

0257-027-02 001 19 Nov

NOTES ON GEOLOGICAL DATA SOURCES:

1. ZONE II PIT LOCATION BASED ON SRK (1991), DERIVED FROM "PLAN MAP, FARO ZONE I, II, III", CYPRUS ANVIL MINING CORP., NOV. 1982.
2. STRUCTURAL MEASUREMENTS BY BGC (SEPTEMBER 2003)
3. BASE TOPOGRAPHY PROVIDED BY SRK, DERIVED FROM 1:20,000 SCALE AIRPHOTOS FLOWN JULY 25, 2003 AND COMPILED BY ORTHOSHOP, CALGARY, SEPTEMBER 2003.
4. SURVEY CONTROL BASED ON UTM PROJECTION, NAD 27 DATUM AND GRID.
5. SURFICIAL GEOLOGICAL FEATURES BASED ON BGC RECONNAISSANCE, GEOLOGICAL MAPPING, AND INTERPRETATION OF 1:20,000 SCALE AIR PHOTOS FLOWN JULY 25, 2003.

20m 0 20m 40m 60m
Scale = 1:1,000

FARO PIT

WATER LEVEL 1141m +/-
(20 SEPTEMBER 2003)

APPROXIMATE TOP OF ROCK IN PIT WALL

APPROXIMATE LIMIT OF ZONE II PIT

APPROXIMATE LOCATION OF ZONE II PIT PUMPING WELL

OUTLINE OF PROPOSED PLUG DAM

BIG INDIAN FAULT No.2

BIG INDIAN FAULT No.3

BIG INDIAN FAULT No.4

NORTH FORK FAULT

SL-1

SL-2

SL-3

BH 86-6

BE-23

BE-24

BE-25

BE-26

BE-27

BE-28

BE-29

BE-30

BE-31

BE-32

BE-33

BE-34

BE-35

BGCTP04-01

BGCTP04-02

BGCTP04-03

BGCTP04-04

BGCTP04-05

BGCTP04-06

1192.26

1180.14

1180.73

1179.67

1180.85

1180.39

1179.31

1178.32

1177.30

1172.27

1176.10

1183.07

1184.75

1184.28

1181.77

1190.33

1190.24

1207.41

1253.96

1254.22

1149.65

1165.04

16A.B.C.

RM1

MDf

MDc

MDw

RV1

RV2

Q

LEGEND

MINE DISTURBED (MD)
- UNDIFFERENTIATED COLLUVIAL DEBRIS
- UNDIFFERENTIATED WASTE ROCK
- UNDIFFERENTIATED FILL

QUATERNARY (Q)
- UNDIFFERENTIATED NATIVE OVERBURDEN MATERIALS

BEDROCK (R)

VANGORDA FORMATION (RV)
(CAMBRIAN TO LOWER ORDOVICIAN)
- CALC-SILICATE GNEISS, CARBONACEOUS SCHIST, SCHIST, CHLORITE SCHIST AND CALC-SILICATE
- FARO DEPOSIT, INCLUDES:
  - RIBBON BANDED GRAPHITIC PYRITE QUARTZITE AND UNDIFFERENTIATED NON-GRAPHITIC SULPHIDE BEARING QUARTZITE.
  - BARREN MASSIVE PYRITE AND MASSIVE PYRITIC SULPHIDES.

MT. MYE FORMATION (RM)
(LOWER CAMBRIAN)
- FINE BIOTITE- MUSCOVITE - ANDALUSITE SCHIST, DARK GREY CARBONACEOUS SCHIST, INCLUDES CHLORITE SCHIST, ALTERED META-BASIC INTRUSIVE. GRADES DOWNWARD INTO BIOTITE-MUSCOVITE-GARNET, STAUROLITE-ANDALUSITE SCHIST.
- RM2: ALTERED QUARTZ MUSCOVITE SCHIST (WHITE MICA ENVELOPE). (MAY BE MAPPED IN THE FIELD WITH UNIT RV2)

- FAULT (LOCATIONS BASED ON SRK (1991), DERIVED FROM CURRAGH RESOURCES, 1988 "FARO MINE ABANDOMENT PLAN" FIGURE 10 ("FARO MINE - PLAN VIEW, ULTIMATE PIT GEOLOGY" MARCH 8, 1988).
- GEOLOGICAL CONTACT
- 35 FOLIATION - (INCLINED)
- 76 JOINTING - INCLINED
- JOINTING - VERTICAL
- BOREHOLE LOCATION
- TESTPIT LOCATION
- BEDROCK EXPOSED LOCATION
- ZONE II PIT PUMPING WELL

CLIENT: Deloitte & Touche

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED

SCALE:	AS SHOWN
DATE:	NOV. 2004
DRAWN:	CJT/GCB
DESIGNED:	DWF
CHECKED:	HHH
APPROVED:	

DRAFT

PROJECT:	PLUG DAM CONCEPTUAL DESIGN NO. 2
TITLE:	DAM SITE GEOLOGY PLAN

PROJECT No.	FIGURE No.	REV.
0257-027-02	4	0

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Calgary, AB Phone: (403) 250 5185

0257-027-02 GEOL PLAN 4.dwg

NOTES ON GEOLOGICAL DATA SOURCES:
1. ZONE II PIT LOCATION BASED ON SRK (1991), DERIVED FROM "PLAN MAP, FARO ZONE I, II, III", CYPRUS ANVIL MINING CORP., NOV. 1982.
2. STRUCTURAL MEASUREMENTS BY BGC (SEPTEMBER 2003)
3. BASE TOPOGRAPHY PROVIDED BY SRK, DERIVED FROM 1:20,000 SCALE AIRPHOTOS FLOWN JULY 25, 2003 AND COMPILED BY ORTHOSHOP, CALGARY, SEPTEMBER 2003.
4. SURVEY CONTROL BASED ON UTM PROJECTION, NAD 27 DATUM AND GRID.
5. SURFICIAL GEOLOGICAL FEATURES BASED ON BGC RECONNAISSANCE, GEOLOGICAL MAPPING, AND INTERPRETATION OF 1:20,000 SCALE AIR PHOTOS FLOWN JULY 25, 2003.

584000 584250 584500

6914750 6914500 6914250

1244.99 1224.01 1188.68 1197.47 1183.53 1142.38

1183.05 BE-1
1172.08 BE-2
1171.47 BE-3
1172.29 BE-4
1160.71 BE-7
1162.55 BE-8
1171.24 BE-5
1162.33 BE-9
1168.48 BE-6
1160.96 BE-10
1160.69 BE-11
1160.94 BE-12
1160.14 BE-14
1160.43 BE-15
1160.47 BE-13
1166.37 BE-16
1175.15 BE-17
1175.38 BE-18
1183.77 BE-19
1181.96 BE-20
1183.73 BE-21
1181.68 BE-22
1193.83 BE-23

FARO PIT

20m 0 20m 40m 60m
Scale = 1:1,000

LEGEND

MINE DISTURBED (MD)
- UNDIFFERENTIATED COLLUVIAL DEBRIS
- UNDIFFERENTIATED WASTE ROCK
- UNDIFFERENTIATED FILL

QUATERNARY (Q)
- UNDIFFERENTIATED NATIVE OVERBURDEN MATERIALS

BEDROCK (R)

VANGORDA FORMATION (RV)
(CAMBRIAN TO LOWER ORDOVICIAN)
- CALC-SILICATE GNEISS, CARBONACEOUS SCHIST, SCHIST, CHLORITE SCHIST AND CALC-SILICATE
- FARO DEPOSIT, INCLUDES:
  - RIBBON BANDED GRAPHITIC PYRITE QUARTZITE AND UNDIFFERENTIATED NON-GRAPHITIC SULPHIDE BEARING QUARTZITE.
  - BARREN MASSIVE PYRITE AND MASSIVE PYRITIC SULPHIDES.

MT. MYE FORMATION (RM)
(LOWER CAMBRIAN)
- FINE BIOTITE- MUSCOVITE - ANDALUSITE SCHIST, DARK GREY CARBONACEOUS SCHIST, INCLUDES CHLORITE SCHIST, ALTERED META-BASIC INTRUSIVE, GRADES DOWNWARD INTO BIOTITE-MUSCOVITE-GARNET, STAUROLITE-ANDALUSITE SCHIST.

RM2 — ALTERED QUARTZ MUSCOVITE SCHIST (WHITE MICA ENVELOPE). (MAY BE MAPPED IN THE FIELD WITH UNIT RV2)

FAULT (LOCATIONS BASED ON SRK (1991), DERIVED FROM CURRAGH RESOURCES, 1988 "FARO MINE ABANDONMENT PLAN" FIGURE 10 ("FARO MINE - PLAN VIEW, ULTIMATE PIT GEOLOGY" MARCH 8, 1988).

GEOLOGICAL CONTACT

35 — FOLIATION - (INCLINED)

76 — JOINTING - INCLINED

JOINTING - VERTICAL

BOREHOLE LOCATION

TESTPIT LOCATION

BEDROCK EXPOSED LOCATION

ZONE II PIT PUMPING WELL

POWER POLE

CLIENT: Deloitte & Touche

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED

SCALE: AS SHOWN
DATE: NOV. 2004
DRAWN: CJT/GCB
DESIGNED: GWF
CHECKED: HHH
APPROVED:

DRAFT

PROJECT: PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE: FARO CREEK GEOLOGY PLAN

PROJECT No.	FIGURE No.	REV.
0257-027-02	5	0

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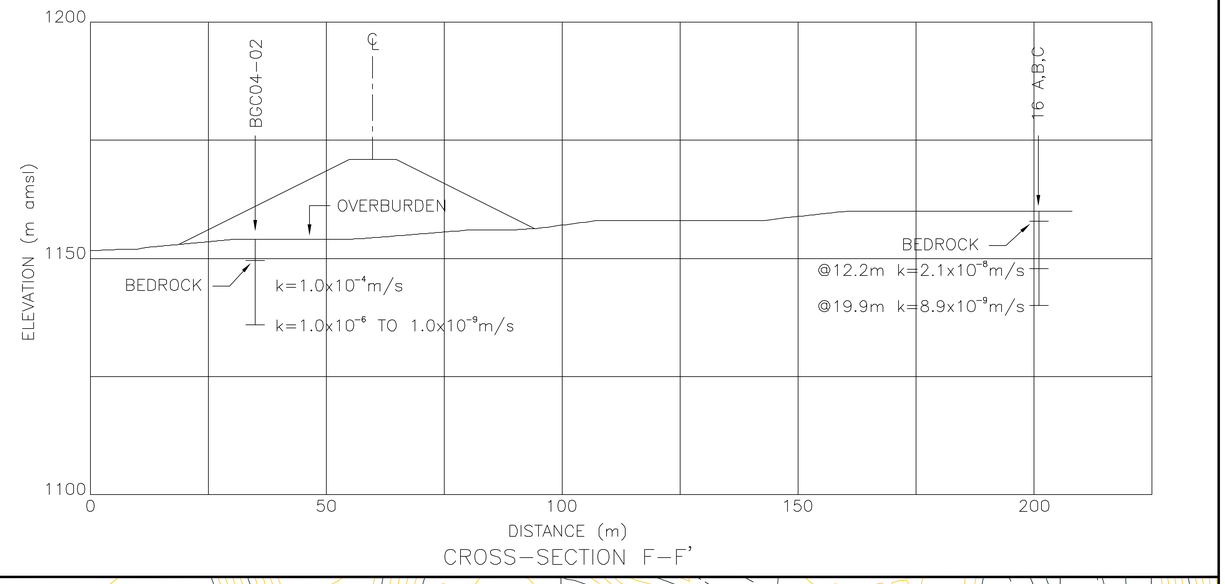
20m 0 20m 40m 60m 24
Scale = 1:1,000

0257-027-02 001 FIG 5.dwg



CROSS-SECTION F-F'

584750 585000 585250 585500 585750

6914500 6914250 6914000

FARO PIT

WATER LEVEL 1141m +/-
(20 SEPTEMBER 2003)

PROPOSED MAXIMUM
PIT WATER LEVEL = 1173.0m +/-

OUTLINE OF PROPOSED
PLUG DAM

APPROXIMATE ALIGNMENT OF
PROPOSED GROUT CURTAIN

APPROXIMATE LOCATION
OF DISCHARGE PIPE FROM
ZONE II PIT PUMPING WELL

EXISTING WATER DIVERSION DITCH
(TO BE RELOCATED)

APPROXIMATE LOCATION OF
ZONE II PIT PUMPING WELL

ELEVATION CONTOURS OF ZONE II PIT IN FEET ABOVE SEA LEVEL.
(SEE TABLE ON FIGURE 2 FOR CONVERTED BENCH LEVEL ELEVATIONS)

1207.41 1190.24 1253.96 1254.22 1149.55 1165.04

1181.77 BE-35 1190.23 BGCTP04-06 1188.28 BGCTP04-05 1179.31 BE-34 1178.32 BE-33 1172.27 BGC04-04 1177.30 BE-32 1184.75 BGCTP04-04 1183.07 BGCTP04-03 1182.71 BGCTP04-01 1176.10 BE-31 1182.96 BGCTP04-02 1152.60 BGC04-02 1168.17 BGC04-03 1192.26 BE-24 1180.14 BE-25 1180.73 BE-26 1179.67 BE-27 1180.85 BE-28 1180.39 BE-29 1179.31 BE-30 BE-23 16A,B,C

3802 3761 3722 3736 3697 3682 3642 3590

SL-3 SL-2 SL-1

1150 1170 1180 1200 1220 1240 1250

NOTES:
1. SITE TOPOGRAPHY BASED ON 1:20,000 SCALE PHOTOGRAPHY DATED JULY 25, 2003, COMPILED BY ORTHOSHOP CALGARY, SEPTEMBER 2003.
2. SURVEY CONTROL BASED ON UTM PROJECTION, NAD27
3. ELEVATION CONTOURS FOR ZONE II PIT WERE OBTAINED FROM SRK REPORT 81705. 'TAILINGS DISPOSAL IN FARO PIT, MAY 1991, FIGURE 4.2'.

20m 0 20m 40m 60m
Scale = 1:1,000

CLIENT: Deloitte & Touche

LEGEND:
- BOREHOLE
- TESTPIT
- BEDROCK EXPOSURE
- SURFACE SAMPLE

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED

SCALE:	AS SHOWN
DATE:	NOV 2004
DRAWN:	CJT/GCB
DESIGNED:	GMT
CHECKED:	HHH
APPROVED:	

DRAFT

PROJECT: PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE: DETAILED SITE PLAN - PLUG DAM

PROJECT No.	FIGURE No.	REV.
0257-027-02	6	0

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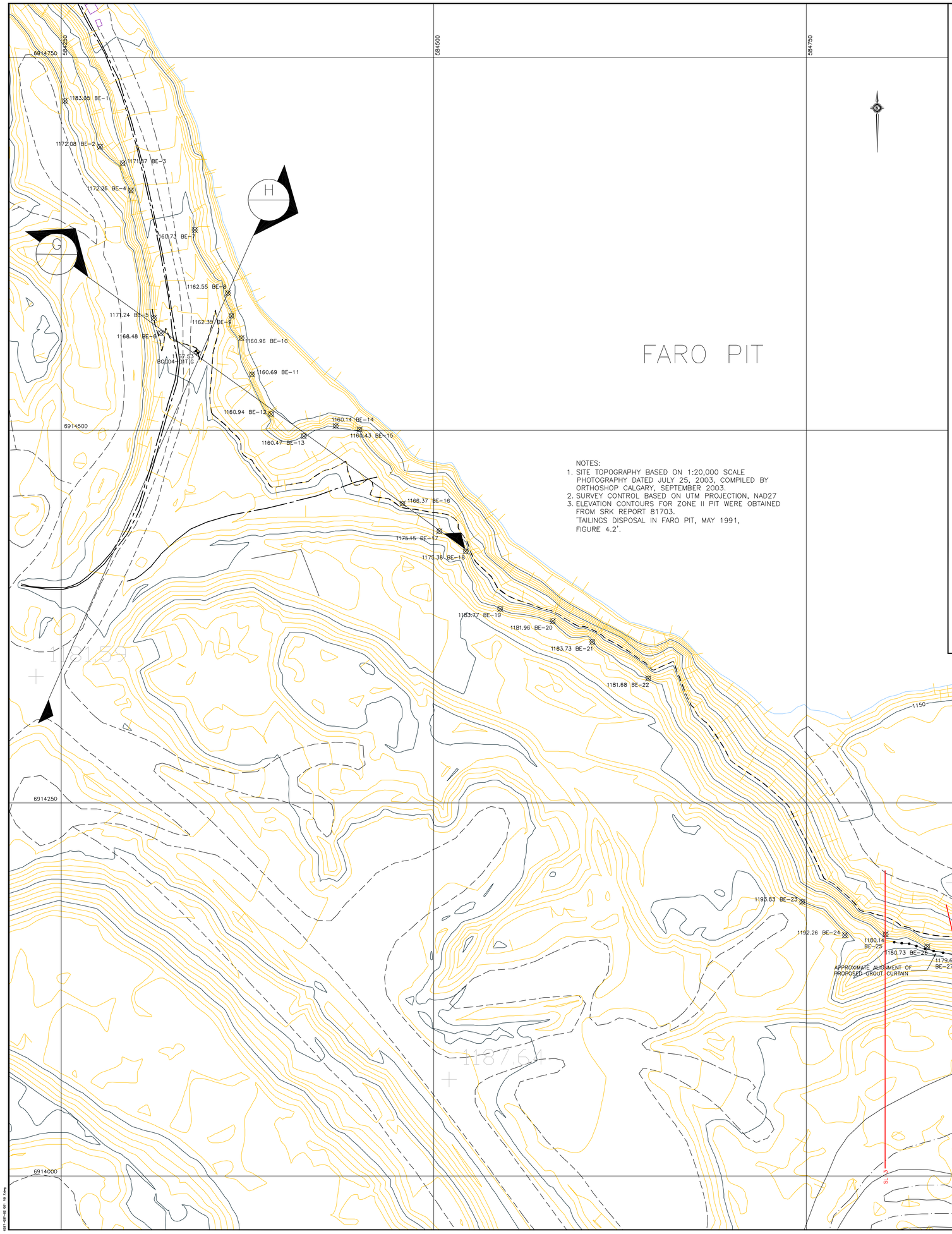
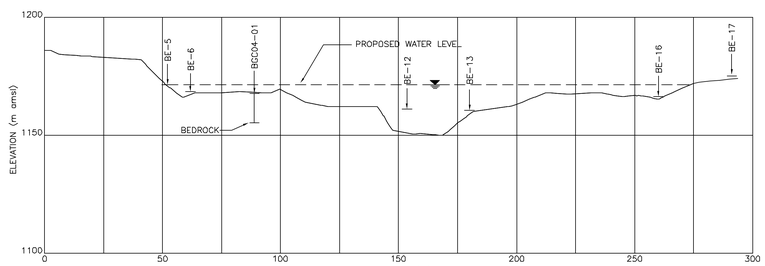
0257-027-02 GIS FIG 6.dwg

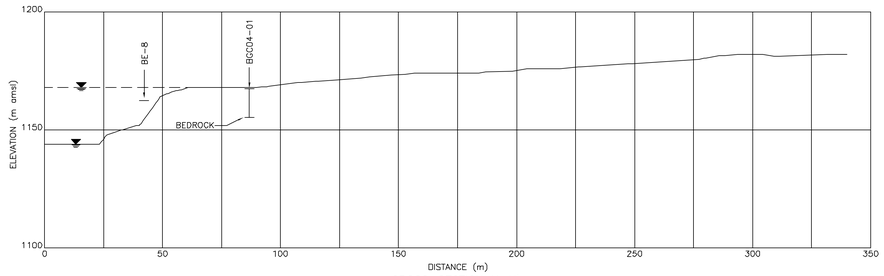
FARO PIT



NOTES:
1. SITE TOPOGRAPHY BASED ON 1:20,000 SCALE PHOTOGRAPHY DATED JULY 25, 2003, COMPILED BY ORTHOSHOP CALGARY, SEPTEMBER 2003.
2. SURVEY CONTROL BASED ON UTM PROJECTION, NAD27
3. ELEVATION CONTOURS FOR ZONE II PIT WERE OBTAINED FROM SRK REPORT 81703. 'TAILINGS DISPOSAL IN FARO PIT, MAY 1991, FIGURE 4.2'.



CROSS-SECTION G-G'



CROSS-SECTION H-H'

CLIENT: **Deloitte & Touche**

LEGEND:
- BOREHOLE
- TESTPIT
- BEDROCK EXPOSURE

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED

SCALE:	AS SHOWN
DATE:	NOV 2004
DRAWN:	CJT/OCB
DESIGNED:	GWF
CHECKED:	HHH
APPROVED:	

DRAFT

PROJECT: PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE: DETAILED SITE PLAN - FARO CREEK

PROJECT No.	FIGURE No.	REV.
0257-027-02	7	0

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0257-027-02 G01 7A.dwg

NOTES:
1. SITE TOPOGRAPHY BASED ON 1:20,000 SCALE PHOTOGRAPHY DATED JULY 25, 2003, COMPILED BY ORTHOSHOP CALGARY, SEPTEMBER 2003.
2. SURVEY CONTROL BASED ON UTM PROJECTION, NAD27
3. ELEVATION CONTOURS FOR ZONE II PIT WERE OBTAINED FROM SRK REPORT 81703. 'TAILINGS DISPOSAL IN FARO PIT, MAY 1991, FIGURE 4.2'.

FARO PIT

585000
585250
585500
585750
1292.90
1291.87
1284.67
1207.41
GWF24
GWF23
GWF22
GWF28
GWF29
1270
1250
BGCTP04-08
BGCTP04-09
BGCTP04-07
GWF25
GWF27
GWF26
WATER LEVEL 1141m +/-
(20 SEPTEMBER 2003)
1150
1220
1181.77 BE-35
1190.23
BGCTP04-06
1188.28
BGCTP04-05
PROPOSED MAXIMUM
PIT WATER LEVEL = 1173.0m +/-
OUTLINE OF PROPOSED
PLUG DAM
1179.31 BE-34
1178.32 BE-33
1190.24
1253.96
1149.65
1172.27
BGCC04-04
1177.30 BE-32
1184.75
BGCTP04-04
1183.07
BGCTP04-03
APPROXIMATE LOCATION
OF DISCHARGE PIPE FROM
ZONE II PIT PUMPING WELL
1168.17
BGCC04-03
1152.60
BGCC04-02
1182.71
BGCTP04-01
EXISTING WATER DIVERSION DITCH
(TO BE RELOCATED)
1176.10 BE-31
1182.96
BGCTP04-02
1179.67
BE-27
1180.85 BE-28
1180.39 BE-29
1179.31 BE-30
1254.22
1250
200
180
170
164.8.C
3802

20m 0 20m 40m 60m
Scale = 1:1,000

CLIENT: Deloitte & Touche

LEGEND:
- BOREHOLE
- TESTPIT
- BEDROCK EXPOSURE
- SURFACE SAMPLE

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED

SCALE:	AS SHOWN
DATE:	NOV 2004
DRAWN:	CJT/GCB
DESIGNED:	GWF
CHECKED:	HHH
APPROVED:	

DRAFT

PROJECT	PLUG DAM CONCEPTUAL DESIGN NO. 2
TITLE	NORTHEAST WASTE DUMP

PROJECT No.	FIGURE No.	REV.
0257-027-02	8	0

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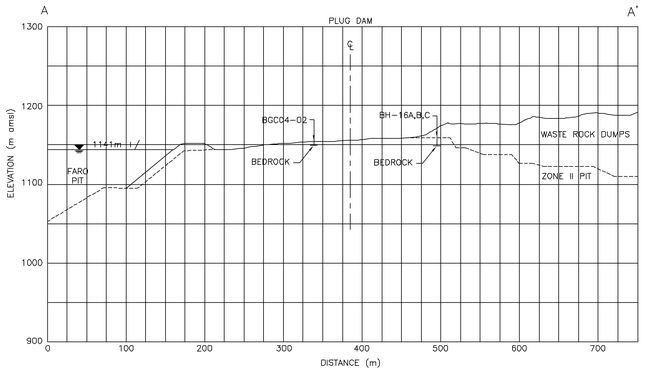
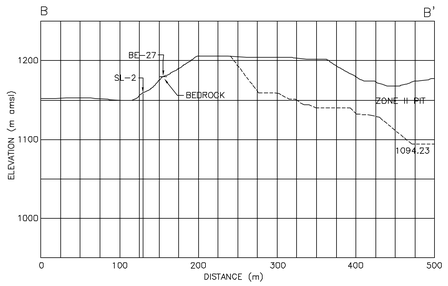
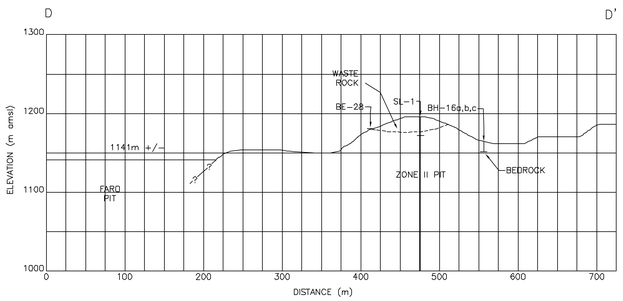
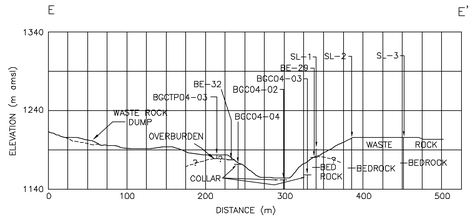
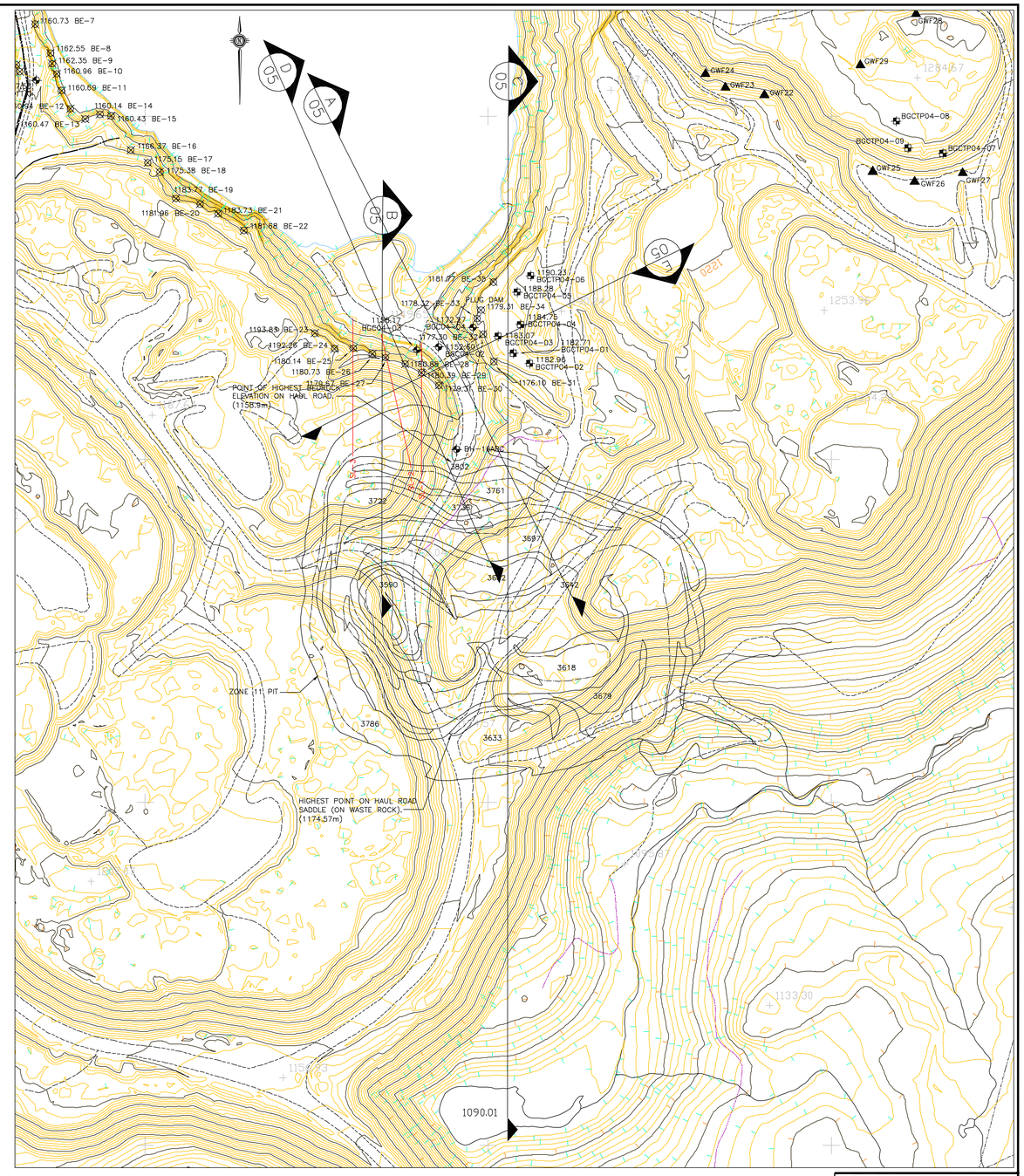
0257-027-02 01 FIG 8.dwg











SOURCES:
1. ZONE II PIT OUTLINE FROM SRK REPORT 81703 "TAILINGS DISPOSAL IN FARO PIT", MAY 1991, FIGURE 4.2.
2. 2m CONTOUR TOPOGRAPHY BASED ON 1:20,000 SCALE PHOTOGRAPHY DATED JULY 25, 2003 COMPILED BY ORTHOSHOP, CALGARY, SEPTEMBER 2003.
3. SURVEY CONTROL BASED ON UTM PROJECTION, NAD27.

