2003 Investigation of Rose Creek Tailings Facility, Faro Mine
Report on Coring and Multi-Level Well Installation

Draft Report

prepared for:
Deloitte & Toiuche Inc.
in their capacity as Interim Receiver for
Anvil Range Mining Corporation

prepared by:
Gartner Lee Limited

reference: GLL 23576

date: December 2003

distribution:
1 Electronic Distribution, Deloitte & Touche Inc.
1 Electronic Distribution, Gartner Lee Limited

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Executive Summary

Gartner Lee Limited completed the field coring and multi-level well installation component of the 2003 Faro Mine Tailings hydrogeological study from August 23 to September 5, 2003 in accordance with the approved workplan dated July 11, 2003. During this field episode, a total of 130 continuous cores were collected in 10 ft sections through tailings into underlying sediments using Sonic drilling and coring at a total of 9 locations identified as P03-01 through P03-09. Holes P03-01 through P03-08 were located on the tailings impoundment and P03-09 was located downgradient of the Cross Valley dam.

The depth of the core holes ranged between 84.5 and 195 ft (25.8 and 59.4 m) below ground surface ("bgs"). Bedrock was encountered in 6 of the 9 holes at depths ranging from 154 ft (47.0 m) bgs. (P03-01) to 84.5 ft (25.8 m) bgs. (P03-06). The deepest core hole was P03-04 which was cored to a depth of 195 ft (59.4 m) bgs. (total casing available) without encountering bedrock. The thickness of the tailings ranged from 34.3 ft (10.5 m) at P03-01 to 67.7 ft (20.6 m) at. P03-08.

A total of 149 tailings samples and 224 native sediment samples were collected for analysis of chemical and physical properties. Field measurements consisting of paste pH, electrical conductivity and soil temperature were measured on the tailings samples.

A total of 9 multi-level sampling devices each with 7 to 9 one foot long screens were installed at each of the coring locations. This resulted in a total of 76 sampling points (21 tailings and 55 aquifer points). More than one thousand digital photographs were taken in order to document the field episode and provide a continuous photographic log of the soil cores.

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1. Introduction

This draft report documents the field activities (coring, drilling and soil sampling) activities that were proposed in the work plan for completing the 2003 field and laboratory investigations at the Rose Creek Tailings Facility. The July 11, 2003 document entitled "Anvil Range: Revised Rose Creek Tailings Facility 2003 Work Plan", was developed and discussed in concert with Gartner Lee Limited ("Gartner Lee"), the Interim Receiver, Environment Canada (Environmental Protection) and the Type II Mines Projects Office.

The specific objectives of the proposed 2003 investigations were to:

1. Investigate the extent of the highly contaminated groundwater "plume" in the vicinity of borehole P01-09;
2. Investigate the aquifer beneath other areas of predominantly "sandy" tailings for comparison to borehole P01-09;
3. Increase the area of coverage for groundwater quality monitoring;
4. Collect additional geochemical data from the tailings and update the 2001 acid rock drainage/ metal leaching characterization.

It was concluded that sonic drilling was the preferred drilling method because it offers many advantages as compared to more conventional techniques. These include minimal "smearing" of tailings into the aquifer, continuous coring for lithology and soil sampling, excellent core recovery, the ability to store and "stockpile" soil cores during coring, and a quick coring rate at similar cost. Similarly, the preferred design of monitoring devices was concluded to be field assembly of "multi-level bundle wells" of small 5/8" OD HDPE tubes, which offer the advantage of an increased number of installations per borehole and depth-discrete sampling with minimal purge volumes.

As proposed, a total of nine drill locations were completed. The proposed locations were originally organized into three priority levels, as outlined in the July 11, 2003 Work Plan, however, the order in which holes were cored and sampled was modified in the field due to site access constraints, time constraints and rig mobility on the tailings. The modified field plan ensured that the work was conducted in the most timely and cost efficient manner, keeping in mind the highest priority tasks outlined in the work plan.

Soil samples were collected from the continuous cores for analysis of physical and chemical parameters. Those test programs and results are not presented in this report. The soil sampling methodology is described in the following section.

Daily update memos were prepared that documented the progression of activities and the complete record of these update memos is provided herein in Appendix F.

The Gartner Lee personnel who completed this work were:

Eric Denholm, P.Eng. (NT/NU), Project Manager
Martin Guilbeault, M.Sc., P.Eng (ON), Hydrogeologist and Field Program Manager
Jonathan Kerr, M.Sc., Project Hydrogeologist
Gavin Cook, Field Assistant and Field Analyst
Wayne Jackson, B.Sc., Field Assistant and Field Analyst

2. Sonic Drilling and Coring

In order to obtain detailed geology and allow installation of monitoring devices with minimal possibility of cross-contamination from the tailings to the underlying aquifer, it was essential to use a drilling methodology that allowed collection of continuous cores with minimal disturbance or smearing of sediments. Sonic drilling provided the best method of completing the nine core holes and multi-level well installations. A Boart Longyear tire mounted Sonic Drilling Rig and support truck were contracted from SDS Drilling in Calgary. The primary rig operator and support truck operator were Bruce Klein and Clayton Madison respectively.

2.1 Site Orientation and Equipment Setup

A project-specific Health and Safety ("H&S") Protocol was developed from the Gartner Lee general template and was applied throughout the field program. The project H&S Protocol was provided to all Gartner Lee and contract personnel and is provided herein in Appendix G.

Gartner Lee personnel met the drill crew on the morning of August 24 and attended a brief site safety and orientation meeting with the Gartner Lee field crew and Dana Haggar, mine operations manager for Anvil Range Mining. All site-specific health and safety issues were discussed and emergency contact information was relayed. Prior to the start of each workday, Gartner Lee personnel and the drilling crew signed in at the main gatehouse and one two-way radio was given to the GLL main field supervisor. Fuel for the drill rigs was obtained from the mine site on an as-needed basis and provided by an on-site mobile fuel truck. The support truck was filled with water from the Rose Creek Diversion Canal once every few days.

2.2 Rig Mobility and Drill Site Setup

Figures 1, 2 and 3 show the location of the 2003 core and multi-level locations. Access to the first drilling location (P03-01) was possible without the use of heavy machinery or rig mats. However, both the drill rig and support truck got stuck when attempting to mobilize to P03-02. This was mainly due to poor tire traction and soft tailings. Heavy machinery owned and operated by Tim Moon Construction was used to drag the drill rig and support truck to the next location. Mobility was further complicated because it was essential that the support truck and drill rig be set up back to back.

It was anticipated that the area around P01-09 (Figure 3) apart from location P03-04 on the secondary impoundment dam and P03-09 downgradient of the tailings impoundment would be the easiest to access and that access to subsequent locations would be questionable. For this reason, eight drill mats owned by Midnight Sun Drilling Co. of Whitehorse were mobilized to the tailings site and used as a pathway and drilling platform for five subsequent locations on the tailings. Hauling, dragging and placing these drill mats as well as constructing access ramps onto the tailings was time consuming. Therefore, for maximum efficiency, these drill mats were moved in the evening, late night and early morning either before or after the drill rigs had moved off the coring locations.

2.3 Coring Equipment

The drilling equipment used was a Superdrill 150, short stroke RDU Sonic Drill. The cores were retrieved in 10 ft (3.0 m) sections. With each stroke (10 ft section) the inner 4" OD core casing was advanced ahead of the outer casing. Photographs of the cutting shoe and other drilling equipment are included in Appendix A. The 6" OD steel outer casing was then vibrated and advanced to the same depth as the core casing to prevent soil from entering the borehole as the core casing was removed. Minimal water was used during the coring process. To prevent heaving of sediments into the casing, clean water was injected into the main casing. A total of four truckloads of water were used during the 2 week field episode, this water was used for washing equipment, coring activities and during installation of multi-level wells. More detailed notes for each core location are provided in Appendix B. A summary of core details is included in Table 1.

Table 1. Details for 2003 Coring Locations

Location	Date completed (2003)	Total Depth Cored (ft)	Depth of Tailings (ft)	Depth of Bedrock (ft)
P03-01	August 25	155	34.3	154
P03-02	August 26	119.9	40.3	118.2
P03-03	August 27	153	51.3	Suspected @ 153
P03-04	August 29	195	46.5	Not encountered
P03-05	August 30	138	65.5	Not encountered ?
P03-06	August 31	85.5	43.6	84.5
P03-07	September 1	175	63.7	Not encountered
P03-08	September 3	109	67.7	108
P03-09	September 4	135	No tailings	133.3

2.4 Soil Core Logging

The cores were retrieved from the boreholes in 10 ft (3.0 m) intervals. Photographs of the core collection procedure are included in Appendix A. Once at ground surface, these 10 ft (3.0 m) sections of continuous core were collected in shorter 2.5 to 3 ft (0.8 to 0.9 m) increments by vibrating the soil into clear plastic sleeves. This was done to ensure that the 4" diameter sections could be manipulated by field personnel. Each sub-section of core was then laid out end to end on a plastic tarp. The plastic sleeve was cut lengthwise to expose the soil and allow logging and sampling. A field team of three people concurrently logged and sampled the soil cores, performed field measurements and photographed the cores.

3. Field Analysis and Sample Collection Methodologies

A sub-sample of soil was collected to perform on-site field tests. Field tests consisted of paste pH, paste conductivity and soil temperature. These tests were performed on tailings samples at a spacing of approximately 2 ft (60 cm) on average.

3.1 Paste pH, Paste Conductivity and Soil Temperature

Temperature was recorded using an Oakton soil thermometer that was stuck directly into the soil at each sampling location into the undisturbed core. It should be noted that coring and casing advancement introduce energy to the soil and could affect soil temperature, therefore these data were used only as a rough guide to determine soil conditions such as identifying zones of frozen soil.

Approximately 500 g of soil was collected at each sampling location for paste pH and paste conductivity measurements. These samples were collected by scooping approximately 100g of soil directly into clean 600 ml plastic beakers. Samples were then brought to the on-site field laboratory station located beside the drilling rig. Approximately 150 ml of distilled water was added to the beaker to form a slurry. The slurry was agitated to ensure complete mixing of the soil and water and then allowed to stand for 3 minutes on average. The field instruments were then inserted into the slurry and allowed to equilibrate. Field paste pH was measured using a Hanna Phep 5 handheld probe and the paste conductivity was measured using a YSI conductivity probe. Measurements were recorded once the probes had stabilized. All measurements were usually performed within 30 minutes following core collection and in all cases within a maximum of 2 hours. Field data are tabulated in Appendix C and shown graphically on figures in Appendix E. See Appendix A for photographs of the field procedure.

Field tests were performed to determine the sensitivity of paste pH and conductivity measurements to factors such as the duration of time before measurement and slight variations in soil to water ratios. These tests were also performed on duplicate samples or, in some cases, the same samples. Results showed that paste pH and paste conductivity measurements were not sensitive to these factors. Based on these results, the exact volume or weight of soil or water were not measured in the field, however, the ratios were kept constant throughout the entire field episode. The volume of water added to each soil sample was enough to form a slurry but also to ensure sufficient coverage of the field probes.

All field instruments and sampling equipment used were decontaminated between samples using a four step cleaning process. Sample beakers were first scrubbed and rinsed with distilled water then rinsed and cleaned in a solution of distilled water and Alconox ™, then immersed in distilled water and air dried. The pH and conductivity probes were first rinsed using water from the support truck and then using distilled water between each measurement. The probes were submerged in water obtained from the support truck when not in use.

Field probes were calibrated daily prior to the start of field activities using new pH and conductivity calibration solutions. The probes were also calibrated throughout the day as much as practical depending on the progress of field activities and the behaviour of the probes.

3.2 Collection of Soil Samples

Soil samples were collected directly from the soil cores immediately after field measurements were recorded. Approximately 500 g of soil were collected at each sampling location and placed directly into a plastic bag which was manually evacuated and sealed. The grab samples were collected by inverting the plastic bag and filling it with a handful of soil. This procedure eliminated the potential for cross-contamination between samples.

All soil samples were collected and preserved in sealed plastic Ziploc™ type bags and tailings samples were subsequently frozen and stored in a Gartner Lee freezer in Whitehorse. All unused tailings and soil core material was left at ground surface for visual inspection during the field episode. The soil cores were disposed of onto the tailings impoundment after the field episode and the plastic core sleeves were removed and disposed of in the landfill. Due to the excellent quality of the cores and very detailed geology, two representative cores (P03-09 and one core from the tailings holes) were left intact and covered with a blue plastic tarp for visual inspection by interested parties in the months following the field episode. These two cores were also ultimately disturbed such that the plastic sleeves and tarps could be removed from the site. The following table summarizes soil sampling details for each coring location.

Table 2. Soil Sampling Details for Each Coring Location

Location	Total number of samples	Tailings samples
P03-01	42	15
P03-02	44	13
P03-03	48	21
P03-04	61	18
P03-05	50	26
P03-06	31	17
P03-07	63	22
P03-08	35	17
P03-09	39	0
Total	**373**	**149**

4. Multi-Level Bundle Well Design and Construction

Multilevel sampling devices have been used for site investigation and monitoring for several decades. The advantage that multi-level sampling devices offer over conventional long-screened wells is that they allow many samples to be collected at the same location, they allow for detailed measurement of hydraulic gradient (water levels), require minimal purge volumes and can be designed, constructed and modified in the field using inexpensive materials.

In addition to allowing groundwater quality samples, the ability to measure vertical gradients provides information that is essential for determining groundwater movement. This is particularly relevant at this site in the context of contaminant movement and potential downward migration of tailings pore-water into the underlying aquifer.

Multi-level bundle wells were installed at all nine core locations (P03-01 to P03-09 per Figures 1, 2 and 3).

4.1 Design and Assembly of Multi-level Bundles

Multilevel bundle samplers similar to the type described by Cherry et al. (1983) were constructed by Gartner Lee personnel in the field concurrently with coring operations so that final design could be adjusted based on inspection of the cored material. As a result, sampling points could be located within the saturated tailings zone and close to the tailings / native sediment interface and a bentonite "packer" type seal could be placed on the bundle at selected locations. Construction details for all nine multilevel bundles are shown on Figure 4 and tabulated in Table 3. The multilevel bundles are constructed of 5/8" OD polyethylene tubes fastened to ¾" schedule 40 PVC center stalk using electrical tape to provide stability during installation. The screens were made in the field by slotting a 1 ft (0.3 m) section of each tube and wrapping it (at least 3 times) with a Nytex ™ mesh. These screens were also wrapped with a colored plastic to protect them and prevent contamination of the screens prior to installation. This protective wrapping was removed during installation. Photographs of multilevel bundle construction and installation are included in Appendix A. The final design of each multilevel bundle resulted in seven to nine monitoring points at each location.

4.2 Design and Construction of Bentonite "Packer" Seals

As discussed in a previous memo dated July 8, 2003 and entitled "22943 – Faro Mine Multi-Level Monitoring Device Details", saturated aquifer and tailings material is expected to collapse around the device as the steel casing is vibrated and withdrawn from the formation. Guilbeault (1999) demonstrated that sampling results and water level measurements at several sites in sandy aquifers indicated that sampling points at a vertical spacing as close as 1 ft (0.3 m) remained isolated after installation by natural formation collapse and that no other seal was required between sampling points. However, to provide an extra level of confidence related to a proper seal between the sampling points located close to and within the tailings/aquifer transition zone or interface, a pre-made seal was fastened around the sampling tubes between the sampling points at the interface. The location of these packers is shown on figures in Appendix D.

Gartner Lee determined that the best design for providing an effective seal while also allowing efficient construction in the field and ensuring minimal risk of complications during multi-level installation was the following (shown schematically on Figure 4):

- Make a slurry/paste by hydrating bentonite pellets or powder;
- Pack the paste around the sampling tube bundle over the interval to be sealed;
- Pack dry bentonite pellets into the paste (these swell as they rehydrate in the hole); and
- Wrap bentonite mixture of paste and dry pellets with a mesh and fasten using electrical tape.

This procedure was used between the sampling points within the transition zone where sampling points were closely spaced and significant vertical gradients were anticipated. The procedure was not necessary at other locations because of the anticipated natural isolation of sampling points as described above and the adequate space between sampling points relative to the small purge and sample volumes. This approach also avoided complications such as smearing, clogging or swelling of the bentonite mixture during multi-level bundle installation in the water filled steel casing.

4.3 Installation of Multi-level Bundle Wells

The multilevel bundle wells were installed inside a 6" OD steel casing. At locations where bedrock was encountered, the casing was driven a few inches into the bedrock surface to provide a firm bottom for the multi-level. The assembled multilevel bundle samplers were then carried over to the drill rig by the Gartner Lee field and drill crew (in some cases requiring seven people as per photographs in Appendix A) and lowered into the hollow steel casing. Contact between the tailings or other ground surface materials and the multi-level well was minimized during carrying and the protective wrap was removed from the screens as the bundle was lowered. The top of each multi-level tube as also wrapped in plastic to prevent the sand or bentonite used during the installation to clog the tubes. The casing was then pulled out and vibrated to ensure formation collapse. This was confirmed by periodic dipping of the casing with a measuring tape to ensure collapse to the bottom of the casing.

A mixture of bentonite pellets was added to seal above the saturated zone at each location and prevent infiltration of surface water through the unsaturated zone. Well completion details are shown in Appendix D.

Table 3. Construction Details for Multi-Level Wells

Sampling Point ID	Depth of screen(ft)	
	top	bottom
P03-01		
P03-01-01	152.5	153.5
P03-01-02	126.5	127.5
P03-01-03	99.5	100.5
P03-01-04	79.5	80.5
P03-01-05	59.5	60.5
P03-01-06	42.5	43.5
P03-01-07	34.5	35.5
P03-01-08	29.5	30.5
P03-01-09	24.5	25.5
P03-02		
P03-02-01	110	111
P03-02-02	99	100
P03-02-03	74	75
P03-02-04	54	55
P03-02-05	44	45
P03-02-06	41	42
P03-02-07	38	39
P03-02-08	28	29
P03-02-09	24	25
P03-03		
P03-03-01	140	141
P03-03-02	108	109
P03-03-03	88	89
P03-03-04	72	73
P03-03-05	60	61
P03-03-06	55	56
P03-03-07	49	50
P03-03-08	39	40
P03-03-09	29	30
P03-04		
P03-04-01	190	191
P03-04-02	155	156
P03-04-03	135	136
P03-04-04	114	115
P03-04-05	84.5	85.5
P03-04-06	56	57
P03-04-07	50	51
P03-04-08	44	45
P03-04-09	41	42
P03-05		
P03-05-01	145	146
P03-05-02	120	121
P03-05-03	90	91
P03-05-04	76	77
P03-05-05	70	71
P03-05-06	60	61
P03-05-07	45	46
P03-05-08	35	36

Sampling Point ID	Depth of screen(ft)	
	top	bottom
P03-06		
P03-06-01	84	85
P03-06-02	74	75
P03-06-03	64	65
P03-06-04	53	54
P03-06-05	46	47
P03-06-06	40	41
P03-06-07	35	36
P03-07		
P03-07-01	125	126
P03-07-02	110	111
P03-07-03	94	95
P03-07-04	70	71
P03-07-05	65	66
P03-07-06	59	60
P03-07-07	54	55
P03-07-08	44	45
P03-08		
P03-08-01	106	107
P03-08-02	92	93
P03-08-03	80	81
P03-08-04	75	76
P03-08-05	70	71
P03-08-06	65	66
P03-08-07	55	56
P03-08-08	45	46
P03-09		
P03-09-01	114	115
P03-09-02	105	106
P03-09-03	88	89
P03-09-04	77	78
P03-09-05	71	72
P03-09-06	61	62
P03-09-07	43	44
P03-09-08	30	31
P03-09-09	24	25

bold & italics = tailings point

The top of each individual sampling well was cut sequentially at a different height above ground surface that indicates the relative depths of the wells in the drill hole. This is shown schematically in Appendix D. The deepest sampling tube was cut off lowest and the shallowest sampling tube was cut off highest above ground surface. Each multilevel installation was completed at ground surface with a protective outer steel casing. This protective outer casing is lidded and can be locked and is secured in place by local backfill around the base. Coarse grained material was placed under and around the protective casing to ensure proper drainage of water from the casing and prevent capillary rise of water within the casing. Approximately 0.5 m of sand was placed into the protective casing to stabilize the multilevel well assembly. This approach is intended to prevent water from entering or remaining in the casing and, thereby, reduce the risk of damage to the sample tubes as a result of freezing.

4.4 Survey of Coring and Multi-Level Well Locations

The 2003 installations were surveyed by Yukon Engineering Services following the field episode. Survey details are listed in Table 4. All sampling tubes on the multi-level wells were cut shorter than the PVC center stock to allow a reference point for water level measurements. Therefore, all design information and construction details are measured relative to the PVC center stalk at each location.

Table 4. Survey Details for 2003 Multi-Level Wells (NAD 27)

Well ID	Easting (m)	Northing (m)	TOC elevation (m. a.s.l.)	Ground elevation (m. a.s.l.)
P03-01	583301.3	6912580	1061.107	1060.581
P03-02	583134.7	6912572	1060.597	1059.905
P03-03	583068.1	6912698	1061.489	1060.672
P03-04	582084.7	6913186	1061.206	1060.429
P03-05	582604.6	6912934	1060.431	1059.588
P03-06	582572.9	6913309	1062.792	1061.925
P03-07	582710.3	6913279	1064.983	1064.207
P03-08	580980.3	6913514	1048.352	1047.474
P03-09	580065.4	6914229	1018.511	1017.822

5. References

Cherry, J.A., R. W. Gillham, E.G. Anderson, and P.E. Johnson. 1983. Migration of contaminants in groundwater at a landfill: A case study. 2. Groundwater Monitoring Devices. Journal of Hydrology 63: 31-49.

Gartner Lee Limited, July 11, 2003. (memo) "Anvil Range Revised Rose Creek Tailings Facility Work Plan", sent to Deloitte and Touche

Gartner Lee, July 8, 2003. (memo) "22943 – Faro Mine Multi-Level Monitoring Device Details"

Guilbeault, M.A., 1999. Suspended DNAPL Source Zones in Three Sandy Aquifers: Plume Anatomy, Mass Discharge and Sampling Scale Considerations. M.Sc. Thesis, University of Waterloo, Waterloo, ON

6. Acknowledgements and Closing

Gartner Lee would like to thank the following individuals for facilitating access to the site, assisting during the field episode and providing useful information: Deloitte & Touche Inc. (in their capacity as Interim Receiver for Anvil Range Mining Corporation), Anvil Range Mining Corporation (Interim Receivership) Care and Maintenance Personnel, DIAND/YTG Type II Mines Project Office, Environment Canada - Environmental Protection Branch, SDS Drilling - A Division of Boart Longyear Inc., T. Moon Construction, Midnight Sun Drilling Co. Ltd. and University of Waterloo staff.

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Figures

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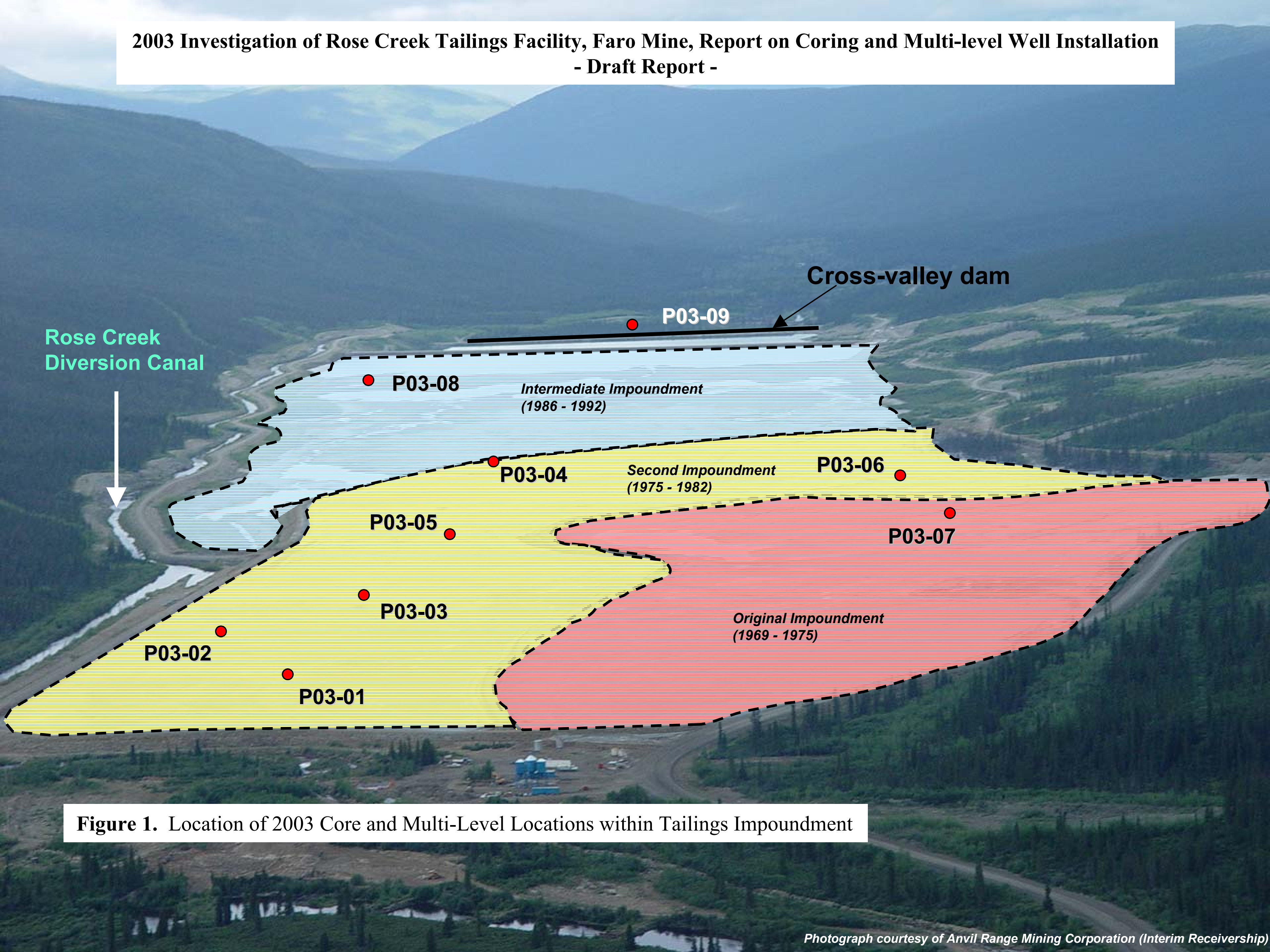


Figure 1. Location of 2003 Core and Multi-Level Locations within Tailings Impoundment

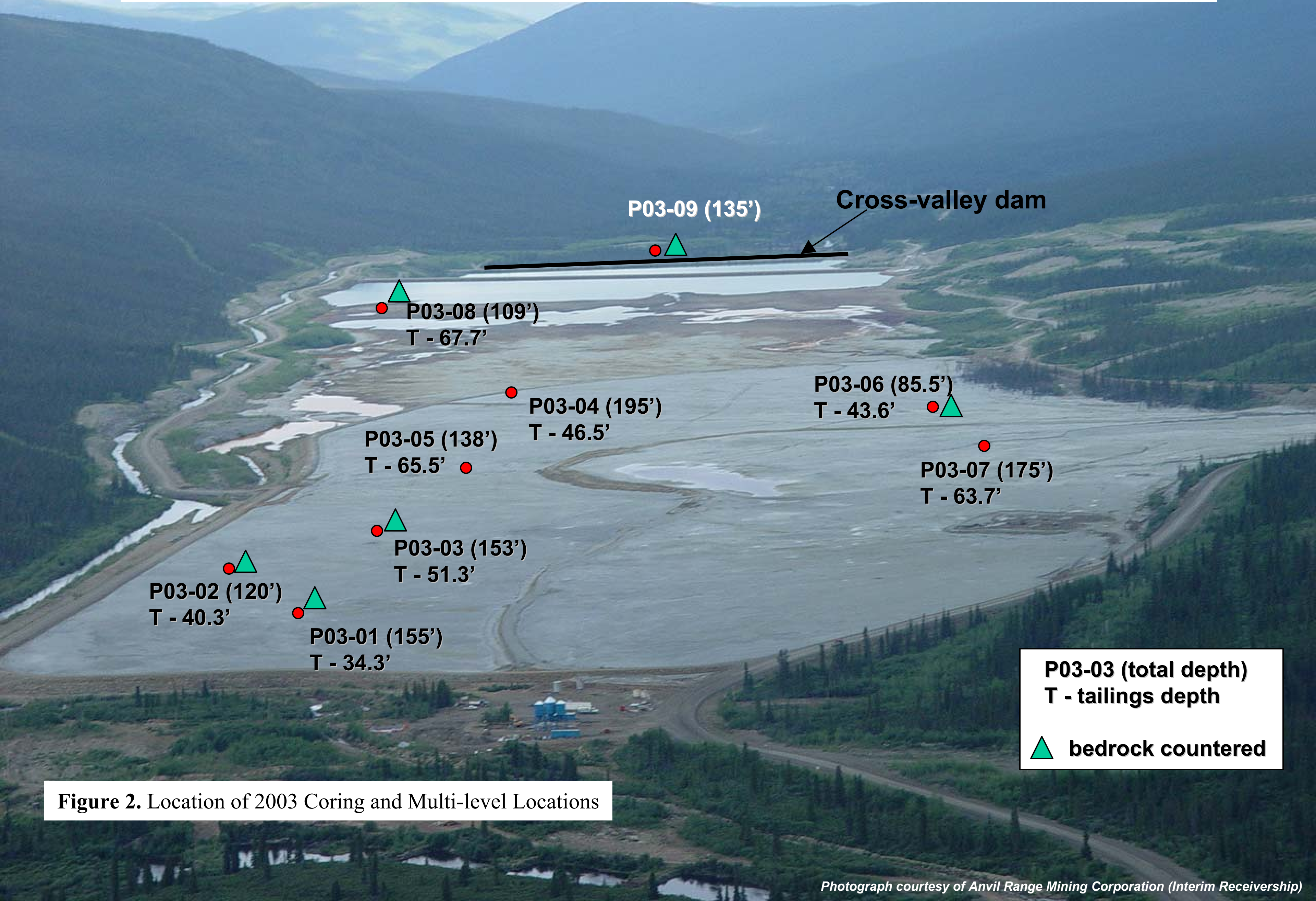
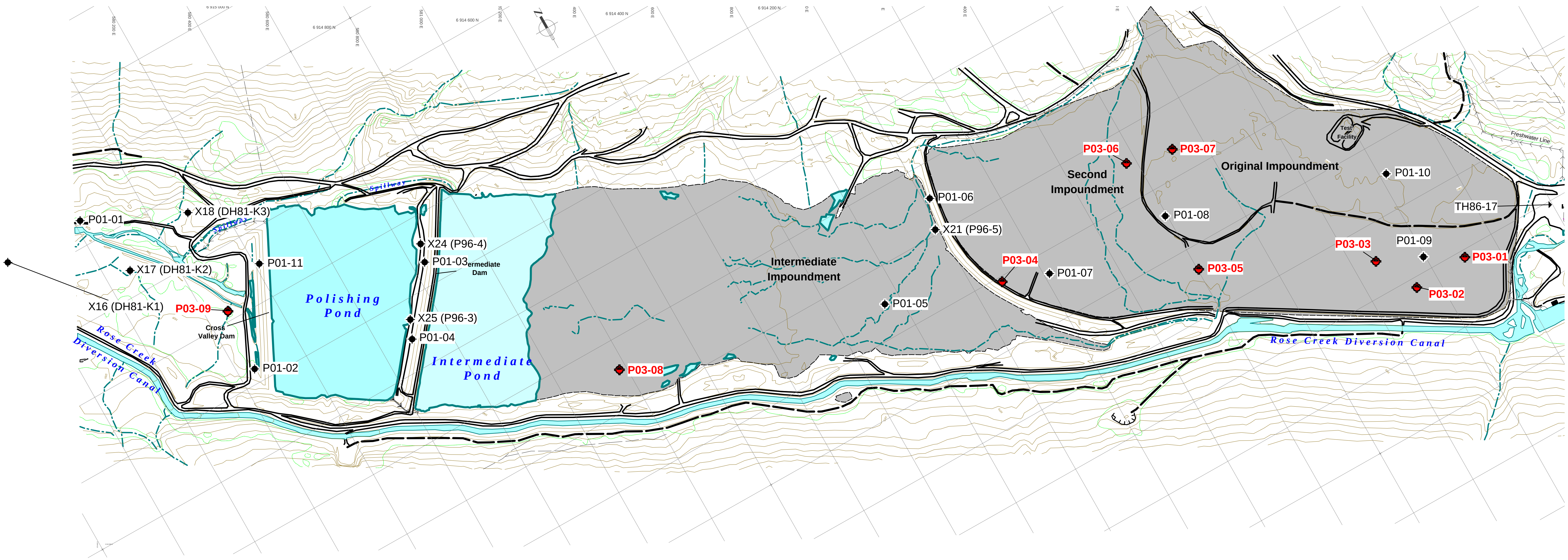


Figure 2. Location of 2003 Coring and Multi-level Locations



Legend

- Multi-Level Well Location (2003)
- Existing Monitoring Well Locations (pre-2003)

Data Sources:

Basemap: Orthoshop, Calgary, AB, January 1991. Based on aerial photography September 17, 1990 at 1:10,000 scale. Based supplied by Robertson Geoconsultants Inc.

200 0 200 400 600

Meters

Scale: 1:11,500

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Locations of all Existing Monitoring Points

Drawn By:	F.K.P.	Approved By:	M.G.
Version No.:	1	Project No.:	GLL 23-576
Date Issued:	Nov. 11/2003	Projection:	UTM Z8, NAD27
Site Name:	Faro	File Name:	23576-F1.WOR

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Figure No. **3**

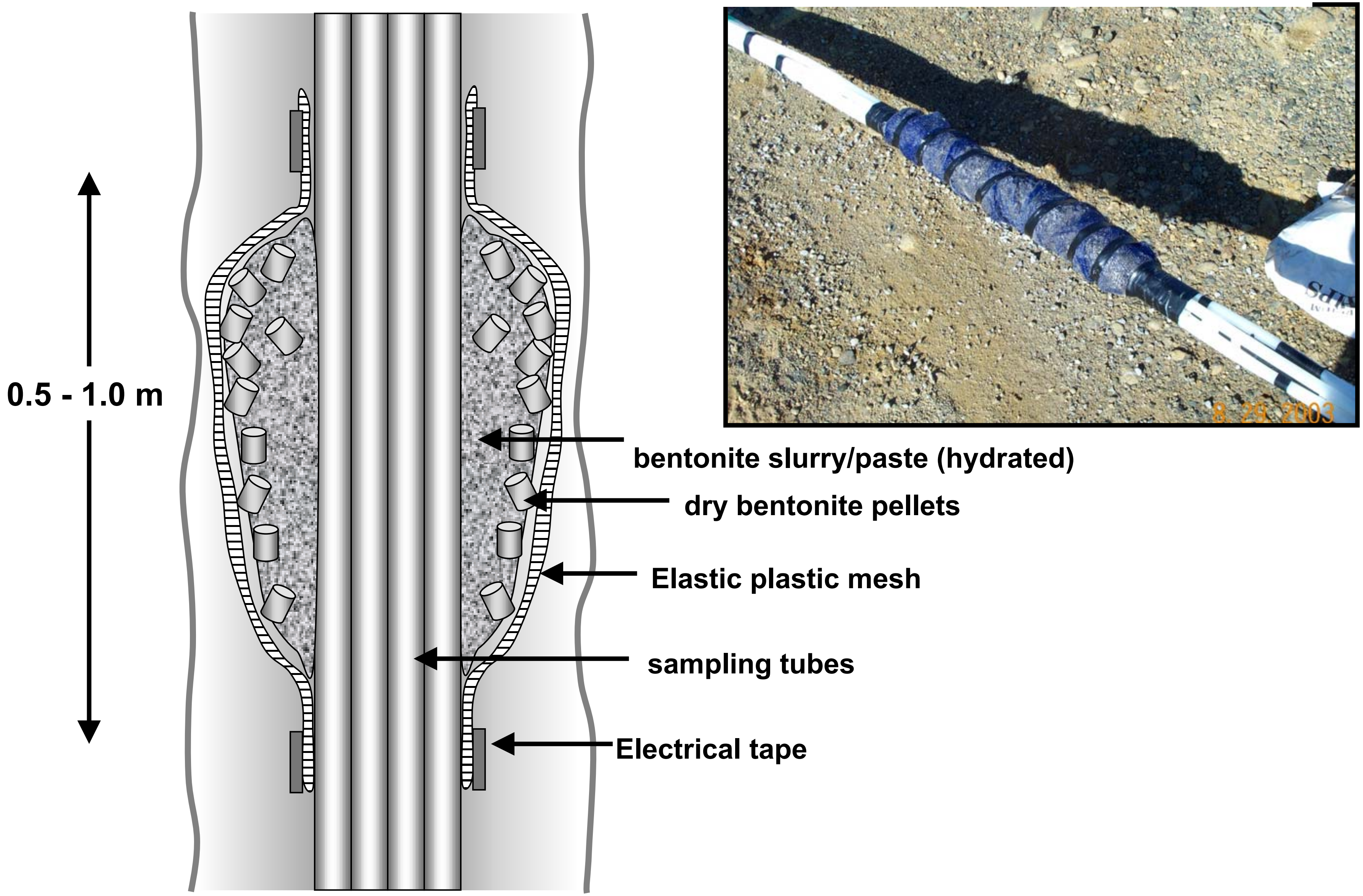
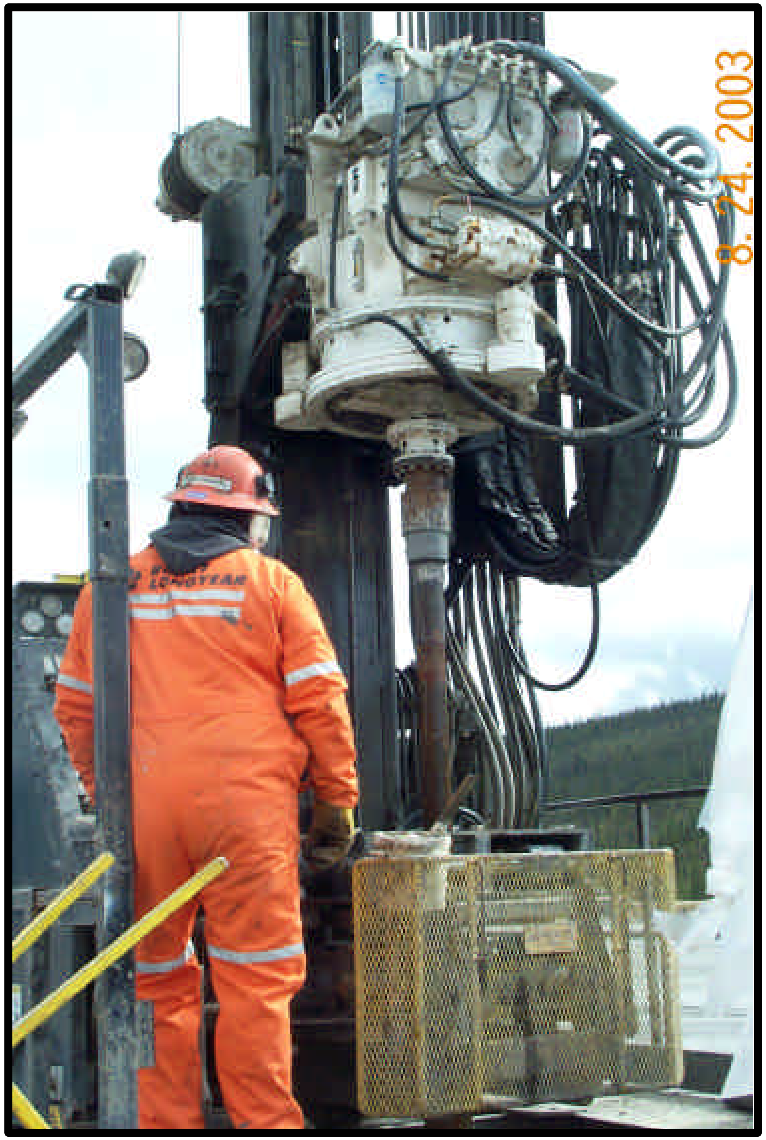


Figure 4. Schematic and photograph of bentonite seal used to ensure proper seal across tailings/native sediments interface

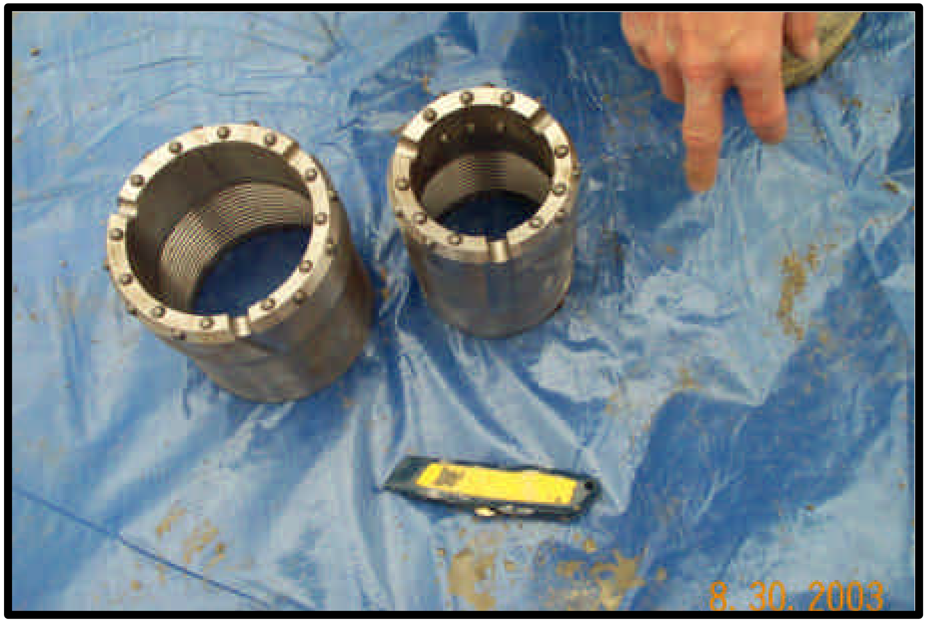
Appendices

Appendix A

Photographs of Field Activities



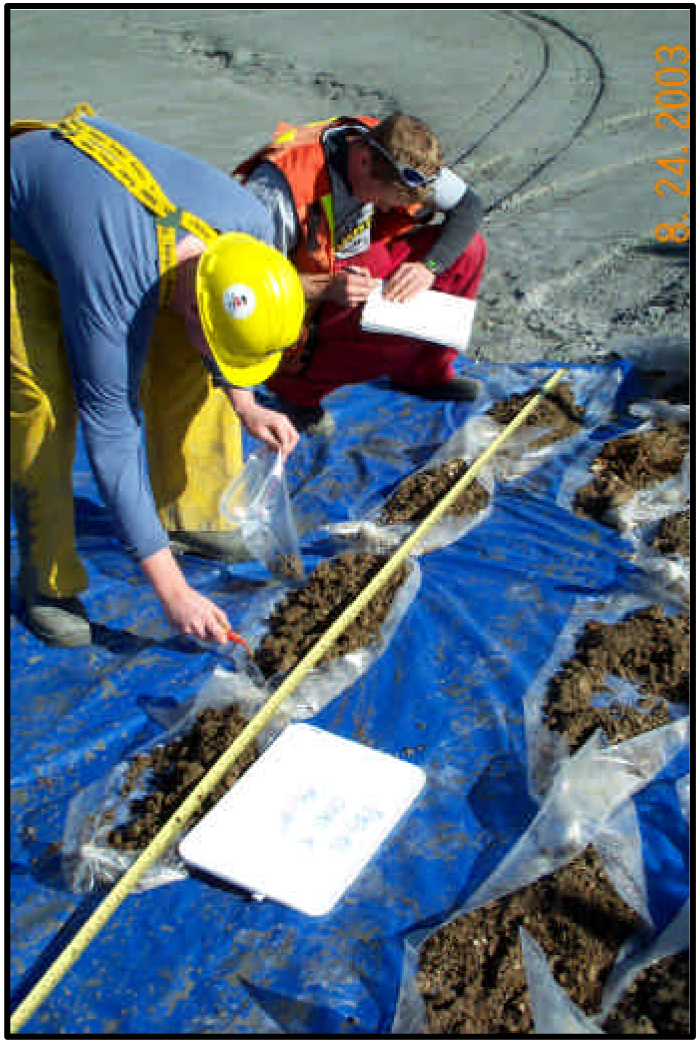
Sonic drill head and inner core casing



Outer casing and inner core barrel stainless steel shoe

Core collected in 4 1/2” plastic sleeve

Cores at ground surface showing detailed geology and sharp transition in geological detail



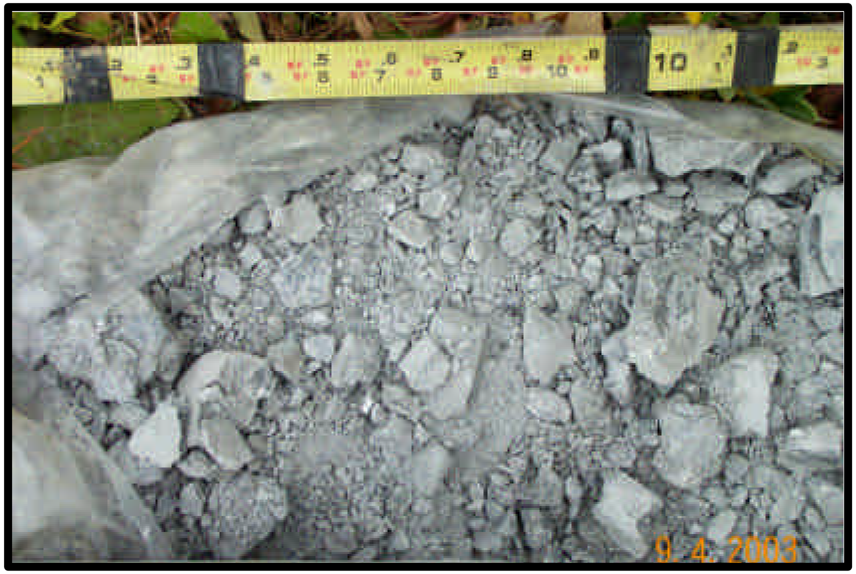
Field sampling of soil using plastic bags and logging of soil cores

Field measurements of soil showing plastic beakers, soil slurry and field conductivity probe

Detailed geology and identification of interface at location P03-02

Detailed geology and identification of interface showing organics under the tailings

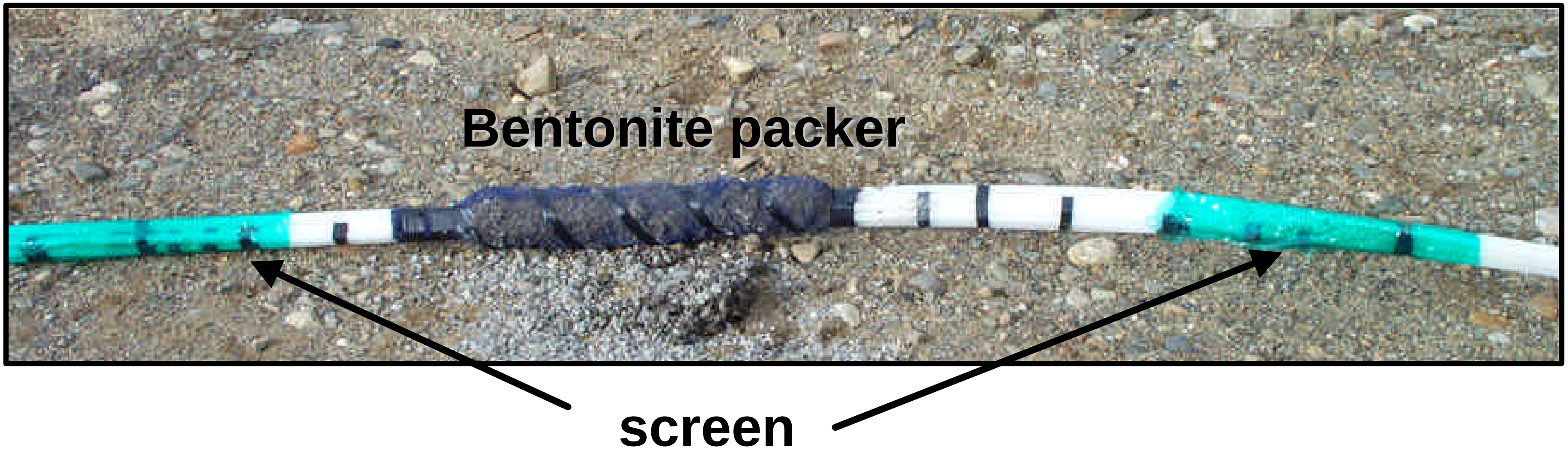
Core sample from P03-07 (155’ - 165’) showing lacustrine sediments (varved sequence)



Identification of weathered bedrock

Assembly of multi-level well

Fully constructed multi-level well on Secondary Impoundment Dam



Assembly of bentonite “packer” screen

Transportation of multi-level well to location P03-09

Installation of multi-level well down casing

Installation of multi-level well showing removal of protective wrapping from screens prior to installation

Newly installed multi-level well wrapped in protective plastic

Completed multi-level well with steel protective casing

Appendix B

Detailed Notes Regarding Individual Core Locations and Multi-Level Well Installations

Appendix B. Detailed Notes about Multi-Level Well Construction and Installation.