60m 0 60m 120m 180m
Scale = 1:3,000

CLIENT: **Deloitte & Touche**

LEGEND:
- BOREHOLE
- TESTPIT
- BEDROCK EXPOSURE
- SURFACE SAMPLE

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED

SCALE:	AS SHOWN
DATE:	NOV 2004
DRAWN:	CJT/GCB
DESIGNED:	CWF
CHECKED:	HHH
APPROVED:	

DRAFT

PROJECT	PLUG DAM CONCEPTUAL DESIGN NO. 2	
TITLE	REPRESENTATIVE CROSS SECTIONS	
PROJECT No.	FIGURE No.	REV.
0257-027-02	9	0

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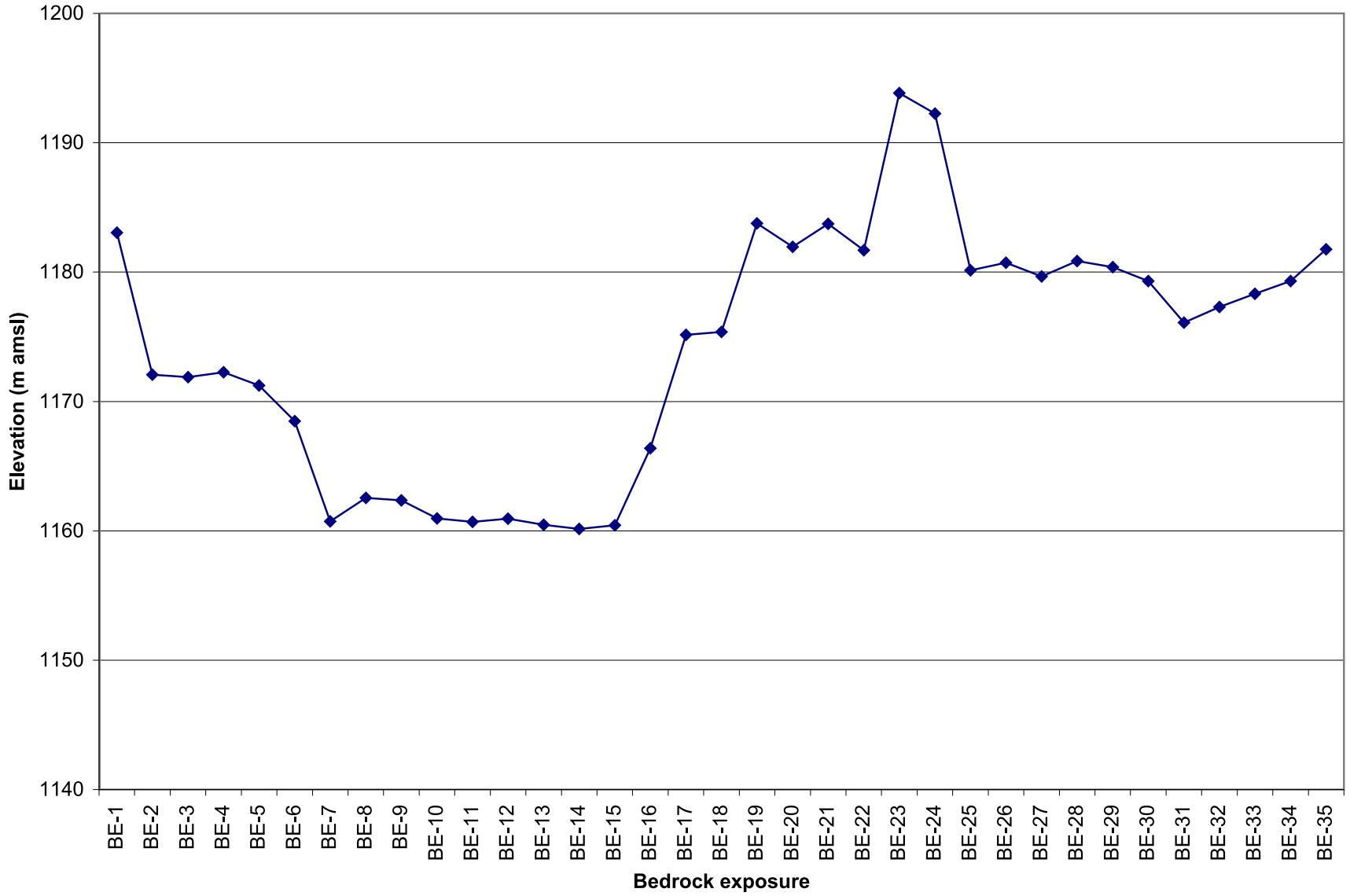


DATE: NOV 2004 | DRAWN: SLF

REFERENCED DRAWING DESCRIPTION

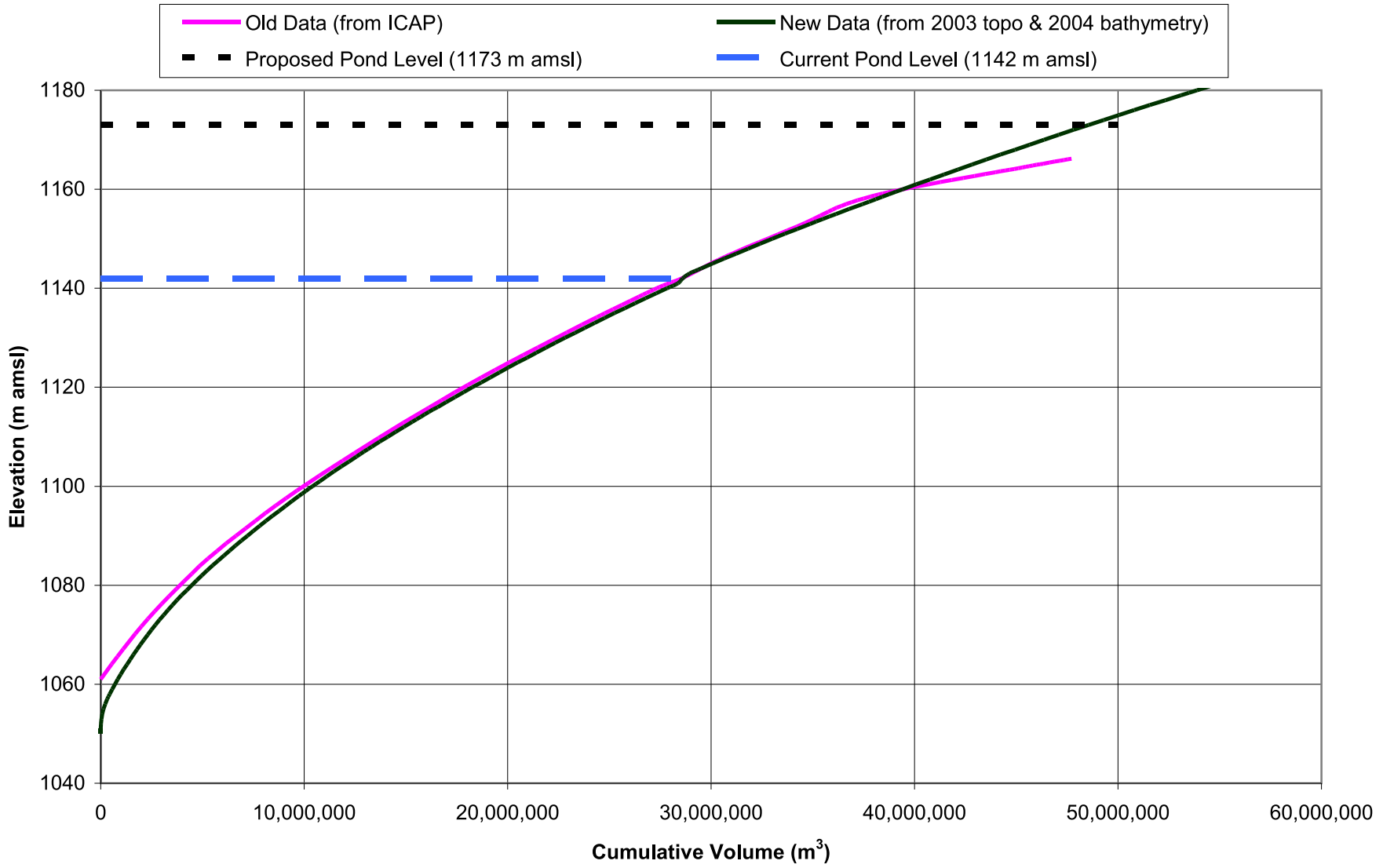
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Calgary, Alberta
Phone: (403) 250-5185

CLIENT: Deloitte & Touche

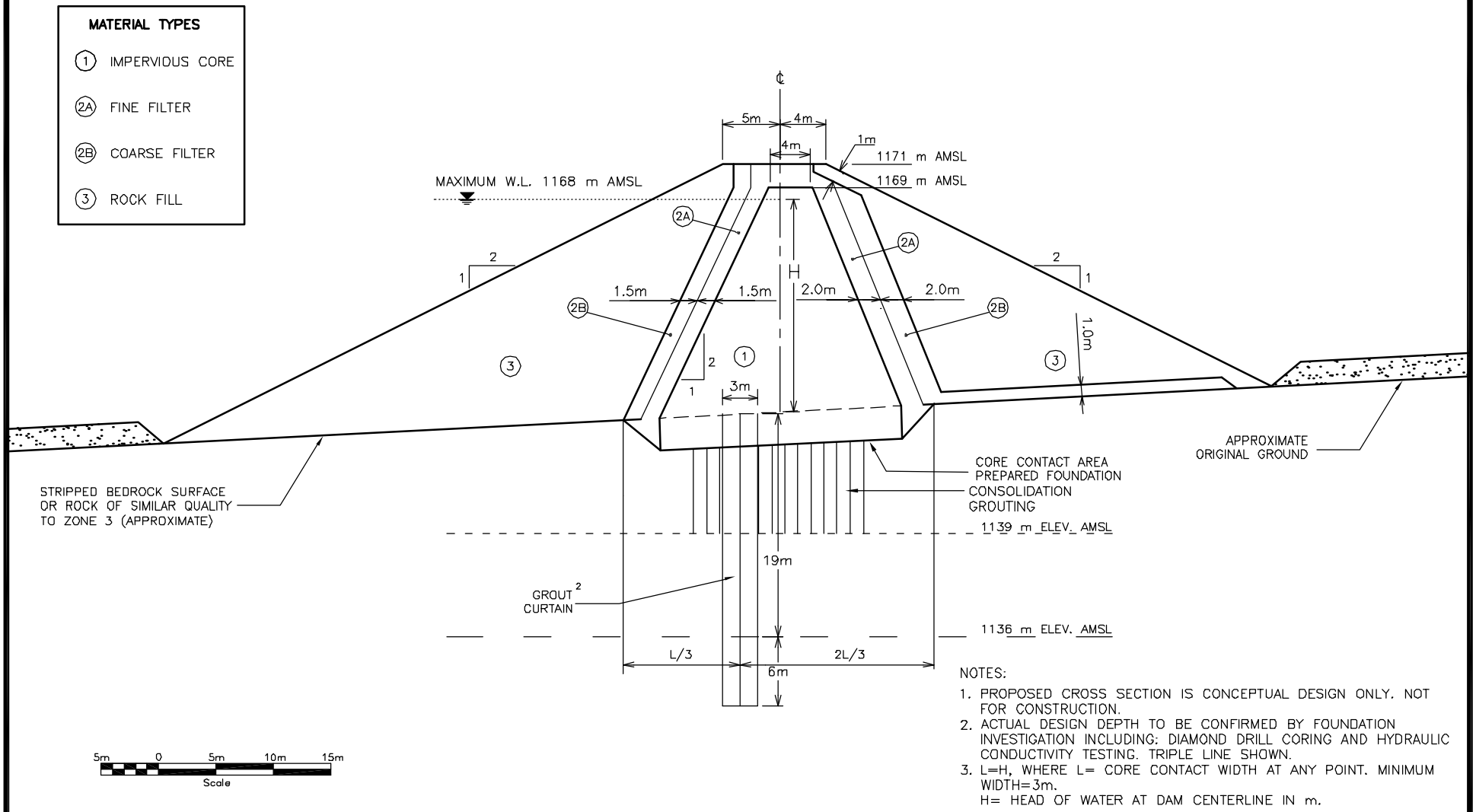
PROJECT: PLUG DAM CONCEPTUAL DESIGN NO. 2

TITLE: BEDROCK EXPOSURE - PIT WALL

PROJECT No.	DWG. No.	REV.
0257-027-02	10	0



DATE: NOV 2004	DRAWN SLF	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY Calgary, Alberta Phone: (403) 250-5185	PROJECT PLUG DAM CONCEPTUAL DESIGN NO. 2
REFERENCED DRAWING DESCRIPTION			TITLE STORAGE - CAPACITY CURVE
AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.		CLIENT Deloitte & Touche	PROJECT No. 0257-027-02 / DWG. No. 11 / REV. 0



NOTES:

1. PROPOSED CROSS SECTION IS CONCEPTUAL DESIGN ONLY. NOT FOR CONSTRUCTION.
2. ACTUAL DESIGN DEPTH TO BE CONFIRMED BY FOUNDATION INVESTIGATION INCLUDING: DIAMOND DRILL CORING AND HYDRAULIC CONDUCTIVITY TESTING. TRIPLE LINE SHOWN.
3. L=H, WHERE L= CORE CONTACT WIDTH AT ANY POINT. MINIMUM WIDTH=3m.
   H= HEAD OF WATER AT DAM CENTERLINE IN m.

SCALE: AS SHOWN	DATE: NOVEMBER 2004	DRAWN: GEJ	DESIGNED: GWF	CHECKED: HHH	APPROVED:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Calgary, AB Phone: (403) 250 5185

CLIENT: Deloitte & Touche

PROJECT: PLUG DAM CONCEPTUAL DESIGN No 2

TITLE: CONCEPTUAL PLUG DAM SECTION

PROJECT No.	DWG No.	REV.
0257-027-02	12	0

APPENDIX I - BOREHOLE LOGS

Core Logging Sheet - Fracture Logging

Run Number	Depth	Type	Shape	Surface	Infill	Angle wrt Core Axis	Alteration	Fracture Aperature	Comments
Run 1	6.07	FO	PL	SM	Calcite	46	Iron stained	Tight	
Run 2	7.52	FO	PL	R	None	59	Iron stained	Partially open	Rubble in fracture.
	7.47	F	PL	R	Calcite	20	Iron stained	Open	
	7.06	FO	PL	R	None	41	Iron stained	Partially open	
Run 3	No loggable fractures, broken core.								
Run 4	No loggable fractures, broken core.								
Run 5	12.12	F	ST	VR	None	44	None	Open	Rubble between these two.
	12.04	FO	PL	SM	Calcite	50	None	Partially open	
	12.00	FO	PL	SM/R	None	56	None	Tight	
	11.76	FO	PL	SM	None	57	None	Tight	
	11.75	FO	PL	SM	Calcite	57	None	Partially open	
	11.51	FO	PL	SM	None	53	None	Partially open	Potential drill break.
	11.48	FO	C	R	None	46	None	Partially open	Rubble above and below.
Run 6	13.23	FO	PL	SM	None	56	None	Partially open	
	13.03	F	PL	R	Calcite	24	None	Partially open	
	12.95	F	PL	R	Calcite	6	None	Open	
Run 7	14.85	FO	PL	SM	Gouge material	57	None	Open	Fine phyllite mica gouge material.
	14.69	FO	PL	R	None	52	None	Partially open	
Run 8	16.71	FO	PL	SM	Calcite, sericite	30	None	Tight	
	16.61	FO	PL	SM	Sericite	44	None	Partially open	
	16.40	FO	PL	SM	Sericite	40	None	Tight	
	16.18	F	PL	VR	Sericite, silt	20	None	Partially open	
	16.15	F	PL	VR	Silt	28	None	Partially open	
Run 9	18.19	F	U	VR	Sericite, silt	52	None	Open	
	17.88	FO	PL	SM	Sericite	47	None	Tight	
	17.83	F	PL	R	Silt	40	None	Open	
	17.31	FO	PL	SM	Silt, sericite	40	None	Tight	
	17.22	F	PL	R	Calcite	5	None	Partially open	
Run 10	19.71	J	U	R	Calcite	40	None	Open	
	19.02	FO	PL	SM	Calcite	65	None	Partially open	

Type:	**J** Joint	Shape:	**PL** Planar	Surface:	**P** Polished	Project Number: 0257-027-01
	F Fault		**C** Curved		**K** Slickensided	Borehole: BGC04-02
	S Shear		**U** Undulating		**SM** Smooth	Depth:19.8 m
	B Bedding		**ST** Stepped		**R** Rough	Logged By: Gerry Ferris
	FO Foliation		**I** Irregular		**VR** Very Rough	Date: August 31, 2004

Core Logging Sheet - Fracture Logging

Run Number	Depth	Type	Shape	Surface	Infill	Angle wrt Core Axis	Alteration	Fracture Aperature	Comments
1	1.42	FO	PL	R	None	85	-	P. Open	
	1.44	FO	PL	R	None	75	Iron stained	Open	
	1.49	FO	PL	R	None	80	-	Open	
	1.51	F	PL	SM	None	75	Iron stained	tight	
2	2.07	FO	PL	SM	calcite	86	-	tight	
	2.34	FO	PL	R	-	80	Iron stained	Open	Heavy Iron Staining
	2.43	J	PL	VR	calcite	28	Iron stained	Open	
	2.49	FO	PL	R	-	66	Iron stained	tight	Light Iron Staining
	2.55	FO	PL	SM	-	62	Iron stained	P. Open	Heavy Iron Staining
	2.62	J	PL	VR	-	32	Iron stained	Open	Heavy Iron Staining
	2.64	FO	PL	SM	calcite	66	-	P. Open	
	2.69	FO	U	SM	-	65	Iron stained	P. Open	Light Iron Staining
	2.72	J	PL	R	-	0	Iron stained	tight	Heavy Iron Staining
	2.74	FO	PL	SM	-	64	-	tight	
3	3.05	FO	PL	R	-	70	Iron stained	P. Open	
	3.17	F	PL	SM	Healed	55	-	very tight	
	3.23	FO	PL	R	-	60	-	tight	
	3.38	J	PL	SM	-	45	Iron stained	P. Open	Heavy Iron Staining
	3.4	FO	PL	R	-	60	Iron stained	tight	
	3.57	FO	PL	R	-	62	-	tight	
	3.63	FO	PL	SM	-	60	-	tight	
	3.78	FO	PL	SM	-	60	Iron stained	tight	
	3.81	F	PL	VR	-	15	Iron stained	Open	
	3.89	FO	PL	SM	-	65	Iron stained	P. Open	Heavy Iron Staining
	3.92	FO	PL	R	-	59	Iron stained	Open	Heavy Iron Staining
	4.04	FO	PL	R	-	53	Iron stained	Open	Heavy Iron Staining
	4.11	FO	ST	R	calcite	54	-	Open	
	4.24	FO	PL	R	-	54	Iron stained	P. Open	Heavy Iron Staining
4	4.70	FO	ST	R	-	40	Iron stained	Tight	
	4.94	J	PL	R	-	0	Iron stained	Partially Open	
	5.05	J	PL	SM	-	60	Iron stained	Tight	
	5.24	FO	PL	R	-	50	Iron stained	Partially Open	
	5.52	FO	PL	R	Rubble in joint	60	Iron stained	Tight	Platey
	5.66	J	PL	R	-	15	Iron stained	Partially Open	Heavy iron staining
	5.75	J	U	VR	-	10	Iron stained	Partially Open	Heavy iron staining
5	6.73	J	PL	R	-	30	Iron stained	Partially Open	Heavy iron staining
	6.88	J	PL	R	-	79	Iron stained	Partially Open	
	7.01	J	PL	R	-	0	Iron stained	Partially Open	
7	10.29	FO	PL	SM/R	Calcite	60	Iron stained	Partially Open	
8	11.60	FO	PL	R	-	76	-	Open	
	11.79	FO	ST	R	-	80	-	Open	
	11.85	FO	PL	R	-	70	-	tight	
	11.89	FO	PL	VR	silt	64	-	P. Open	
9	13.39	F	PL	R	-	18	Iron stained	Tight	
10	13.92	FO	PL	R	-	64	Iron stained	Tight	Slight iron staining
	14.50	F	PL	R	Calcite	21	-	Tight	
	14.80	F	PL	R	-	46	Iron stained	Partially Open	Slight iron staining
11	15.14	FO	PL	SM	Silt	56	Iron stained	Tight	
	16.00	FO	PL	SM	Silt	15	-	Open	Possible drill break
	16.23	FO	PL	R	Silt	62	-	Partially Open	Rubble
12	17.04	FO	PL	SM	-	56	Iron stained	Partially Open	Slight iron staining
	17.23	J	PL	R	-	1	Iron stained	Open	Slight iron staining
	17.29	J	PL	VR	Calcite	90	-	Open	
	17.40	FO	PL	SM	-	50	Iron stained	Partially Open	Slight iron staining
	17.53	FO	PL	SM	-	56	-	Tight	Broken core at this location
	17.67	FO	PL	SM	Calcite	61	-	Tight	
	17.68	F	PL	P	Calcite	3	-	Partially Open	Partially healed with calcite.
	17.94	FO	PL	SM	Silt, Calcite	62	-	Partially Open	
14	20.92	FO	PL	SM	calcite	40	-	Open	
	21.02	J	PL	R	calcite	5	-	Open	
15	22.40	F	PL	SM	Sericite	24	-	Open	
	22.47	F	PL	R	Sericite	30	-	P. Open	
	22.52	FO	PL	SM	Sericite	24	-	P. Open	
16	23.19	FO	PL	SM	Sericite	44	-	P. Open	
	23.52	FO	PL	SM	-	38	-	tight	
	23.76	FO	PL	SM	-	52	-	tight	
	23.77	J	PL	R	Healed	25	-	very tight	drill break
	23.80	FO	PL	SM	-	52	-	tight	
	23.99	J	PL	R	Healed	24	-	very tight	drill break
	24.00	F	PL	R	-	25	-	tight	
	24.04	FO	PL	R	-	80	-	tight	
17	25.43	F	PL	R	-	71	-	P. Open	
	25.51	FO	PL	VR	-	63	-	P. Open	Possible drill break
	25.57	F	PL	R	-	30	-	tight	

Type:	**J** Joint	Shape:	**PL** Planar	Surface:	**P** Polished
	F Fault		**C** Curved		**K** Slickensided
	S Shear		**U** Undulating		**SM** Smooth
	B Bedding		**ST** Stepped		**R** Rough
	FO Foliation		**I** Irregular		**VR** Very Rough

Project Number: 0257-027-01
Borehole: BGC04-03
Depth:21.03 m
Logged By: Gerry Ferris
Date: September 3, 2004

Core Logging Sheet - Fracture Logging

Run Number	Depth	Type	Shape	Surface	Infill	Angle wrt Core Axis	Alteration	Fracture Aperature	Comments
2	2.26	FO	ST	R	-	68	Iron staining	Open	Heavy iron staining.
	2.41	FO	U	SM	-	68	Iron staining	Partially open	Heavy iron staining.
	2.54	J	PL	SM	-	28	Iron staining	Partially open	Heavy iron staining.
3	2.92	FO	PL	R	Silt	73	-	Tight	
	4.04	J	PL	VR	Silt	0	Iron staining	Tight	
	4.17	FO	PL	R	Silt	32	-	Tight	Trace silt on joint surface.
4	4.75	FO	PL	SM	Silt	65	-	Partially open	
	5.31	J	PL	R	Silt	14	-	Partially open	
	5.56	J	PL	SM	-	20	-	Partially open	Rubble, broken core
5	6.05	FO	PL	R	Silt	56	-	Tight	Yellow silt on joint surface.
	6.20	J	PL	R	-	40	-	Tight	
	6.88	J	PL	SM	Silt	37	-	Tight	Yellow silt on joint surface.
	7.24	FO	PL	SM	Silt	64	-	Partially open	
6	7.90	FO	PL	SM	Sand	49	-	Filled	Sand and rubble, 38 mm thick.
	8.76	FO	PL	SM	Silt and sand	40	-	Filled	Silt and Sand, 3 mm thick.
7	9.88	FO	PL	SM	Silt	47	-	Tight	Yellow silt on joint surface.
8	11.76	FO	PL	R	Sand	24	-	Filled	Sand, 3 mm thick.
9	13.06	J	PL	SM	Silt	77	-	Filled	Silt, 3 mm thick.
	13.20	FO	PL	SM	Silt	47	-	Tight	
	13.31	FO	ST	R	Sand	46	-	Filled	Sand, 25 mm thick.
10	14.33	J	PL	SM	Silt	22	-	Tight	Silt coating on joint surfaces.
	14.63	FO	PL	SM	Silt	47	-	Filled	Silt, 6 mm thick.
	14.73	J	ST	R	-	22	-	Partially open	
11	15.14	J	PL	R	Silt	24	-	Partially open	
12	17.68	J	PL	R	-	39	-	Tight	
	17.77	FO	PL	SM	-	44	-	Coated	Rubble.
	17.78	FO	PL	SM	Silt and sand	50	-	Coated	
13	18.16	FO	PL	SM	Silt	70	-	Rubble	
	18.82	F	ST	R	-	86	-	Partially open	Silt, 13 mm thick.
	19.20	F	PL	SM	Silt	80	-	Filled	
	19.43	FO	PL	R	-	26	-	Tight	
14	19.84	FO	PL	R	-	54	-	Partially open	
	20.27	F	PL	SM	-	22	-	Partially open	
15	21.64	F	PL	R	-	32	-	Tight	Drill break.
16	23.70	F	PL	R	Silt	48	-	Tight	
	23.55	FO	ST	R	Silt	48	-	Partially open	
17	24.13	FO	PL	SM	Silt	73	-	Partially open	Reddish silt.
	24.49	F	PL	R	-	13	-	Tight	
18	25.70	F	PL	R	Silt	38	-	Tight	
	26.31	F	PL	R	Silt	5	-	Tight	
	26.34	FO	PL	R	Rubble	74	-	Tight	
19	28.09	F	PL	VR	Silt	56	-	Tight	
	28.22	F	PL	SM	Silt	62	-	Filled	Silt, 25 mm thick.
	28.30	F	PL	R	Sand	56	-	Filled	Sand, 25 mm thick.
	28.37	F	PL	R	Silt	30	-	Partially open	
	28.40	FO	PL	SM	Silt	78	-	Coated	
	28.45	FO	PL	SM	Silt	74	-	Filled	Silt, 13 mm thick.
20	28.88	J	PL	R	Silt	12	-	Partially open	
	29.35	F	PL	R	-	30	-	Tight	
	29.34	J	PL	R	-	90	-	Tight	
	29.44	FO	PL	R	Silt	58	-	Tight	
21	30.66	F	PL	R	-	18	-	Partially open	
	30.91	F	PL	SM	Silt	63	-	Tight	
22	32.56	J	PL	R	-	10	-	Tight	
	32.99	FO	PL	SM	Silt	54	-	Partially open	
23	33.66	F	PL	SM	-	26	-	Tight	
	33.96	FO	PL	R	Silt	56	-	Tight	
	34.14	J	PL	R	-	0	-	Tight	
	34.23	F	PL	VR	Sand	86	-	Open	
	34.32	J	PL	SM	-	25	-	Tight	
24	35.56	J	PL	R	Silt	5	-	Partially open	
	36.14	FO	PL	SM	Silt	70	-	Tight	
25	36.45	FO	PL	SM	Silt	75	-	Tight	
	36.58	J	PL	R	-	25	-	Partially open	
	37.36	J	PL	R	Silt	32	-	Tight	Possible drill break.