Location P03-01

Started coring on August 24, 2003. Cored 0' to 105' below ground surface. Casing was left in hole overnight. Coring activities resumed on the morning of August 25. Multi-level was constructed on road between BXL plant and tailings. Reached bedrock at 154' bgs. Installed multi-level without any complications. Drillers confirmed that hole had collapsed to 25' (bottom of casing). Installation was completed, casing was pulled and rigs were mobilized off location by 4:30pm. Approximately ¼ of a truck of water was added during coring.

Location P03-02

Rigs were mobilized (using heavy machinery) to the location on the evening of August 25. Rig mats were brought to the location in the morning and used as a platform. Other rig mats were used to make a roadway to location P03-03. Bedrock was encountered at 117.5' bgs on the afternoon of Aug. 25. The corehole was extended 1.5' into the weathered bedrock surface (according to driller), this provided a firm bottom for installation of the multi-level well. The multi-level well was constructed on the roadway between the tailings impoundment and the Rose Creek Diversion Channel. The multi-level well was inserted into the cased hole to a depth of 115' bgs, the casing was vibrated and somehow fell 4 ft below ground surface. This was attributed to formation collapse and error in depth measurements. It is not possible to see the multi-level while the casing is being pulled out because of the threaded head that is used to pull the casing. Therefore, the depth of the multi-level was checked periodically by unscrewing the casing head and looking into the casing.

A rope was looped around the top of the multi-level and the device was pulled up and removed from the hole trying to prevent contact with the tailings. GLL noted that the bentonite seal had remained intact, the outer bentonite pellets were starting to hydrate and the outer mesh had not ripped, demonstrating that the seal's integrity had not been compromised by manipulation of the casing and multi-level. This provided visual proof that the seal design is rugged and appropriate for these applications. A small piece of PVC pipe with a plastic disc was added to the bottom tip of the multi-level to ensure that the multi-level was installed at the proper elevation. The system was re-inserted into the corehole and was installed without any other problems. It is not anticipated that this delay and modification affected the performance of the system. The casing was pulled up to 44' bgs and left overnight. On the morning of Aug. 26, the formation was "tagged" to confirm that soil had collapsed around the bundle. Two bags of bentonite pellets were added above 22' bgs. Installation was completed by 9am. Approximately ½ truck of water was added during coring and installation.

Location P03-03

Rig mats were used to mobilize to P03-03. Coring started 10am on August 27. The inner core casing was tripped out at 5pm and the multi-level was lowered into the hole at 5:30pm. A small rope loop was attached to the top of the multi-level in subsequent installations to allow the system to be pulled up in case problems were encountered during installation. The casing was pulled up to 23' bgs and left overnight. On the morning of August 28, it was confirmed that formation had collapsed to the bottom of the casing (23' bgs). Two bags of bentonite pellets were added to the hole to create a 12 ft plug. The installation was completed by 9am.

Location P03-04

This location on the secondary impoundment dam was chosen to allow time for the rig mats to be moved to location P03-05 during coring at P03-04. This hole was located as close to the upgradient side of the road as possible (towards secondary impoundment). Coring started at 10am. Coring was completed down to 135' bgs by the end of the day. Coring resumed on the morning of August 29th. By noon, all the casing was used to reach a depth of 195' bgs without reaching bedrock. The multi-level installation was completed without any problems by 2pm.

<u>Location P03-05</u>

Coring began on the morning of August 30. Coring had reached 145' by noon. Coring progressed to 155' bgs. The multi-level was installed in the afternoon and was completed by 3pm. No problems were encountered during installation.

<u>Location P03-06</u>

Coring began on the morning of August 31. Bedrock was encountered by noon at a depth of approximately 85' bgs, much shallower than expected. The multi-level bundle was then constructed and installed by 2pm without any complications.

<u>Location P03-07</u>

Coring began on the morning of September 1. A frozen section of core was encountered from approx. 38' to 45' bgs. This did not cause any problems for coring and was not noticed until the core was exposed at surface. The hole was cored to a depth of 185' below ground surface, bedrock was not encountered, very fine-grained lacustrine sediments were encountered. It was decided by the field manager that the bottom of the hole should be grouted to preserve the integrity of the lacustrine sediments which may act as an aquitard and offer protection to underlying aquifers. This was done using bentonite pellets. The support truck was out of water and therefore no water could be added with the pellets. The pellets were added too quickly and bridging occurred. Because no water could be added and the support truck could not be moved without moving the drill rig off the hole, the driller attempted to core through the bentonite with the inner rods. Once this was done, the multi-level was put down the hole and it was buoyant (i.e. it floated approximately 15 ft out of the hole). This was attributed at the time to the sample tubes not filling up quickly enough. The multi-level was inserted down the hole and it was capped to keep the multi-level from rising in the hole. The next morning, the multi-level remained at the proper depth and the casing was removed. The casing was pulled up to 37' bgs and 2 bags of sand and 4 bags of bentonite were added in an attempt to provide drainage and a seal throughout the frozen section. This sand and bentonite only increased the depth in the hole for 2 feet, indicating that there seems to be a larger void under the frozen tailings (thaw bulb?). The casing was removed completely and tailings and bentonite were added to provide a plug through the unsaturated zone. It was later confirmed during groundwater sampling that some of the sampling points had been clogged by bentonite and prevented water from recharging the tubes, causing the multi-level to float. The integrity of the multi-level at this location may, therefore, have been compromised and groundwater quality analyses should be evaluated to gain more information.

<u>Location P03-08</u>

Coring began on the morning of September 3. The tailings were noticeable finer at this location. Bedrock was encountered at 109' bgs. The multi-level was installed without any problems in the afternoon.

<u>Location P03-09</u>

Coring began on the afternoon of September 3 and resumed on September 4. Bedrock was encountered at 135' bgs. The multi-level bundle was constructed in the afternoon and was installed by 4pm. No tailings are present at this location as it is downgradient of the Cross Valley Dam. Significant vertical gradients were measured immediately after installation indicating a proper seal between sampling points.

Appendix C

Field Analytical Data for Soil Samples

- **Soil Samples Collected**
- **Paste pH**
- **Soil Temperature**
- **Paste Conductivity**

Gartner Lee

Summary table of soil samples collected for physical and chemical parameters

	depth of sample (ft)			elevation of sample (m a.s.l.)	
sample name	from	to	date collected	from	to
P03-01-AS1	0.8	1.2	24-Aug-03	1060.34	1060.22
P03-01-AS2	2.3	2.7	24-Aug-03	1059.88	1059.76
P03-01-AS3	3.8	4.2	24-Aug-03	1059.42	1059.30
P03-01-BS1	5.5	5.9	24-Aug-03	1058.90	1058.78
P03-01-BS2	6.8	7.2	24-Aug-03	1058.51	1058.39
P03-01-BS3	9.8	10.2	24-Aug-03	1057.59	1057.47
P03-01-BS4	11.8	12.2	24-Aug-03	1056.98	1056.86
P03-01-CS1	15.8	16.2	24-Aug-03	1055.77	1055.64
P03-01-CS2	18.3	18.7	24-Aug-03	1055.00	1054.88
P03-01-CS3	20.8	21.2	24-Aug-03	1054.24	1054.12
P03-01-CS4	23.3	23.7	24-Aug-03	1053.48	1053.36
P03-01-DS1	25.8	26.2	24-Aug-03	1052.72	1052.60
P03-01-DS2	28.3	28.7	24-Aug-03	1051.96	1051.83
P03-01-DS3	30.8	31.2	24-Aug-03	1051.19	1051.07
P03-01-DS4	33.3	33.7	24-Aug-03	1050.43	1050.31
P03-01-ES1	36.3	36.7	24-Aug-03	1049.52	1049.40
P03-01-ES2	38.8	39.2	24-Aug-03	1048.76	1048.63
P03-01-FS1	46.3	46.7	24-Aug-03	1046.47	1046.35
P03-01-FS2	48.8	49.2	24-Aug-03	1045.71	1045.59
P03-01-GS1	56.3	56.7	24-Aug-03	1043.42	1043.30
P03-01-HS1	66.8	67.2	24-Aug-03	1040.22	1040.10
P03-01-HS2	70.8	71.2	24-Aug-03	1039.00	1038.88
P03-01-HS3	73.8	74.2	24-Aug-03	1038.09	1037.97
P03-01-IS1	76.8	77.2	24-Aug-03	1037.17	1037.05
P03-01-IS2	80.8	81.2	24-Aug-03	1035.95	1035.83
P03-01-IS3	83.8	84.2	24-Aug-03	1035.04	1034.92
P03-01-JS1	86.8	87.2	24-Aug-03	1034.13	1034.00
P03-01-KS1	96.8	97.2	24-Aug-03	1031.08	1030.96
P03-01-KS2	100.8	101.2	24-Aug-03	1029.86	1029.74
P03-01-KS3	102.8	103.2	24-Aug-03	1029.25	1029.13
P03-01-LS1	106.8	107.2	24-Aug-03	1028.03	1027.91
P03-01-LS2	109.3	109.7	24-Aug-03	1027.27	1027.15
P03-01-MS1	116.8	117.2	24-Aug-03	1024.98	1024.86
P03-01-MS2	119.6	120	24-Aug-03	1024.13	1024.01
P03-01-NS1	125.3	125.7	24-Aug-03	1022.39	1022.27
P03-01-NS2	128.8	129.2	24-Aug-03	1021.32	1021.20
P03-01-NS3	133.8	134.2	24-Aug-03	1019.80	1019.68
P03-01-OS1	136.8	137.2	24-Aug-03	1018.89	1018.76
P03-01-OS2	141.4	141.8	24-Aug-03	1017.48	1017.36
P03-01-OS3	143.8	144.2	24-Aug-03	1016.75	1016.63
P03-01-PS1	146.3	146.7	24-Aug-03	1015.99	1015.87
P03-01-PS2	148.1	148.5	24-Aug-03	1015.44	1015.32
P03-01-PS3	151.8	152.2	24-Aug-03	1014.31	1014.19
P03-01-PS4	153.8	154.2	24-Aug-03	1013.71	1013.58
P03-02-AS1	1.3	1.7	26-Aug-03	1059.51	1059.39
P03-02-AS2	2.3	2.7	26-Aug-03	1059.20	1059.08
P03-02-BS1	7.3	7.7	26-Aug-03	1057.68	1057.56

Gartner Lee **Summary table of soil samples collected for physical and chemical parameters**

sample name	depth of sample (ft)		date collected	elevation of sample (m a.s.l.)	
	from	to		from	to
P03-02-CS1	16.3	16.7	26-Aug-03	1054.94	1054.82
P03-02-CS2	19.8	20.2	26-Aug-03	1053.87	1053.75
P03-02-CS3	23.3	23.7	26-Aug-03	1052.80	1052.68
P03-02-DS1	26.8	27.2	26-Aug-03	1051.74	1051.61
P03-02-DS2	29.3	29.7	26-Aug-03	1050.97	1050.85
P03-02-DS3	31.8	32.2	26-Aug-03	1050.21	1050.09
P03-02-DS4	34.3	34.7	26-Aug-03	1049.45	1049.33
P03-02-ES1	36.1	36.5	26-Aug-03	1048.90	1048.78
P03-02-ES2	38.3	38.7	26-Aug-03	1048.23	1048.11
P03-02-ES3	39.8	40.2	26-Aug-03	1047.77	1047.65
P03-02-ES4	40.3	40.7	26-Aug-03	1047.62	1047.50
P03-02-ES5	41.2	41.6	26-Aug-03	1047.35	1047.23
P03-02-ES6	42.8	43.2	26-Aug-03	1046.86	1046.74
P03-02-ES7	43.8	44.2	26-Aug-03	1046.56	1046.43
P03-02-FS1	46.8	47.2	26-Aug-03	1045.64	1045.52
P03-02-FS2	49.8	50.2	26-Aug-03	1044.73	1044.60
P03-02-FS3	51.2	51.6	26-Aug-03	1044.30	1044.18
P03-02-FS4	53.8	54.2	26-Aug-03	1043.51	1043.39
P03-02-GS1	55.8	56.2	26-Aug-03	1042.90	1042.78
P03-02-GS2	58.3	58.7	26-Aug-03	1042.14	1042.01
P03-02-GS3	60.3	60.7	26-Aug-03	1041.53	1041.40
P03-02-GS4	61.8	62.2	26-Aug-03	1041.07	1040.95
P03-02-HS1	65.8	66.2	26-Aug-03	1039.85	1039.73
P03-02-HS2	67.8	68.2	26-Aug-03	1039.24	1039.12
P03-02-HS3	69.8	70.2	26-Aug-03	1038.63	1038.51
P03-02-HS4	72.3	72.7	26-Aug-03	1037.87	1037.75
P03-02-IS1	75.1	75.5	26-Aug-03	1037.02	1036.89
P03-02-IS2	76.8	77.2	26-Aug-03	1036.50	1036.38
P03-02-IS3	77.3	77.7	26-Aug-03	1036.35	1036.22
P03-02-JS1	86.8	87.2	26-Aug-03	1033.45	1033.33
P03-02-JS2	88.8	89.2	26-Aug-03	1032.84	1032.72
P03-02-JS3	90.8	91.2	26-Aug-03	1032.23	1032.11
P03-02-JS4	92.8	93.2	26-Aug-03	1031.62	1031.50
P03-02-KS1	97.8	98.2	26-Aug-03	1030.10	1029.98
P03-02-KS2	100.8	101.2	26-Aug-03	1029.18	1029.06
P03-02-KS3	103.1	103.5	26-Aug-03	1028.48	1028.36
P03-02-KS4	103.8	104.2	26-Aug-03	1028.27	1028.15
P03-02-LS1	106.8	107.2	26-Aug-03	1027.35	1027.23
P03-02-LS2	109.8	110.2	26-Aug-03	1026.44	1026.32
P03-02-LS3	113.6	114	26-Aug-03	1025.28	1025.16
P03-02-LS4	114.3	114.7	26-Aug-03	1025.07	1024.95
P03-03-BS2	10.3	10.7	27-Aug-03	1057.53	1057.41
P03-03-BS3	12.8	13.2	27-Aug-03	1056.77	1056.65
P03-03-CS1	16.3	16.7	27-Aug-03	1055.70	1055.58
P03-03-CS2	18.8	19.2	27-Aug-03	1054.94	1054.82
P03-03-CS3	21.8	22.2	27-Aug-03	1054.03	1053.91
P03-03-CS4	23.8	24.2	27-Aug-03	1053.42	1053.30

Gartner Lee **Summary table of soil samples collected for physical and chemical parameters**

sample name	depth of sample (ft)		date collected	elevation of sample (m a.s.l.)	
	from	to		from	to
P03-03-DS1	25.8	26.2	27-Aug-03	1052.81	1052.69
P03-03-DS2	28.3	28.7	27-Aug-03	1052.05	1051.92
P03-03-DS3	30.8	31.2	27-Aug-03	1051.28	1051.16
P03-03-DS4	33.3	33.7	27-Aug-03	1050.52	1050.40
P03-03-ES1	36.8	37.2	27-Aug-03	1049.46	1049.33
P03-03-ES2	39.3	39.7	27-Aug-03	1048.69	1048.57
P03-03-ES3	41.8	42.2	27-Aug-03	1047.93	1047.81
P03-03-ES4	44.3	44.7	27-Aug-03	1047.17	1047.05
P03-03-FS1	47.8	48.2	27-Aug-03	1046.10	1045.98
P03-03-FS2	51.3	51.7	27-Aug-03	1045.04	1044.91
P03-03-FS3	52.8	53.2	27-Aug-03	1044.58	1044.46
P03-03-FS4	54.3	54.7	27-Aug-03	1044.12	1044.00
P03-03-GS1	56.8	57.2	27-Aug-03	1043.36	1043.24
P03-03-GS2	58.8	59.2	27-Aug-03	1042.75	1042.63
P03-03-GS3	61.8	62.2	27-Aug-03	1041.84	1041.71
P03-03-HS1	65.8	66.2	27-Aug-03	1040.62	1040.50
P03-03-IS1	75.8	76.2	27-Aug-03	1037.57	1037.45
P03-03-JS1	86.8	87.2	27-Aug-03	1034.22	1034.09
P03-03-JS2	88.8	89.2	27-Aug-03	1033.61	1033.49
P03-03-JS3	91.3	91.7	27-Aug-03	1032.85	1032.72
P03-03-JS4	93.8	94.2	27-Aug-03	1032.08	1031.96
P03-03-AS1	0.8	1.2	27-Aug-03	1060.43	1060.31
P03-03-AS2	2.8	3.2	27-Aug-03	1059.82	1059.70
P03-03-AS3	4.8	5.2	27-Aug-03	1059.21	1059.09
P03-03-BS1	6.8	7.2	27-Aug-03	1058.60	1058.48
P03-03-KS1	95.8	96.2	27-Aug-03	1031.47	1031.35
P03-03-LS1	105.8	106.2	27-Aug-03	1028.43	1028.30
P03-03-LS2	107.3	107.7	27-Aug-03	1027.97	1027.85
P03-03-LS3	108.8	109.2	27-Aug-03	1027.51	1027.39
P03-03-LS4	111.3	111.7	27-Aug-03	1026.75	1026.63
P03-03-MS1	115.3	115.7	27-Aug-03	1025.53	1025.41
P03-03-NS1	126.8	127.2	27-Aug-03	1022.03	1021.90
P03-03-NS2	128.8	129.2	27-Aug-03	1021.42	1021.29
P03-03-NS3	131.3	131.7	27-Aug-03	1020.65	1020.53
P03-03-NS4	133.8	134.2	27-Aug-03	1019.89	1019.77
P03-03-OS1	135.8	136.2	27-Aug-03	1019.28	1019.16
P03-03-OS2	137.3	137.7	27-Aug-03	1018.83	1018.70
P03-03-OS3	140.8	141.2	27-Aug-03	1017.76	1017.64
P03-03-OS4	143.8	144.2	27-Aug-03	1016.84	1016.72
P03-03-PS1	145.3	145.7	27-Aug-03	1016.39	1016.26
P03-03-PS2	149.3	149.7	27-Aug-03	1015.17	1015.05
P03-03-PS3	151.3	151.7	27-Aug-03	1014.56	1014.44
P03-04-AS1	1.8	2.2	28-Aug-03	1059.88	1059.76
P03-04-AS2	4.3	4.7	28-Aug-03	1059.12	1059.00
P03-04-BS1	6.8	7.2	28-Aug-03	1058.36	1058.23
P03-04-BS2	9.3	9.7	28-Aug-03	1057.59	1057.47
P03-04-BS3	11.8	12.2	28-Aug-03	1056.83	1056.71

Gartner Lee

Summary table of soil samples collected for physical and chemical parameters

	depth of sample (ft)			elevation of sample (m a.s.l.)	
sample name	from	to	date collected	from	to
P03-04-BS4	14.3	14.7	28-Aug-03	1056.07	1055.95
P03-04-CS1	16.8	17.2	28-Aug-03	1055.31	1055.19
P03-04-CS2	19.3	19.7	28-Aug-03	1054.55	1054.42
P03-04-CS3	21.8	22.2	28-Aug-03	1053.78	1053.66
P03-04-CS4	24.3	24.7	28-Aug-03	1053.02	1052.90
P03-04-DS1	26.8	27.2	28-Aug-03	1052.26	1052.14
P03-04-DS2	29.3	29.7	28-Aug-03	1051.50	1051.38
P03-04-DS3	31.8	32.2	28-Aug-03	1050.74	1050.61
P03-04-DS4	34.3	34.7	28-Aug-03	1049.97	1049.85
P03-04-ES1	36.8	37.2	28-Aug-03	1049.21	1049.09
P03-04-ES2	39.3	39.7	28-Aug-03	1048.45	1048.33
P03-04-ES3	41.8	42.2	28-Aug-03	1047.69	1047.57
P03-04-ES4	44.3	44.7	28-Aug-03	1046.93	1046.81
P03-04-FS1	46.8	47.2	28-Aug-03	1046.17	1046.04
P03-04-FS2	49.3	49.7	28-Aug-03	1045.40	1045.28
P03-04-FS3	51.8	52.2	28-Aug-03	1044.64	1044.52
P03-04-FS4	54.3	54.7	28-Aug-03	1043.88	1043.76
P03-04-GS1	56.8	57.2	28-Aug-03	1043.12	1043.00
P03-04-GS2	59.3	59.7	28-Aug-03	1042.36	1042.23
P03-04-GS3	61.8	62.2	28-Aug-03	1041.59	1041.47
P03-04-GS4	64.3	64.7	28-Aug-03	1040.83	1040.71
P03-04-HS1	66.8	67.2	28-Aug-03	1040.07	1039.95
P03-04-HS2	69.3	69.7	28-Aug-03	1039.31	1039.19
P03-04-HS3	71.8	72.2	28-Aug-03	1038.55	1038.42
P03-04-HS4	74.6	75	28-Aug-03	1037.69	1037.57
P03-04-IS1	78.8	79.2	28-Aug-03	1036.41	1036.29
P03-04-IS2	82.55	82.95	28-Aug-03	1035.27	1035.15
P03-04-IS3	83.8	84.2	28-Aug-03	1034.89	1034.77
P03-04-JS1	86.8	87.2	28-Aug-03	1033.97	1033.85
P03-04-JS2	88	88.4	28-Aug-03	1033.61	1033.49
P03-04-JS3	88.8	89.2	28-Aug-03	1033.36	1033.24
P03-04-KS1	95.3	95.7	28-Aug-03	1031.38	1031.26
P03-04-KS2	98.3	98.7	28-Aug-03	1030.47	1030.35
P03-04-KS3	100.8	101.2	28-Aug-03	1029.71	1029.58
P03-04-KS4	103.3	103.7	28-Aug-03	1028.94	1028.82
P03-04-LS1	107.8	108.2	28-Aug-03	1027.57	1027.45
P03-04-LS2	111.8	112.2	28-Aug-03	1026.35	1026.23
P03-04-LS3	114.6	115	28-Aug-03	1025.50	1025.38
P03-04-MS1	115.8	116.2	28-Aug-03	1025.13	1025.01
P03-04-MS2	118.3	118.7	28-Aug-03	1024.37	1024.25
P03-04-MS3	120.8	121.2	28-Aug-03	1023.61	1023.49
P03-04-MS4	123.3	123.7	28-Aug-03	1022.85	1022.73
P03-04-NS1	125.8	126.2	28-Aug-03	1022.09	1021.97
P03-04-NS2	128.3	128.7	28-Aug-03	1021.33	1021.20
P03-04-NS3	130.8	131.2	28-Aug-03	1020.56	1020.44
P03-04-NS4	133.3	133.7	28-Aug-03	1019.80	1019.68
P03-04-OS1	137.3	137.7	28-Aug-03	1018.58	1018.46

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Summary table of soil samples collected for physical and chemical parameters

sample name	depth of sample (ft)		date collected	elevation of sample (m a.s.l.)	
	from	to		from	to
P03-04-OS2	140.8	141.2	28-Aug-03	1017.52	1017.39
P03-04-OS3	143.3	143.7	28-Aug-03	1016.75	1016.63
P03-04-OS4	144.3	144.7	28-Aug-03	1016.45	1016.33
P03-04-PS1	144.8	145.2	28-Aug-03	1016.30	1016.17
P03-04-QS1	161.8	162.2	28-Aug-03	1011.11	1010.99
P03-04-RS1	170.8	171.2	28-Aug-03	1008.37	1008.25
P03-04-RS2	173.8	174.2	28-Aug-03	1007.46	1007.34
P03-04-SS1	183.8	184.2	28-Aug-03	1004.41	1004.29
P03-04-TS1	186.3	186.7	28-Aug-03	1003.65	1003.53
P03-05-AS1	1.3	1.7	30-Aug-03	1059.19	1059.07
P03-05-AS2	3.8	4.2	30-Aug-03	1058.43	1058.31
P03-05-BS1	6.3	6.7	30-Aug-03	1057.67	1057.55
P03-05-BS2	8.8	9.2	30-Aug-03	1056.91	1056.78
P03-05-BS3	9.8	10.2	30-Aug-03	1056.60	1056.48
P03-05-BS4	13.8	14.2	30-Aug-03	1055.38	1055.26
P03-05-CS1	16.3	16.7	30-Aug-03	1054.62	1054.50
P03-05-CS2	18.8	19.2	30-Aug-03	1053.86	1053.74
P03-05-CS3	21.3	21.7	30-Aug-03	1053.10	1052.97
P03-05-CS4	23.8	24.2	30-Aug-03	1052.33	1052.21
P03-05-DS1	26.3	26.7	30-Aug-03	1051.57	1051.45
P03-05-DS2	28.8	29.2	30-Aug-03	1050.81	1050.69
P03-05-DS3	31.3	31.7	30-Aug-03	1050.05	1049.93
P03-05-DS4	33.8	34.2	30-Aug-03	1049.29	1049.16
P03-05-ES1	36.3	36.7	30-Aug-03	1048.52	1048.40
P03-05-ES2	38.8	39.2	30-Aug-03	1047.76	1047.64
P03-05-ES3	41.3	41.7	30-Aug-03	1047.00	1046.88
P03-05-ES4	43.8	44.2	30-Aug-03	1046.24	1046.12
P03-05-FS1	46.3	46.7	30-Aug-03	1045.48	1045.35
P03-05-FS2	48.8	49.2	30-Aug-03	1044.71	1044.59
P03-05-FS3	51.3	51.7	30-Aug-03	1043.95	1043.83
P03-05-FS4	53.8	54.2	30-Aug-03	1043.19	1043.07
P03-05-GS1	56.3	56.7	30-Aug-03	1042.43	1042.31
P03-05-GS2	58.8	59.2	30-Aug-03	1041.67	1041.54
P03-05-GS3	61.3	61.7	30-Aug-03	1040.90	1040.78
P03-05-GS4	63.8	64.2	30-Aug-03	1040.14	1040.02
P03-05-HS1	65.55	65.95	30-Aug-03	1039.61	1039.49
P03-05-HS2	66.8	67.2	30-Aug-03	1039.23	1039.11
P03-05-HS3	69.3	69.7	30-Aug-03	1038.47	1038.34
P03-05-HS4	72.2	72.6	30-Aug-03	1037.58	1037.46
P03-05-IS1	74.8	75.2	30-Aug-03	1036.79	1036.67
P03-05-IS2	74.8	75.2	30-Aug-03	1036.79	1036.67
P03-05-IS3	74.8	75.2	30-Aug-03	1036.79	1036.67
P03-05-IS4	74.8	75.2	30-Aug-03	1036.79	1036.67
P03-05-JS1	85.8	86.2	30-Aug-03	1033.44	1033.32
P03-05-JS2	90.8	91.2	30-Aug-03	1031.91	1031.79
P03-05-JS3	92.05	92.45	30-Aug-03	1031.53	1031.41
P03-05-JS4	93.8	94.2	30-Aug-03	1031.00	1030.88

Gartner Lee

Summary table of soil samples collected for physical and chemical parameters

sample name	depth of sample (ft)		date collected	elevation of sample (m a.s.l.)	
	from	to		from	to
P03-05-KS1	96.3	96.7	30-Aug-03	1030.24	1030.12
P03-05-KS2	97.8	98.2	30-Aug-03	1029.78	1029.66
P03-05-KS3	100.8	101.2	30-Aug-03	1028.87	1028.74
P03-05-LS1	105.8	106.2	30-Aug-03	1027.34	1027.22
P03-05-MS1	116.3	116.7	30-Aug-03	1024.14	1024.02
P03-05-MS2	117.8	118.2	30-Aug-03	1023.68	1023.56
P03-05-NS1	125.8	126.2	30-Aug-03	1021.25	1021.12
P03-05-OS1	137.8	138.2	30-Aug-03	1017.59	1017.47
P03-05-OS2	140.8	141.2	30-Aug-03	1016.67	1016.55
P03-05-OS3	142.8	143.2	30-Aug-03	1016.06	1015.94
P03-05-OS4	144.3	144.7	30-Aug-03	1015.61	1015.49
P03-05-PS1	145.8	146.2	30-Aug-03	1015.15	1015.03
P03-05-PS2	148.3	148.7	30-Aug-03	1014.39	1014.27
P03-05-PS3	150.8	151.2	30-Aug-03	1013.63	1013.50
P03-05-PS4	153.3	153.7	30-Aug-03	1012.86	1012.74
P03-06-AS1	0.8	1.2	31-Aug-03	1061.68	1061.56
P03-06-AS2	3.3	3.7	31-Aug-03	1060.92	1060.80
P03-06-AS3	4.3	4.7	31-Aug-03	1060.61	1060.49
P03-06-BS1	5.8	6.2	31-Aug-03	1060.16	1060.04
P03-06-BS2	7.8	8.2	31-Aug-03	1059.55	1059.43
P03-06-BS3	9.8	10.2	31-Aug-03	1058.94	1058.82
P03-06-CS1	16.8	17.2	31-Aug-03	1056.80	1056.68
P03-06-CS2	19.3	19.7	31-Aug-03	1056.04	1055.92
P03-06-CS3	21.8	22.2	31-Aug-03	1055.28	1055.16
P03-06-CS4	23.8	24.2	31-Aug-03	1054.67	1054.55
P03-06-DS1	26.8	27.2	31-Aug-03	1053.76	1053.63
P03-06-DS2	29.3	29.7	31-Aug-03	1052.99	1052.87
P03-06-DS3	31.8	32.2	31-Aug-03	1052.23	1052.11
P03-06-DS4	34.3	34.7	31-Aug-03	1051.47	1051.35
P03-06-ES1	38.8	39.2	31-Aug-03	1050.10	1049.98
P03-06-ES2	40.3	40.7	31-Aug-03	1049.64	1049.52
P03-06-ES3	43.3	43.7	31-Aug-03	1048.73	1048.61
P03-06-ES4	44.3	44.7	31-Aug-03	1048.42	1048.30
P03-06-FS1	45.8	46.2	31-Aug-03	1047.97	1047.84
P03-06-FS2	47.55	47.95	31-Aug-03	1047.43	1047.31
P03-06-GS1	58.8	59.2	31-Aug-03	1044.00	1043.88
P03-06-GS2	61.8	62.2	31-Aug-03	1043.09	1042.97
P03-06-GS3	62.8	63.2	31-Aug-03	1042.78	1042.66
P03-06-GS4	63.8	64.2	31-Aug-03	1042.48	1042.36
P03-06-HS1	65.8	66.2	31-Aug-03	1041.87	1041.75
P03-06-HS2	68.8	69.2	31-Aug-03	1040.96	1040.83
P03-06-HS3	71.8	72.2	31-Aug-03	1040.04	1039.92
P03-06-HS4	73.8	74.2	31-Aug-03	1039.43	1039.31
P03-06-IS1	81.3	81.7	31-Aug-03	1037.15	1037.02
P03-06-IS2	81.8	82.2	31-Aug-03	1036.99	1036.87
P03-06-IS3	84.3	84.7	31-Aug-03	1036.23	1036.11
P03-07-AS1	1.8	2.2	1-Sep-03	1063.66	1063.54

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Summary table of soil samples collected for physical and chemical parameters

	depth of sample (ft)			elevation of sample (m a.s.l.)	
sample name	from	to	date collected	from	to
P03-07-AS2	4.3	4.7	1-Sep-03	1062.90	1062.77
P03-07-BS1	10.1	10.5	1-Sep-03	1061.13	1061.01
P03-07-BS2	12.2	12.6	1-Sep-03	1060.49	1060.37
P03-07-BS3	14.3	14.7	1-Sep-03	1059.85	1059.73
P03-07-CS1	15.8	16.2	1-Sep-03	1059.39	1059.27
P03-07-CS2	18.3	18.7	1-Sep-03	1058.63	1058.51
P03-07-CS3	20.8	21.2	1-Sep-03	1057.87	1057.75
P03-07-CS4	23.3	23.7	1-Sep-03	1057.11	1056.98
P03-07-DS1	25.8	26.2	1-Sep-03	1056.34	1056.22
P03-07-DS2	28.55	28.95	1-Sep-03	1055.51	1055.38
P03-07-DS3	30.8	31.2	1-Sep-03	1054.82	1054.70
P03-07-DS4	33.3	33.7	1-Sep-03	1054.06	1053.94
P03-07-ES1	38.3	38.7	1-Sep-03	1052.53	1052.41
P03-07-ES2	41.3	41.7	1-Sep-03	1051.62	1051.50
P03-07-ES3	43.8	44.2	1-Sep-03	1050.86	1050.74
P03-07-FS1	45.8	46.2	1-Sep-03	1050.25	1050.13
P03-07-FS2	48.3	48.7	1-Sep-03	1049.49	1049.36
P03-07-FS3	50.3	50.7	1-Sep-03	1048.88	1048.75
P03-07-FS4	53.05	53.45	1-Sep-03	1048.04	1047.92
P03-07-GS1	56.8	57.2	1-Sep-03	1046.90	1046.77
P03-07-GS2	60.8	61.2	1-Sep-03	1045.68	1045.55
P03-07-GS3	62.1	62.5	1-Sep-03	1045.28	1045.16
P03-07-GS4	63	63.4	1-Sep-03	1045.01	1044.88
P03-07-GS5	64	64.4	1-Sep-03	1044.70	1044.58
P03-07-HS1	65.8	66.2	1-Sep-03	1044.15	1044.03
P03-07-HS2	67.8	68.2	1-Sep-03	1043.54	1043.42
P03-07-HS3	68.8	69.2	1-Sep-03	1043.24	1043.12
P03-07-IS1	76.8	77.2	1-Sep-03	1040.80	1040.68
P03-07-IS2	79.8	80.2	1-Sep-03	1039.89	1039.76
P03-07-IS3	81.8	82.2	1-Sep-03	1039.28	1039.15
P03-07-IS4	84.3	84.7	1-Sep-03	1038.51	1038.39
P03-07-JS1	91.3	91.7	1-Sep-03	1036.38	1036.26
P03-07-JS2	93.8	94.2	1-Sep-03	1035.62	1035.50
P03-07-KS1	96.8	97.2	1-Sep-03	1034.70	1034.58
P03-07-KS2	98.8	99.2	1-Sep-03	1034.09	1033.97
P03-07-KS3	100.8	101.2	1-Sep-03	1033.48	1033.36
P03-07-KS4	103.8	104.2	1-Sep-03	1032.57	1032.45
P03-07-LS1	107.2	107.6	1-Sep-03	1031.53	1031.41
P03-07-LS2	108.8	109.2	1-Sep-03	1031.05	1030.92
P03-07-LS3	111.3	111.7	1-Sep-03	1030.28	1030.16
P03-07-LS4	113.3	113.7	1-Sep-03	1029.67	1029.55
P03-07-MS1	116.8	117.2	1-Sep-03	1028.61	1028.49
P03-07-MS2	120.1	120.5	1-Sep-03	1027.60	1027.48
P03-07-MS3	122.8	123.2	1-Sep-03	1026.78	1026.66
P03-07-MS4	124.4	124.8	1-Sep-03	1026.29	1026.17
P03-07-NS1	126.8	127.2	1-Sep-03	1025.56	1025.44
P03-07-NS2	129.8	130.2	1-Sep-03	1024.65	1024.52

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Summary table of soil samples collected for physical and chemical parameters

sample name	depth of sample (ft)		date collected	elevation of sample (m a.s.l.)	
	from	to		from	to
P03-07-NS3	132.3	132.7	1-Sep-03	1023.88	1023.76
P03-07-NS4	133.8	134.2	1-Sep-03	1023.43	1023.30
P03-07-OS1	136.3	136.7	1-Sep-03	1022.66	1022.54
P03-07-OS2	140.8	141.2	1-Sep-03	1021.29	1021.17
P03-07-OS3	142.3	142.7	1-Sep-03	1020.84	1020.71
P03-07-OS4	143.8	144.2	1-Sep-03	1020.38	1020.26
P03-07-PS1	145.8	146.2	1-Sep-03	1019.77	1019.65
P03-07-PS2	148.8	149.2	1-Sep-03	1018.85	1018.73
P03-07-PS3	151.8	152.2	1-Sep-03	1017.94	1017.82
P03-07-PS4	154.3	154.7	1-Sep-03	1017.18	1017.06
P03-07-QS1	155.8	156.2	1-Sep-03	1016.72	1016.60
P03-07-QS2	158.8	159.2	1-Sep-03	1015.81	1015.69
P03-07-QS3	161.8	162.2	1-Sep-03	1014.89	1014.77
P03-07-QS4	163.8	164.2	1-Sep-03	1014.28	1014.16
P03-07-RS1	173.8	174.2	1-Sep-03	1011.24	1011.11
P03-08-AS1	1.3	1.7	2-Sep-03	1047.08	1046.96
P03-08-AS2	2.2	2.6	2-Sep-03	1046.80	1046.68
P03-08-AS3	3.8	4.2	2-Sep-03	1046.32	1046.19
P03-08-BS1	8.1	8.5	2-Sep-03	1045.01	1044.88
P03-08-BS2	10.8	11.2	2-Sep-03	1044.18	1044.06
P03-08-BS3	12.9	13.3	2-Sep-03	1043.54	1043.42
P03-08-BS4	14.8	15.2	2-Sep-03	1042.96	1042.84
P03-08-CS1	19.1	19.5	2-Sep-03	1041.65	1041.53
P03-08-CS2	21.4	21.8	2-Sep-03	1040.95	1040.83
P03-08-CS3	24	24.4	2-Sep-03	1040.16	1040.04
P03-08-DS1	32.3	32.7	2-Sep-03	1037.63	1037.51
P03-08-DS2	34.2	34.6	2-Sep-03	1037.05	1036.93
P03-08-FS1	45.9	46.3	2-Sep-03	1033.48	1033.36
P03-08-FS2	48.3	48.7	2-Sep-03	1032.75	1032.63
P03-08-FS3	50.6	51	2-Sep-03	1032.05	1031.93
P03-08-FS4	53.4	53.8	2-Sep-03	1031.20	1031.08
P03-08-HS1	65.8	66.2	2-Sep-03	1027.42	1027.30
P03-08-HS2	67.4	67.8	2-Sep-03	1026.93	1026.81
P03-08-HS3	68.7	69.1	2-Sep-03	1026.54	1026.41
P03-08-HS4	70.1	70.5	2-Sep-03	1026.11	1025.99
P03-08-IS1	75.8	76.2	2-Sep-03	1024.37	1024.25
P03-08-IS2	78.3	78.7	2-Sep-03	1023.61	1023.49
P03-08-IS3	80.8	81.2	2-Sep-03	1022.85	1022.73
P03-08-IS4	83.8	84.2	2-Sep-03	1021.93	1021.81
P03-08-JS1	86.55	86.95	2-Sep-03	1021.09	1020.97
P03-08-JS2	88.6	89	2-Sep-03	1020.47	1020.35
P03-08-JS3	90.8	91.2	2-Sep-03	1019.80	1019.68
P03-08-JS4	93.8	94.2	2-Sep-03	1018.89	1018.76
P03-08-KS1	102.3	102.7	2-Sep-03	1016.29	1016.17
P03-08-KS2	104.3	104.7	2-Sep-03	1015.68	1015.56
P03-08-LS1	106.8	107.2	2-Sep-03	1014.92	1014.80
P03-08-LS2	107.55	107.95	2-Sep-03	1014.69	1014.57

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Summary table of soil samples collected for physical and chemical parameters

sample name	depth of sample (ft)		date collected	elevation of sample (m a.s.l.)	
	from	to		from	to
P03-09-AS1	1.8	2.2	4-Sep-03	1017.27	1017.15
P03-09-AS2	3.8	4.2	4-Sep-03	1016.66	1016.54
P03-09-BS1	5.8	6.2	4-Sep-03	1016.05	1015.93
P03-09-BS2	8.3	8.7	4-Sep-03	1015.29	1015.17
P03-09-BS3	11.3	11.7	4-Sep-03	1014.38	1014.26
P03-09-BS4	12.8	13.2	4-Sep-03	1013.92	1013.80
P03-09-CS1	18.3	18.7	4-Sep-03	1012.24	1012.12
P03-09-CS2	19.8	20.2	4-Sep-03	1011.79	1011.67
P03-09-CS3	24.3	24.7	4-Sep-03	1010.42	1010.29
P03-09-DS1	25.8	26.2	4-Sep-03	1009.96	1009.84
P03-09-DS2	27.8	28.2	4-Sep-03	1009.35	1009.23
P03-09-DS3	32.8	33.2	4-Sep-03	1007.83	1007.70
P03-09-ES1	36.8	37.2	4-Sep-03	1006.61	1006.48
P03-09-ES2	43.8	44.2	4-Sep-03	1004.47	1004.35
P03-09-FS1	45.8	46.2	4-Sep-03	1003.86	1003.74
P03-09-FS2	47.8	48.2	4-Sep-03	1003.25	1003.13
P03-09-FS3	51.8	52.2	4-Sep-03	1002.03	1001.91
P03-09-FS4	54.3	54.7	4-Sep-03	1001.27	1001.15
P03-09-GS1	58.8	59.2	4-Sep-03	999.90	999.78
P03-09-GS2	64.4	64.8	4-Sep-03	998.19	998.07
P03-09-HS1	65.3	65.7	4-Sep-03	997.92	997.80
P03-09-HS2	68.8	69.2	4-Sep-03	996.85	996.73
P03-09-HS3	72.8	73.2	4-Sep-03	995.63	995.51
P03-09-IS1	77.8	78.2	4-Sep-03	994.11	993.99
P03-09-IS2	78.1	78.5	4-Sep-03	994.02	993.90
P03-09-IS3	82.8	83.2	4-Sep-03	992.59	992.46
P03-09-JS1	86.8	87.2	4-Sep-03	991.37	991.24
P03-09-JS2	88.8	89.2	4-Sep-03	990.76	990.64
P03-09-KS1	99.3	99.7	4-Sep-03	987.56	987.43
P03-09-KS2	101.8	102.2	4-Sep-03	986.79	986.67
P03-09-KS3	104.3	104.7	4-Sep-03	986.03	985.91
P03-09-LS1	105.8	106.2	4-Sep-03	985.58	985.45
P03-09-LS2	107.8	108.2	4-Sep-03	984.97	984.84
P03-09-LS3	111.3	111.7	4-Sep-03	983.90	983.78
P03-09-MS1	115.8	116.2	4-Sep-03	982.53	982.41
P03-09-MS2	121.8	122.2	4-Sep-03	980.70	980.58
P03-09-NS1	125.8	126.2	4-Sep-03	979.48	979.36
P03-09-NS2	128.3	128.7	4-Sep-03	978.72	978.60
P03-09-NS3	133.8	134.2	4-Sep-03	977.04	976.92

Gartner Lee

Summary table of paste pH measurements

sample name	elevation of sample (m a.s.l.)		paste pH
	from	to	
P03-01-AS1	1060.34	1060.22	1.68
P03-01-AS2	1059.88	1059.76	1.67
P03-01-AS3	1059.42	1059.30	3.11
P03-01-BS1	1058.90	1058.78	4.5
P03-01-BS2	1058.51	1058.39	4.38
P03-01-BS3	1057.59	1057.47	4.31
P03-01-BS4	1056.98	1056.86	5.16
P03-01-CS1	1055.77	1055.64	5.2
P03-01-CS2	1055.00	1054.88	5.1
P03-01-CS3	1054.24	1054.12	5.43
P03-01-CS4	1053.48	1053.36	5.88
P03-01-DS1	1052.72	1052.60	7.65
P03-01-DS2	1051.96	1051.83	10.06
P03-01-DS3	1051.19	1051.07	10.07
P03-01-DS4	1050.43	1050.31	8.37
P03-01-ES1	1049.52	1049.40	5.49
P03-01-ES2	1048.76	1048.63	6.04
P03-01-HS1	1040.22	1040.10	5.6
P03-02-AS1	1059.51	1059.39	2.06
P03-02-AS2	1059.20	1059.08	5.06
P03-02-BS1	1057.68	1057.56	4.62
P03-02-CS1	1054.94	1054.82	4.75
P03-02-CS2	1053.87	1053.75	4.63
P03-02-CS3	1052.80	1052.68	4.78
P03-02-DS1	1051.74	1051.61	5.41
P03-02-DS2	1050.97	1050.85	5.48
P03-02-DS3	1050.21	1050.09	5.5
P03-02-DS4	1049.45	1049.33	5.78
P03-02-ES2	1048.23	1048.11	6.3
P03-02-ES3	1047.77	1047.65	6.9
P03-02-ES4	1047.62	1047.50	7.05
P03-02-ES5	1047.35	1047.23	7.28
P03-03-AS1	1060.43	1060.31	1.96
P03-03-AS2	1059.82	1059.70	2.8
P03-03-AS3	1059.21	1059.09	3.41
P03-03-BS2	1057.53	1057.41	4.2
P03-03-BS3	1056.77	1056.65	4.1
P03-03-BS3	1058.60	1058.48	4.1
P03-03-CS1	1055.70	1055.58	2.3
P03-03-CS2	1054.94	1054.82	4.08
P03-03-CS3	1054.03	1053.91	4.27
P03-03-CS4	1053.42	1053.30	4.8