Type:	**J** Joint	Shape:	**PL** Planar	Surface:	**P** Polished	Project Number: 0257-027-01
	F Fault		**C** Curved		**K** Slickensided	Borehole: BGC04-04
	S Shear		**U** Undulating		**SM** Smooth	Depth: 37.8 m
	B Bedding		**ST** Stepped		**R** Rough	Logged By: Gerry Ferris
	FO Foliation		**I** Irregular		**VR** Very Rough	Date: September 7, 2004

BORING/MONITORING WELL # BGC04-01

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Faro Creek
Co-ordinates (m) : 584341.00E, 6914552.00N
Ground Elevation (m) : 1167.100
Top Casing Elevation (m) : 1167.530
First Water :
Stabilized Water Level : 8.84

Drill Designation : RIG 10
Drilling Contractor : Midnight Sun Drilling
Drill Method : ODEX
Sampling Method : Air Cuttings Return
Air Monitoring Device :
Boring Diameter/Depth :

Start Date : 09 Aug 04
Finish Date : 14 Aug 04
Final Depth of Hole (m) : 16.70
Logged by : MJM
Reviewed by : GWF

Depth (m)	Sample Type	Sample No.	Lithologic Description	Backfill	Instrument Details	SPT Blows per 300mm
0			Fill Waste Rock	Concrete		
1						
2				Cuttings		
			Sand Silty, gravelly, trace clay; light brown. Alternating layers of finer and coarser fragments.			
3						
4						
5						
6						
		1	@ 6.10 m: mixed light grey, light brown			
7						
8						

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines ● SPT (blows/300mm)
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

(Continued on next page)

BORING/MONITORING WELL # BGC04-01

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Faro Creek
Co-ordinates (m) : 584341.00E, 6914552.00N
Ground Elevation (m) : 1167.100
Top Casing Elevation (m) : 1167.530
First Water :
Stabilized Water Level : 8.84

Drill Designation : RIG 10
Drilling Contractor : Midnight Sun Drilling
Drill Method : ODEX
Sampling Method : Air Cuttings Return
Air Monitoring Device :
Boring Diameter/Depth :

Start Date : 09 Aug 04
Finish Date : 14 Aug 04
Final Depth of Hole (m) : 16.70
Logged by : MJM
Reviewed by : GWF

Depth (m)	Sample Type	Sample No.	Lithologic Description	Backfill	Instrument Details	SPT Blows per 300mm
8			@ 8.2 m: grey			
9						
10						
11		2				
12			Schistose Bedrock Dark grey to black.			
13				Bentonite		
14						
15				Silica Sand		
16						

Su - kPa: 40, 80, 120, 160

VANE PEAK REMOLD — FIELD ◆ ◇ — LAB ■ □ — ▲ UC/2 — △ Pocket Pen /2

★ % Fines — ● SPT (blows/300mm)

Moisture Content & SPT N: W_p% × — ○ — × W_L%; 20, 40, 60, 80

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Client: Deloitte & Touche Inc. Faro Mine

BORING/MONITORING WELL # BGC04-01

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Faro Creek
Co-ordinates (m) : 584341.00E, 6914552.00N
Ground Elevation (m) : 1167.100
Top Casing Elevation (m) : 1167.530
First Water :
Stabilized Water Level : 8.84

Drill Designation : RIG 10
Drilling Contractor : Midnight Sun Drilling
Drill Method : ODEX
Sampling Method : Air Cuttings Return
Air Monitoring Device :
Boring Diameter/Depth :

Start Date : 09 Aug 04
Finish Date : 14 Aug 04
Final Depth of Hole (m) : 16.70
Logged by : MJM
Reviewed by : GWF

Depth (m)	Sample Type	Sample No.	Lithologic Description	Backfill	Instrument Details	SPT Blows per 300mm
16						
			Piezometric Details:			
17			50 mm ID schedule 40 PVC pipe, screen as indicated. Stick-up of 0.31m.			
			Falling head water tests performed during drilling.			
18			Test Increment (m) Hydraulic Conductivity (m/s) 0 - 4.3 6.2 x 10 -5 4.3 - 7.3 8.7 x 10 -6 7.3 - 10.4 5.7 x 10 -6 10.4 - 13.4 7.0 x 10 -6 13.4 - 16.5 1.1 x 10 -5			
19			Slug Test Results for screen zone (13.89 - 16.79 m)			
			Falling Head k = 1.73 x 10 -5 m/s			
			Rising Head k = 1.80 x 10 -5 m/s			
20						
21						
22						
23						
24						

Su - kPa: 40, 80, 120, 160

VANE / FIELD / LAB
PEAK ◆ ■ ▲ UC/2
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines ● SPT (blows/300mm)

Moisture Content & SPT N
W_p% × — — — — o — — — — × W_L%
W%
20, 40, 60, 80

BGC ENGINEERING INC.
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Client: Deloitte & Touche Inc. Faro Mine

DRILL HOLE # BGC04-02

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Center of access road
Co-ordinates (m) : 584,927.00E, 6,914,164.00N
Ground Elevation (m) : 1152.6
Datum : Geodetic
Dip (degrees from horizontal) : 90
Direction : -

Drill Designation : Rig 6
Drilling Contractor : Midnight Sun Drilling
Drill Method : Diamond
Core : NQ3
Fluid : Water
Casing : HW **Cased To (m)** : 5.00

Start Date : 31 Aug 04
Finish Date : 31 Aug 04
Final Depth of Hole (m) : 19.8
Depth to Top of Rock (m) : Unknown
Logged by : GWF
Reviewed by : GWF

Depth (m)	Flush Return	Run No.	Weathering Grade	Strength Index	Casing/Core Diameter	Lithologic Description
0						9.5 cm casing installed to a depth of 4.25 m prior to start of diamond drilling with BGC supervision.
1						
2					HW	
3						Driller reported hard drilling at 3 m depth.
4						
5					NW	
	Light grey creamy					Muscovite - Biotite Schist
6		1		R2	NQ3	Slightly weathered, foliated, light grey green, weak Muscovite - Biotite Schist.
		2	W1	R1/ R2	NQ3	Foliated at 45° wrt to core axis with folding on core scale.
7			W1/ W0	R2/ R3		
		3	WO	R2	NQ3	
8						

Instrument Details

Fracture Angle wrt Core Axis: 30° 60°

Total Core Recovery %

RQD %: 20 40 60 80

Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4}

(Continued on next page)

DRILL HOLE # BGC04-02

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Center of access road
Co-ordinates (m) : 584,927.00E, 6,914,164.00N
Ground Elevation (m) : 1152.6
Datum : Geodetic
Dip (degrees from horizontal) : 90
Direction : -

Drill Designation : Rig 6
Drilling Contractor : Midnight Sun Drilling
Drill Method : Diamond
Core : NQ3
Fluid : Water
Casing : HW **Cased To (m)** : 5.00

Start Date : 31 Aug 04
Finish Date : 31 Aug 04
Final Depth of Hole (m) : 19.8
Depth to Top of Rock (m) : Unknown
Logged by : GWF
Reviewed by : GWF

Depth (m)	Flush Return	Run No.	Weathering Grade	Strength Index	Casing/Core Diameter	Lithologic Description
8		3	WO	R2	NQ3	Fresh
9				R5	NQ3	Quartz, multiple fractures and healed zones, some calcite infill, vuggy.
	No visible return	4				Quartz veins, multiple quartz healed fractures.
10						5 cm quartz band at 10 m.
	White Grey return			R2		Heavy fractures, quartz healed, mica in matrix, thin calcite banding.
						Thin calcite banding.
11	Grey	5		R1	NQ3	
				R3		Multiple quartz bands, metal flecs.
12		6	WO/ W1	R3/ R4	NQ3	Highly altered mica minerals, joints healed with calcite and metalic material.
				R5		Quartz with 2 major veins, one 5 cm grey phyllite vein and one 4 cm galena vein.
13						Porous.
				R4		5 cm quartz vein at 13.5 m.
						Copper coloured metal flecs, calcite.
14	Light grey	7	WO	R2	NQ3	Light grey/green.
	Reddish tinge to grey			R0/ R1		Quartz bands.
15		8		R4	NQ3	
16						

Instrument Details

Fracture Angle wrt Core Axis: 30° 60°

Total Core Recovery %

RQD %: 20 40 60 80

Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4}

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DRILL HOLE # BGC04-02

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Center of access road
Co-ordinates (m) : 584,927.00E, 6,914,164.00N
Ground Elevation (m) : 1152.6
Datum : Geodetic
Dip (degrees from horizontal) : 90
Direction : -

Drill Designation : Rig 6
Drilling Contractor : Midnight Sun Drilling
Drill Method : Diamond
Core : NQ3
Fluid : Water
Casing : HW **Cased To (m)** : 5.00

Start Date : 31 Aug 04
Finish Date : 31 Aug 04
Final Depth of Hole (m) : 19.8
Depth to Top of Rock (m) : Unknown
Logged by : GWF
Reviewed by : GWF

Depth (m)	Flush Return	Run No.	Weathering Grade	Strength Index	Casing/Core Diameter	Lithologic Description	Instrument Details
16	Light grey white	8	WO	R4	NQ3		
17	Light Grey	9			NQ3		
18						Calc silicate, mottled light grey, dark grey and white.	
19	Grey	10		R4/ R5	NQ3	Marbled calc silicate, metalic flecs, foliated 70° wrt core axis with multiple local changes in foliation. Bands of white, dark grey and grey/green and some black minerals in foliation.	
20						Backfilled with cement grout.	
21							
22							
23							
24							

Fracture Angle wrt Core Axis: 30° 60°

Total Core Recovery %

RQD %: 20 40 60 80

Hydraulic Conductivity (m/sec): 10^{-5} 10^{-6} 10^{-4}

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Client: Deloitte & Touche Inc. Faro Mine

DRILL HOLE # BGC04-03

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Right Abutment, Bench 1
Co-ordinates (m) : 584,896.00E, 6,914,159.00N
Ground Elevation (m) : 1158.2
Datum : Geodetic
Dip (degrees from horizontal) : 90
Direction : -

Drill Designation : Rig 6
Drilling Contractor : Midnight Sun Drilling
Drill Method : Diamond
Core : NQ3
Fluid : Water
Casing : NW **Cased To (m)** : 0.91

Start Date : 03 Mar 04
Finish Date : 04 Sep 04
Final Depth of Hole (m) : 21.0
Depth to Top of Rock (m) : 0.6
Logged by : GWF
Reviewed by : GWF

Depth (m)	Flush Return	Run No.	Weathering Grade	Strength Index	Casing/Core Diameter	Lithologic Description
0					NW	Overburden
1	Metalic lustre	1	W1	R3	NQ3	Muscovite - Biotite schist. Slightly weathered, moderately strong, foliated, grey Muscovite - Biotite schist.
2	Creamy grey	2		R3/ R4	NQ3	Foliated at 75° with respect to core axis. 1.29 to 1.37 m: Quartz. 2.47 m: foliated at 60° wrt core axis.
3	Dark grey	3		R4	NQ3	
4						
5		4		R2	NQ3	Carbonaceous Schist. Slightly weathered, foliated, weak, black to dark grey Carbonaceous Schist. Some pyrite/sulphide minerals present.
6	No return	5		R2/ R3	NQ3	
7			WO	R5		Quartz.
8		6		R3	NQ3	Muscovite - Biotite Schist. Fresh, foliated, medium strong, grey to grey green Muscovite-Biotite Schist.

Instrument Details

Fracture Angle wrt Core Axis: 30° 60°

Total Core Recovery %

RQD %: 20 40 60 80

Hydraulic Conductivity (m/sec): 10^{-5} 10^{-6} 10^{-4}

(Continued on next page)

DRILL HOLE # BGC04-03

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Right Abutment, Bench 1
Co-ordinates (m) : 584,896.00E, 6,914,159.00N
Ground Elevation (m) : 1158.2
Datum : Geodetic
Dip (degrees from horizontal) : 90
Direction : -

Drill Designation : Rig 6
Drilling Contractor : Midnight Sun Drilling
Drill Method : Diamond
Core : NQ3
Fluid : Water
Casing : NW ***Cased To (m)*** : 0.91

Start Date : 03 Mar 04
Finish Date : 04 Sep 04
Final Depth of Hole (m) : 21.0
Depth to Top of Rock (m) : 0.6
Logged by : GWF
Reviewed by : GWF

Depth (m)	Flush Return	Run No.	Weathering Grade	Strength Index	Casing/Core Diameter	Lithologic Description
8	Light metalic lustre	6	WO	R3	NQ3	
9	No return	7		R2	NQ3	
10				R4		Dark grey with thin 3 mm grey-green bands.
	Medium metalic lustre	8		R2	NQ3	Grey-green with thin bands of dark grey and occasional quartz within matrix.
11						
12		9			NQ3	
13				R3/ R4		Light grey, foliated at 66° wrt core axis.
14		10		R2	NQ3	At 14.83 m: 3 mm quartz intrusion at 14.83 m.
15		11		R1/ R2	NQ3	More porous structure, mottled grey-green and dark grey.
16						

Instrument Details

Fracture Angle wrt Core Axis: 30° 60°

Total Core Recovery %

RQD %: 20 40 60 80

Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4}

(Continued on next page)

DRILL HOLE # BGC04-03

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Right Abutment, Bench 1
Co-ordinates (m) : 584,896.00E, 6,914,159.00N
Ground Elevation (m) : 1158.2
Datum : Geodetic
Dip (degrees from horizontal) : 90
Direction : -

Drill Designation : Rig 6
Drilling Contractor : Midnight Sun Drilling
Drill Method : Diamond
Core : NQ3
Fluid : Water
Casing : NW **Cased To (m)** : 0.91

Start Date : 03 Mar 04
Finish Date : 04 Sep 04
Final Depth of Hole (m) : 21.0
Depth to Top of Rock (m) : 0.6
Logged by : GWF
Reviewed by : GWF

Depth (m)	Flush Return	Run No.	Weathering Grade	Strength Index	Casing/Core Diameter	Lithologic Description
16	Medium metalic lustre	11	WO	R3	NQ3	15.98 m to 16.0 m: Massive quartz. Foliated at 45° wrt core axis.
17		12		R4	NQ3	17.24 m: 13 mm quartz vein.
18	Creamy light grey	13			NQ3	Foliated at 40° wrt core axis. Calcite or sericite on some fractures.
19				R2		
20		14			NQ3	
21	Grey			R5		Massive quartz.
22	Creamy grey	15		R2	NQ3	
23		16		R1	NQ3	22.53 m to 22.56 m: quartz vein. Quartz vein at 40° wrt core axis, 50 mm thick with a vuggy surface and associated black metalic rocks.
24						

Instrument Details

Fracture Angle wrt Core Axis: 30° 60°

Total Core Recovery %

RQD %: 20 40 60 80

Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4}

(Continued on next page)

DRILL HOLE # BGC04-03

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Right Abutment, Bench 1
Co-ordinates (m) : 584,896.00E, 6,914,159.00N
Ground Elevation (m) : 1158.2
Datum : Geodetic
Dip (degrees from horizontal) : 90
Direction : -

Drill Designation : Rig 6
Drilling Contractor : Midnight Sun Drilling
Drill Method : Diamond
Core : NQ3
Fluid : Water
Casing : NW **Cased To (m)** : 0.91

Start Date : 03 Mar 04
Finish Date : 04 Sep 04
Final Depth of Hole (m) : 21.0
Depth to Top of Rock (m) : 0.6
Logged by : GWF
Reviewed by : GWF

Depth (m)	Flush Return	Run No.	Weathering Grade	Strength Index	Casing/Core Diameter	Lithologic Description	Instrument Details	Fracture Angle wrt Core Axis (30° 60°)	Total Core Recovery % / RQD % (20 40 60 80)	Hydraulic Conductivity (m/sec) (10^{-8} 10^{-6} 10^{-4})
24										
25	Light creamy grey	17		R2	NQ3					
						Backfilled with cement grout.				
26										
27										
28										
29										
30										
31										
32										

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Client: Deloitte & Touche Inc. Faro Mine

DRILL HOLE # BGC04-04

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Left Abutment
Co-ordinates (m) : 584,978.00E, 6,914,192.00N
Ground Elevation (m) : 1172.3
Datum : Geodetic
Dip (degrees from horizontal) : 90
Direction : -

Drill Designation : Rig 6
Drilling Contractor : Midnight Sun Drilling
Drill Method : Diamond
Core : NQ3
Fluid : Water
Casing : NW **Cased To (m)** : 0.61

Start Date : 07 Sep 04
Finish Date : 08 Sep 04
Final Depth of Hole (m) : 37.8
Depth to Top of Rock (m) : 0.5
Logged by : GWF
Reviewed by : GWF

Depth (m)	Flush Return	Run No.	Weathering Grade	Strength Index	Casing/Core Diameter	Lithologic Description
0	Creamy tan				NW	
1	Creamy grey	1	W1	R5	NQ3	Quartz rubble, heavy iron staining.
						Quartz with phyllite infill.
		2		R3	NQ3	Muscovite - Biotite Schist. Slightly weathered; foliated; medium strong; light grey. Muscovite - Biotite Schist.
2						More altered, higher mica content; foliated at 57° wrt core axis; most fractures are iron stained; fresh.
3		3	W0	R2	NQ3	Dark grey to black.
						Minor chlorite.
4		4			NQ3	
5						50 mm quartz vein
		5		R3	NQ3	High concentration of black crystals.
6						Thinly banded grey, dark grey and white.
7		6			NQ3	
8						

Instrument Details

Fracture Angle wrt Core Axis: 30° 60°

Total Core Recovery %

RQD %: 20 40 60 80

Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4}

(Continued on next page)

DRILL HOLE # BGC04-04

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Left Abutment
Co-ordinates (m) : 584,978.00E, 6,914,192.00N
Ground Elevation (m) : 1172.3
Datum : Geodetic
Dip (degrees from horizontal) : 90
Direction : -

Drill Designation : Rig 6
Drilling Contractor : Midnight Sun Drilling
Drill Method : Diamond
Core : NQ3
Fluid : Water
Casing : NW **Cased To (m)** : 0.61

Start Date : 07 Sep 04
Finish Date : 08 Sep 04
Final Depth of Hole (m) : 37.8
Depth to Top of Rock (m) : 0.5
Logged by : GWF
Reviewed by : GWF

Depth (m)	Flush Return	Run No.	Weathering Grade	Strength Index	Casing/Core Diameter	Lithologic Description
8						
	Creamy grey	6			NQ3	
9		7			NQ3	
10				R3		50 mm quartz vein.
	Reddish tinge	8			NQ3	
11						Dark grey, thinly banded with light grey-green.
12		9	W0		NQ3	
13						
	Light grey	10		R2	NQ3	50 mm quartz vein.
14						
						Four quartz veins between 14.69 m and 14.81 m. One is 75 mm thick.
15	Creamy grey	11		R2/ R3	NQ3	
16						

Instrument Details

Fracture Angle wrt Core Axis: 30° 60°

Total Core Recovery %

RQD %: 20 40 60 80

Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4}

(Continued on next page)

DRILL HOLE # BGC04-04

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Left Abutment
Co-ordinates (m) : 584,978.00E, 6,914,192.00N
Ground Elevation (m) : 1172.3
Datum : Geodetic
Dip (degrees from horizontal) : 90
Direction : -

Drill Designation : Rig 6
Drilling Contractor : Midnight Sun Drilling
Drill Method : Diamond
Core : NQ3
Fluid : Water
Casing : NW **Cased To (m)** : 0.61

Start Date : 07 Sep 04
Finish Date : 08 Sep 04
Final Depth of Hole (m) : 37.8
Depth to Top of Rock (m) : 0.5
Logged by : GWF
Reviewed by : GWF

Depth (m)	Flush Return	Run No.	Weathering Grade	Strength Index	Casing/Core Diameter	Lithologic Description
16	Creamy grey	11	W0	R2/R3	NQ3	
						Multiple drill breaks in this zone.
17		12			NQ3	
18	Dark grey	13		R2	NQ3	
19						25 mm quartz vein.
						Grey green with some dark purple banding.
						Dark purple inclusion.
20		14			NQ3	19.81 to 19.91 m: this zone is covered and filled with a reddish-brown silt.
						20.52 m: Quartz inclusion.
21	Creamy grey to whitish grey					Quartz rubble.
		15		R2/R3	NQ3	
22						22.32 m: 6 mm quartz vein.
						Dark grey-green with yellow silt cutting through foliation, mica.
23		16			NQ3	
24						

Instrument Details

Fracture Angle wrt Core Axis: 30° 60°

Total Core Recovery %

RQD %

20 40 60 80

Hydraulic Conductivity (m/sec)

10^{-8} 10^{-6} 10^{-4}

(Continued on next page)

DRILL HOLE # BGC04-04

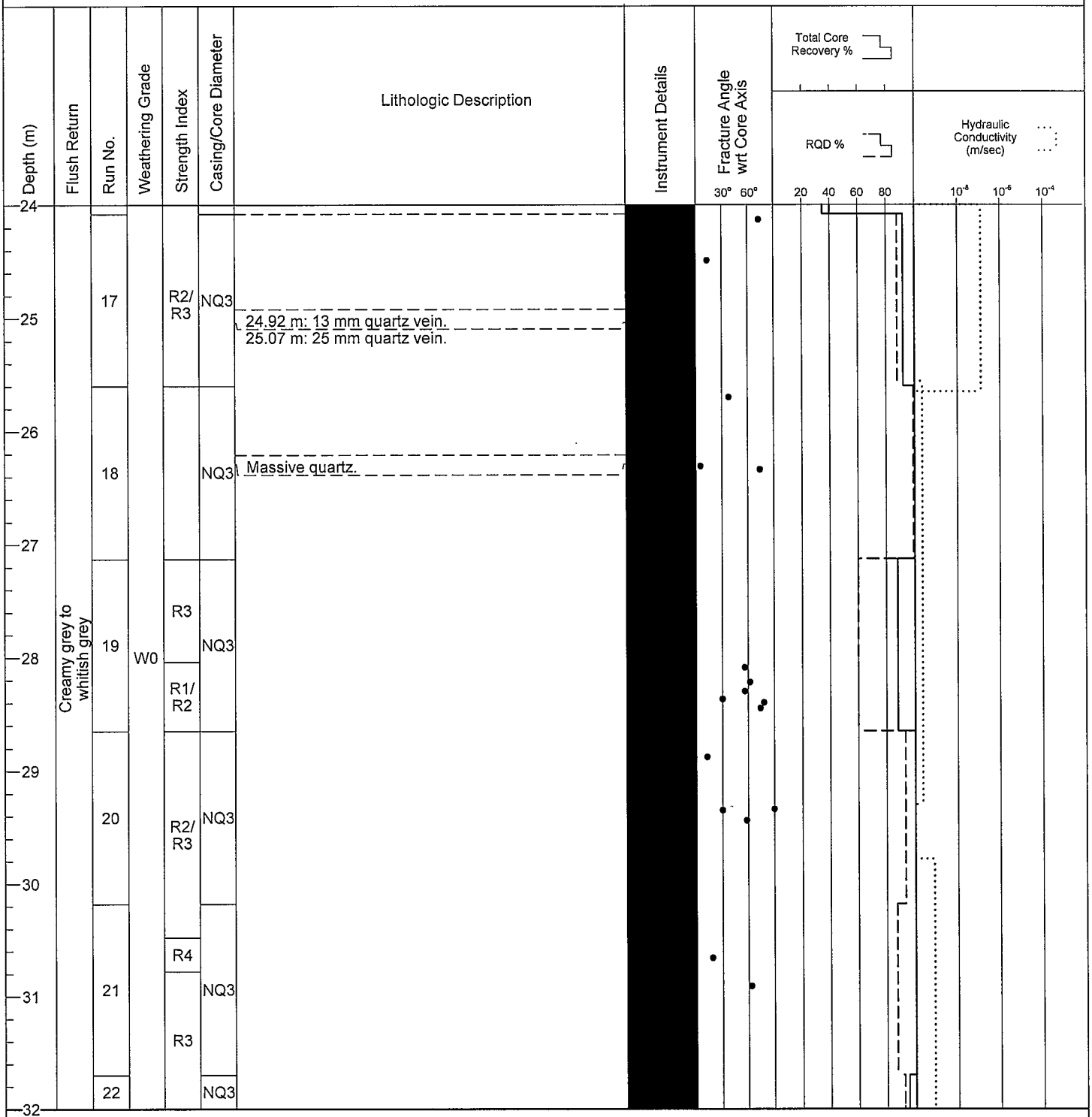
Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Left Abutment
Co-ordinates (m) : 584,978.00E, 6,914,192.00N
Ground Elevation (m) : 1172.3
Datum : Geodetic
Dip (degrees from horizontal) : 90
Direction : -

Drill Designation : Rig 6
Drilling Contractor : Midnight Sun Drilling
Drill Method : Diamond
Core : NQ3
Fluid : Water
Casing : NW **Cased To (m)** : 0.61

Start Date : 07 Sep 04
Finish Date : 08 Sep 04
Final Depth of Hole (m) : 37.8
Depth to Top of Rock (m) : 0.5
Logged by : GWF
Reviewed by : GWF



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Client: Deloitte & Touche Inc. Faro Mine

DRILL HOLE # BGC04-04

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Left Abutment
Co-ordinates (m) : 584,978.00E, 6,914,192.00N
Ground Elevation (m) : 1172.3
Datum : Geodetic
Dip (degrees from horizontal) : 90
Direction : -

Drill Designation : Rig 6
Drilling Contractor : Midnight Sun Drilling
Drill Method : Diamond
Core : NQ3
Fluid : Water
Casing : NW **Cased To (m)** : 0.61

Start Date : 07 Sep 04
Finish Date : 08 Sep 04
Final Depth of Hole (m) : 37.8
Depth to Top of Rock (m) : 0.5
Logged by : GWF
Reviewed by : GWF

Depth (m)	Flush Return	Run No.	Weathering Grade	Strength Index	Casing/Core Diameter	Lithologic Description	Instrument Details
32	Creamy grey to whitish grey	22	W0	R3	NQ3		
33						Marble zone.	
34		23			NQ3		
35						Dark grey with thin quartz and dark grey (purplish) banding.	
		24			NQ3		
36						Marbled surface with dark grey and quartz, occasional zone of mica concentration, metalics.	
		25			NQ3		
37				R4		Massive, medium grained gabbro, mostly grey with 15% black specs.	
38						Backfilled with cement grout.	
39							
40							

Fracture Angle wrt Core Axis: 30° 60°

Total Core Recovery %

RQD %: 20 40 60 80

Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4}

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Client: Deloitte & Touche Inc. Faro Mine

TEST PIT # BGC TP04-01

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Left abutment
Co-ordinates (m): 585036 E, 6914154 N
Ground Elevation (m) : 1182.7
Datum : Geodetic

Excavator : Anvil's 235 Hoe
Operator : John Salo
Comments : Excavated to maximum reach of excavator.

Start Date : 13 Sep 04
Finish Date : 13 Sep 04
Final Depth of Pit (m) : 4.9
Logged by : GWF
Reviewed by : GWF

Depth (m)	Sample Type	Sample No.	Lithologic Description
0			WASTE ROCK Cobbles to sand sized, reddish colour.
1			ORGANICS Mix of topsoil, volcanic ash and decaying trees.
2			
3			SAND Silty, some gravel, trace clay, trace cobbles; olive brown; moist; low plasticity; stiff.
4		GWF-01	
5			Backfilled with excavcated material. No seepage. Some sloughing of waste rock and organic layer.
6			
7			
8			

Su - kPa: 40, 80, 120, 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

Moisture Content: W_P% × — W% ○ — W_L% ×; 20, 40, 60, 80

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Client: Deloitte & Touche Inc. Faro Mine

TEST PIT # BGC TP04-02

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Left abutment
Co-ordinates (m): 585060 E, 6914139 N
Ground Elevation (m) : 1183.0
Datum : Geodetic

Excavator : Anvil's 235 Hoe
Operator : John Salo
Comments : Excavated to maximum reach of excavator.

Start Date : 13 Sep 04
Finish Date : 13 Sep 04
Final Depth of Pit (m) : 4.6
Logged by : GWF
Reviewed by : GWF

Depth (m)	Sample Type	Sample No.	Lithologic Description
0			WASTE ROCK Cobbles, some gravel, some sand; reddish colour.
3			SAND (FILL) Reddish colour.
			TOPSOIL Sand, organics, trace volcanic ash.
4			SAND
		GWF-03	Silty, some gravel, trace clay, trace cobbles; moist; low plasticity; olive brown.
			Backfilled with excavcated material. No seepage. Some sloughing of waste rock.
8			

Su - kPa: 40, 80, 120, 160

VANE PEAK: FIELD ◆ LAB ■ — ▲ UC/2
VANE REMOLD: FIELD ◇ LAB □ — △ Pocket Pen /2

Moisture Content: W_P% × — O — × W_L%; W%; 20, 40, 60, 80

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Client: Deloitte & Touche Inc. Faro Mine

TEST PIT # BGC TP04-03

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Left abutment
Co-ordinates (m): 585014 E, 6914179 N
Ground Elevation (m) : 1183.1
Datum : Geodetic

Excavator : Anvil's 235 Hoe
Operator : John Salo
Comments : Excavated to confirmationn of bedrock surface.

Start Date : 13 Sep 04
Finish Date : 13 Sep 04
Final Depth of Pit (m) : 4.0
Logged by : GWF
Reviewed by : GWF

Depth (m)	Sample Type	Sample No.	Lithologic Description
0			TOPSOIL Black, organics.
			SAND
		GWF-09	Silty, gravelly, some clay, trace cobbles; moist; olive brown; low plasticity. 0.7 m: 39.1% silt, 41.2% sand, 19.7% gravel.
1			
		GWF-04	1.5 m: 38.8% silt, 41.4% sand, 19.8% gravel.
2			
		GWF-05	2.4 m: 20.9% silt, 43.3% sand, 35.8% gravel.
3			
		GWF-06	3.2 m: 24.2% silt, 43.3% sand, 32.5% gravel.
		GWF-07	
4		GWF-08	WEATHERED SCHISTOSE BEDROCK Backfilled with excavated material. No seepage or sloughing.
5			
6			
7			
8			

Su - kPa: 40, 80, 120, 160

	FIELD	LAB	
VANE PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

Moisture Content: W_P% — W% — W_L%; 20, 40, 60, 80

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Client: Deloitte & Touche Inc. Faro Mine

TEST PIT # BGC TP04-04

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Left abutment
Co-ordinates (m): 585047 E, 6914196 N
Ground Elevation (m) : 1184.8
Datum : Geodetic

Excavator : Anvil's 235 Hoe
Operator : John Salo
Comments : Excavated to maximum reach of excavator.