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Summary table of paste pH measurements

sample name	elevation of sample (m a.s.l.)		paste pH
	from	to	
P03-03-DS1	1052.81	1052.69	5.44
P03-03-DS2	1052.05	1051.92	5.54
P03-03-DS3	1051.28	1051.16	5.85
P03-03-DS4	1050.52	1050.40	5.82
P03-03-ES1	1049.46	1049.33	5.6
P03-03-ES2	1048.69	1048.57	5.9
P03-03-ES3	1047.93	1047.81	6.15
P03-03-ES4	1047.17	1047.05	6.3
P03-03-FS1	1046.10	1045.98	8.45
P03-03-FS2	1045.04	1044.91	8.64
P03-03-FS3	1044.58	1044.46	8.44
P03-04-AS1	1059.88	1059.76	6.35
P03-04-AS2	1059.12	1059.00	4.28
P03-04-BS1	1058.36	1058.23	4.95
P03-04-BS2	1057.59	1057.47	4.93
P03-04-BS3	1056.83	1056.71	5.4
P03-04-BS4	1056.07	1055.95	4.8
P03-04-CS1	1055.31	1055.19	4.4
P03-04-CS2	1054.55	1054.42	4.52
P03-04-CS3	1053.78	1053.66	5.68
P03-04-CS4	1053.02	1052.90	5.44
P03-04-DS1	1052.26	1052.14	5.76
P03-04-DS2	1051.50	1051.38	5.9
P03-04-DS3	1050.74	1050.61	6.19
P03-04-DS4	1049.97	1049.85	5.45
P03-04-ES1	1049.21	1049.09	4.14
P03-04-ES2	1048.45	1048.33	4.74
P03-04-ES3	1047.69	1047.57	4.42
P03-04-ES4	1046.93	1046.81	4.6
P03-05-AS1	1059.19	1059.07	1.89
P03-05-AS2	1058.43	1058.31	4.33
P03-05-BS1	1057.67	1057.55	4.52
P03-05-BS2	1056.91	1056.78	4.61
P03-05-BS3	1056.60	1056.48	4.1
P03-05-BS4	1055.38	1055.26	4.01
P03-05-CS1	1054.62	1054.50	4.28
P03-05-CS2	1053.86	1053.74	4.32
P03-05-CS3	1053.10	1052.97	4.81
P03-05-CS4	1052.33	1052.21	4.83
P03-05-DS1	1051.57	1051.45	4.94
P03-05-DS2	1050.81	1050.69	5.23
P03-05-DS3	1050.05	1049.93	6.17

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Summary table of paste pH measurements

sample name	elevation of sample (m a.s.l.) from	to	paste pH
P03-05-DS4	1049.29	1049.16	6.45
P03-05-ES1	1048.52	1048.40	6.13
P03-05-ES2	1047.76	1047.64	6.08
P03-05-ES3	1047.00	1046.88	6.5
P03-05-ES4	1046.24	1046.12	6.25
P03-05-FS1	1045.48	1045.35	6.21
P03-05-FS2	1044.71	1044.59	6.32
P03-05-FS3	1043.95	1043.83	6.28
P03-05-FS4	1043.19	1043.07	6.36
P03-05-GS1	1042.43	1042.31	6.64
P03-05-GS3	1040.90	1040.78	6.54
P03-06-AS1	1061.68	1061.56	2.62
P03-06-AS2	1060.92	1060.80	4.06
P03-06-AS3	1060.61	1060.49	4.01
P03-06-BS1	1060.16	1060.04	4.66
P03-06-BS2	1059.55	1059.43	4.87
P03-06-BS3	1058.94	1058.82	4.78
P03-06-CS1	1056.80	1056.68	5.25
P03-06-CS2	1056.04	1055.92	5.41
P03-06-CS3	1055.28	1055.16	5.05
P03-06-CS4	1054.67	1054.55	4.96
P03-06-DS1	1053.76	1053.63	5.46
P03-06-DS2	1052.99	1052.87	5.7
P03-06-DS3	1052.23	1052.11	5.98
P03-06-DS4	1051.47	1051.35	6.1
P03-06-ES1	1050.10	1049.98	6.41
P03-06-ES2	1049.64	1049.52	6.39
P03-06-ES3	1048.73	1048.61	6.68
P03-06-ES4	1048.42	1048.30	6.5
P03-07-AS1	1063.66	1063.54	1.97
P03-07-AS2	1062.90	1062.77	3.9
P03-07-BS1	1061.13	1061.01	4.7
P03-07-BS2	1060.49	1060.37	4.71
P03-07-BS3	1059.85	1059.73	4.68
P03-07-CS1	1059.39	1059.27	5.38
P03-07-CS2	1058.63	1058.51	5.12
P03-07-CS3	1057.87	1057.75	5.12
P03-07-CS4	1057.11	1056.98	4.92
P03-07-DS1	1056.34	1056.22	5.35
P03-07-DS2	1055.51	1055.38	5.05
P03-07-DS3	1054.82	1054.70	5.19
P03-07-DS4	1054.06	1053.94	5.46

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Summary table of paste pH measurements

sample name	elevation of sample (m a.s.l.) from	elevation of sample (m a.s.l.) to	paste pH
P03-07-ES1	1052.53	1052.41	5.79
P03-07-ES2	1051.62	1051.50	5.84
P03-07-ES3	1050.86	1050.74	6.18
P03-07-FS1	1050.25	1050.13	7.33
P03-07-FS2	1049.49	1049.36	6.97
P03-07-FS3	1048.88	1048.75	7.09
P03-07-FS4	1048.04	1047.92	7.34
P03-07-GS1	1046.90	1046.77	6.67
P03-07-GS2	1045.68	1045.55	6.76
P03-07-GS3	1045.28	1045.16	6.68
P03-07-GS4	1045.01	1044.88	6.69
P03-07-GS5	1044.70	1044.58	6.68
P03-08-AS1	1047.08	1046.96	3.61
P03-08-AS2	1046.80	1046.68	5.23
P03-08-AS3	1046.32	1046.19	5.62
P03-08-BS1	1045.01	1044.88	6.73
P03-08-BS2	1044.18	1044.06	7.33
P03-08-BS3	1043.54	1043.42	7.62
P03-08-BS4	1042.96	1042.84	7.54
P03-08-CS1	1041.65	1041.53	7.77
P03-08-CS2	1040.95	1040.83	8.04
P03-08-CS3	1040.16	1040.04	8.13
P03-08-DS1	1037.63	1037.51	6.5
P03-08-DS2	1037.05	1036.93	6.2
P03-08-FS1	1033.48	1033.36	4.8
P03-08-FS2	1032.75	1032.63	5.74
P03-08-FS3	1032.05	1031.93	6
P03-08-FS4	1031.20	1031.08	6.06

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Summary table of soil temperature measurements

sample name	sample elevation (m a.s.l.)		soil temp. (C)
	from	to	
P03-01-AS1	1060.34	1060.22	11.5
P03-01-BS3	1057.59	1057.47	8.7
P03-01-BS4	1056.98	1056.86	8.3
P03-01-CS4	1053.48	1053.36	5.2
P03-01-DS1	1052.72	1052.60	7.5
P03-01-DS4	1050.43	1050.31	7.2
P03-02-AS1	1059.51	1059.39	12.8
P03-02-AS2	1059.20	1059.08	14.2
P03-02-BS1	1057.68	1057.56	10.2
P03-02-CS1	1054.94	1054.82	8.7
P03-02-CS2	1053.87	1053.75	6.6
P03-02-CS3	1052.80	1052.68	5.4
P03-02-DS1	1051.74	1051.61	7.7
P03-02-DS2	1050.97	1050.85	7.8
P03-02-DS3	1050.21	1050.09	8.5
P03-02-DS4	1049.45	1049.33	7.8
P03-02-ES1	1048.90	1048.78	8.7
P03-02-ES2	1048.23	1048.11	8
P03-02-ES3	1047.77	1047.65	8.2
P03-02-ES4	1047.62	1047.50	8.2
P03-02-ES5	1047.35	1047.23	8.9
P03-03-AS1	1060.43	1060.31	11.2
P03-03-AS2	1059.82	1059.70	14.2
P03-03-AS3	1059.21	1059.09	14.2
P03-03-BS2	1057.53	1057.41	12.9
P03-03-BS3	1056.77	1056.65	12.3
P03-03-BS3	1058.60	1058.48	12.3
P03-03-CS1	1055.70	1055.58	10.8
P03-03-CS2	1054.94	1054.82	10.9
P03-03-CS3	1054.03	1053.91	7.7
P03-03-CS4	1053.42	1053.30	7.7
P03-03-DS1	1052.81	1052.69	8.1
P03-03-DS2	1052.05	1051.92	7.6
P03-03-DS3	1051.28	1051.16	8.1
P03-03-DS4	1050.52	1050.40	7.2
P03-03-ES1	1049.46	1049.33	10.6
P03-03-ES2	1048.69	1048.57	11.6
P03-03-ES3	1047.93	1047.81	9.7
P03-03-ES4	1047.17	1047.05	9.8
P03-03-FS1	1046.10	1045.98	10.9

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Summary table of soil temperature measurements

sample name	sample elevation (m a.s.l.) from	sample elevation (m a.s.l.) to	soil temp. (C)
P03-03-FS2	1045.04	1044.91	10.2
P03-03-FS3	1044.58	1044.46	11.6
P03-03-FS4	1044.12	1044.00	11.6
P03-04-AS1	1059.88	1059.76	20.6
P03-04-AS2	1059.12	1059.00	23.9
P03-04-BS1	1058.36	1058.23	26.2
P03-04-BS2	1057.59	1057.47	34.7
P03-04-BS3	1056.83	1056.71	17
P03-04-BS4	1056.07	1055.95	15.3
P03-04-CS1	1055.31	1055.19	20.3
P03-04-CS2	1054.55	1054.42	24.4
P03-04-CS3	1053.78	1053.66	19.6
P03-04-CS4	1053.02	1052.90	14.8
P03-04-DS1	1052.26	1052.14	10.9
P03-04-DS2	1051.50	1051.38	10.4
P03-04-DS3	1050.74	1050.61	11.1
P03-04-DS4	1049.97	1049.85	11.5
P03-04-ES1	1049.21	1049.09	11.4
P03-04-ES2	1048.45	1048.33	9.6
P03-04-ES3	1047.69	1047.57	8.3
P03-04-ES4	1046.93	1046.81	8.2
P03-05-AS1	1059.19	1059.07	16.1
P03-05-AS2	1058.43	1058.31	14.8
P03-05-BS1	1057.67	1057.55	11.7
P03-05-BS2	1056.91	1056.78	12.1
P03-05-BS3	1056.60	1056.48	12.5
P03-05-BS4	1055.38	1055.26	13.2
P03-05-CS1	1054.62	1054.50	15.8
P03-05-CS2	1053.86	1053.74	14.6
P03-05-CS3	1053.10	1052.97	14.3
P03-05-CS4	1052.33	1052.21	15.1
P03-05-DS1	1051.57	1051.45	10.8
P03-05-DS2	1050.81	1050.69	10.1
P03-05-DS3	1050.05	1049.93	11.5
P03-05-DS4	1049.29	1049.16	12.8
P03-05-ES1	1048.52	1048.40	13.1
P03-05-ES2	1047.76	1047.64	12.5
P03-05-ES3	1047.00	1046.88	12.3
P03-05-ES4	1046.24	1046.12	11.8
P03-05-FS1	1045.48	1045.35	13.9

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Summary table of soil temperature measurements

sample name	sample elevation (m a.s.l.)		soil temp. (C)
	from	to	
P03-05-FS2	1044.71	1044.59	12.9
P03-05-FS3	1043.95	1043.83	12.8
P03-05-FS4	1043.19	1043.07	12.9
P03-05-GS1	1042.43	1042.31	13.4
P03-05-GS2	1041.67	1041.54	11.5
P03-05-GS3	1040.90	1040.78	12.5
P03-06-AS1	1061.68	1061.56	11.9
P03-06-AS2	1060.92	1060.80	10.6
P03-06-AS3	1060.61	1060.49	10.2
P03-06-BS1	1060.16	1060.04	8.9
P03-06-BS2	1059.55	1059.43	8.9
P03-06-BS3	1058.94	1058.82	9.2
P03-06-CS1	1056.80	1056.68	10.8
P03-06-CS2	1056.04	1055.92	8.7
P03-06-CS3	1055.28	1055.16	8
P03-06-CS4	1054.67	1054.55	8.7
P03-06-DS1	1053.76	1053.63	7.8
P03-06-DS2	1052.99	1052.87	8.9
P03-06-DS3	1052.23	1052.11	8.4
P03-06-DS4	1051.47	1051.35	8.9
P03-06-ES1	1050.10	1049.98	7.4
P03-06-ES2	1049.64	1049.52	7.1
P03-06-ES3	1048.73	1048.61	6.3
P03-06-ES4	1048.42	1048.30	7.5
P03-07-AS1	1063.66	1063.54	10.3
P03-07-AS2	1062.90	1062.77	10.5
P03-07-BS1	1061.13	1061.01	10.8
P03-07-BS2	1060.49	1060.37	10.1
P03-07-BS3	1059.85	1059.73	8.7
P03-07-CS1	1059.39	1059.27	7.1
P03-07-CS2	1058.63	1058.51	6.3
P03-07-CS3	1057.87	1057.75	5.1
P03-07-CS4	1057.11	1056.98	5.1
P03-07-DS1	1056.34	1056.22	10.7
P03-07-DS2	1055.51	1055.38	7.3
P03-07-DS3	1054.82	1054.70	5.6
P03-07-DS4	1054.06	1053.94	4.7
P03-07-ES1	1052.53	1052.41	0.4
P03-07-ES2	1051.62	1051.50	0.3
P03-07-ES3	1050.86	1050.74	0.4

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Summary table of soil temperature measurements

sample name	sample elevation (m a.s.l.)		soil temp. (C)
	from	to	
P03-07-FS1	1050.25	1050.13	4.7
P03-07-FS2	1049.49	1049.36	4.3
P03-07-FS3	1048.88	1048.75	4.8
P03-07-FS4	1048.04	1047.92	5.7
P03-07-GS1	1046.90	1046.77	6.5
P03-07-GS2	1045.68	1045.55	6
P03-07-GS3	1045.28	1045.16	5.3
P03-07-GS4	1045.01	1044.88	5.6
P03-07-GS5	1044.70	1044.58	5.4
P03-08-AS1	1047.08	1046.96	9
P03-08-AS2	1046.80	1046.68	9.4
P03-08-AS3	1046.32	1046.19	10.3
P03-08-BS1	1045.01	1044.88	9.7
P03-08-BS2	1044.18	1044.06	8.5
P03-08-BS3	1043.54	1043.42	6.7
P03-08-BS4	1042.96	1042.84	5.5
P03-08-CS1	1041.65	1041.53	8.3
P03-08-CS2	1040.95	1040.83	6.8
P03-08-CS3	1040.16	1040.04	5
P03-08-DS1	1037.63	1037.51	6.5
P03-08-DS2	1037.05	1036.93	5.7
P03-08-FS1	1033.48	1033.36	6
P03-08-FS2	1032.75	1032.63	5.6
P03-08-FS3	1032.05	1031.93	5.4
P03-08-FS4	1031.20	1031.08	5.5

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Summary table of paste conductivity measurements

sample name	elevation of sample (m a.s.l.)		paste Conductivity (uS/cm)
	from	to	
P03-01-AS1	1060.34	1060.22	1335
P03-01-AS2	1059.88	1059.76	2060
P03-01-AS3	1059.42	1059.30	2492
P03-01-BS1	1058.90	1058.78	2655
P03-01-BS2	1058.51	1058.39	1348
P03-01-BS3	1057.59	1057.47	3495
P03-01-BS4	1056.98	1056.86	1691
P03-01-CS1	1055.77	1055.64	3002
P03-01-CS2	1055.00	1054.88	3630
P03-01-CS3	1054.24	1054.12	1960
P03-01-CS4	1053.48	1053.36	850
P03-01-DS1	1052.72	1052.60	324
P03-01-DS2	1051.96	1051.83	202
P03-01-DS3	1051.19	1051.07	117
P03-01-DS4	1050.43	1050.31	78
P03-01-ES1	1049.52	1049.40	158
P03-01-ES2	1048.76	1048.63	48
P03-01-HS1	1040.22	1040.10	17.1
P03-02-AS1	1059.51	1059.39	2734
P03-02-AS2	1059.20	1059.08	803
P03-02-BS1	1057.68	1057.56	1701
P03-02-CS1	1054.94	1054.82	1295
P03-02-CS2	1053.87	1053.75	2450
P03-02-CS3	1052.80	1052.68	2320
P03-02-DS1	1051.74	1051.61	1573
P03-02-DS2	1050.97	1050.85	871
P03-02-DS3	1050.21	1050.09	773
P03-02-DS4	1049.45	1049.33	924
P03-02-ES2	1048.23	1048.11	1723
P03-02-ES3	1047.77	1047.65	62
P03-02-ES4	1047.62	1047.50	76
P03-02-ES5	1047.35	1047.23	53
P03-03-AS1	1060.43	1060.31	4095
P03-03-AS2	1059.82	1059.70	5370
P03-03-AS3	1059.21	1059.09	2945
P03-03-BS2	1057.53	1057.41	3276
P03-03-BS3	1056.77	1056.65	3340
P03-03-BS3	1058.60	1058.48	3340

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Summary table of paste conductivity measurements

sample name	elevation of sample (m a.s.l.)		paste Conductivity (uS/cm)
	from	to	
P03-03-CS1	1055.70	1055.58	4512
P03-03-CS2	1054.94	1054.82	2943
P03-03-CS3	1054.03	1053.91	3330
P03-03-CS4	1053.42	1053.30	4740
P03-03-DS1	1052.81	1052.69	1859
P03-03-DS2	1052.05	1051.92	3490
P03-03-DS3	1051.28	1051.16	1310
P03-03-DS4	1050.52	1050.40	912
P03-03-ES1	1049.46	1049.33	2140
P03-03-ES2	1048.69	1048.57	710
P03-03-ES3	1047.93	1047.81	395
P03-03-ES4	1047.17	1047.05	550
P03-03-FS1	1046.10	1045.98	169
P03-03-FS2	1045.04	1044.91	98
P03-03-FS3	1044.58	1044.46	104
P03-04-AS1	1059.88	1059.76	1515
P03-04-AS2	1059.12	1059.00	1539
P03-04-BS1	1058.36	1058.23	500
P03-04-BS2	1057.59	1057.47	422
P03-04-BS3	1056.83	1056.71	393
P03-04-BS4	1056.07	1055.95	571
P03-04-CS1	1055.31	1055.19	825
P03-04-CS2	1054.55	1054.42	242
P03-04-CS3	1053.78	1053.66	355
P03-04-CS4	1053.02	1052.90	250
P03-04-DS1	1052.26	1052.14	915
P03-04-DS2	1051.50	1051.38	590
P03-04-DS3	1050.74	1050.61	453
P03-04-DS4	1049.97	1049.85	675
P03-04-ES1	1049.21	1049.09	636
P03-04-ES2	1048.45	1048.33	517
P03-04-ES3	1047.69	1047.57	555
P03-04-ES4	1046.93	1046.81	706
P03-05-AS1	1059.19	1059.07	2865
P03-05-AS2	1058.43	1058.31	1180
P03-05-BS1	1057.67	1057.55	2910
P03-05-BS2	1056.91	1056.78	1810
P03-05-BS3	1056.60	1056.48	208

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Summary table of paste conductivity measurements

sample name	elevation of sample (m a.s.l.)		paste Conductivity (uS/cm)
	from	to	
P03-05-BS4	1055.38	1055.26	521
P03-05-CS1	1054.62	1054.50	815
P03-05-CS2	1053.86	1053.74	643
P03-05-CS3	1053.10	1052.97	612
P03-05-CS4	1052.33	1052.21	695
P03-05-DS1	1051.57	1051.45	1020
P03-05-DS2	1050.81	1050.69	496
P03-05-DS3	1050.05	1049.93	472
P03-05-DS4	1049.29	1049.16	332
P03-05-ES1	1048.52	1048.40	270
P03-05-ES2	1047.76	1047.64	238
P03-05-ES3	1047.00	1046.88	390
P03-05-ES4	1046.24	1046.12	372
P03-05-FS1	1045.48	1045.35	280
P03-05-FS2	1044.71	1044.59	188
P03-05-FS3	1043.95	1043.83	365
P03-05-FS4	1043.19	1043.07	255
P03-05-GS1	1042.43	1042.31	75
P03-05-GS3	1040.90	1040.78	145
P03-06-AS1	1061.68	1061.56	1197
P03-06-AS2	1060.92	1060.80	466
P03-06-AS3	1060.61	1060.49	3420
P03-06-BS1	1060.16	1060.04	2219
P03-06-BS2	1059.55	1059.43	1717
P03-06-BS3	1058.94	1058.82	4180
P03-06-CS1	1056.80	1056.68	3979
P03-06-CS2	1056.04	1055.92	615
P03-06-CS3	1055.28	1055.16	1450
P03-06-CS4	1054.67	1054.55	868
P03-06-DS1	1053.76	1053.63	901
P03-06-DS2	1052.99	1052.87	375
P03-06-DS3	1052.23	1052.11	315
P03-06-DS4	1051.47	1051.35	213
P03-06-ES1	1050.10	1049.98	267
P03-06-ES2	1049.64	1049.52	319
P03-06-ES3	1048.73	1048.61	108
P03-06-ES4	1048.42	1048.30	86
P03-07-AS1	1063.66	1063.54	2436

Gartner Lee

Summary table of paste conductivity measurements

sample name	elevation of sample (m a.s.l.)		paste Conductivity (uS/cm)
	from	to	
P03-07-AS2	1062.90	1062.77	1811
P03-07-BS1	1061.13	1061.01	532
P03-07-BS2	1060.49	1060.37	291
P03-07-BS3	1059.85	1059.73	589
P03-07-CS1	1059.39	1059.27	352
P03-07-CS2	1058.63	1058.51	659
P03-07-CS3	1057.87	1057.75	479
P03-07-CS4	1057.11	1056.98	595
P03-07-DS1	1056.34	1056.22	1105
P03-07-DS2	1055.51	1055.38	682
P03-07-DS3	1054.82	1054.70	1282
P03-07-DS4	1054.06	1053.94	322
P03-07-ES1	1052.53	1052.41	696
P03-07-ES2	1051.62	1051.50	357
P03-07-ES3	1050.86	1050.74	130
P03-07-FS1	1050.25	1050.13	42
P03-07-FS2	1049.49	1049.36	85
P03-07-FS3	1048.88	1048.75	74
P03-07-FS4	1048.04	1047.92	31
P03-07-GS1	1046.90	1046.77	56
P03-07-GS2	1045.68	1045.55	53
P03-07-GS3	1045.28	1045.16	83
P03-07-GS4	1045.01	1044.88	66
P03-07-GS5	1044.70	1044.58	50
P03-08-AS1	1047.08	1046.96	141
P03-08-AS2	1046.80	1046.68	348
P03-08-AS3	1046.32	1046.19	63
P03-08-BS1	1045.01	1044.88	179
P03-08-BS2	1044.18	1044.06	70
P03-08-BS3	1043.54	1043.42	43
P03-08-BS4	1042.96	1042.84	53
P03-08-CS1	1041.65	1041.53	94
P03-08-CS2	1040.95	1040.83	46
P03-08-CS3	1040.16	1040.04	52
P03-08-DS1	1037.63	1037.51	78
P03-08-DS2	1037.05	1036.93	124
P03-08-FS1	1033.48	1033.36	96
P03-08-FS2	1032.75	1032.63	170