Start Date : 13 Sep 04
Finish Date : 13 Sep 04
Final Depth of Pit (m) : 4.5
Logged by : GWF
Reviewed by : GWF

Depth (m)	Sample Type	Sample No.	Lithologic Description
0			TOPSOIL Black organic topsoil and volcanic ash.
		GWF-11	SAND Silty, some gravel, trace cobbles; moist; reddish brown. 0.5 m: 28.5% silt, 55.9% sand, 15.6% gravel.
1			
		GWF-10	SILT AND SAND, some gravel, some clay, trace cobbles; moist; olive brown; low plasticity.
2			
3			
		GWF-12	
4			
			Backfilled with excavated material. No seepage or sloughing.
5			
6			
7			
8			

Su - kPa: 40, 80, 120, 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

Moisture Content: W_P% — W% — W_L%; 20, 40, 60, 80

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Client: Deloitte & Touche Inc. Faro Mine

TEST PIT # BGC TP04-05

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Left abutment
Co-ordinates (m): 585042 E, 6914243 N
Ground Elevation (m) : 1188.3
Datum : Geodetic

Excavator : Anvil's 235 Hoe
Operator : John Salo
Comments : Excavated to maximum reach of excavator.

Start Date : 13 Sep 04
Finish Date: 13 Sep 04
Final Depth of Pit (m) : 4.4
Logged by : GWF
Reviewed by : GWF

Depth (m)	Sample Type	Sample No.	Lithologic Description
0			TOPSOIL Black organics and volcanic ash.
			SAND Silty, some gravel, trace clay; moist; reddish tan colour; low plasticity.
1			SAND Silty, gravelly, some clay, trace cobble; moist; tan; low plasticity.
		GWF-13	
2			
		GWF-14	
3			
		GWF-15	
4			4.0 m: Some cobbles.
		GWF-16	Backfilled with excavated material. No seepage or sloughing.
5			
6			
7			
8			

Su - kPa: 40, 80, 120, 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

Moisture Content: W_P% — W% — W_L%; 20, 40, 60, 80

TEST PIT # BGC TP04-06

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Left abutment
Co-ordinates (m): 585062 E, 6914267 N
Ground Elevation (m) : 1190.2
Datum : Geodetic

Excavator : Anvil's 235 Hoe
Operator : John Salo
Comments : Excavated to maximum reach of excavator.

Start Date : 13 Sep 04
Finish Date : 13 Sep 04
Final Depth of Pit (m) : 4.4
Logged by : GWF
Reviewed by : GWF

Depth (m)	Sample Type	Sample No.	Lithologic Description
0			TOPSOIL Black organic soil and volcanic ash.
			SAND Silty, some gravel, trace clay; moist; tan.
1			SAND Silty, some gravel, trace cobbles; low plasticity to non-plastic; olive; moist.
		GWF-19	1.5 m: 23.9% silt, 51.0% sand, 25.1% gravel.
2			
3			
4		GWF-17	3.9 m: 31.6% silt, 57.0% sand, 11.4% gravel.
		GWF-18	4.2 m: 26.9% silt, 54.6% sand, 18.5% gravel.
			Backfilled with excavated material. No seepage or sloughing.
5			
6			
7			
8			

Su - kPa: 40, 80, 120, 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

Moisture Content: W_P% × — — — o — — — × W_L%; 20, 40, 60, 80

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Client: Deloitte & Touche Inc. Faro Mine

TEST PIT # BGC TP04-07

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Top of north dump
Co-ordinates (m): E, N
Ground Elevation (m) :
Datum : Geodetic

Excavator : Anvil's 235 Hoe
Operator : John Salo
Comments : Excavated to maximum reach of excavator.

Start Date : 13 Sep 04
Finish Date : 13 Sep 04
Final Depth of Pit (m) : 4.0
Logged by : GWF
Reviewed by : GWF

Depth (m)	Sample Type	Sample No.	Lithologic Description
0			WASTE ROCK Boulders to sand sized particles, dominated by cobble size; reddish brown.
4			Backfilled with excavated material. No seepage. Extensive sloughing of waste rock.

Su - kPa: 40, 80, 120, 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

Moisture Content: W_P% × — W% ○ — W_L% ×; 20, 40, 60, 80

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Client: Deloitte & Touche Inc. Faro Mine

TEST PIT # BGC TP04-08

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Top of north dump
Co-ordinates (m): E, N
Ground Elevation (m) :
Datum : Geodetic

Excavator : Anvil's 235 Hoe
Operator : John Salo
Comments : Excavated to maximum reach of excavator.

Start Date : 13 Sep 04
Finish Date : 13 Sep 04
Final Depth of Pit (m) : 5.0
Logged by : GWF
Reviewed by : GWF

Depth (m)	Sample Type	Sample No.	Lithologic Description
0			WASTE ROCK Boulders to sand sized particles, dominated by cobbles; angular; reddish brown.
3			SAND (FILL) Some cobbles, some gravel, some silt; moist. Placed as part of a dump.
5		GWF-20	Backfilled with excavated material. No seepage. Extensive sloughing of waste rock.

Su - kPa: 40, 80, 120, 160

VANE: FIELD PEAK ◆ REMOLD ◇ | LAB PEAK ■ REMOLD □ | ▲ UC/2 | △ Pocket Pen /2

Moisture Content: W_P% × — — — O — — — × W_L%; W% 20, 40, 60, 80

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Client: Deloitte & Touche Inc. Faro Mine

TEST PIT # BGC TP04-09

Project : Plug Dam Investigation

Project No. : 0257-027-01

Location : Top of north dump
Co-ordinates (m): E, N
Ground Elevation (m) :
Datum : Geodetic

Excavator : Anvil's 235 Hoe
Operator : John Salo
Comments : Excavated to maximum reach of excavator.

Start Date : 13 Sep 04
Finish Date : 13 Sep 04
Final Depth of Pit (m) : 4.2
Logged by : GWF
Reviewed by : GWF

Depth (m)	Sample Type	Sample No.	Lithologic Description
0			WASTE ROCK Boulders to sand sized particles, dominated by cobbles; angular; reddish brown.
4			Backfilled with excavated material. Extensive sloughing of waste rock. Dry.
8			

Su - kPa: 40, 80, 120, 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

Moisture Content: W_P% × — W% ○ — W_L% ×; 20, 40, 60, 80

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Client: Deloitte & Touche Inc. Faro Mine

APPENDIX II - HYDRAULIC CONDUCTIVITY TESTING

Summary of Hydrualic Conductivity Testing - BGC04-01

			K (m/s)	
Location	Date	Interval	Standard Hvorslev	Comments
BGC04-01	09-Aug-04	0 - 4.3m	1.89E-05	During Drilling, Falling head
BGC04-01	09-Aug-04	4.3 - 7.3 m	2.69E-06	During Drilling, Falling head
BGC04-01	09-Aug-04	7.3 - 10.4 m	1.76E-06	During Drilling, Falling head
BGC04-01	14-Aug-04	10.4 - 13.41	2.17E-06	During Drilling, Falling head
BGC04-01	14-Aug-04	13.41 - 16.46	3.31E-06	During Drilling, Falling head
BGC04-01	15-Aug-04	Well screen	2.18E-06	Test performed immediately following installation, well was not developed. Falling Head
BGC04-01	08-Sep-04	Well screen	5.17E-06	Well was developed on the 7th, Slug test performed and measurements made with "level logger"
BGC04-01	08-Sep-04	Well screen	5.38E-06	Well was developed on the 7th, Slug test performed and measurements made with "level logger"

Note: Well screen is from 13.89m to 16.76m

Falling Head Test

BGC ENGINEERING INC.
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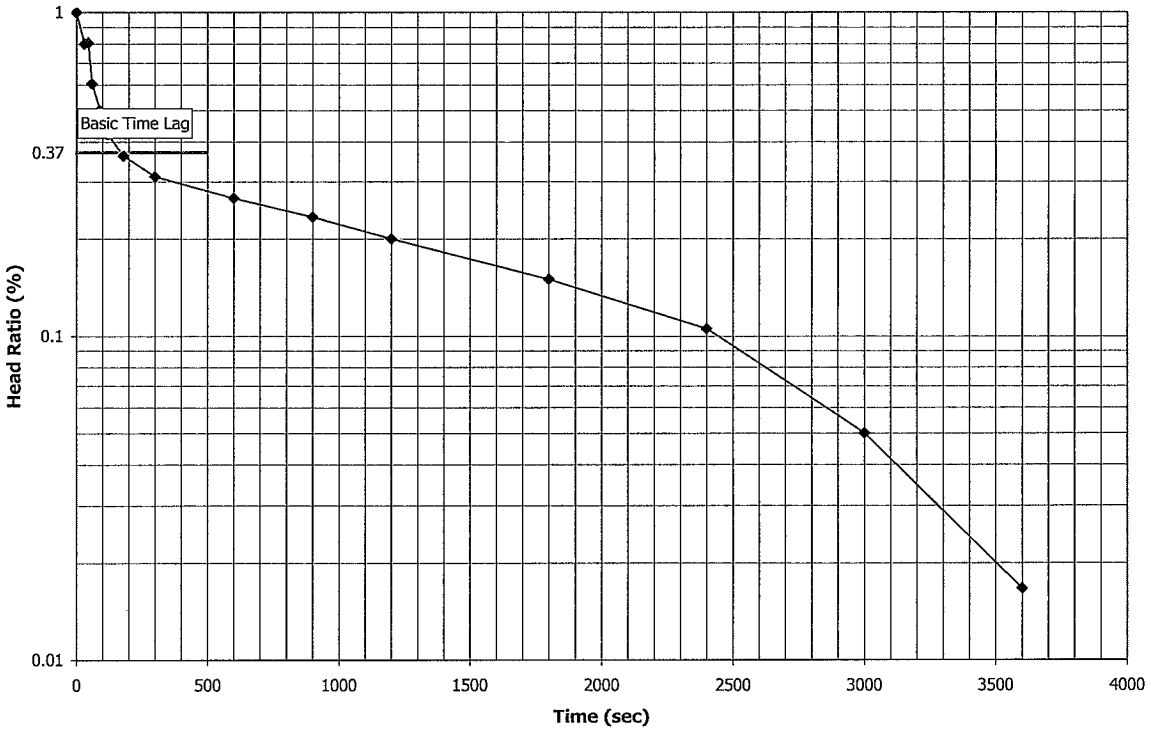
Client:	Deloitte & Touche Inc. -Faro Mine
Project:	Plug Dam Investigation
Project Number:	0257-027-01
Borehole Number:	BGC04-01, 0 to 4.3 m
Date of Test:	09-Aug-04

Static Water Level:	1.80	m
Stick-up:	0	m
Piezometer Radius (r):	0.0857	m
Drill Hole Radius (R):	0.0857	m
Test Interval (L):	4.27	m
T_0 (from graph below):	2 minutes	58 seconds

K = 1.89E-05 m/s

$$K = \frac{r^2 \ln(L/R)}{2L\,T_0} \qquad \text{Head Ratio} = \frac{\text{Change in Water Level (h)}}{\text{Initial Change in Water Level } (h_0)}$$

Elaspsed Time		Total Elapsed Time (S)	Depth to Water Level (m)	Change in Water Level (m)	Head Ratio (%)
Minutes	Seconds				
Initial Level		0	1.80	0.00	
0	0	0	0.00	1.80	100%
0	30	30	0.36	1.44	80%
0	45	45	0.35	1.45	81%
0	60	60	0.71	1.09	61%
1.5	0	90	0.90	0.90	50%
2	0	120	1.04	0.76	42%
3	0	180	1.15	0.65	36%
5	0	300	1.24	0.56	31%
10	0	600	1.32	0.48	27%
15	0	900	1.38	0.42	23%
20	0	1200	1.44	0.36	20%
30	0	1800	1.53	0.27	15%
40	0	2400	1.61	0.19	11%
50	0	3000	1.71	0.09	5%
60	0	3600	1.77	0.03	2%



Falling Head Test

BGC ENGINEERING INC.
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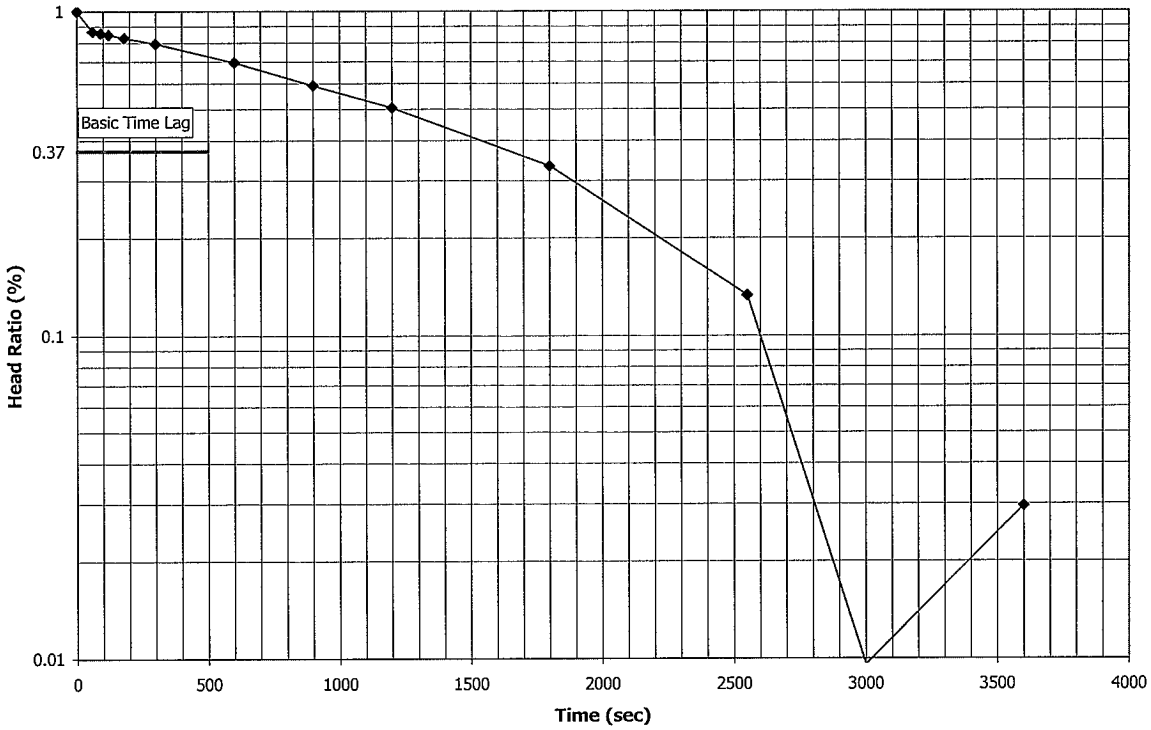
Client: Deloitte & Touche Inc. - Faro Mine
Project: Plug Dam Investigation
Project Number: 0257-027-01
Borehole Number: BGC04-01, 4.3 to 7.3 m
Date of Test: 09-Aug-04

Static Water Level: 2.00 m
Stick-up: 0.4 m
Piezometer Radius (r): 0.0857 m
Drill Hole Radius (R): 0.0857 m
Test Interval (L): 3.05 m
T_0 (from graph below): 0 minutes 1600 seconds

K = 2.69E-06 m/s

$$K = \frac{r^2 \ln(L/R)}{2L\,T_0} \qquad \text{Head Ratio} = \frac{\text{Change in Water Level (h)}}{\text{Initial Change in Water Level } (h_0)}$$

Elaspsed Time		Total Elapsed Time (S)	Depth to Water Level (m)	Change in Water Level (m)	Head Ratio (%)
Minutes	Seconds				
Initial Level		0	1.05	0.00	
0	0	0	0.00	1.05	100%
0	60	60	0.14	0.91	87%
1.5	0	90	0.15	0.90	86%
2	0	120	0.16	0.89	85%
3	0	180	0.18	0.87	83%
5	0	300	0.22	0.84	80%
10	0	600	0.32	0.73	70%
15	0	900	0.43	0.62	59%
20	0	1200	0.52	0.53	50%
30	0	1800	0.70	0.35	33%
42	30	2550	0.91	0.14	13%
50	0	3000	1.04	0.01	1%
60	0	3600	1.02	0.03	3%



Falling Head Test

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Client: Deloitte & Touche Inc. - Faro Mine
Project: Plug Dam Investigation
Project Number: 0257-027-01
Borehole Number: BGC04-01, 10.4 to 13.41m
Date of Test: 14-Aug-04

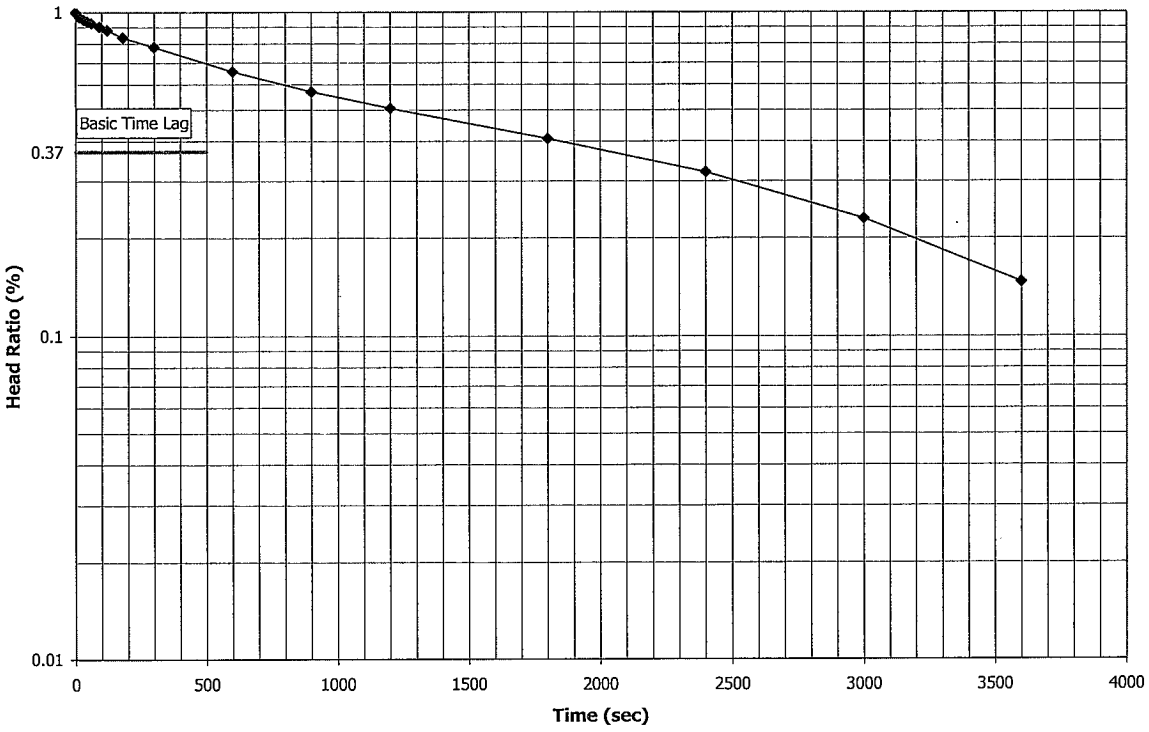
Static Water Level: 3.00 m
Stick-up: 0.5 m
Piezometer Radius (r): 0.0857 m
Drill Hole Radius (R): 0.0857 m
Test Interval (L): 3.05 m
T_0 (from graph below): 0 minutes 1980 seconds

K = 2.17E-06 m/s

$$K = \frac{r^2 \ln(L/R)}{2L\,T_0}$$

$$\text{Head Ratio} = \frac{\text{Change in Water Level (h)}}{\text{Initial Change in Water Level } (h_0)}$$

Elaspsed Time		Total Elapsed Time (S)	Depth to Water Level (m)	Change in Water Level (m)	Head Ratio (%)
Minutes	Seconds				
Initial Level		0	3.00	0.00	
0	0	0	0.00	3.00	100%
0	15	15	0.10	2.90	97%
0	30	30	0.15	2.85	95%
0	45	45	0.19	2.81	94%
0	60	60	0.22	2.78	93%
1.5	0	90	0.29	2.71	90%
2	0	120	0.36	2.64	88%
3	0	180	0.49	2.51	84%
5	0	300	0.66	2.34	78%
10	0	600	1.03	1.97	66%
15	0	900	1.29	1.71	57%
20	0	1200	1.48	1.52	51%
30	0	1800	1.78	1.22	41%
40	0	2400	2.04	0.96	32%
50	0	3000	2.31	0.69	23%
60	0	3600	2.56	0.44	15%



Falling Head Test

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Deloitte & Touche Inc. - Faro Mine
Project: Plug Dam Investigation
Project Number: 0257-027-01
Borehole Number: BGC04-01, 13.4 - 16.5m
Date of Test: 14-Aug-04

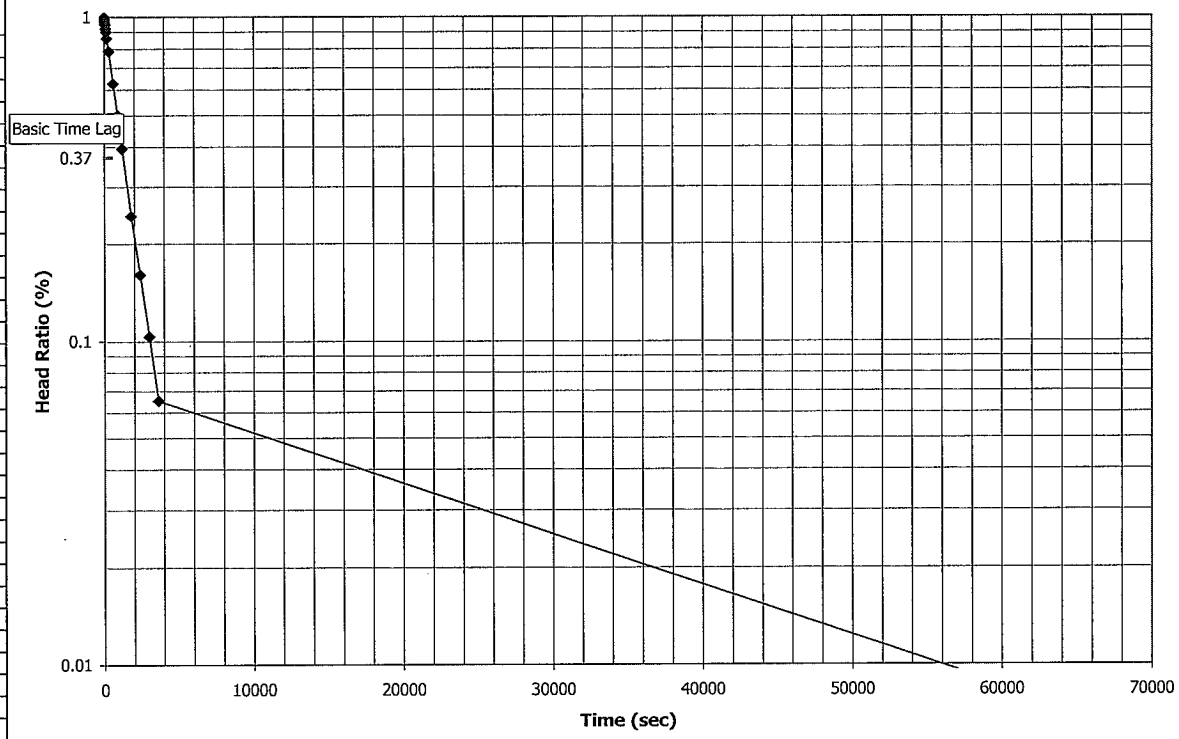
Static Water Level: 8.90 m
Stick-up: 0.5 m
Piezometer Radius (r): 0.0857 m
Drill Hole Radius (R): 0.0857 m
Test Interval (L): 3.05 m
T_0 (from graph below): 0 minutes 1300 seconds

K = 3.31E-06 m/s

$$K = \frac{r^2 \ln(L/R)}{2L\,T_0}$$

$$\text{Head Ratio} = \frac{\text{Change in Water Level (h)}}{\text{Initial Change in Water Level } (h_0)}$$

Elaspsed Time		Total Elapsed Time (S)	Depth to Water Level (m)	Change in Water Level (m)	Head Ratio (%)
Minutes	Seconds				
Initial Level		0	8.90	0.00	
0	0	0	0.00	8.90	100%
0	15	15	0.15	8.75	98%
0	30	30	0.26	8.64	97%
0	45	45	0.37	8.53	96%
0	60	60	0.46	8.44	95%
1.5	0	90	0.69	8.21	92%
2	0	120	0.88	8.02	90%
3	0	180	1.24	7.66	86%
5	0	300	1.90	7.00	79%
10	0	600	3.33	5.57	63%
15	0	900	4.45	4.45	50%
20	0	1200	5.39	3.51	39%
30	0	1800	6.73	2.17	24%
40	0	2400	7.47	1.43	16%
50	0	3000	7.98	0.92	10%
60	0	3600	8.32	0.58	7%
1044	0	62640	8.83	0.07	1%



Falling Head Test

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

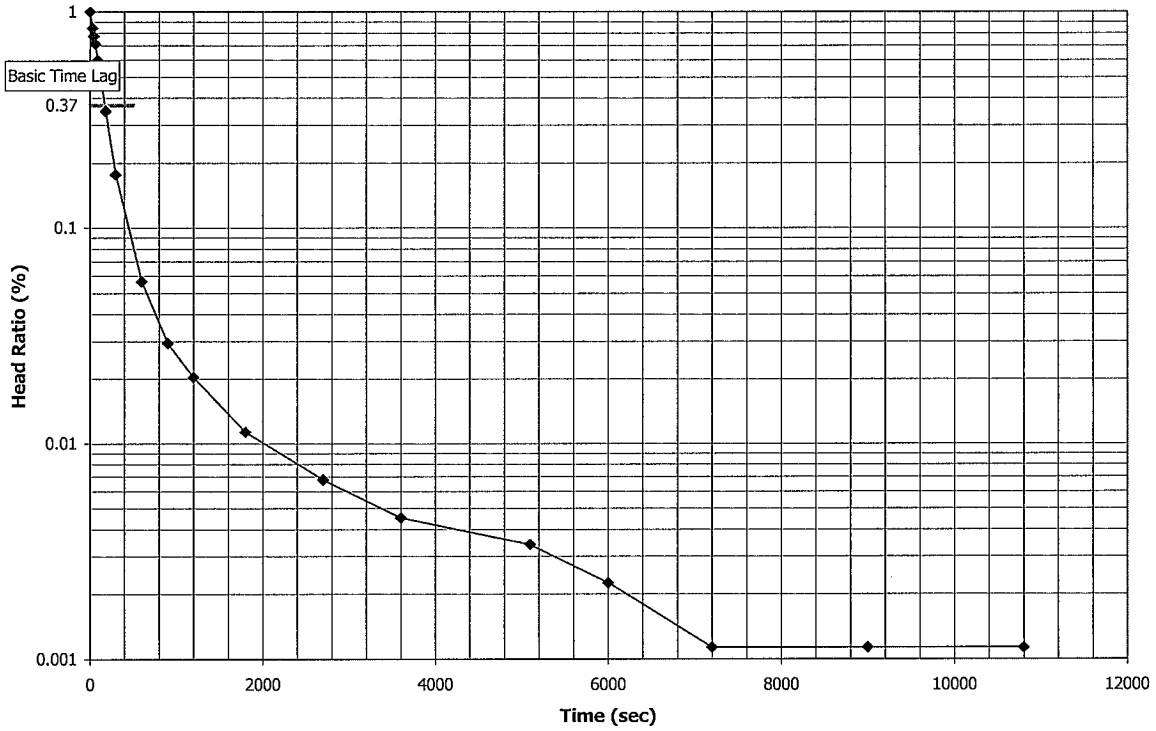
Client:	Deloitte & Touche Inc. - Faro Mine
Project:	Plug Dam Investigation
Project Number:	0257-027-01
Borehole Number:	BGC04-01, Well Screen 13.9 to 16.8m
Date of Test:	14-Aug-04

Static Water Level:	8.85	m
Stick-up:	0.5	m
Piezometer Radius (r):	0.025	m
Drill Hole Radius (R):	0.0857	m
Test Interval (L):	2.87	m
T_0 (from graph below):	2 minutes	55 seconds

K = 2.18E-06 m/s

$$K = \frac{r^2 \ln(L/R)}{2L\,T_0} \qquad \text{Head Ratio} = \frac{\text{Change in Water Level (h)}}{\text{Initial Change in Water Level } (h_0)}$$