Gartner Lee

Summary table of paste conductivity measurements

sample name	elevation of sample (m a.s.l.)		paste Conductivity (uS/cm)
	from	to	
P03-08-FS3	1032.05	1031.93	138
P03-08-FS4	1031.20	1031.08	195

Appendix D

Multi-Level Well Completion Diagrams

(Not Available for the Draft Report)

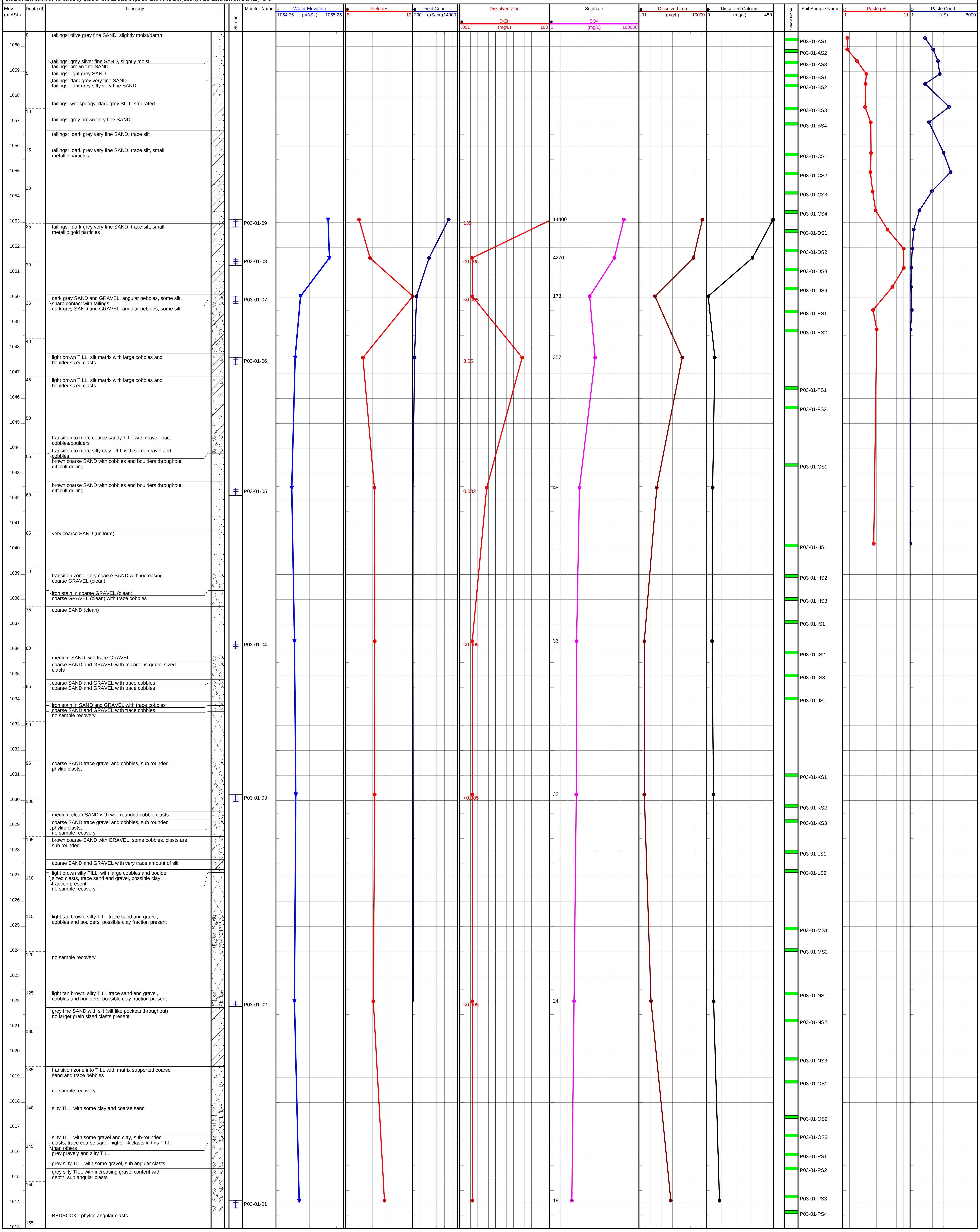
Appendix E

Core Logs and Chemical Profiles for 2003 Multi-Level Wells

Well Name: P03-01

LOG SCALE: 1:70

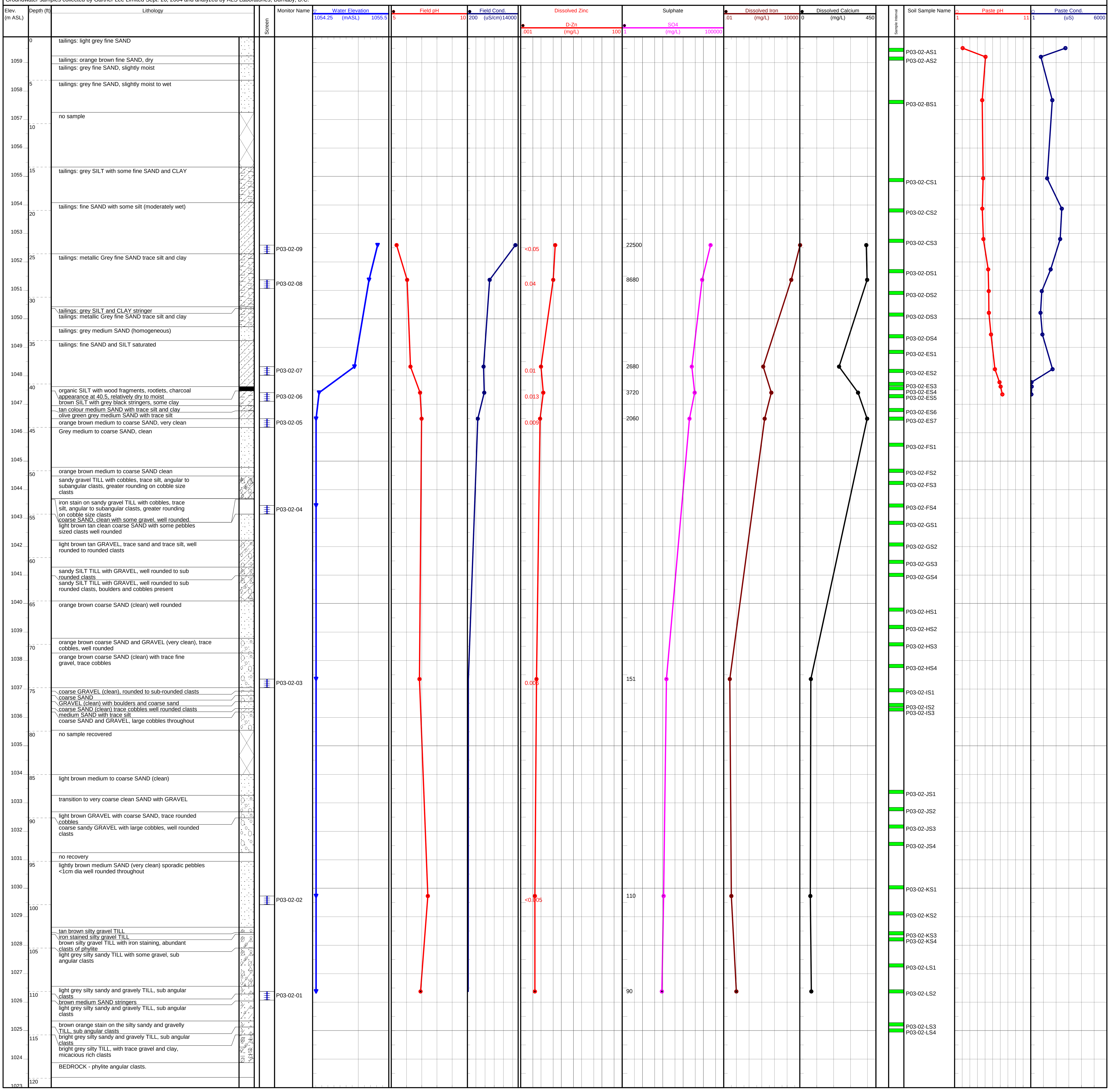
NOTES:
Borehole cored August xx, 2003 by SDS Drilling Company of Calgary, AB, a division of Boart Longyear using a RDU 150 Sonic Drill with continuous core collection. Soil samples collected from continuous core in the field and analyzed for paste pH and paste conductivity in the field
Borehole logged by J. Kerr, Gartner Lee Limited. Log produced using Viewlog Log Analysis Software
Multi-level well designed and constructed by Gartner Lee Limited on August xx, 2003.
Groundwater samples collected by Gartner Lee Limited Sept. 26, 2004 and analyzed by ALS Laboratories, Burnaby, B.C.



Well Name: P03-02

LOG SCALE: 1:70

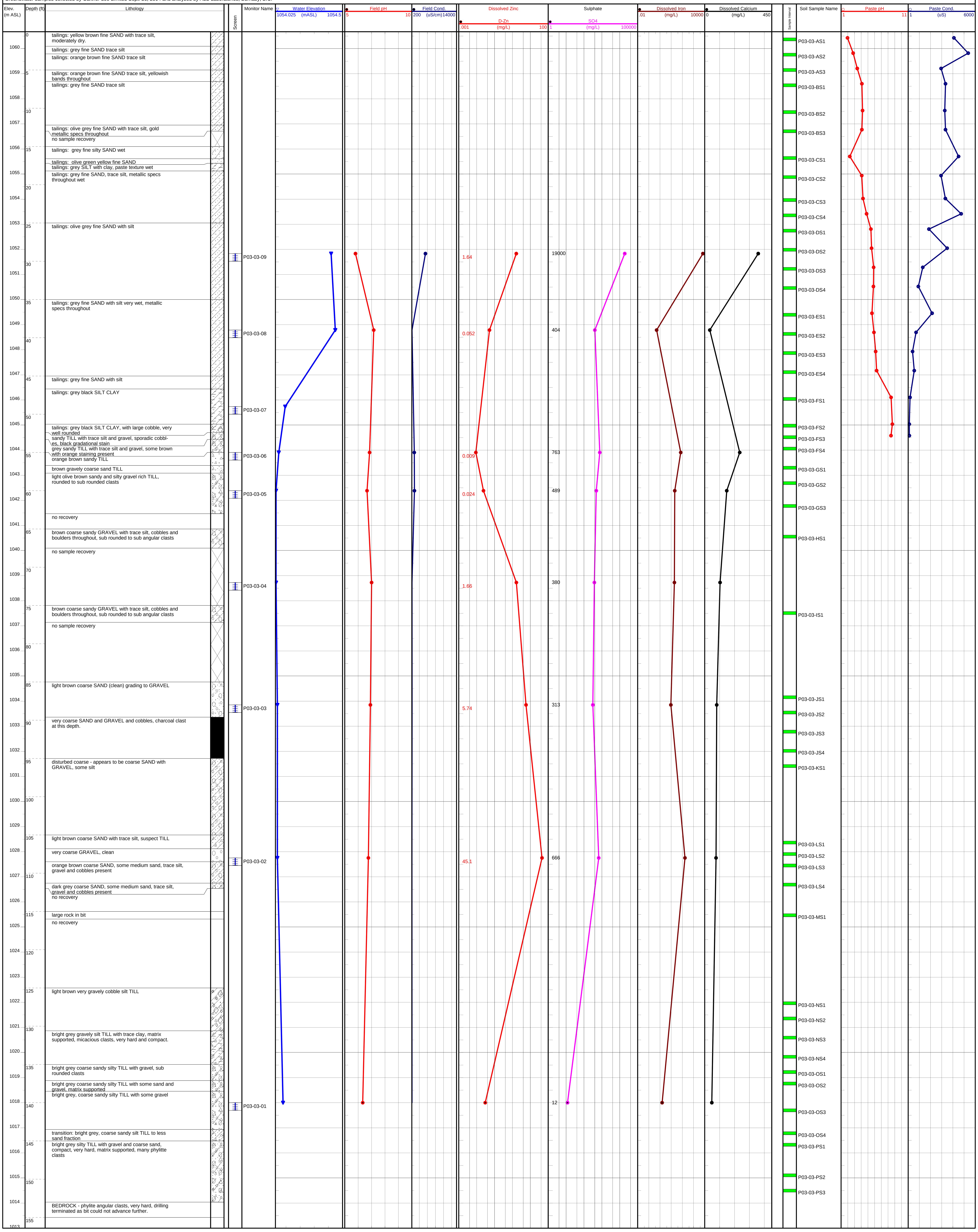
NOTES:
Borehole cored August xx, 2003 by SDS Drilling Company of Calgary, AB, a division of Boart Longyear using a RDU 150 Sonic Drill with continuous core collection. Soil samples collected from continuous core in the field and analyzed for paste pH and paste conductivity in the field
Borehole logged by J. Kerr, Gartner Lee Limited. Log produced using Viewlog Log Analysis Software
Multi-level well designed and constructed by Gartner Lee Limited on August xx, 2003.
Groundwater samples collected by Gartner Lee Limited Sept. 26, 2004 and analyzed by ALS Laboratories, Burnaby, B.C.



Well Name: P03-03

LOG SCALE: 1:70

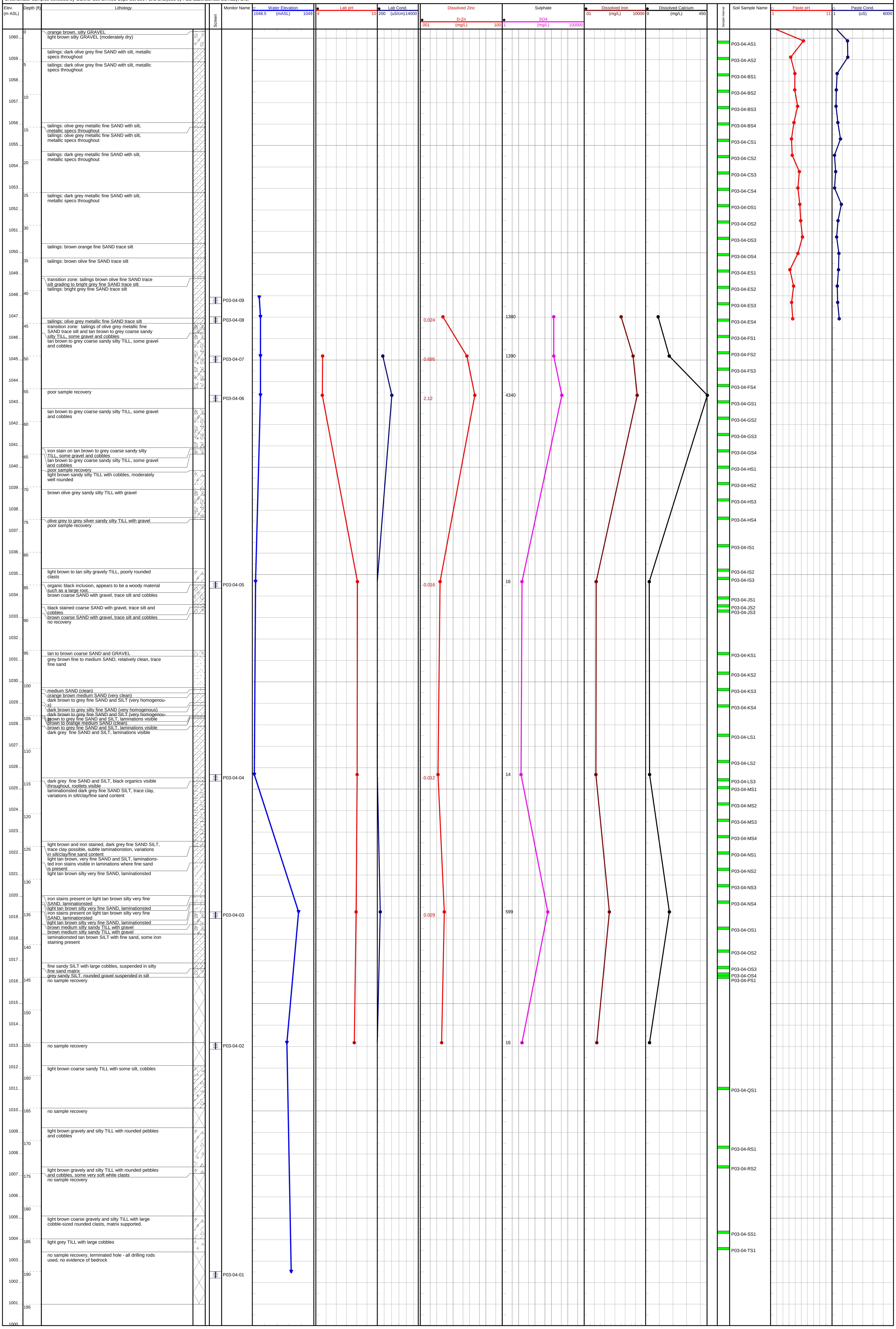
NOTES:
Borehole cored August xx, 2003 by SDS Drilling Company of Calgary, AB, a division of Boart Longyear using a RDU 150 Sonic Drill with continuous core collection. Soil samples collected from continuous core in the field and analyzed for paste pH and paste conductivity in the field
Borehole logged by J. Kerr, Gartner Lee Limited. Log produced using Viewlog Log Analysis Software
Multi-level well designed and constructed by Gartner Lee Limited on August xx, 2003.
Groundwater samples collected by Gartner Lee Limited Sept. 26, 2004 and analyzed by ALS Laboratories, Burnaby, B.C.



Well Name: P03-04

LOG SCALE: 1:75

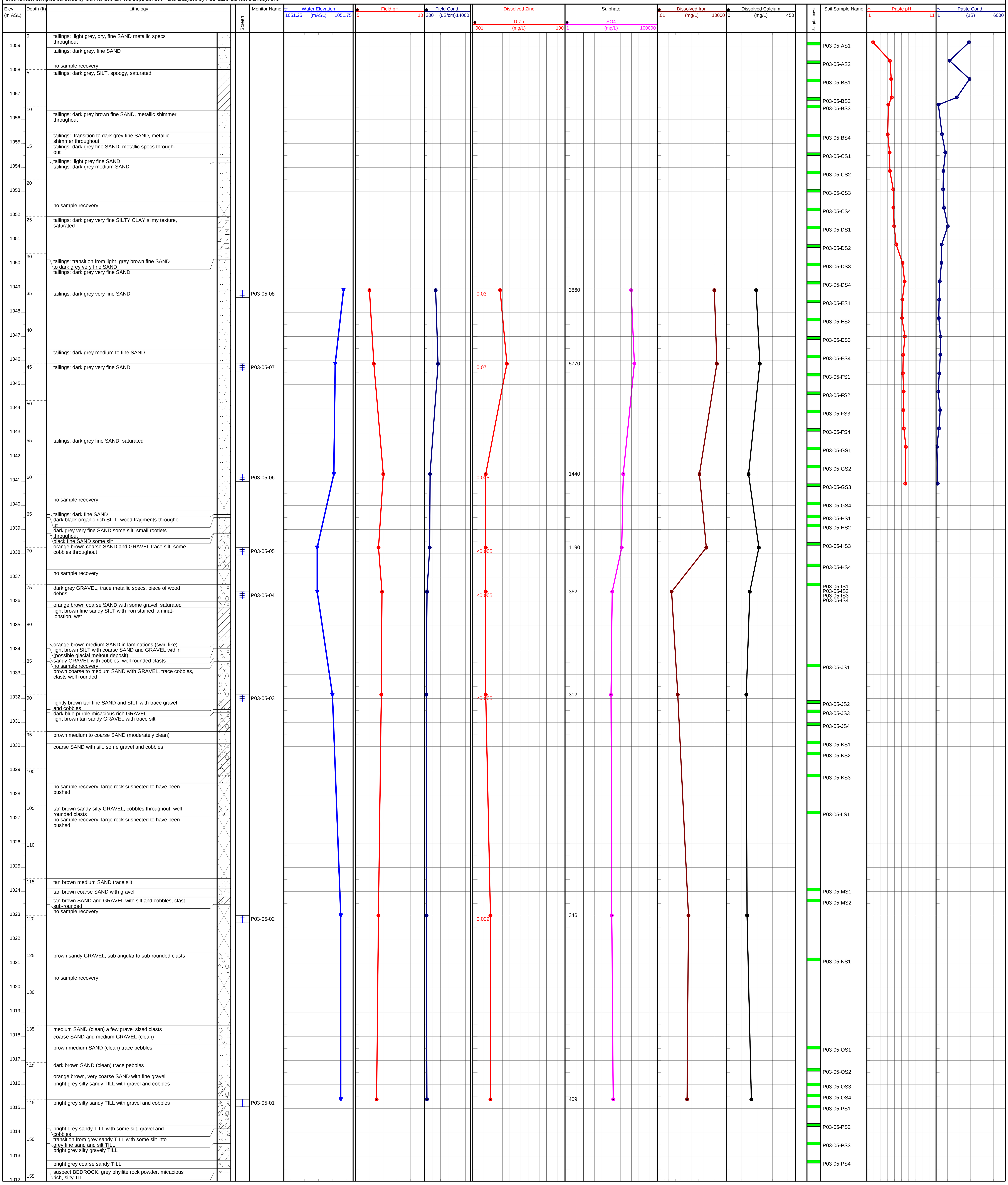
NOTES:
Borehole cored August xx, 2003 by SDS Drilling Company of Calgary, AB, a division of Boart Longyear using a RDU 150 Sonic Drill with continuous core collection. Soil samples collected from continuous core in the field and analyzed for paste pH and paste conductivity in the field
Borehole logged by J. Kerr, Gartner Lee Limited. Log produced using Viewlog Log Analysis Software
Multi-level well designed and constructed by Gartner Lee Limited on August xx, 2003.
Groundwater samples collected by Gartner Lee Limited Sept. 26, 2004 and analyzed by ALS Laboratories, Burnaby, B.C.



Well Name: P03-05

LOG SCALE: 1:75

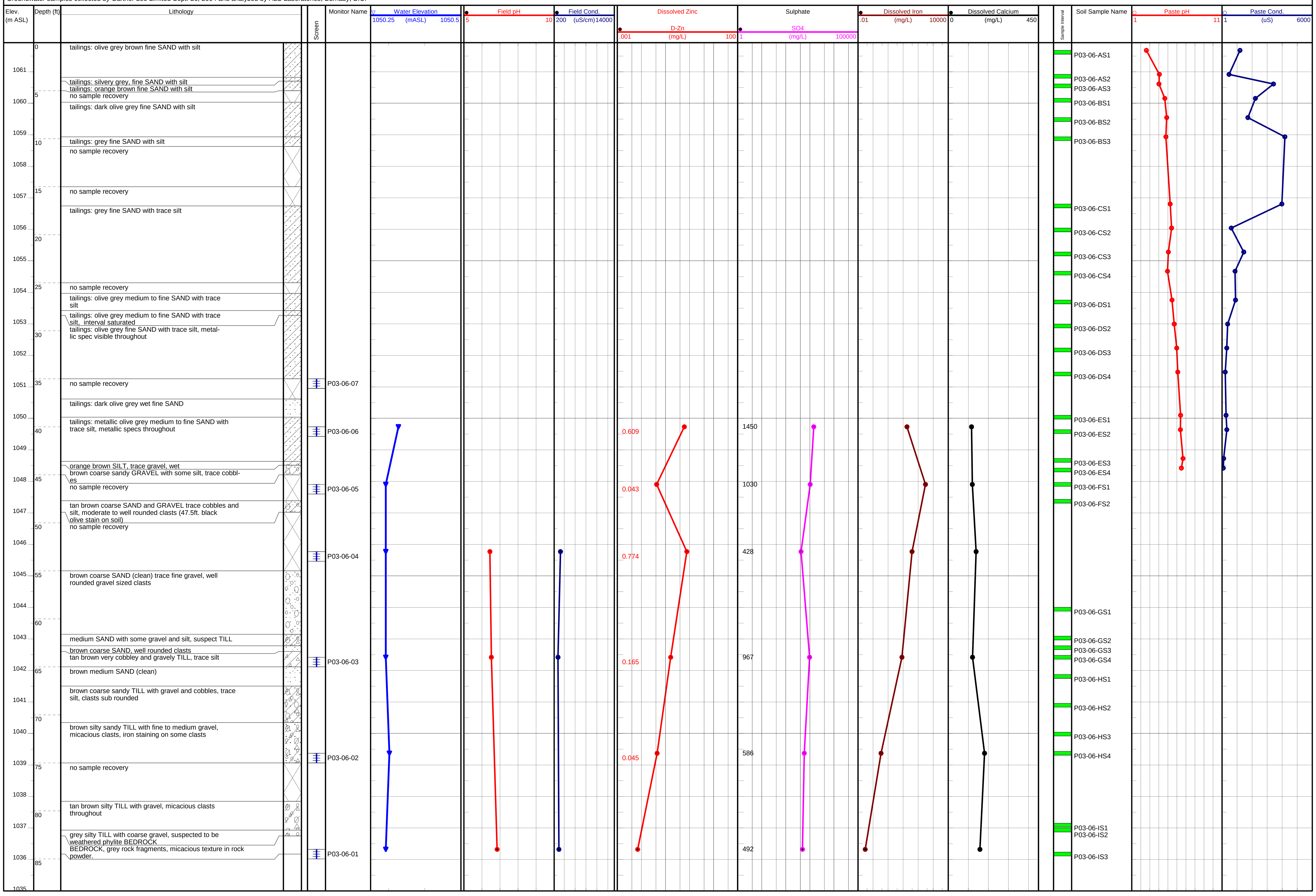
NOTES:
Borehole cored August xx, 2003 by SDS Drilling Company of Calgary, AB, a division of Boart Longyear using a RDU 150 Sonic Drill with continuous core collection. Soil samples collected from continuous core in the field and analyzed for paste pH and paste conductivity in the field
Borehole logged by J. Kerr, Gartner Lee Limited. Log produced using Viewlog Log Analysis Software
Multi-level well designed and constructed by Gartner Lee Limited on August xx, 2003.
Groundwater samples collected by Gartner Lee Limited Sept. 26, 2004 and analyzed by ALS Laboratories, Burnaby, B.C.



Well Name: P03-06

LOG SCALE: 1:75

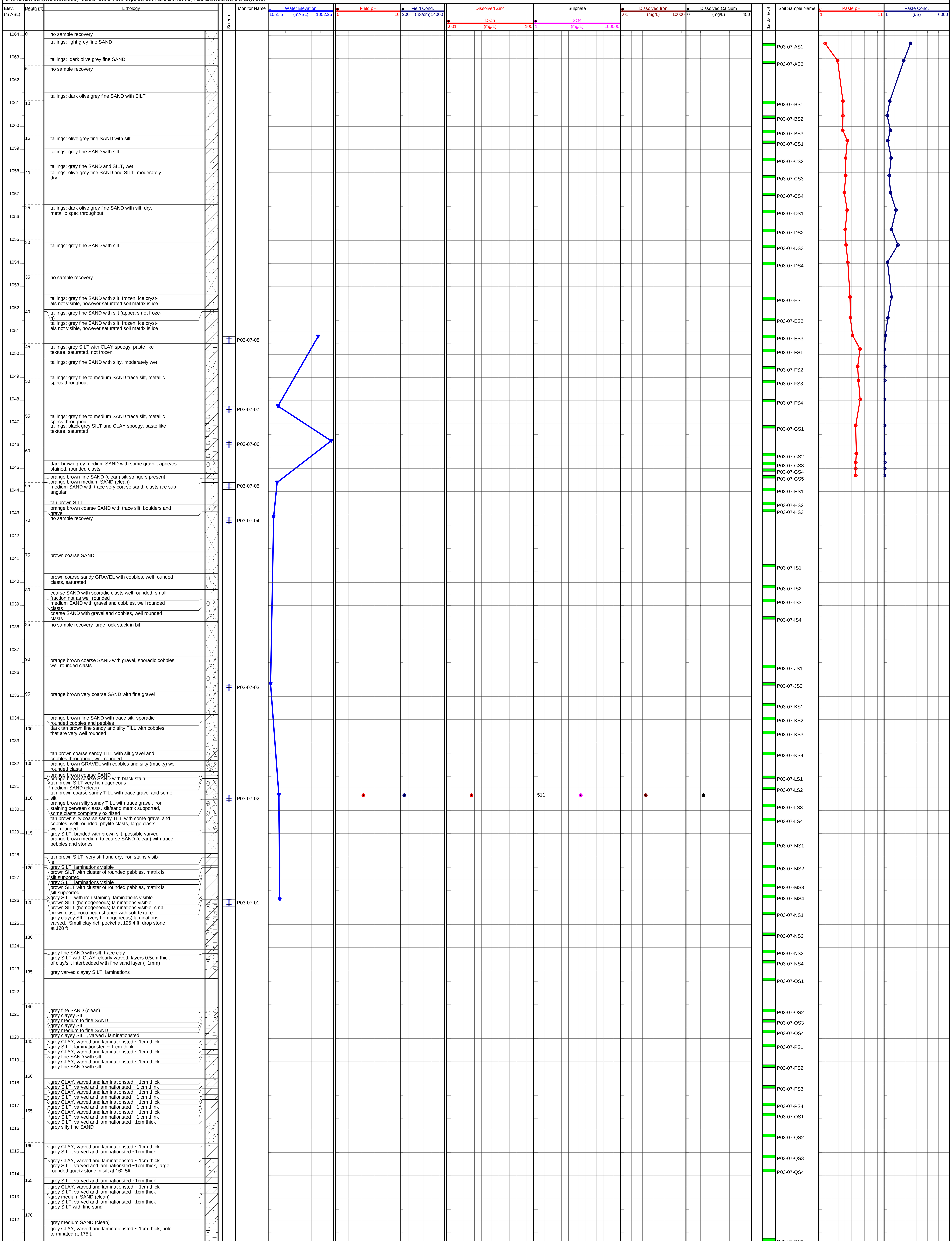
NOTES:
Borehole cored August xx, 2003 by SDS Drilling Company of Calgary, AB, a division of Boart Longyear using a RDU 150 Sonic Drill with continuous core collection. Soil samples collected from continuous core in the field and analyzed for paste pH and paste conductivity in the field
Borehole logged by J. Kerr, Gartner Lee Limited. Log produced using Viewlog Log Analysis Software
Multi-level well designed and constructed by Gartner Lee Limited on August xx, 2003.
Groundwater samples collected by Gartner Lee Limited Sept. 26, 2004 and analyzed by ALS Laboratories, Burnaby, B.C.



Well Name: P03-07

LOG SCALE: 1:75

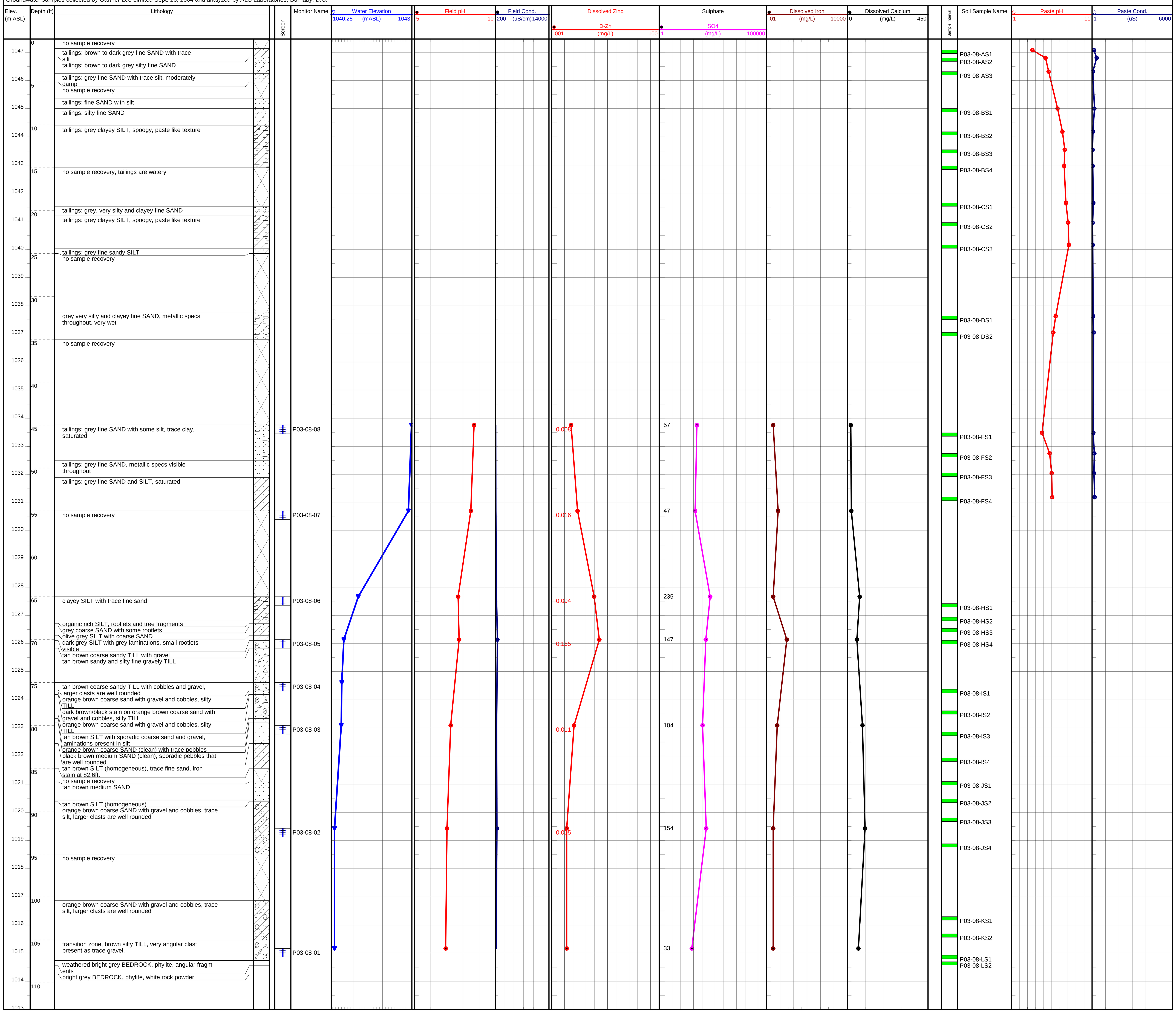
NOTES:
Borehole cored August xx, 2003 by SDS Drilling Company of Calgary, AB, a division of Boart Longyear using a RDU 150 Sonic Drill with continuous core collection. Soil samples collected from continuous core in the field and analyzed for paste pH and paste conductivity in the field
Borehole logged by J. Kerr, Gartner Lee Limited. Log produced using Viewlog Log Analysis Software
Multi-level well designed and constructed by Gartner Lee Limited on August xx, 2003.
Groundwater samples collected by Gartner Lee Limited Sept. 26, 2004 and analyzed by ALS Laboratories, Burnaby, B.C.



Well Name: P03-08

LOG SCALE: 1:75

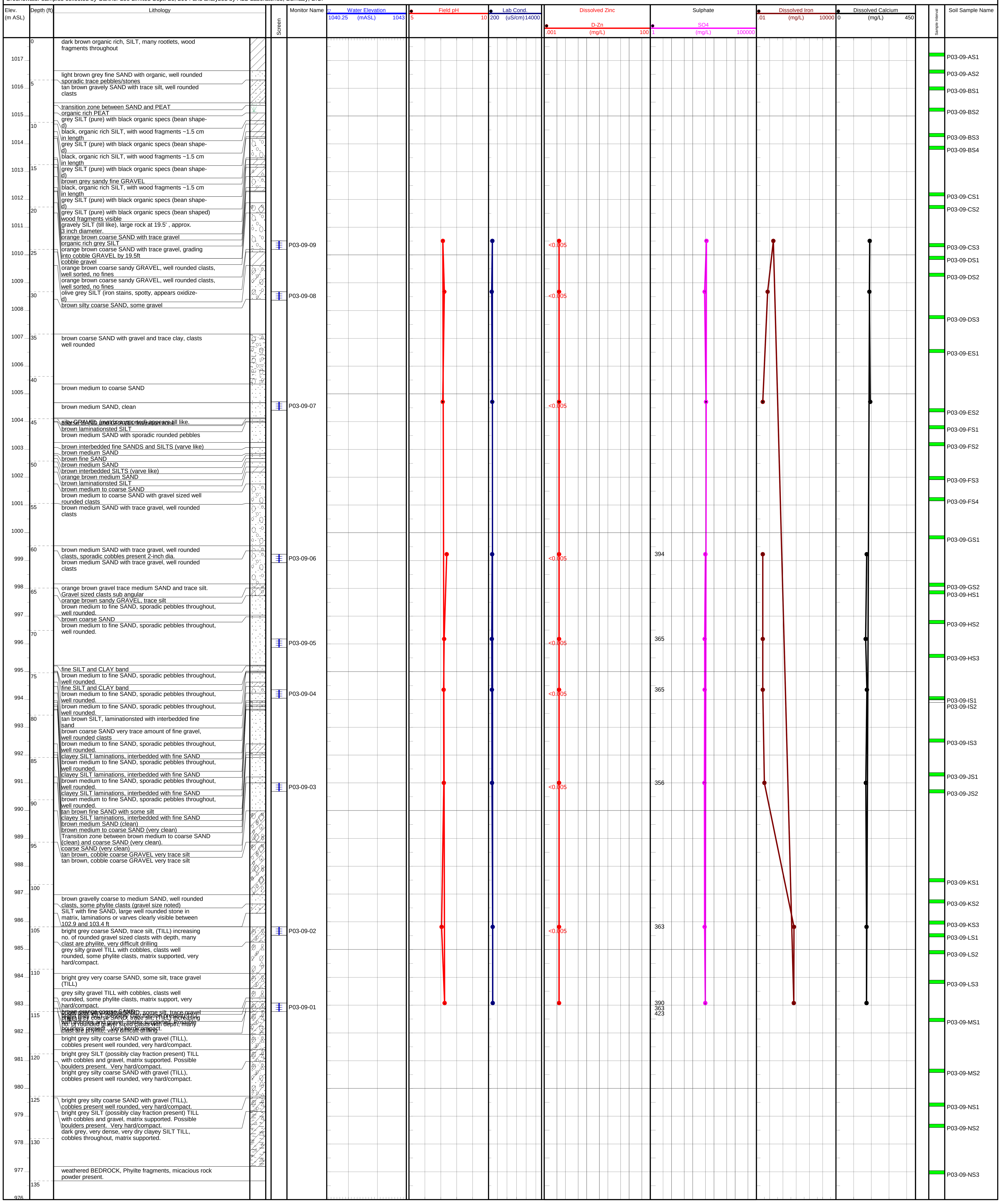
NOTES:
Borehole cored August xx, 2003 by SDS Drilling Company of Calgary, AB, a division of Boart Longyear using a RDU 150 Sonic Drill with continuous core collection. Soil samples collected from continuous core in the field and analyzed for paste pH and paste conductivity in the field
Borehole logged by J. Kerr, Gartner Lee Limited. Log produced using Viewlog Log Analysis Software
Multi-level well designed and constructed by Gartner Lee Limited on August xx, 2003.
Groundwater samples collected by Gartner Lee Limited Sept. 26, 2004 and analyzed by ALS Laboratories, Burnaby, B.C.



Well Name: P03-09

LOG SCALE: 1:75

NOTES:
Borehole cored August xx, 2003 by SDS Drilling Company of Calgary, AB, a division of Boart Longyear using a RDU 150 Sonic Drill with continuous core collection. Soil samples collected from continuous core in the field and analyzed for paste pH and paste conductivity in the field
Borehole logged by J. Kerr, Gartner Lee Limited. Log produced using Viewlog Log Analysis Software
Multi-level well designed and constructed by Gartner Lee Limited on August xx, 2003.
Groundwater samples collected by Gartner Lee Limited Sept. 26, 2004 and analyzed by ALS Laboratories, Burnaby, B.C.



Appendix F

Daily Field Program Updates

to: Distribution
from: Eric Denholm
date: August 27, 2003
re: **Anvil Range – Update for 2003 Tailings Drill Program**

General

This will provide you with an update to the end of the day on Tuesday August 26.

Drilling commenced on Sunday August 24. Ground conditions have been manageable but not favourable. The drill rig and water truck have been stuck in the area around P01-09, which is an area that is typically dry enough to drive on in the summer. The rented drill mats have been utilized and are proving to be very useful in accessing the drill locations. Extra costs are being incurred, however, for equipment and operator time to deploy the mats.

In general, drilling advance rates and core recovery are good and as expected.

Progress to Date

Hole P03-01 has been completed upgradient of P01-09. Bedrock was encountered at 47.2 m (155 ft) and a thin organic layer marking the original ground interface was encountered. A multilevel monitoring bundle was installed with 2 points in the tailings saturated zone and 7 points in the aquifer.

Hole P03-02 lateral (south) of P01-09 has been completed and a multilevel monitoring bundle installed. Bedrock was encountered at 37.8 m (124 ft). This location was designed to be both lateral and downgradient of P01-09. However, the poor surface conditions requiring deployment of the rig mats with a hydraulic excavator after the drill rig was stuck necessitated a minor change to the location to be lateral to P01-09.

<u>Next Activities</u>

Hole P03-03, downgradient of P01-09 by approximately the same distance that P03-01 was upgradient is scheduled for drilling today with completion and installation of the monitoring bundle anticipated tomorrow.

The poor surface conditions will necessitate a minor change to the drilling sequence in order to maintain good progress and reduce risks of excessive downtime. The next hole scheduled will be the "replacement" for P81-04, drilled from the Second Impoundment Dam and this will be P03-04. The relatively secure access to this drill location will allow time for 1) continued drying of the tailings surface (weather dependent) and 2) deployment of the rig mats and preparation of an access ramp to the next priority location in the northern area of predominantly sandy tailings on the Second Impoundment tailings. This would then be location P03-05.

(via email)

Eric Denholm, Senior Mining Consultant

<u>Distribution:</u> Bud McAlpine
Dana Haggar
Martin Guilbeault
Shannon Glenn
Valerie Chort
Vic Enns

Gartner Lee Limited

memorandum

to: Distribution
from: Eric Denholm
date: August 28, 2003
re: **Anvil Range – Update for 2003 Tailings Drill Program**

Update on Progress to end of day, Wednesday August 27.

Hole P03-03, near and downgradient of P01-09 was completed at the end of the day. Bedrock was encountered at 46.3 m (152 ft) and a 9-point monitoring bundle was installed. The rig mats were required as both a roadway and a drilling platform to access the drill location and will also be required to demob the drill and water truck from the site this (Thursday) morning.

Next Activities

As per the revised drilling sequence, hole P03-04 will be moved to and initiated on the Second Impoundment Dam near inoperable well P81-04. This will avoid delays while access is prepared from the Original Impoundment Dam and rig mats are deployed as a roadway to access the P03-05 location in the north, predominantly sandy tailings area of the Second Impoundment.

The visual drill logs and other field information for P03-01, P03-02 and P03-03, all in the vicinity of P01-09, will be reviewed on Thursday in order to identify any preliminary trends or items of interest that could benefit from additional drill investigation at this stage.

(via email)

Eric Denholm, Senior Mining Consultant

Distribution: Bud McAlpine
Dana Haggar
Martin Guilbeault
Shannon Glenn
Valerie Chort
Vic Enns

to: Distribution
from: Eric Denholm
date: August 29, 2003
re: **Anvil Range – Update for 2003 Tailings Drill Program**

Update on Progress to end of day, Thursday August 28.

Hole P03-03, near and downgradient of P01-09 was demobed (requiring some extra time related to driving the rig and water truck on a single width of rig mats) and the rig commenced drilling on hole P03-04, on the Second Impoundment Dam.

Hole P03-04 was drilled to a depth of approximately 42.7 m (140 ft) and bedrock was not encountered at the end of the day. The original ground interface was encountered at a depth of approximately 15.2 m (50 ft) and no organic layer was observed as had been observed in some of the previous holes. A general observation of the aquifer stratigraphy in hole P03-04 is predominantly lacustrine materials (finer grained sands, silts and clays) which is different from the predominant sands and gravels in the previous 3 holes.

Field information for holes P03-01 to P03-03 was compiled but not reviewed for trends, as this time may have detracted from maintaining a priority on efficient drilling progress. This review of information is scheduled for Friday.

Next Activities

Hole P03-04 will be completed on Friday and the drill rig moved to P03-05.

Experience gained in manipulating and utilizing the rig mats suggested that mobilizing to the north corner of the Second Impoundment would likely hold up the drilling time and require stand by time for the drillers and rig. As a means of maintaining best project efficiency, hole P03-05 will be the drilled at the location approximately midway between P01-09 and P01-07 on the Second Impoundment Tailings (and somewhat in-line laterally with P01-08).

It is possible that the next move after P01-05 to the north corner of the Second Impoundment will require a small amount of stand by time regardless and this will be minimized to as great an extent as possible. This change in sequence will also allow the good weather conditions being experienced at the mine to dry out access conditions slightly over an additional day or two.

The visual drill logs and other field information for P03-01, P03-02 and P03-03, all in the vicinity of P01-09, will be reviewed on Friday in order to identify any preliminary trends or items of interest that could benefit from additional drill investigation at this stage.

(via email)

Eric Denholm, Senior Mining Consultant

Distribution: Bud McAlpine
Dana Haggar
Martin Guilbeault
Shannon Glenn
Valerie Chort
Vic Enns

Gartner Lee Limited

memorandum

to: Distribution
from: Eric Denholm
date: August 30, 2003
re: **Anvil Range – Update for 2003 Tailings Drill Program**

Update on Progress to end of day, Friday August 29

Hole P03-04, on the Second Impoundment Dam, was completed and a multi-level monitoring bundle was installed. The hole was drilled to a depth of 59.4 m (195 ft) and bedrock was not encountered. However, drilling ceased at this depth as all drill casings had been used. This occurred because that depth is approximately 8 m deeper than any of the anticipated drilling depths that were estimated at the outset of the program and that were specified to the driller.

Hole P03-05, on the Second Impoundment tailings approximately mid-distance between P01-09 and P01-07 was initiated. By the end of day, the hole was drilled to a depth of 19.8 m (65 ft), which was at the original ground interface where organic soil was observed.

Field information for holes P03-01 to P03-03 was compiled but not reviewed for trends, as this time may have detracted from maintaining a priority on efficient drilling progress. This review of information is scheduled for the weekend.

Next Activities

Hole P03-05 will be completed on Saturday and the drill rig moved to P03-06, in the northern corner of predominantly sandy tailings in the Second Impoundment. It is likely that this move will require a small amount of stand by time for redeployment of the drill mats and this will be minimized to as great an extent as possible.

The visual drill logs and other field information (especially for P03-01, P03-02 and P03-03 in the vicinity of P01-09) will be reviewed over the weekend in order to identify any preliminary trends or items of interest that could benefit from additional drill investigation at this stage.

P.O. Box 98, 4912-49th Street, Yellowknife, NT, X1A 2N1 tel 867.873.5808 fax 867.873.4453
Toronto | Vancouver | Calgary | Montreal | St. Catharines | Whitehorse | Yellowknife | Bracebridge
www.gartnerlee.com

Eric Denholm will travel to Faro on Monday and have an update meeting with the field crew at that time to follow up on teleconference updates. Vic Enns is scheduled to visit the site on Tuesday.