Elaspsed Time		Total Elapsed Time (S)	Depth to Water Level (m)	Change in Water Level (m)	Head Ratio (%)
Minutes	Seconds				
Initial Level		0	8.85	0.00	
0	0	0	0.00	8.85	100%
0	30	30	1.42	7.43	84%
0	45	45	2.02	6.83	77%
0	60	60	2.56	6.29	71%
1.5	0	90	3.56	5.29	60%
2	0	120	4.39	4.46	50%
3	0	180	5.78	3.07	35%
5	0	300	7.29	1.56	18%
10	0	600	8.35	0.50	6%
15	0	900	8.59	0.26	3%
20	0	1200	8.67	0.18	2%
30	0	1800	8.75	0.10	1%
45	0	2700	8.79	0.06	1%
60	0	3600	8.81	0.04	0%
85	0	5100	8.82	0.03	0%
100	0	6000	8.83	0.02	0%
120	0	7200	8.84	0.01	0%
150	0	9000	8.84	0.01	0%
180	0	10800	8.84	0.01	0%



Falling Head Slug Test

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Deloitte & Touche Inc. - Faro Mine
Project: Plug Dam Investigation
Project Number: 0257-027-01
Borehole Number: BGC04-01, Well Screen 13.9 to 16.8 m
Date of Test: 08-Sep-04

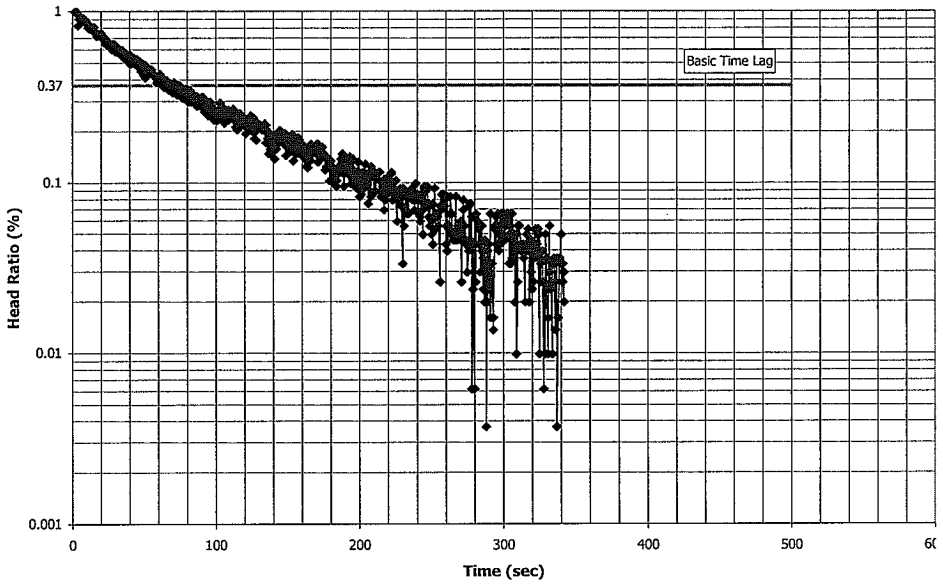
Static Water Level: 3.96 m
Stick-up: 0 m
Piezometer Radius (r): 0.025 m
Drill Hole Radius (R): 0.09857 m
Test Interval (L): 2.87 m
T_0 (from graph below): 0 minutes 71 seconds

K = 5.17E-06 m/s

$$K = \frac{r^2 \ln(L/R)}{2L\,T_0}$$

$$\text{Head Ratio} = \frac{\text{Change in Water Level (h)}}{\text{Initial Change in Water Level } (h_0)}$$

Total Elapsed Time	Total Elapsed Time (S)	Depth to Water Level (cm)	Depth to Water Level (m)	Change in Water Level (m)	Head Ratio (%)
0:00:02	2	477.10	4.77	0.81	100%
0:00:02	2	476.30	4.76	0.80	99%
0:00:03	3	475.50	4.76	0.80	98%
0:00:03	3	476.00	4.76	0.80	99%
0:00:04	4	473.60	4.74	0.78	96%
0:00:04	4	462.70	4.63	0.67	82%
0:00:05	5	469.60	4.70	0.74	91%
0:00:05	5	468.80	4.69	0.73	90%
0:00:06	6	468.00	4.68	0.72	89%
0:00:06	6	468.30	4.68	0.72	89%
0:00:07	7	469.60	4.70	0.74	91%
0:00:07	7	469.90	4.70	0.74	91%
0:00:08	8	469.30	4.69	0.73	90%
0:00:08	8	468.30	4.68	0.72	89%
0:00:09	9	468.30	4.68	0.72	89%
0:00:09	9	465.90	4.66	0.70	86%
0:00:10	10	465.60	4.66	0.70	86%
0:00:10	10	465.30	4.65	0.69	85%
0:00:11	11	464.50	4.65	0.69	84%
0:00:11	11	460.80	4.61	0.65	80%
0:00:12	12	460.30	4.60	0.64	79%
0:00:12	12	462.10	4.62	0.66	82%
0:00:13	13	460.00	4.60	0.64	79%
0:00:13	13	459.50	4.60	0.64	78%
0:00:14	14	460.00	4.60	0.64	79%
0:00:14	14	458.70	4.59	0.63	77%
0:00:15	15	461.30	4.61	0.65	81%
0:00:15	15	458.70	4.59	0.63	77%
0:00:16	16	456.80	4.57	0.61	75%
0:00:16	16	456.5	4.57	0.61	75%
0:00:17	17	456	4.56	0.60	74%
0:00:17	17	453.9	4.54	0.58	71%
0:00:18	18	455.5	4.56	0.60	73%



Rising Head Slug Test

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Deloitte & Touche Inc. - Faro Mine
Project: Plug Dam Investigation
Project Number: 0257-027-01
Borehole Number: BGC04-01, Well Screen 13.9 to 16.8 m
Date of Test: 08-Sep-04

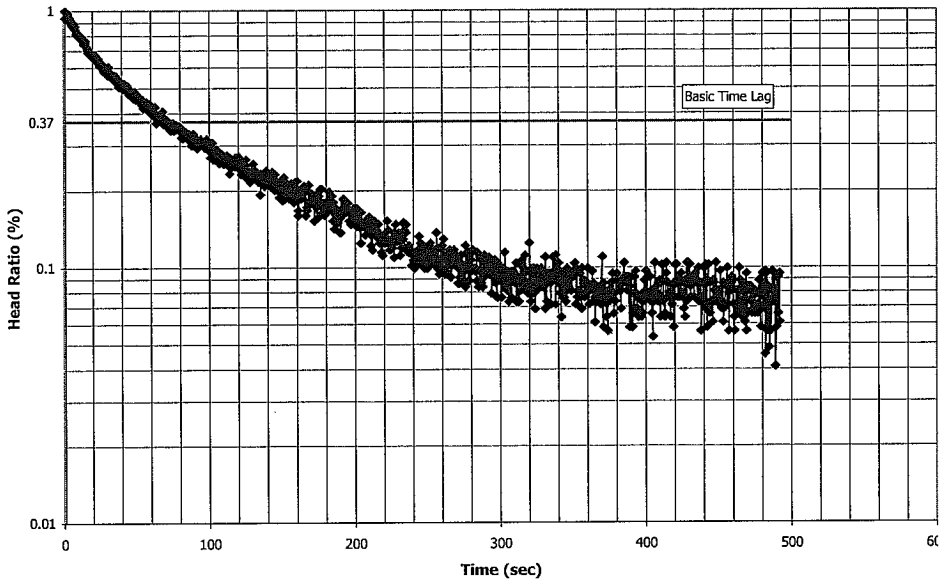
Static Water Level: 3.96 m
Stick-up: 0 m
Piezometer Radius (r): 0.025 m
Drill Hole Radius (R): 0.0857 m
Test Interval (L): 2.87 m
T_0 (from graph below): 0 minutes 71 seconds

K = 5.38E-06 m/s

$$K = \frac{r^2 \ln(L/R)}{2L\,T_0}$$

$$\text{Head Ratio} = \frac{\text{Change in Water Level (h)}}{\text{Initial Change in Water Level } (h_0)}$$

Total Elapsed Time	Total Elapsed Time (S)	Depth to Water Level (cm)	Depth to Water Level (m)	Change in Water Level (m)	Head Ratio (%)
0:00:00	0	280.80	2.81	1.15	100%
0:00:00	0	286.90	2.87	1.09	95%
0:00:01	1	288.00	2.88	1.08	94%
0:00:01	1	290.90	2.91	1.05	100%
0:00:02	2	290.70	2.91	1.05	100%
0:00:02	2	292.00	2.92	1.04	99%
0:00:03	3	293.30	2.93	1.03	98%
0:00:03	3	296.00	2.96	1.00	95%
0:00:04	4	297.30	2.97	0.99	94%
0:00:04	4	298.70	2.99	0.97	93%
0:00:05	5	299.20	2.99	0.97	92%
0:00:05	5	301.60	3.02	0.94	90%
0:00:06	6	303.50	3.04	0.93	88%
0:00:06	6	304.00	3.04	0.92	88%
0:00:07	7	302.40	3.02	0.94	89%
0:00:07	7	303.20	3.03	0.93	88%
0:00:08	8	306.90	3.07	0.89	85%
0:00:08	8	304.50	3.05	0.92	87%
0:00:09	9	309.90	3.10	0.86	82%
0:00:09	9	310.90	3.11	0.85	81%
0:00:10	10	309.90	3.10	0.86	82%
0:00:10	10	311.50	3.12	0.85	80%
0:00:11	11	313.30	3.13	0.83	79%
0:00:11	11	311.70	3.12	0.84	80%
0:00:12	12	312.30	3.12	0.84	80%
0:00:12	12	314.40	3.14	0.82	78%
0:00:13	13	315.50	3.16	0.81	77%
0:00:13	13	314.70	3.15	0.81	77%
0:00:14	14	316.50	3.17	0.80	76%
0:00:14	14	317.9	3.18	0.78	74%
0:00:15	15	315.7	3.16	0.80	76%
0:00:15	15	317.3	3.17	0.79	75%
0:00:16	16	320	3.20	0.76	72%



Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-02

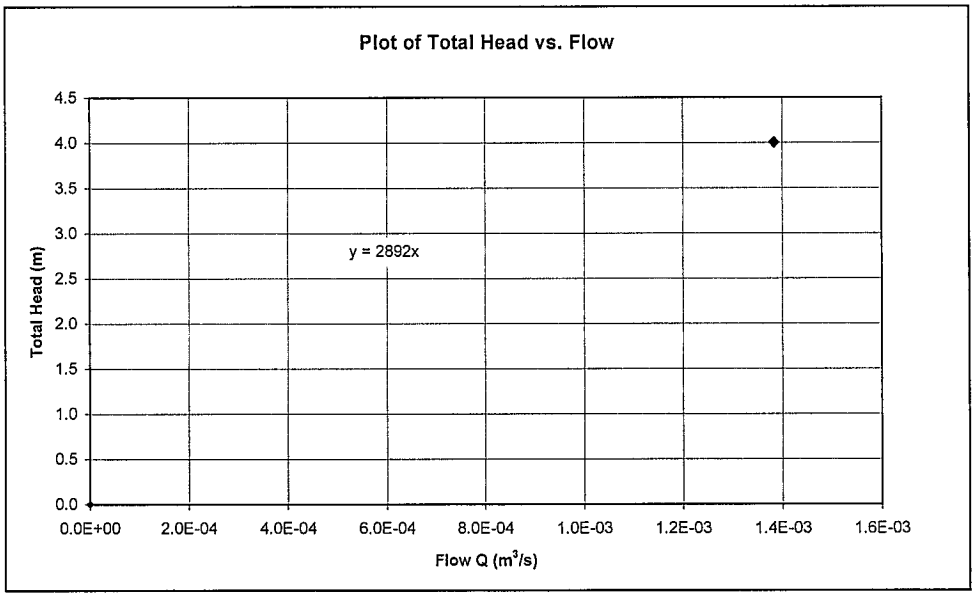
Water Test Interval: 8.45m to 10.67m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Road
North Coordinate:	6914164
East Coordinate:	584927
Azimuth:	deg
Dip:	90 deg
Date:	Sept 1/04
Static W.L. from stick-up:	4.00 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	4.00 m (vertical)
Height of gauge A.G.L.:	1.14 m (vertical)
Bottom of Interval:	10.67 m
Top of Interval:	8.45 m
Length of Interval L:	2.22 m
Middle of Interval to D.F.:	9.56 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
1	83	83.00	-1.6	1.38E-03	4.0	1.0E-04

Q ave: 1.38E-03 (m^3/sec)

Comments: Static WL estimated at 4.0 m below ground. Could not develop gauge pressure above those measured in calibration test, therefore "take" exceeded capacity of pump (83 Lpm). Water level assummed to be at ground surface.



Graphical Analysis

Q ave: 1.38E-03 (m^3/sec)

Head H from Plot: 4.00 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 1.0E-04 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-02

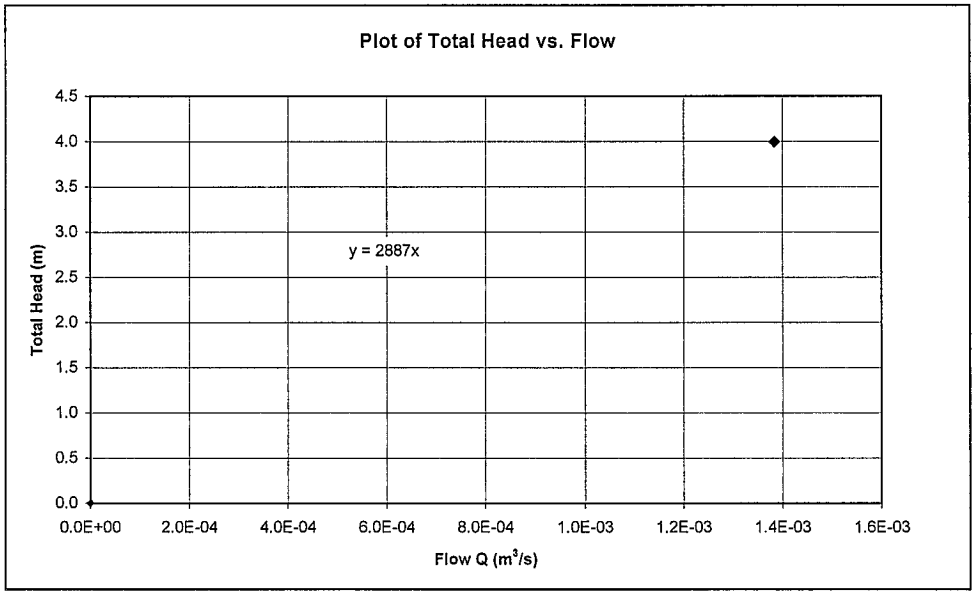
Water Test Interval: 9.71m to 11.93m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Road
North Coordinate:	6914164
East Coordinate:	584927
Azimuth:	deg
Dip:	90 deg
Date:	Sept 1/04
Static W.L. from stick-up:	4.00 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	4.00 m (vertical)
Height of gauge A.G.L.:	1.14 m (vertical)
Bottom of Interval:	11.93 m
Top of Interval:	9.71 m
Length of Interval L:	2.22 m
Middle of Interval to D.F.:	10.82 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
1	83	83.00	-1.6	1.38E-03	4.0	1.0E-04

Q ave: 1.38E-03 (m^3/sec)

Comments: Static WL estimated at 4.0 m below ground. Could not develop gauge pressure above those measured in calibration test, therefore "take" exceeded capacity of pump (83 Lpm). Water level assummed to be at ground surface.



Graphical Analysis

Q ave: 1.38E-03 (m^3/sec)

Head H from Plot: 3.99 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 1.0E-04 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-02

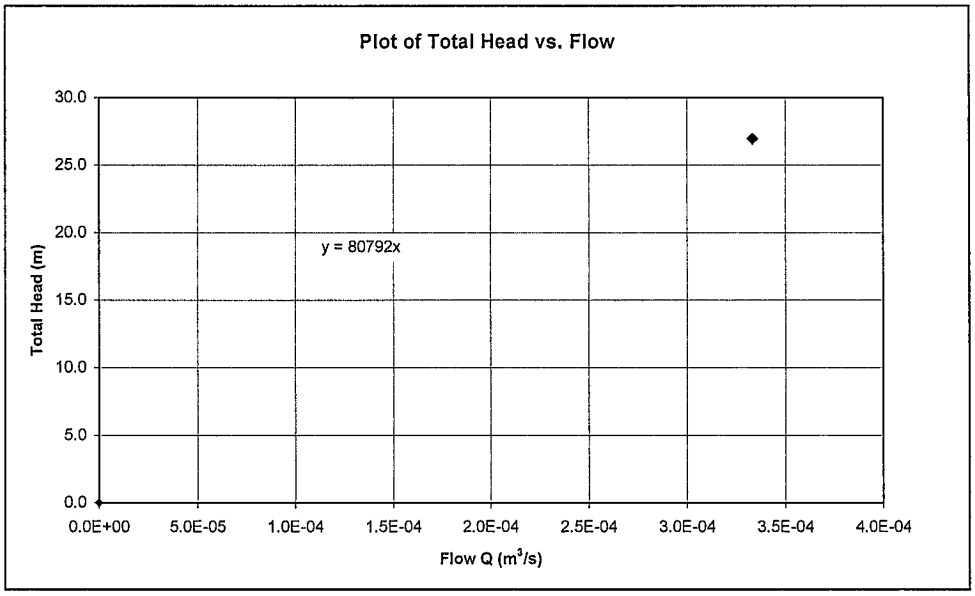
Water Test Interval: 13.06m to 15.28m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Road
North Coordinate:	6914164
East Coordinate:	584927
Azimuth:	deg
Dip:	90 deg
Date:	Sept 1/04
Static W.L. from stick-up:	4.00 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	4.00 m (vertical)
Height of gauge A.G.L.:	1.14 m (vertical)
Bottom of Interval:	15.28 m
Top of Interval:	13.06 m
Length of Interval L:	2.22 m
Middle of Interval to D.F.:	14.17 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
1	20	20.00	31.0	3.33E-04	26.9	3.6E-06

Q ave: 3.33E-04 (m^3/sec)

Comments: Static WL estimated at 4.0 m below ground. Flow rate of 0.5 Litres for pressure of 31 psi. Flow meter later found to be malfunctioning for low flow rates. Flow rates of upto 20 Lpm registered as 0.



Graphical Analysis

Q ave: 3.33E-04 (m^3/sec)

Head H from Plot: 26.94 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 3.6E-06 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-02

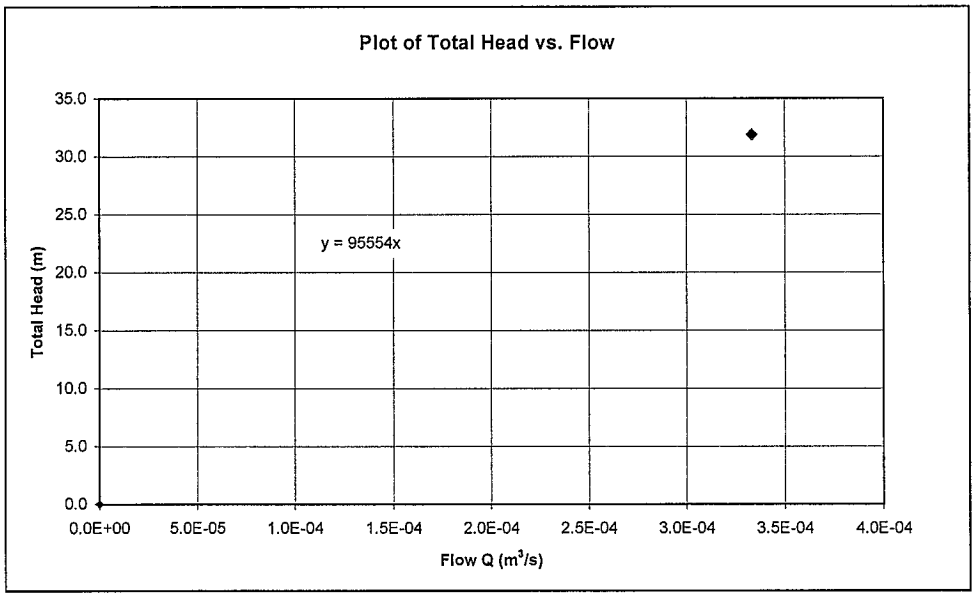
Water Test Interval: 15.81m to 18.03m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Road
North Coordinate:	6914164
East Coordinate:	584927
Azimuth:	deg
Dip:	90 deg
Date:	Sept 1/04
Static W.L. from stick-up:	4.00 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	4.00 m (vertical)
Height of gauge A.G.L.:	1.14 m (vertical)
Bottom of Interval:	18.03 m
Top of Interval:	15.81 m
Length of Interval L:	2.22 m
Middle of Interval to D.F.:	16.92 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
1	20	20.00	38.0	3.33E-04	31.9	3.1E-06

Q ave: 3.33E-04 (m^3/sec)

Comments: Static WL estimated at 4.0 m below ground. Flow rate of 0 Litres for pressure of 38 psi. Flow meter later found to be malfunctioning for low flow rates. Flow rates of upto 20 Lpm registered as 0.



Graphical Analysis

Q ave: 3.33E-04 (m^3/sec)

Head H from Plot: 31.86 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 3.1E-06 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-03

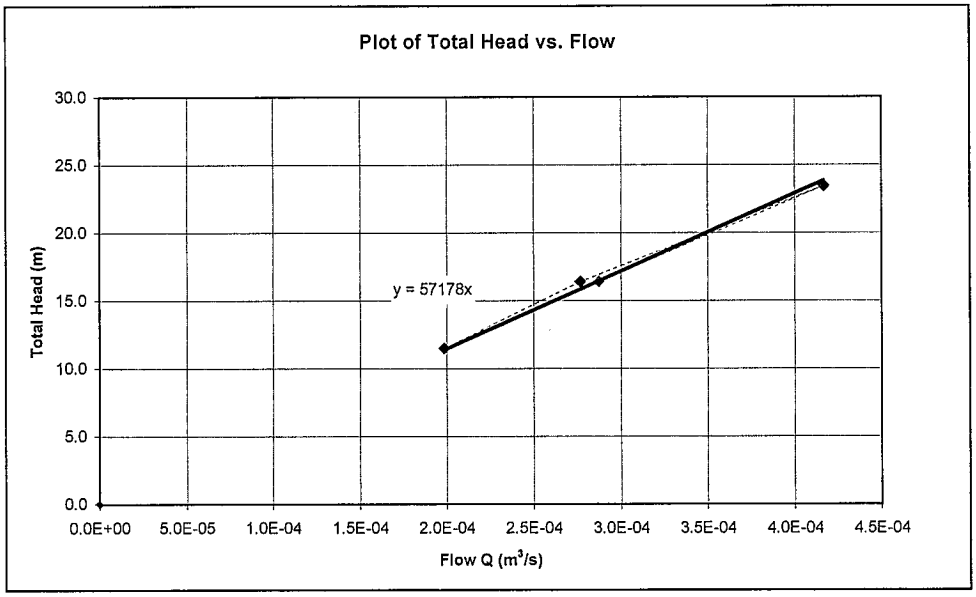
Water Test Interval: 3.01m to 5.23m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Right Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 5/04
Static W.L. from stick-up:	4.00 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	4.00 m (vertical)
Height of gauge A.G.L.:	1.14 m (vertical)
Bottom of Interval:	5.23 m
Top of Interval:	3.01 m
Length of Interval L:	2.22 m
Middle of Interval to D.F.:	4.12 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
5	86.15	17.23	16.0	2.87E-04	16.4	5.1E-06
5	125.02	25.00	26.0	4.17E-04	23.4	5.2E-06
5	82.97	16.59	16.0	2.77E-04	16.4	4.9E-06
5	59.55	11.91	9.0	1.99E-04	11.5	5.1E-06

Q ave: 2.95E-04 (m^3/sec)

Comments: Static WL estimated at 4.0 m below ground. Flow rate measured in Igal and converted to Litres.



Graphical Analysis

Q ave: 2.95E-04 (m^3/sec)

Head H from Plot: 16.86 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 5.1E-06 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-03

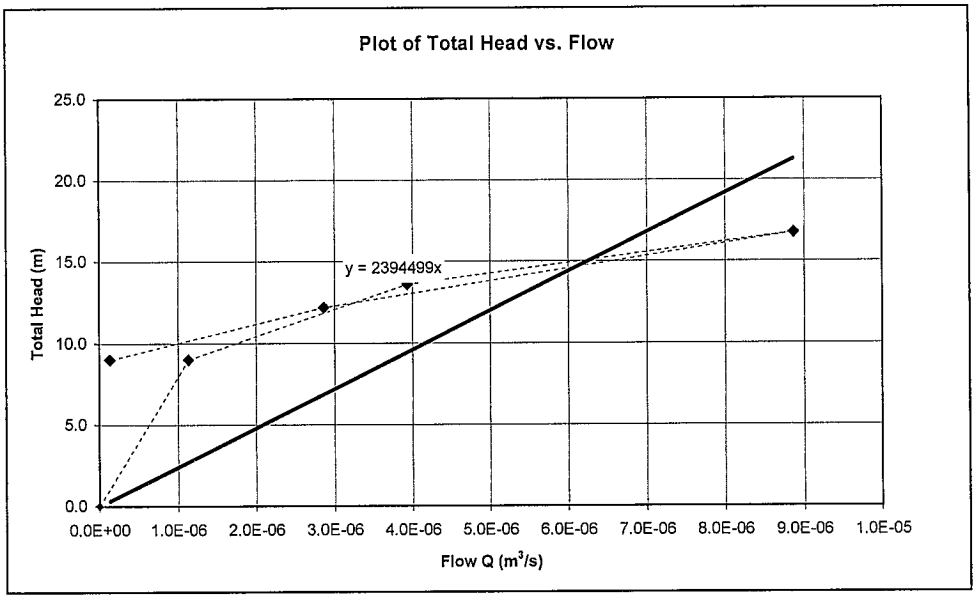
Water Test Interval: 5.75m to 7.97m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Right Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 4/04
Static W.L. from stick-up:	4.00 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	4.00 m (vertical)
Height of gauge A.G.L.:	1.14 m (vertical)
Bottom of Interval:	7.97 m
Top of Interval:	5.75 m
Length of Interval L:	2.22 m
Middle of Interval to D.F.:	6.86 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
5	.34	0.07	5.5	1.13E-06	9.0	3.7E-08
5	1.18	0.24	12.0	3.93E-06	13.6	8.5E-08
5	2.66	0.53	16.5	8.87E-06	16.7	1.5E-07
5	.86	0.17	10.0	2.87E-06	12.2	6.9E-08
5	0.04	0.01	5.5	1.33E-07	9.0	4.3E-09

Q ave: 3.39E-06 (m^3/sec)

Comments: Static WL estimated at 4.0 m below ground. Flow rate measured in Igal and converted to L. Volume of 0.04L for a 5 min test was input when "take" was 0, which is estimated lowest flow possibly read with this flow meter.



Graphical Analysis

Q ave: 3.39E-06 (m^3/sec)

Head H from Plot: 8.11 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 1.2E-07 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-03

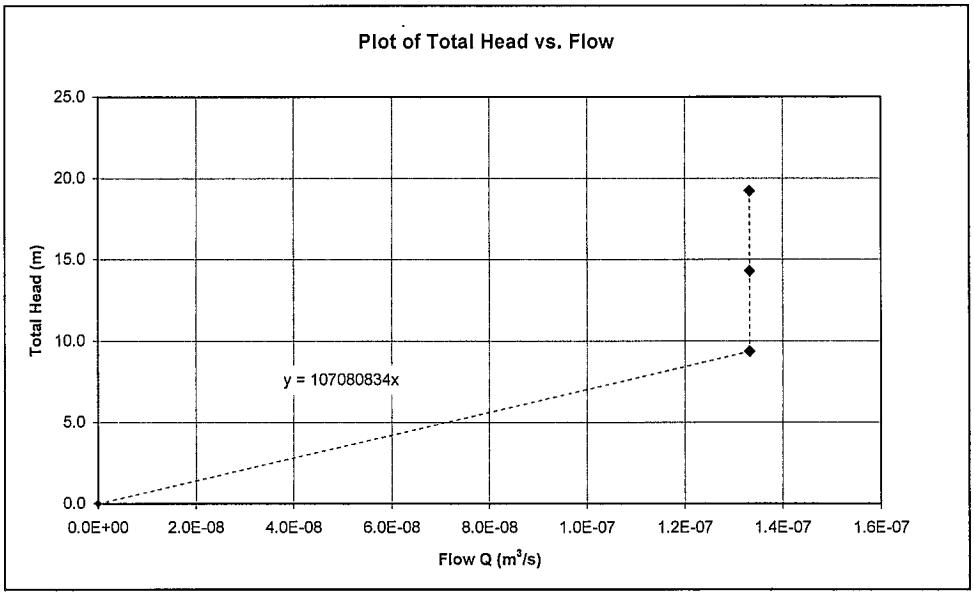
Water Test Interval: 8.49m to 10.71m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Right Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 4/04
Static W.L. from stick-up:	4.00 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	4.00 m (vertical)
Height of gauge A.G.L.:	1.14 m (vertical)
Bottom of Interval:	10.71 m
Top of Interval:	8.49 m
Length of Interval L:	2.22 m
Middle of Interval to D.F.:	9.60 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
5	0.04	0.01	6.0	1.33E-07	9.4	4.2E-09
5	0.04	0.01	13.0	1.33E-07	14.3	2.7E-09
5	0.04	0.01	20.0	1.33E-07	19.2	2.0E-09

Q ave: 1.33E-07 (m^3/sec)

Comments: Static WL estimated at 4.0 m below ground. Flow rate measured in lgal and converted to L. Volume of 0.04L for a 5 min test was input when "take" was 0, which is estimated lowest flow possibly read with this flow meter.



Graphical Analysis

Q ave: 1.33E-07 (m^3/sec)

Head H from Plot: 14.28 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 2.7E-09 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-03

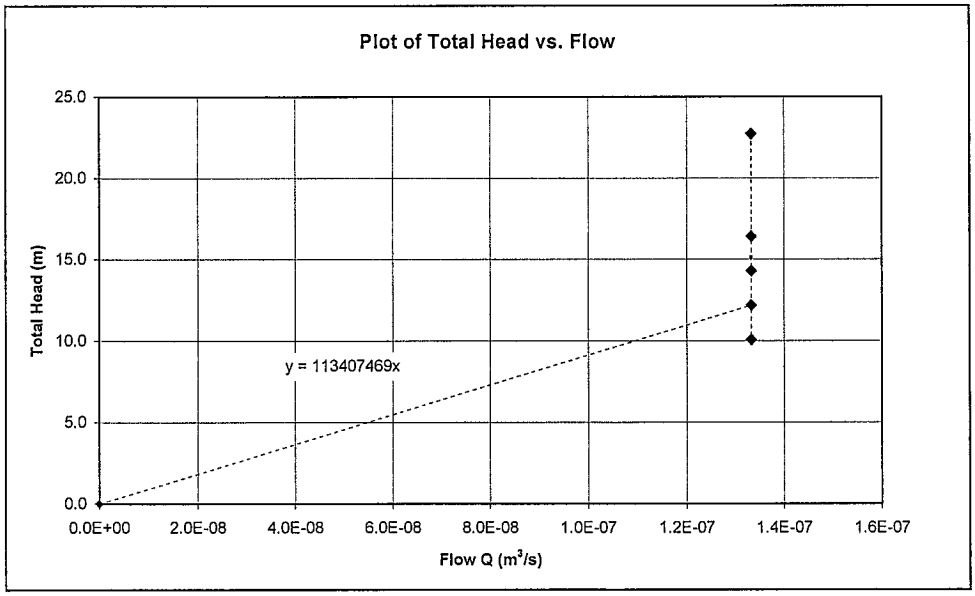
Water Test Interval: 11.24m to 13.46m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Right Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 4/04
Static W.L. from stick-up:	4.00 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	4.00 m (vertical)
Height of gauge A.G.L.:	1.14 m (vertical)
Bottom of Interval:	13.46 m
Top of Interval:	11.24 m
Length of Interval L:	2.22 m
Middle of Interval to D.F.:	12.35 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
5	0.04	0.01	10.0	1.33E-07	12.2	3.2E-09
5	0.04	0.01	16.0	1.33E-07	16.4	2.4E-09
5	0.04	0.01	25.0	1.33E-07	22.7	1.7E-09
5	0.04	0.01	13.0	1.33E-07	14.3	2.7E-09
5	0.04	0.01	7.0	1.33E-07	10.1	3.9E-09

Q ave: 1.33E-07 (m^3/sec)

Comments: Static WL estimated at 4.0 m below ground. Flow rate measured in Igal and converted to L. Volume of 0.04L for a 5 min test was input when "take" was 0, which is estimated lowest flow possibly read with this flow meter.



Graphical Analysis

Q ave: 1.33E-07 (m^3/sec)

Head H from Plot: 15.11 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 2.6E-09 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-03

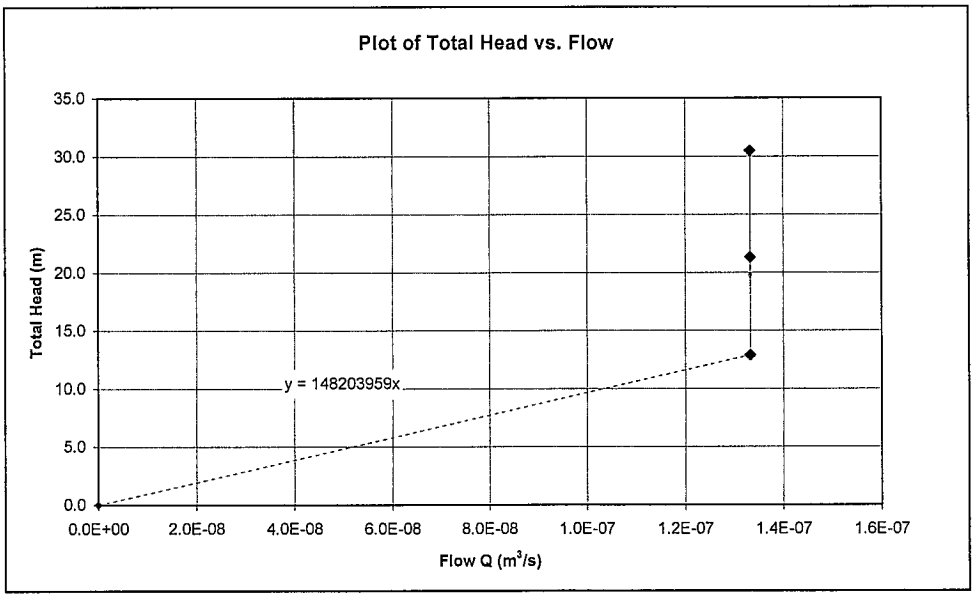
Water Test Interval: 16.72m to 18.94m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Right Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 4/04
Static W.L. from stick-up:	4.00 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	4.00 m (vertical)
Height of gauge A.G.L.:	1.14 m (vertical)
Bottom of Interval:	18.94 m
Top of Interval:	16.72 m
Length of Interval L:	2.22 m
Middle of Interval to D.F.:	17.83 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
5	0.04	0.01	11.0	1.33E-07	12.9	3.0E-09
5	0.04	0.01	23.0	1.33E-07	21.3	1.8E-09
5	0.04	0.01	36.0	1.33E-07	30.5	1.3E-09
5	0.04	0.01	23.0	1.33E-07	21.3	1.8E-09
5	0.04	0.01	11.0	1.33E-07	12.9	3.0E-09

Q ave: 1.33E-07 (m^3/sec)

Comments: Static WL estimated at 4.0 m below ground. Flow rate measured in lgal and converted to L. Volume of 0.04L for a 5 min test was input when "take" was 0, which is estimated lowest flow possibly read with this flow meter.



Graphical Analysis

Q ave: 1.33E-07 (m^3/sec)

Head H from Plot: 19.76 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 2.0E-09 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-03

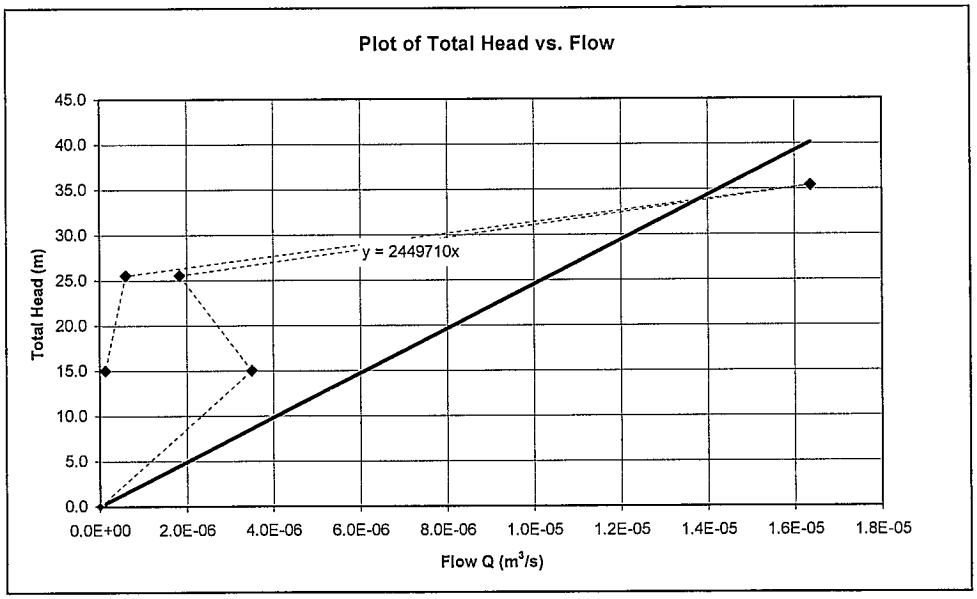
Water Test Interval: 19.46m to 21.68m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Right Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 4/04
Static W.L. from stick-up:	4.00 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	4.00 m (vertical)
Height of gauge A.G.L.:	1.14 m (vertical)
Bottom of Interval:	21.68 m
Top of Interval:	19.46 m
Length of Interval L:	2.22 m
Middle of Interval to D.F.:	20.57 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
5	1.05	0.21	14.0	3.50E-06	15.0	6.8E-08
5	0.55	0.11	29.0	1.83E-06	25.5	2.1E-08
5	4.91	0.98	43.0	1.64E-05	35.4	1.4E-07
5	0.18	0.04	29.0	6.00E-07	25.5	6.9E-09
5	0.04	0.01	14.0	1.33E-07	15.0	2.6E-09

Q ave: 4.49E-06 (m^3/sec)

Comments: Static WL estimated at 4.0 m below ground. Flow rate measured in lgal and converted to L. Volume of 0.04L for a 5 min test was input when "take" was 0, which is estimated lowest flow possibly read with this flow meter.



Graphical Analysis

Q ave: 4.49E-06 (m^3/sec)

Head H from Plot: 10.99 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 1.2E-07 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-03

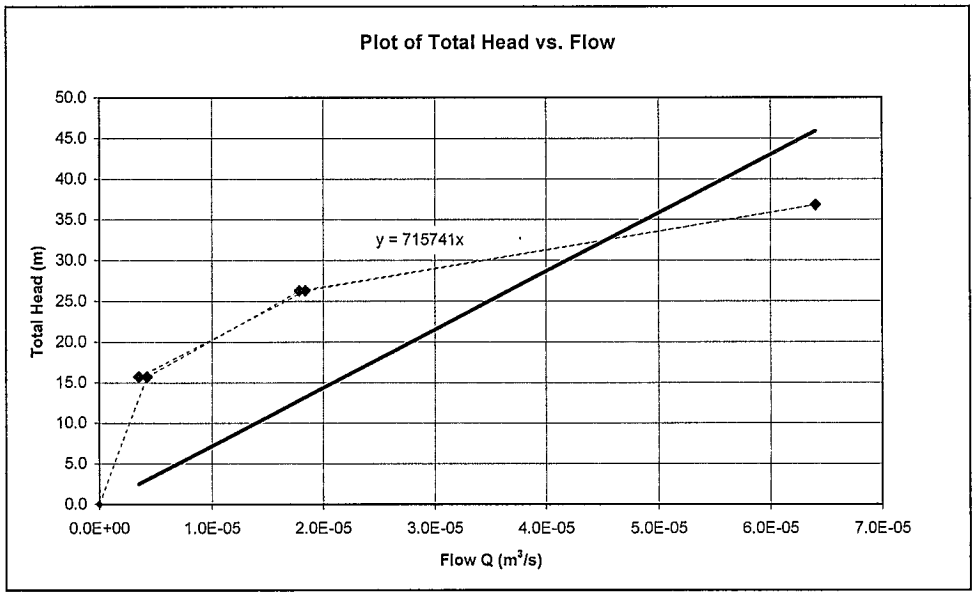
Water Test Interval: 21.90m to 24.12m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Right Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 4/04
Static W.L. from stick-up:	4.00 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	4.00 m (vertical)
Height of gauge A.G.L.:	1.14 m (vertical)
Bottom of Interval:	24.12 m
Top of Interval:	21.90 m
Length of Interval L:	2.22 m
Middle of Interval to D.F.:	23.01 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
5	1.27	0.25	15.0	4.23E-06	15.7	7.9E-08
5	5.36	1.07	30.0	1.79E-05	26.2	2.0E-07
5	19.21	3.84	45.0	6.40E-05	36.8	5.1E-07
5	5.52	1.10	30.0	1.84E-05	26.2	2.1E-07
5	1.05	0.21	15.0	3.50E-06	15.7	6.5E-08

Q ave: 2.16E-05 (m^3/sec)

Comments: Static WL estimated at 4.0 m below ground. Flow rate measured in lgal and converted.



Graphical Analysis

Q ave: 2.16E-05 (m^3/sec)

Head H from Plot: 15.47 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 4.1E-07 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-04

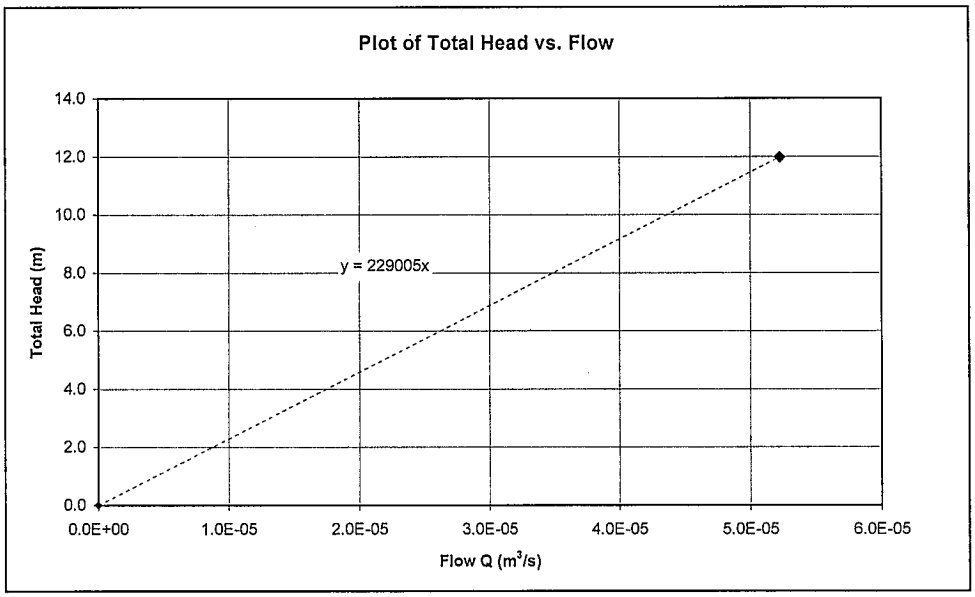
Water Test Interval: 2.79m to 5.79m (Single Packer)

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Left Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 8/04
Static W.L. from stick-up:	5.75 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	5.75 m (vertical)
Height of gauge A.G.L.:	1.30 m (vertical)
Bottom of Interval:	5.79 m
Top of Interval:	2.79 m
Length of Interval L:	3.00 m
Middle of Interval to D.F.:	4.29 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Pressure (psi)	Q (m^3/sec)	Pressure (mH_2O)	K (m/sec)
5	15.68	3.14	7.0	5.23E-05	12.0	1.0E-06

Q ave: 5.23E-05 (m^3/sec)

Comments: Static WL measured at 5.75 m below ground. Flow rate measured in Igal and converted to L.



Graphical Analysis

Q ave: 5.23E-05 (m^3/sec)

Head H from Plot: 11.97 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 1.0E-06 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-04

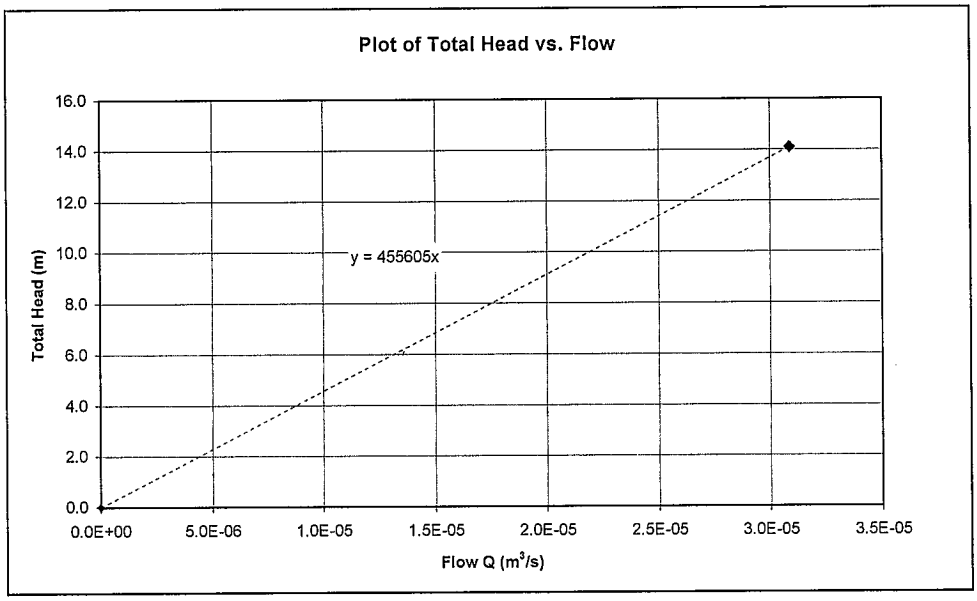
Water Test Interval: 3.61m to 7.36m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Left Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 9/04
Static W.L. from stick-up:	5.75 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	5.75 m (vertical)
Height of gauge A.G.L.:	1.30 m (vertical)
Bottom of Interval:	7.36 m
Top of Interval:	3.61 m
Length of Interval L:	3.75 m
Middle of Interval to D.F.:	5.49 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
5	9.27	1.85	10.0	3.09E-05	14.1	4.3E-07

Q ave: 3.09E-05 (m^3/sec)

Comments: Static WL measured at 5.75 m below ground. Flow rate measured in Igal and converted to L.



Graphical Analysis

Q ave: 3.09E-05 (m^3/sec)

Head H from Plot: 14.08 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 4.3E-07 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-04

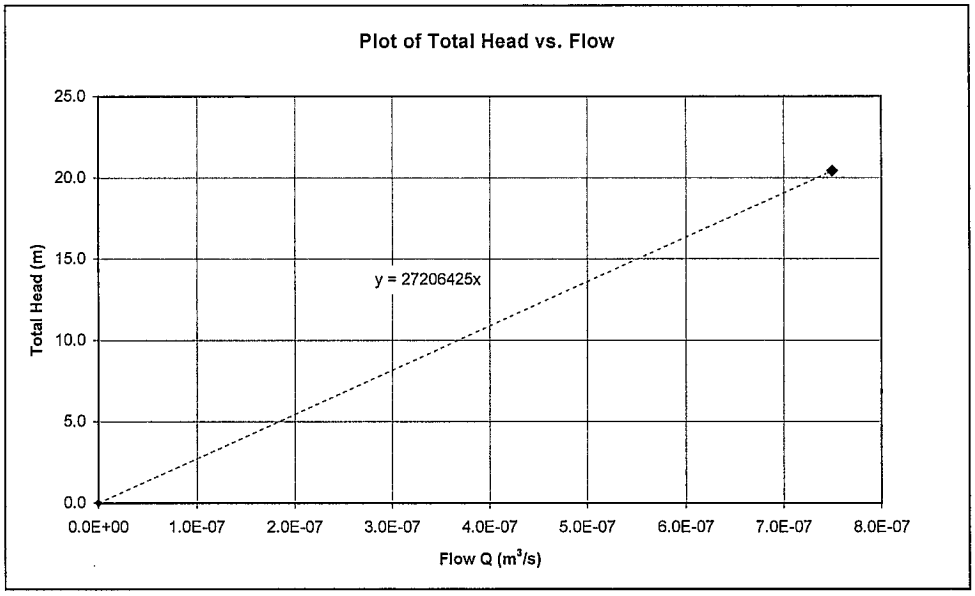
Water Test Interval: 7.27m to 11.02m

Project Number:	0257-027-01	
Client:	Deloitte & Touche Inc.	
Project Site:	Plug Dam	
General Location:	Left Abutment	
North Coordinate:	6914159	
East Coordinate:	584896	
Azimuth:		deg
Dip:	90	deg
Date:	Sept 9/04	
Static W.L. from stick-up:	5.75	m
Stick-up A.G.L. along dip:	0.00	m
Static W.L. below G.L.:	5.75	m (vertical)
Height of gauge A.G.L.:	1.30	m (vertical)
Bottom of Interval:	11.02	m
Top of Interval:	7.27	m
Length of Interval L:	3.75	m
Middle of Interval to D.F.:	9.15	m (vertical)
Open Hole Radius R:	0.0375	m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
10	0.45	0.05	19.0	7.50E-07	20.4	7.2E-09

Q ave: 7.50E-07 (m^3/sec)

Comments: Static WL measured at 5.75 m below ground. Flow rate measured in Igal and converted to L.



Graphical Analysis

Q ave: 7.50E-07 (m^3/sec)

Head H from Plot: 20.41 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 7.2E-09 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-04

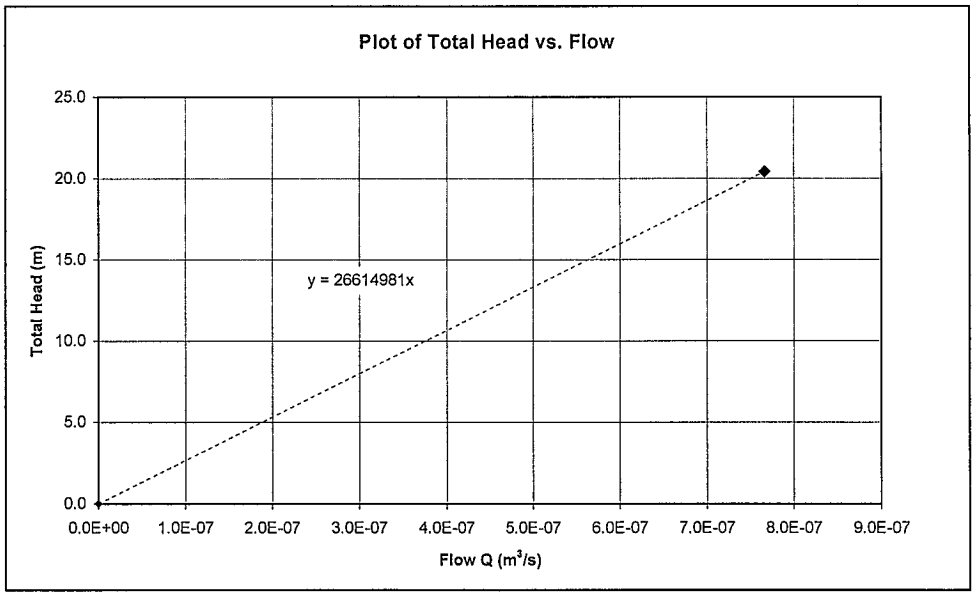
Water Test Interval: 10.92m to 14.67m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Left Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 9/04
Static W.L. from stick-up:	5.75 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	5.75 m (vertical)
Height of gauge A.G.L.:	1.30 m (vertical)
Bottom of Interval:	14.67 m
Top of Interval:	10.92 m
Length of Interval L:	3.75 m
Middle of Interval to D.F.:	12.80 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
5	0.23	0.05	19.0	7.67E-07	20.4	7.3E-09

Q ave: 7.67E-07 (m^3/sec)

Comments: Static WL measured at 5.75 m below ground. Flow rate measured in Igal and converted to L.



Graphical Analysis

Q ave: 7.67E-07 (m^3/sec)

Head H from Plot: 20.41 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 7.3E-09 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-04

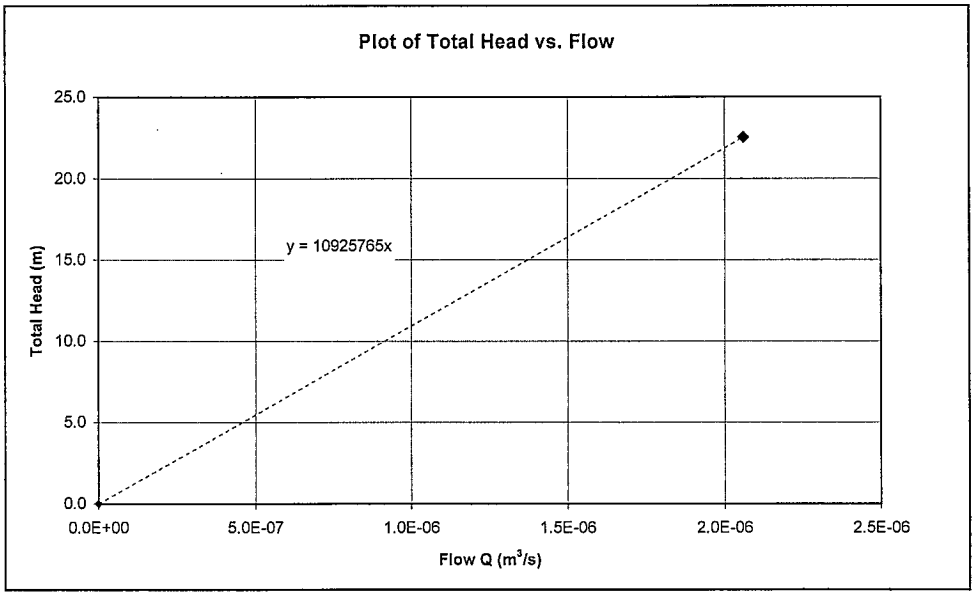
Water Test Interval: 14.58m to 18.33m

Project Number:	0257-027-01	
Client:	Deloitte & Touche Inc.	
Project Site:	Plug Dam	
General Location:	Left Abutment	
North Coordinate:	6914159	
East Coordinate:	584896	
Azimuth:		deg
Dip:	90	deg
Date:	Sept 9/04	
Static W.L. from stick-up:	5.75	m
Stick-up A.G.L. along dip:	0.00	m
Static W.L. below G.L.:	5.75	m (vertical)
Height of gauge A.G.L.:	1.30	m (vertical)
Bottom of Interval:	18.33	m
Top of Interval:	14.58	m
Length of Interval L:	3.75	m
Middle of Interval to D.F.:	16.46	m (vertical)
Open Hole Radius R:	0.0375	m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
11	1.36	0.12	22.0	2.06E-06	22.5	1.8E-08

Q ave: 2.06E-06 (m^3/sec)

Comments: Static WL measured at 5.75 m below ground. Flow rate measured in Igal and converted to L.



Graphical Analysis

Q ave: 2.06E-06 (m^3/sec)

Head H from Plot: 22.52 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 1.8E-08 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-04

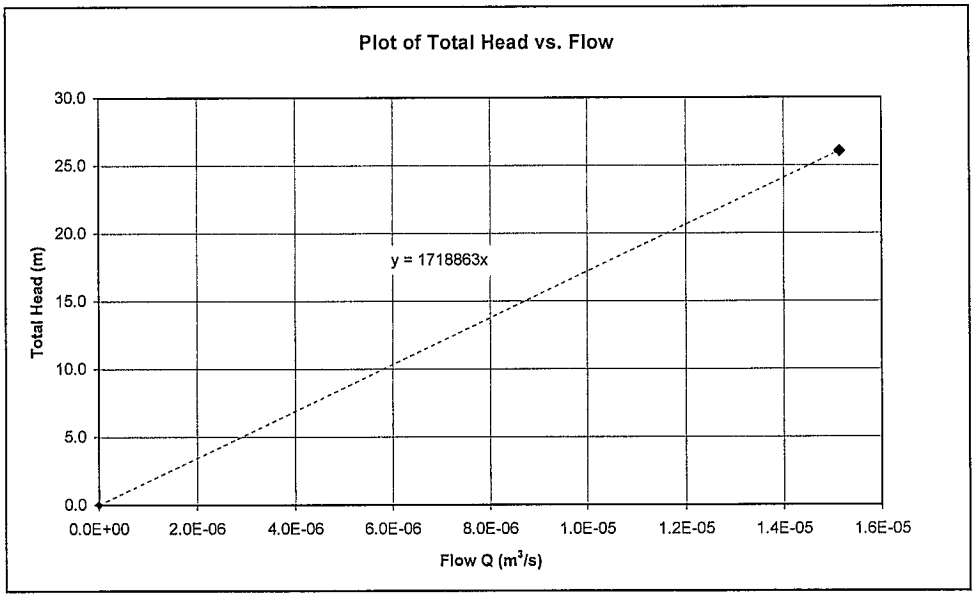
Water Test Interval: 18.24m to 21.99m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Left Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 9/04
Static W.L. from stick-up:	5.75 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	5.75 m (vertical)
Height of guage A.G.L.:	1.30 m (vertical)
Bottom of Interval:	21.99 m
Top of Interval:	18.24 m
Length of Interval L:	3.75 m
Middle of Interval to D.F.:	20.12 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
7	6.36	0.91	27.0	1.51E-05	26.0	1.1E-07

Q ave: 1.51E-05 (m^3/sec)

Comments: Static WL measured at 5.75 m below ground. Flow rate measured in Igal and converted to L.



Graphical Analysis

Q ave: 1.51E-05 (m^3/sec)

Head H from Plot: 26.03 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 1.1E-07 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-04

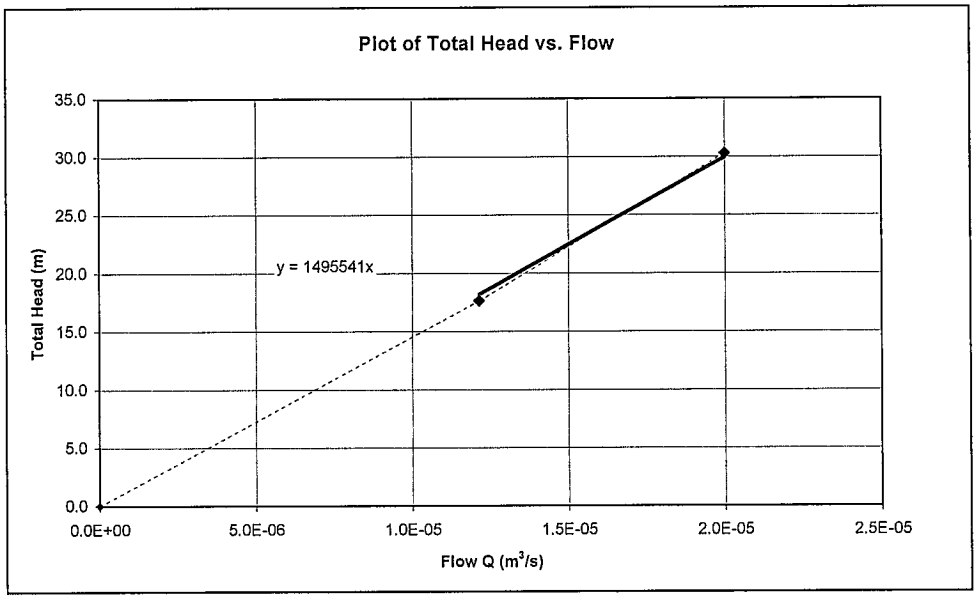
Water Test Interval: 21.90m to 25.65m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Left Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 9/04
Static W.L. from stick-up:	5.75 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	5.75 m (vertical)
Height of gauge A.G.L.:	1.30 m (vertical)
Bottom of Interval:	25.65 m
Top of Interval:	21.90 m
Length of Interval L:	3.75 m
Middle of Interval to D.F.:	23.78 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
5	3.64	0.73	15.0	1.21E-05	17.6	1.3E-07
5	6.00	1.20	33.0	2.00E-05	30.3	1.3E-07

Q ave: 1.61E-05 (m^3/sec)

Comments: Static WL measured at 5.75 m below ground. Flow rate measured in Igal and converted to L.



Graphical Analysis

Q ave: 1.61E-05 (m^3/sec)

Head H from Plot: 24.03 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 1.3E-07 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-04

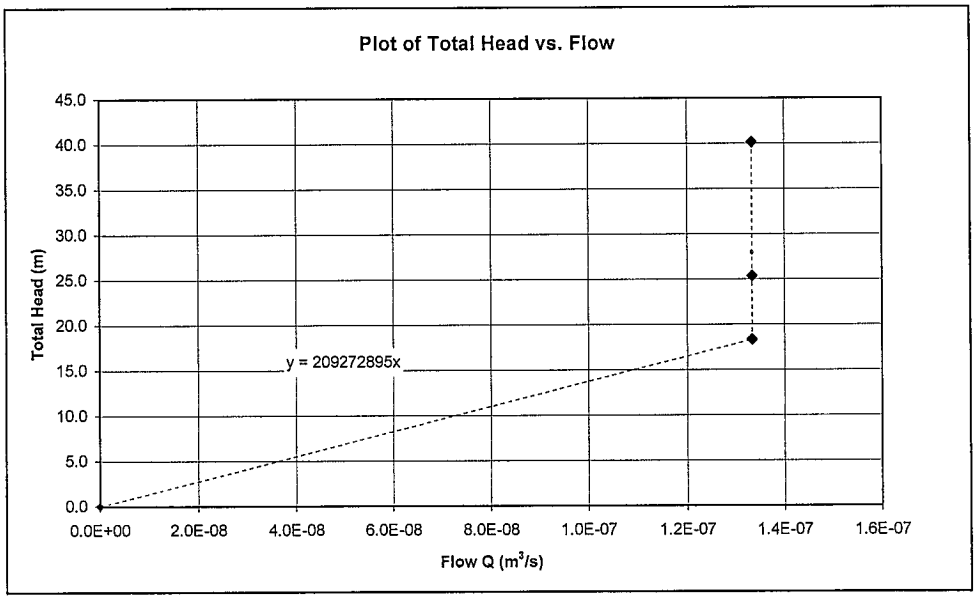
Water Test Interval: 25.56m to 29.30m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Left Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 9/04
Static W.L. from stick-up:	5.75 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	5.75 m (vertical)
Height of gauge A.G.L.:	1.30 m (vertical)
Bottom of Interval:	29.30 m
Top of Interval:	25.56 m
Length of Interval L:	3.74 m
Middle of Interval to D.F.:	27.43 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
5	0.04	0.01	16.0	1.33E-07	18.3	1.4E-09
5	0.04	0.01	26.0	1.33E-07	25.3	1.0E-09
5	0.04	0.01	47.0	1.33E-07	40.1	6.5E-10

Q ave: 1.33E-07 (m^3/sec)

Comments: Static WL measured at 5.75 m below ground. Flow rate measured in Igal and converted to L.



Graphical Analysis

Q ave: 1.33E-07 (m^3/sec)

Head H from Plot: 27.91 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 9.4E-10 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-04

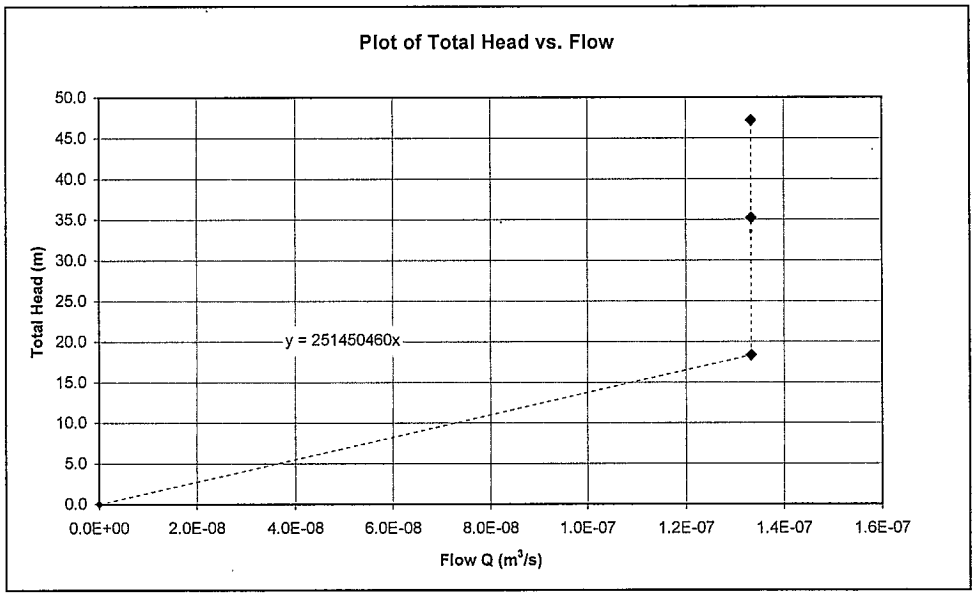
Water Test Interval: 29.78m to 33.53m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Left Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 9/04
Static W.L. from stick-up:	5.75 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	5.75 m (vertical)
Height of gauge A.G.L.:	1.30 m (vertical)
Bottom of Interval:	33.53 m
Top of Interval:	29.78 m
Length of Interval L:	3.75 m
Middle of Interval to D.F.:	31.66 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
5	0.04	0.01	16.0	1.33E-07	18.3	1.4E-09
5	0.04	0.01	40.0	1.33E-07	35.2	7.4E-10
5	0.04	0.01	57.0	1.33E-07	47.1	5.5E-10

Q ave: 1.33E-07 (m^3/sec)

Comments: Static WL measured at 5.75 m below ground. Flow rate measured in Igal and converted to L.



Graphical Analysis

Q ave: 1.33E-07 (m^3/sec)

Head H from Plot: 33.53 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 7.8E-10 m/s

Constant Head (Lugeon) Test Analysis

Diamond Drillhole: BGC04-04

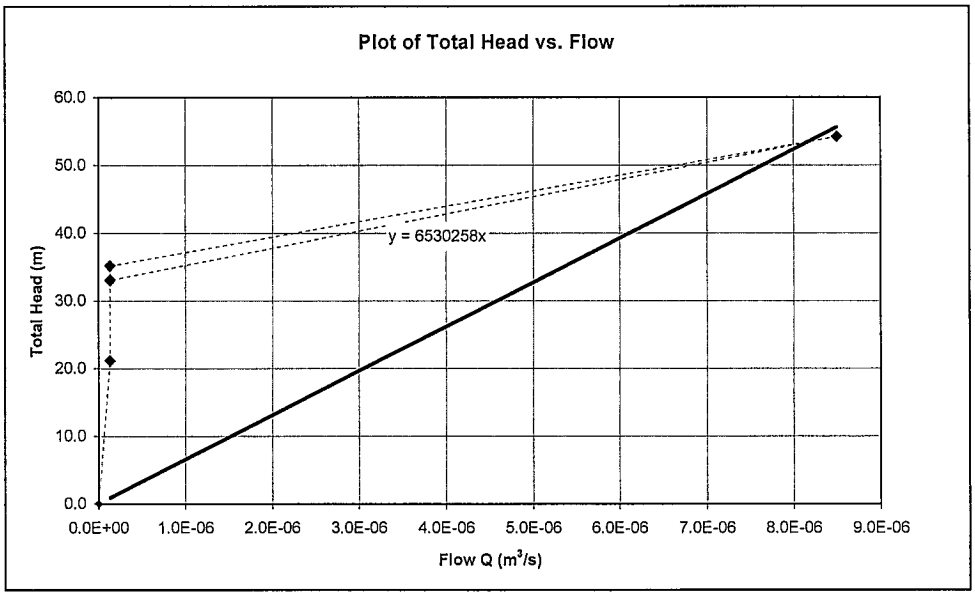
Water Test Interval: 32.57m to 36.32m

Project Number:	0257-027-01
Client:	Deloitte & Touche Inc.
Project Site:	Plug Dam
General Location:	Left Abutment
North Coordinate:	6914159
East Coordinate:	584896
Azimuth:	deg
Dip:	90 deg
Date:	Sept 9/04
Static W.L. from stick-up:	5.75 m
Stick-up A.G.L. along dip:	0.00 m
Static W.L. below G.L.:	5.75 m (vertical)
Height of gauge A.G.L.:	1.30 m (vertical)
Bottom of Interval:	36.32 m
Top of Interval:	32.57 m
Length of Interval L:	3.75 m
Middle of Interval to D.F.:	34.45 m (vertical)
Open Hole Radius R:	0.0375 m

Time (min)	Volume (Litres)	Q (Lpm)	Gauge Pressure (psi)	Q (m^3/sec)	Total Head (mH_2O)	K (m/sec)
5	0.04	0.01	20.0	1.33E-07	21.1	1.2E-09
5	0.04	0.01	40.0	1.33E-07	35.2	7.4E-10
5	2.55	0.51	67.0	8.50E-06	54.2	3.1E-08
5	0.04	0.01	37.0	1.33E-07	33.1	7.9E-10

Q ave: 2.23E-06 (m^3/sec)

Comments: Static WL measured at 5.75 m below ground. Flow rate measured in lgal and converted to L.



Graphical Analysis

Q ave: 2.23E-06 (m^3/sec)

Head H from Plot: 14.53 (m)

$$K = \frac{Q\ln(L/R)}{2(pi)LH}$$

K = 3.0E-08 m/s

APPENDIX III - LABORATORY ANALYSIS

Laboratory Testing Summary
BGC - Anvil Range Mine September 2004
Project # 1200091.015

Borehole Number	Sample Number	Moisture Content (%)	Grain Size Distribution (%)				Atterberg Limits (%)			Standard Proctor			
			Clay	Silt	Sand	Gravel	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Dry Density	Optimum Water Content		
BGCTP04-01	GWF - 1	10.7											
BGCTP04-02	GWF - 3	11.1											
BGCTP04-03	GWF - 4	8.9	38.8		41.4	19.8	22	13	9				
BGCTP04-03	GWF - 5	8.5	20.9		43.3	35.8	22	15	7				
BGCTP04-03	GWF - 6	10.1	24.2		43.3	32.5	19	10	9				
BGCTP04-03	GWF - 7	8.2	27.3		52.1	20.6	21	8	13				
BGCTP04-03	GWF - 8	5.3	13.2		28.4	58.4	25	15	10				
BGCTP04-03	GWF - 9	10.0	39.1		41.2	19.7	21	7	14				
BGCTP04-04	GWF - 10	10.1											
BGCTP04-04	GWF - 11	8.8	28.5		55.9	15.6	18	7	11				
BGCTP04-04	GWF - 12	8.6											
BGCTP04-05	GWF - 13	7.9								2,065 kg/m^3	11%		
BGCTP04-05	GWF - 14	9.5					23	10	13				
BGCTP04-05	GWF - 15	8.0											
BGCTP04-05	GWF - 16	6.8											
BGCTP04-06	GWF - 17	8.0	31.6		57.0	11.4	17	13	4				
BGCTP04-06	GWF - 18	9.0	26.9		54.6	18.5							
BGCTP04-06	GWF - 19	8.4	23.9		51.0	25.1							
BGCTP04-08	GWF - 20	8.9											
	GWF - 21	10.0											
	GWF - 22	8.1											
	GWF - 23	8.0											
	GWF - 24	6.5											
	GWF - 25	7.2											
	GWF - 26	7.6											
	GWF - 27	8.7											
	GWF - 28	9.0	15.6		43.6	40.8							
	GWF - 29	8.8	17.2		53.7	29.1							
	GWF - 30	5.5	13.4		44.3	42.3							

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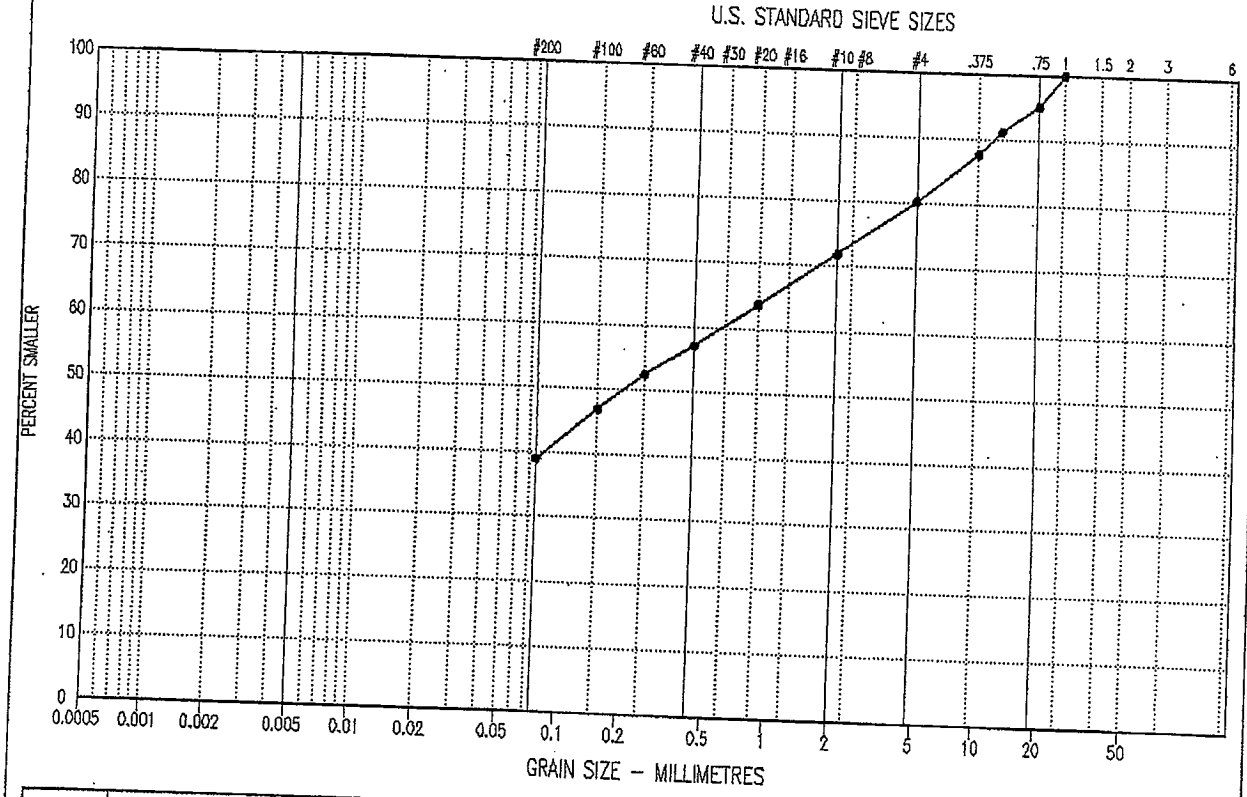
PARTICLE SIZE – ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●	TP04–03	1.50	39	41	20	–	–	

Project: 0201–1200091.015

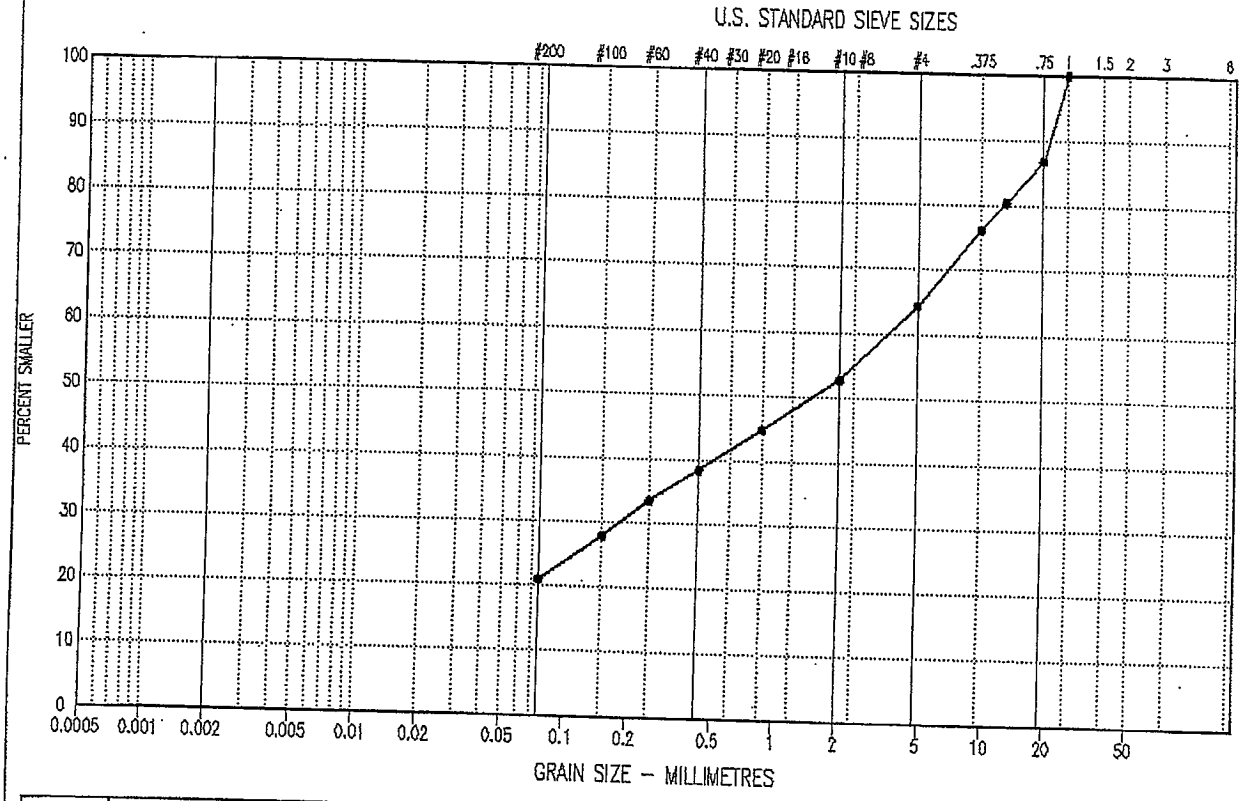
Date Tested: 04/09/22 BY: MS

Tested in accordance with ASTM D422 unless otherwise noted.

EBA Engineering

PARTICLE SIZE – ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●	TP04–03	2.40	21	43	36	–	–	

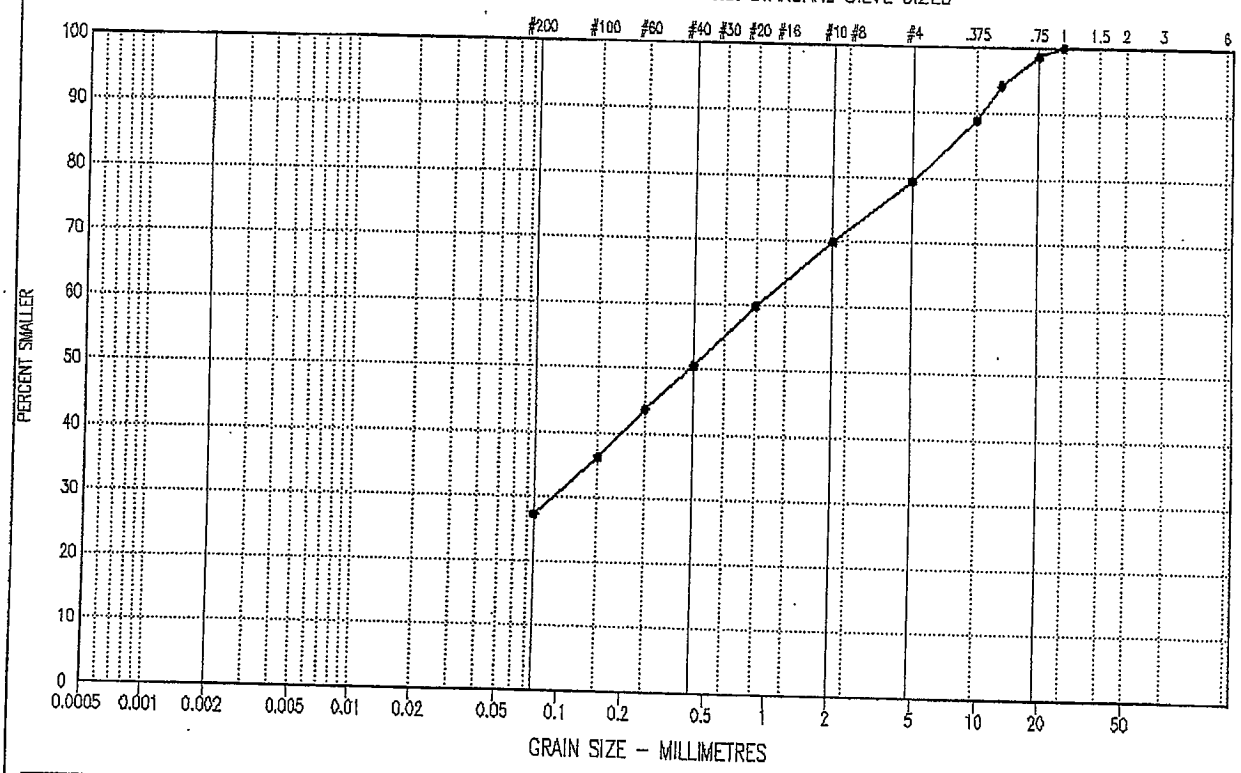
Project: 0201–1200091.015 Date Tested: 04/09/22 BY: MS

Tested in accordance with ASTM D422 unless otherwise noted.

EBA Engineering

PARTICLE SIZE – ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●—●	TP04-03	3.80	27	52	21	–	–	

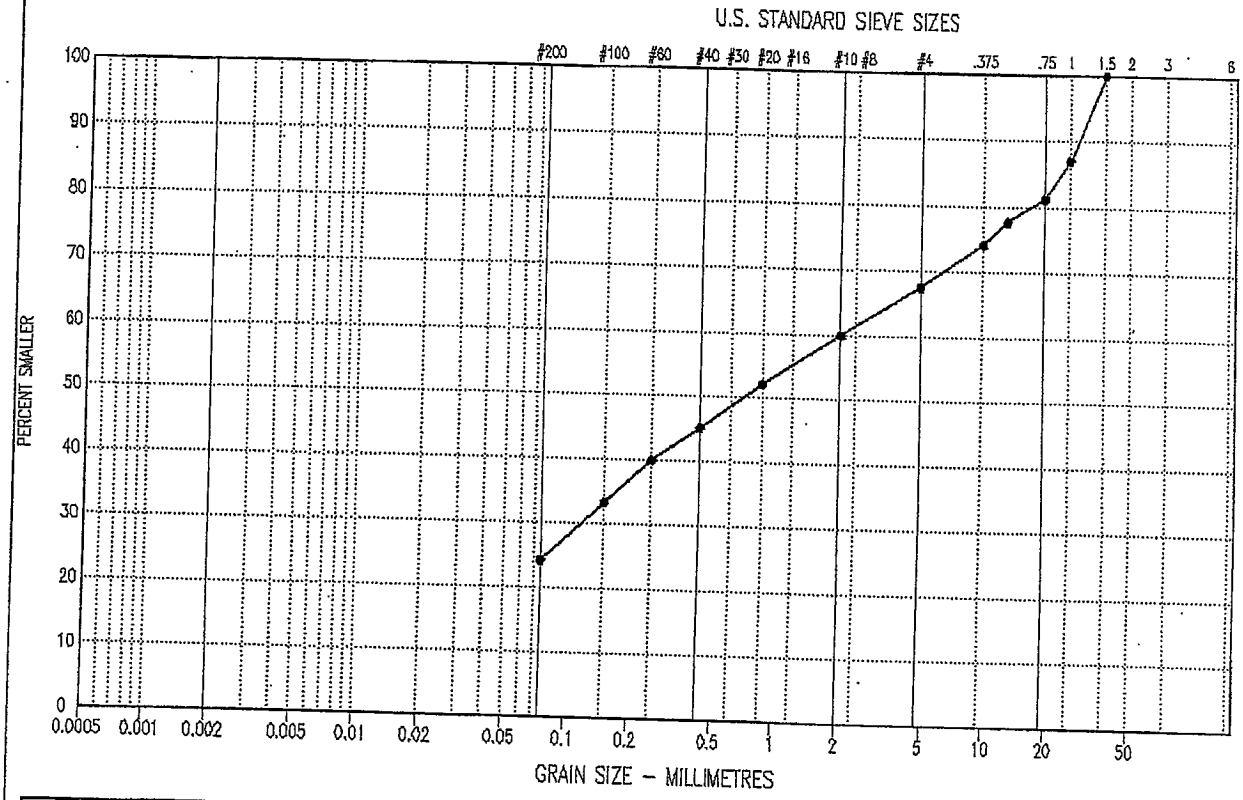
Project: 0201-1200091.015 Date Tested: 04/09/22 BY: MS

Tested in accordance with ASTM D422 unless otherwise noted.

EBA Engineering

PARTICLE SIZE – ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●	TP04-03	3.20	24	43	33	–	–	

Project: 0201-1200091.015

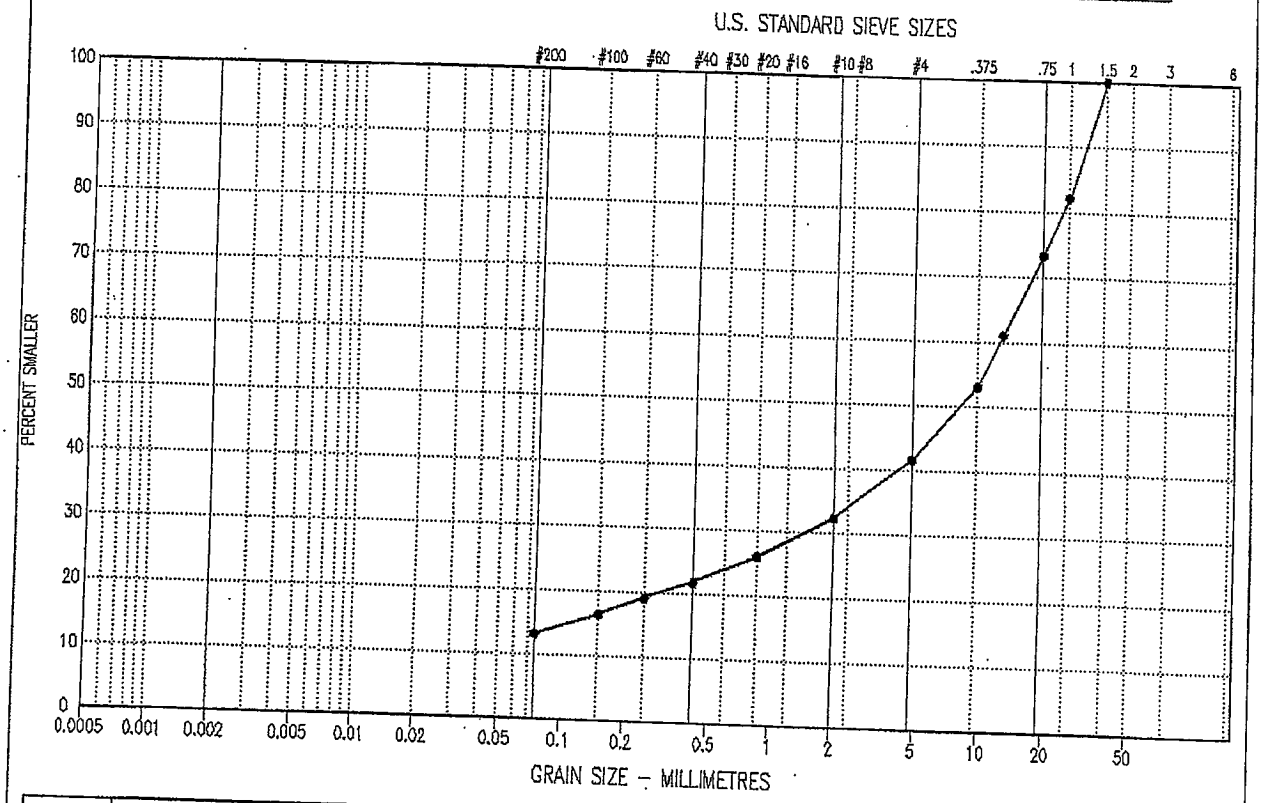
Date Tested: 04/09/22 BY: MS

Tested in accordance with ASTM D422 unless otherwise noted.

EBA Engineering

PARTICLE SIZE – ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●—●	TP04-03	4.00	13	28	59	–	–	

Project: 0201-1200091.015

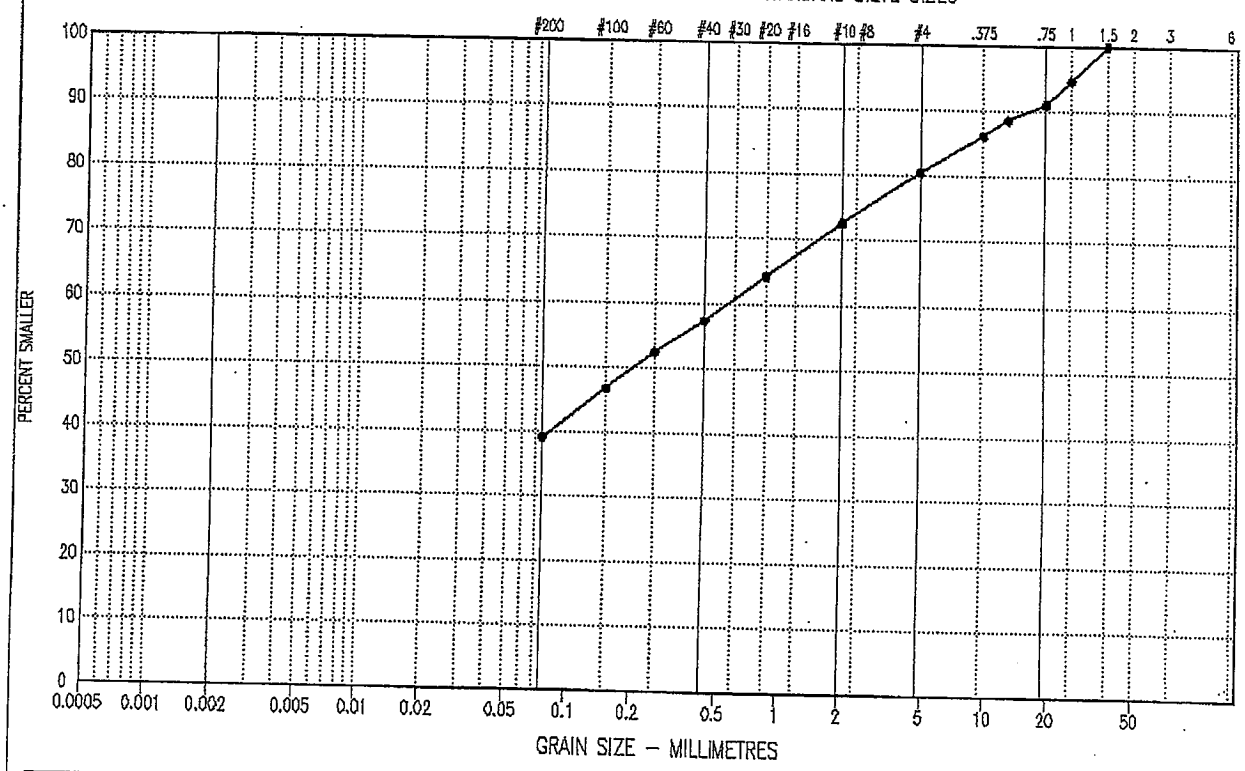
Date Tested: 04/09/22 BY: MS

Tested in accordance with ASTM D422 unless otherwise noted.

EBA Engineering

PARTICLE SIZE – ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●—●	TP04-03	0.70	39	41	20	–	–	

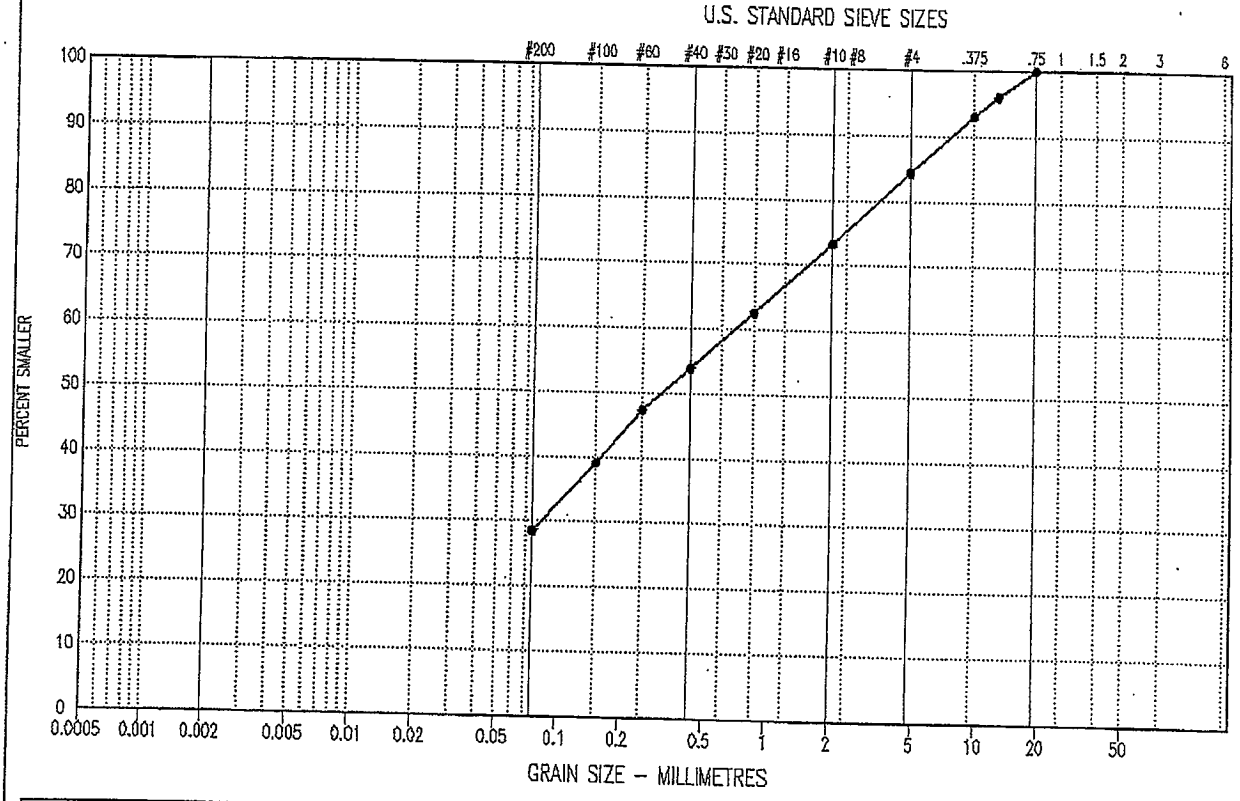
Project: 0201-1200091.015 Date Tested: 04/09/22 BY: MS

Tested in accordance with ASTM D422 unless otherwise noted.

EBA Engineering

PARTICLE SIZE – ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●—●	TP04-04	0.50	28	56	16	–	–	

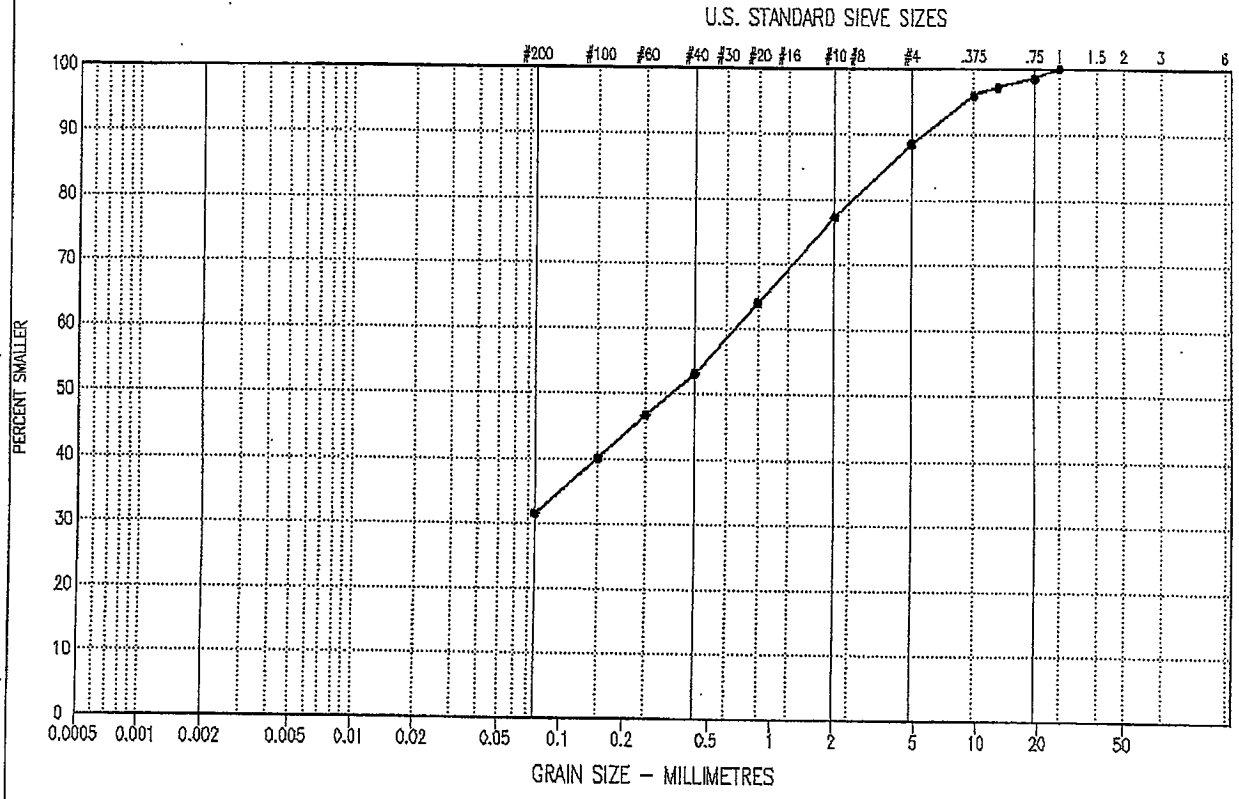
Project: 0201-1200091.015 Date Tested: 04/09/22 BY: MS

Tested in accordance with ASTM D422 unless otherwise noted.

EBA Engineering

PARTICLE SIZE – ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●—●	TP04-06	3.90	32	57	12	–	–	

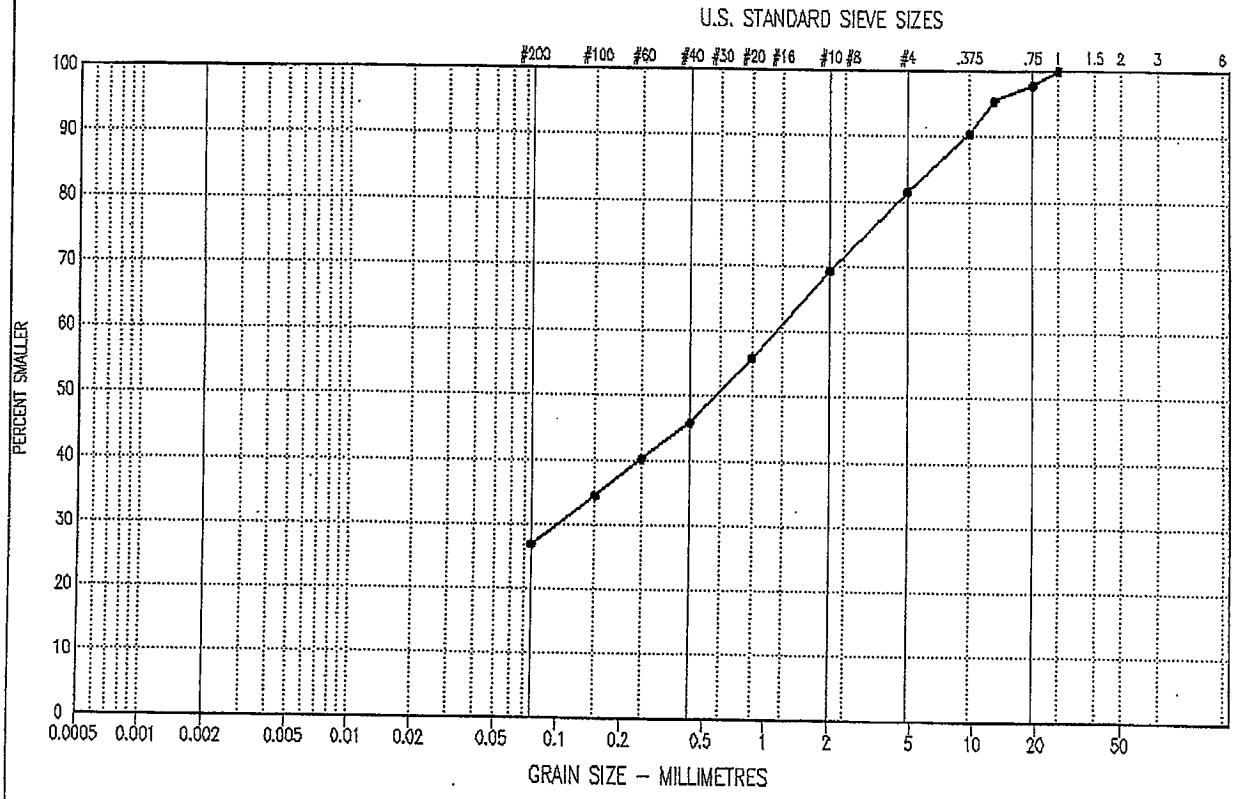
Project: 0201-1200091.015 Date Tested: 04/09/22 BY: MS

Tested in accordance with ASTM D422 unless otherwise noted.

EBA Engineering

PARTICLE SIZE – ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●—●	TP04-06	4.20	27	55	19	–	–	

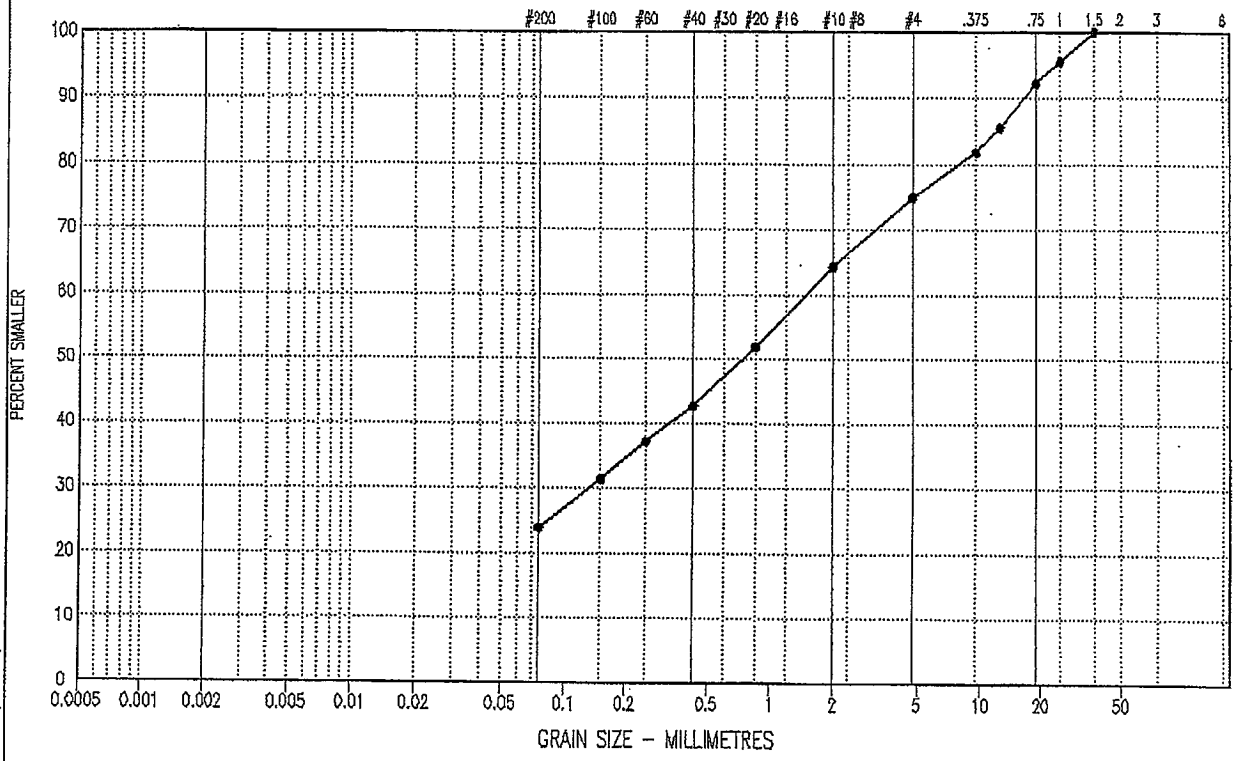
Project: 0201-1200091.015 Date Tested: 04/09/22 BY: MS

Tested in accordance with ASTM D422 unless otherwise noted.

EBA Engineering

PARTICLE SIZE – ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●—●	TP04-06	1.50	24	51	25	–	–	

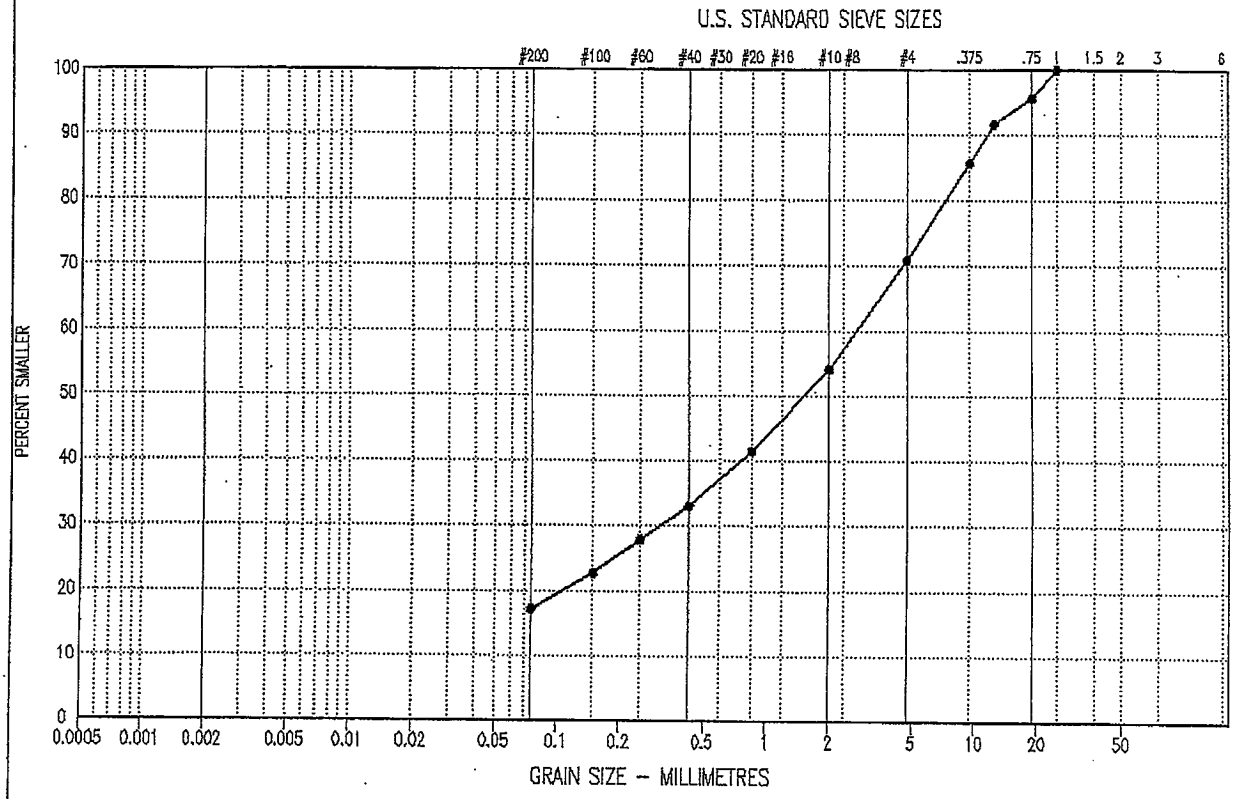
Project: 0201-1200091.015 Date Tested: 04/09/22 BY: MS

Tested in accordance with ASTM D422 unless otherwise noted.

EBA Engineering

PARTICLE SIZE – ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



SYMBOL	BOREHOLE NUMBER	DEPTH (ft)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●—●	TP04-08	0.00	17	54	29	–	–	

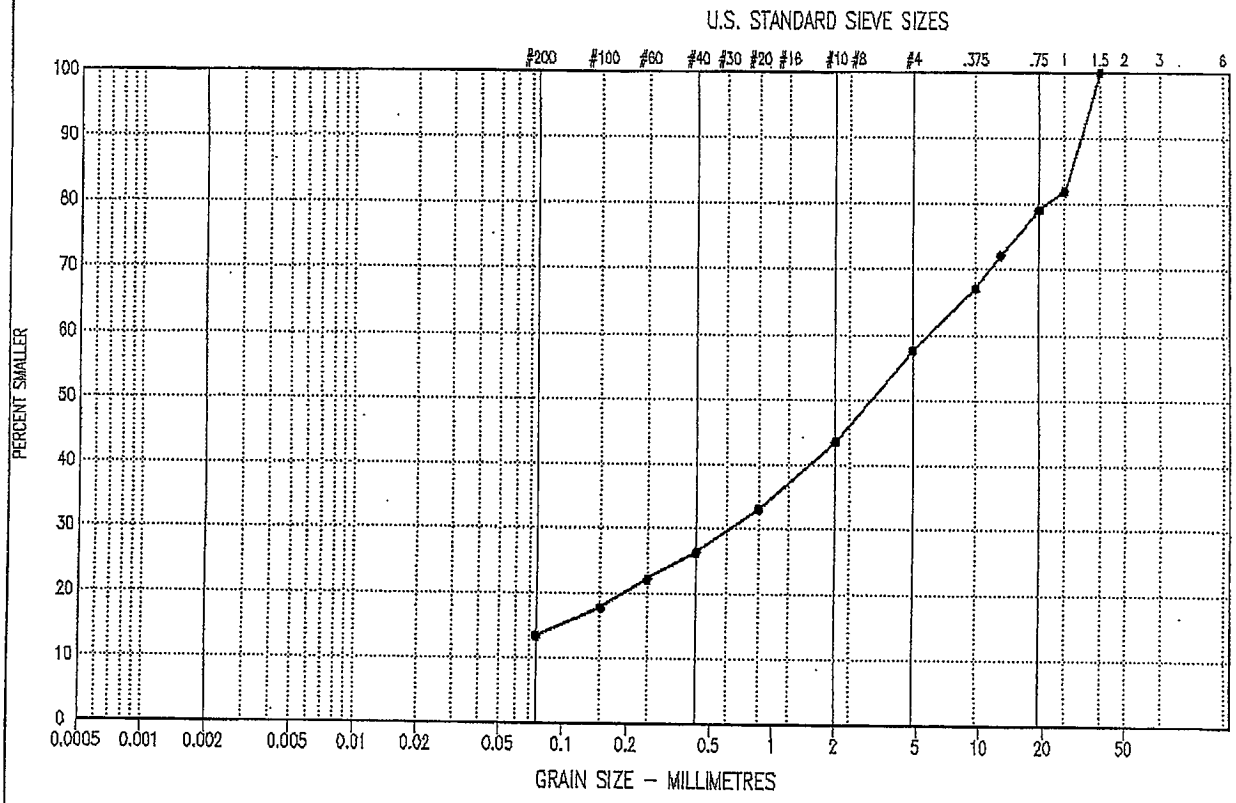
Project: 0201-1200091.015 Date Tested: 04/09/22 BY: MS

Tested in accordance with ASTM D422 unless otherwise noted.

EBA Engineering

PARTICLE SIZE – ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



SYMBOL	BOREHOLE NUMBER	DEPTH (ft)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●—●	TP04-08	0.05	13	44	42	–	4.5	SM

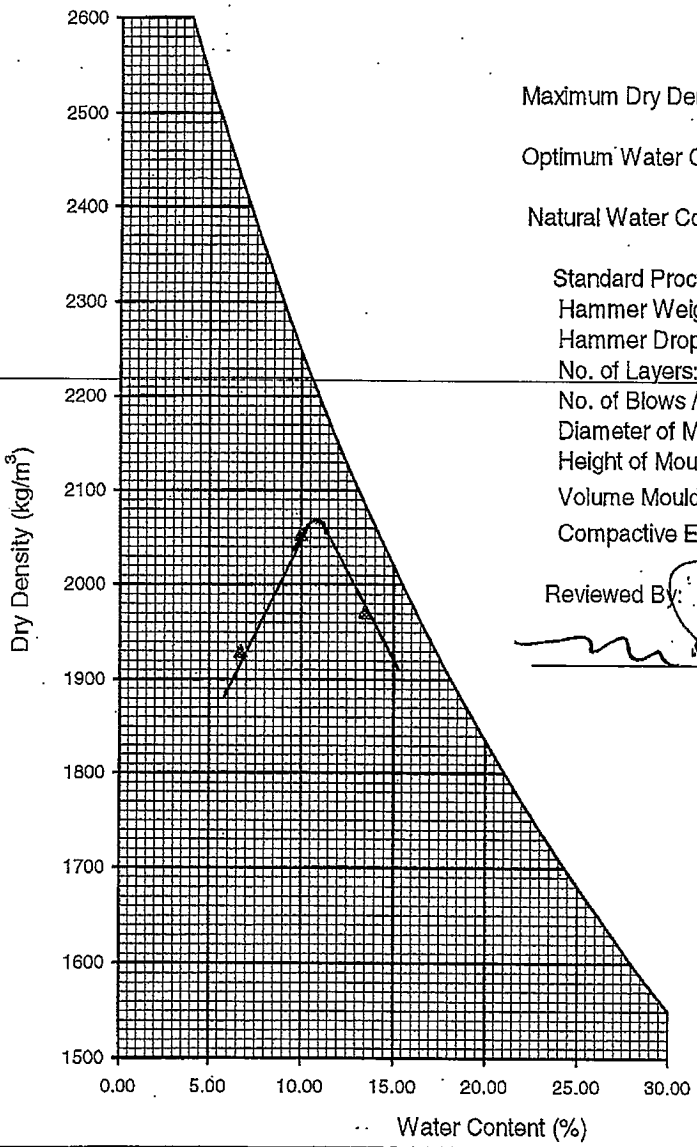
Project: 0201-1200091.015 Date Tested: 04/09/22 BY: MS

Tested in accordance with ASTM D422 unless otherwise noted.

EBA Engineering Consultants Ltd.

MOISTURE-DENSITY RELATIONSHIP

Project:	Anvil Range Mine	Sample No.:	GSF 13-16
Address:	Faro, YT	Date Sampled:	
		Sample Location:	
Project No.:	0201-1200091.015		
Date Tested:	7-Oct-04 By: MS	Sample Description:	SAND & GRAVEL - silty
Client:	BGC		
Attention:	Gerry Ferris		



Maximum Dry Density : 2065 kg/m^3

Optimum Water Content: 11.0 %

Natural Water Content: 6.7 %

Standard Proctor (ASTM D 698)

Hammer Weight:	2.5	kg
Hammer Drop:	305	mm
No. of Layers:	3	
No. of Blows / Layer:	25	
Diameter of Mould:	102	mm
Height of Mould:	116	mm
Volume Mould	9.44 x 10^{-4}	m^3
Compactive Effort	600	kJ/m^3

Reviewed By:

APPENDIX IV - GEOPHYSICS ASSESSMENT