(via email)

Eric Denholm, Senior Mining Consultant

Distribution: Bud McAlpine
Dana Haggar
Martin Guilbeault
Shannon Glenn
Valerie Chort
Vic Enns

Gartner Lee Limited

memorandum

to: Distribution
from: Eric Denholm
date: August 31, 2003
re: **Anvil Range – Update for 2003 Tailings Drill Program**

Update on Progress to end of day, Saturday August 30

Hole P03-05, on the Second Impoundment tailings was completed and a multi-level monitoring bundle was installed. The hole was drilled to bedrock at a depth of approximately 47.2 m (155 ft). The drill rig and water truck were demobed from this hole and drilling ceased earlier than usual so that the drill mats could be redeployed to the next location.

A preliminary review of field paste pH and paste conductivity readings through the tailings at locations P03-01 to P03-03 showed generally similar trends to hole P01-09 with strongly acidic pH near surface increasing with depth. Paste conductivity readings in the "03" drill holes were elevated near surface, as anticipated, but were not as high as were observed in P01-09. Hole P03-02, "lateral" and south of P01-09 shows a variation of the pH trend with only a shallow acidic range which quickly increases to near neutral within the unsaturated zone.

Preliminary graphs of paste pH and paste conductivity through the tailings in holes P03-01 to P03-03 are attached. These graphs are preliminary in nature and have not undergone any interpretation or quality control checks and, therefore, may change and must not be used for anything beyond internal (this distribution) preliminary observation.

Next Activities

Hole P03-06, located in the north area of the Second Impoundment Tailings, will be mobed to and drilling will commence on Sunday. Access to this location is very poor and even deployment of the drill mats with the excavator is anticipated to be slow.

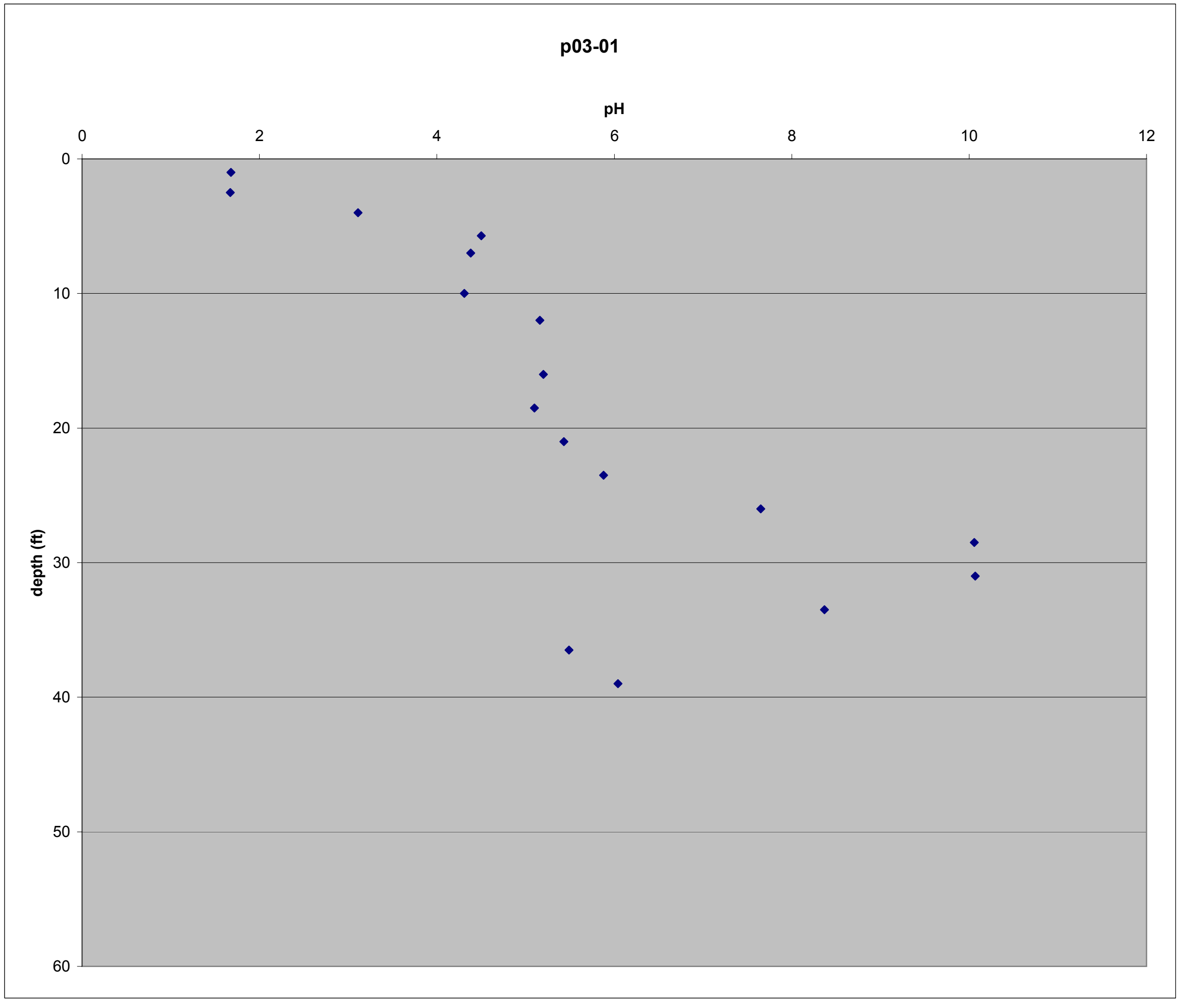
The visual drill logs and other field information will continue to be reviewed as it becomes available in order to identify any preliminary trends or items of interest that could benefit from additional drill investigation at this stage.

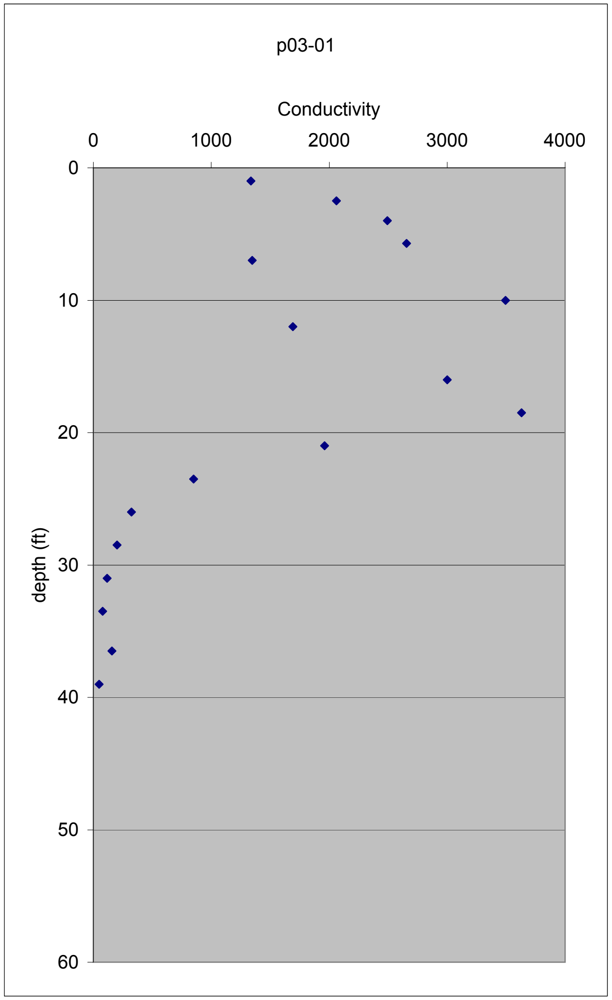
Eric Denholm will travel to Faro on Monday and have an update meeting with the field crew at that time to follow up on teleconference updates. Vic Enns is scheduled to visit the site on Tuesday.

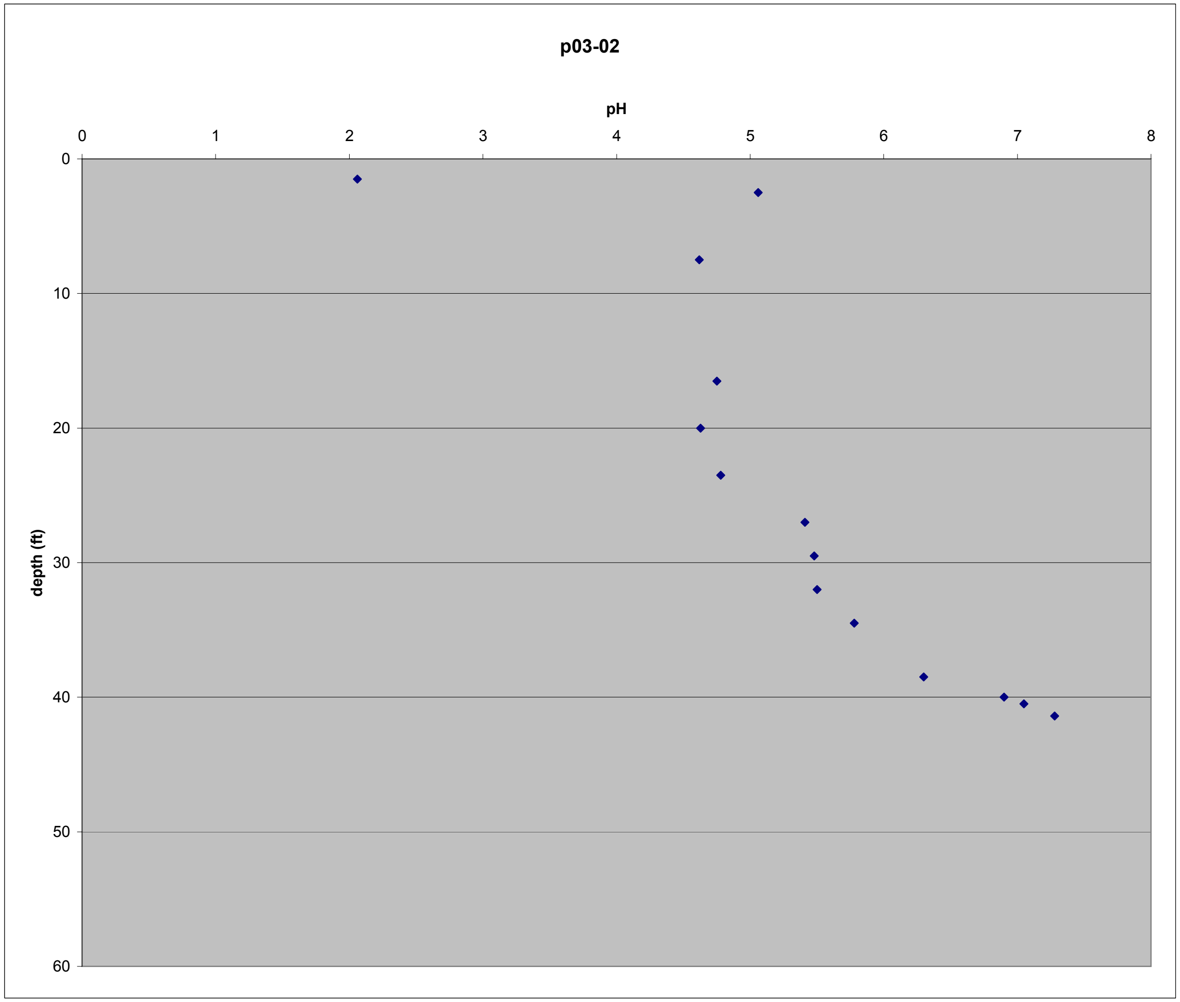
(via email)

Eric Denholm, Senior Mining Consultant

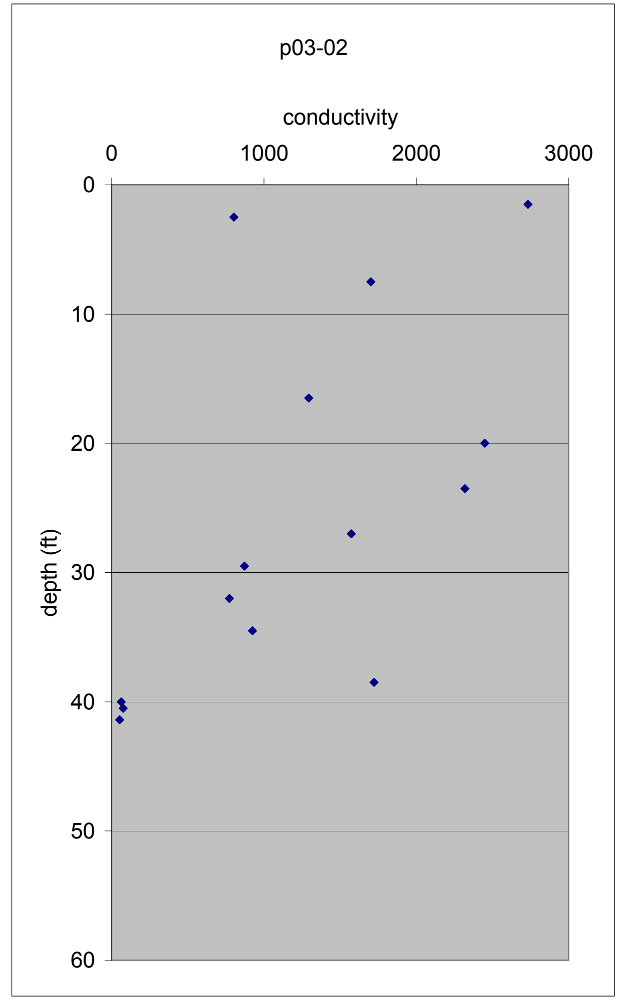
Distribution: Bud McAlpine
Dana Haggar
Martin Guilbeault
Shannon Glenn
Valerie Chort
Vic Enns


p03-01
pH
0
2
4
6
8
10
12
0
10
20
30
40
50
60
depth (ft)

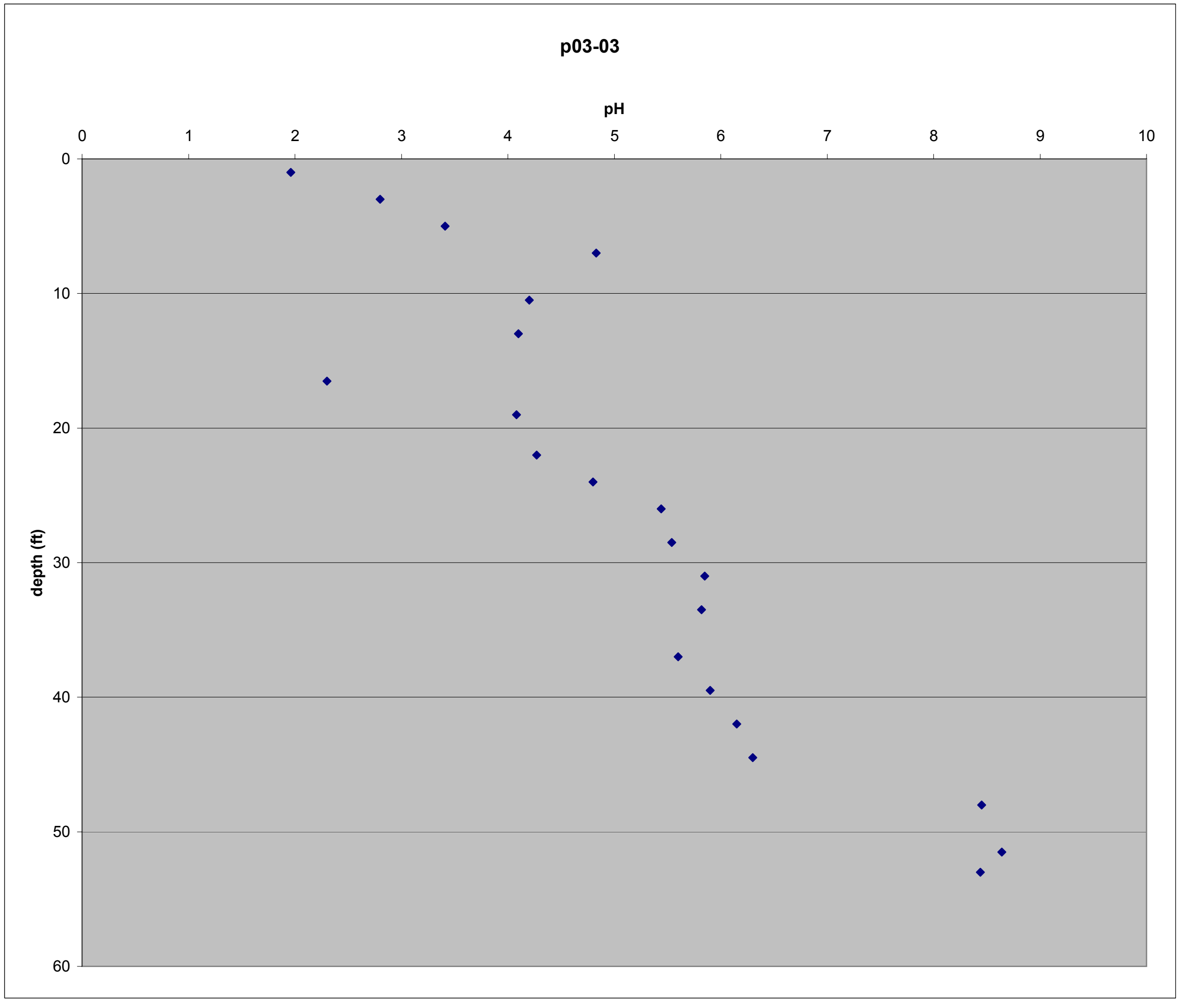

p03-01
Conductivity
0
1000
2000
3000
4000
0
10
20
30
40
50
60
depth (ft)



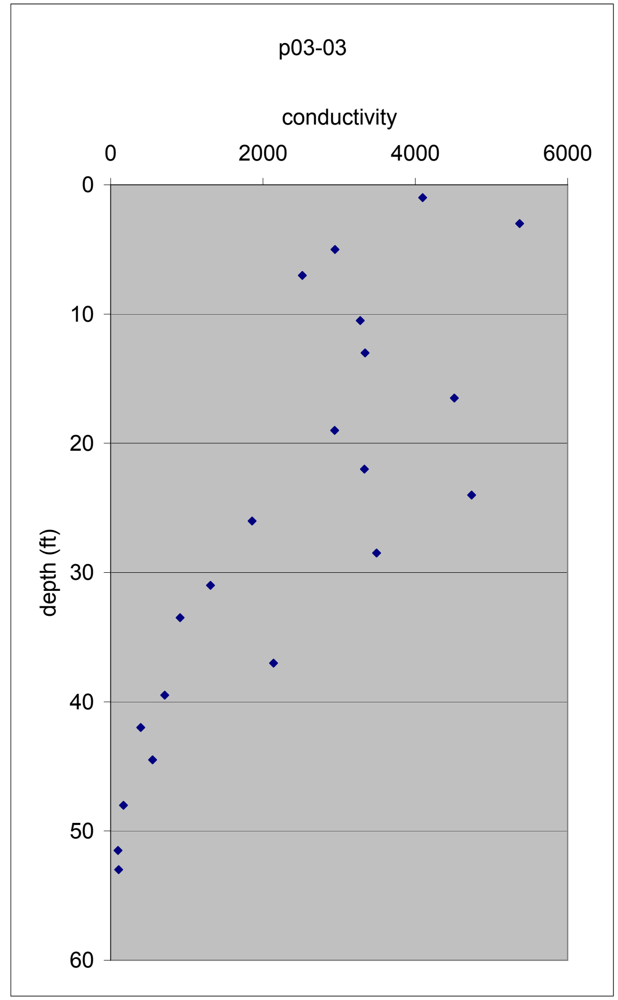
p03-02
pH
0
1
2
3
4
5
6
7
8
depth (ft)
0
10
20
30
40
50
60



p03-02
conductivity
0
1000
2000
3000
depth (ft)
0
10
20
30
40
50
60



p03-03
pH
0
1
2
3
4
5
6
7
8
9
10
0
10
20
30
40
50
60
depth (ft)



p03-03
conductivity
0
2000
4000
6000
0
10
20
30
40
50
60
depth (ft)

Gartner Lee Limited

memorandum

to: Distribution
from: Eric Denholm
date: September 02, 2003
re: **Anvil Range – Update for 2003 Tailings Drill Program**

Update on Progress to end of day, Monday September 01 (including August 31)

This update covers the work completed over two days: Sunday August 31 and Monday September 01, Labour Day.

Hole P03-06, in the northern area of the Second Impoundment tailings, was completed (including installation of a multi level monitoring bundle) on August 31. The hole was accessed from the toe of the Original Impoundment Dam via the rig mats and, by necessity, is located closer to the Original Impoundment Dam than initially intended. The drill location is approximately 85 m (280 ft) out from the toe of the dam. The hole was drilled to bedrock at a depth of approximately 25.9 m (85 ft). The drill rig and water truck were demobed from this hole early in the day upon completion such that redeployment of the rig mats to the next location commenced.

Hole P03-07, on the Original Impoundment tailings in the estimated area of inflow of the original Faro Creek channel, was completed at the end of the day on September 01. This drill hole was drilled to the maximum drill depth (56.4 m / 185 ft) and did not encounter bedrock. This is somewhat unexpected and the anticipated versus observed stratigraphy will be reviewed in more detail on Tuesday morning as the drill rig pulls casings and demobs from the drill location. A substantial "package" of fine grained (assumed) lacustrine sediments was observed deep in the hole and a zone of frozen tailings was observed. This drill location was also accessed via the rig mats and, consequently, was approximately 85 m (280 ft) out from the crest of the Original Impoundment Dam.

Eric Denholm arrived in Faro on Monday evening and had an update meeting with the technical crew.

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Next Activities

The next scheduled drill location will be Hole P03-08, located on the south side of the Intermediate Impoundment along the internal dyke that is exposed due to the lowered pond water level. This location on the Intermediate Impoundment was selected to take advantage of the internal dyke to access the Intermediate Tailings further downgradient than previously possible using the rig mats accessed from the Rose Creek Diversion Canal containment dyke (road). It is likely that drilling will not commence at this location until afternoon on Tuesday due to the time required for puling casing and demobing from location P03-07, redeployment of the rig mats and setting up on location P03-08.

It is unlikely that access onto the north side of the Intermediate Tailings Impoundment will be possible at this time.

The visual drill logs and other field information will continue to be reviewed as it becomes available in order to identify any preliminary trends or items of interest that could benefit from additional drill investigation at this stage.

Vic Enns is scheduled to visit the site on Tuesday. This opportunity will be taken to review the field results obtained to date and to discuss alternatives for completing the drill program (i.e., additional drill locations in the tailings impoundments versus continuing to the downgradient area to "replace" the X19 monitoring wells). These discussions will be held with or communicated as quickly as possible to Deloitte & Touche Inc. for their inclusion.

(via email)

Eric Denholm, Senior Mining Consultant

Distribution: Bud McAlpine
Dana Haggar
Martin Guilbeault
Shannon Glenn
Valerie Chort
Vic Enns

Gartner Lee Limited

memorandum

to: Distribution
from: Eric Denholm
date: September 02, 2003
re: **Anvil Range – Update for 2003 Tailings Drill Program**

Update on Progress to end of day, Tuesday September 02

The drill rig and water truck were demobed from hole P03-07, on the Original Impoundment tailings in the estimated area of inflow of the original Faro Creek channel, and did not drill on Tuesday. The rig mats were redeployed to the next location, P03-08 on the south side of the Intermediate Impoundment, by the end of the day. This was a long move requiring the rig mats to be loaded onto the flat deck trailer for the move. The drillers performed maintenance on their rigs during the day.

A budget reconciliation indicated that 1 or 2 holes can be completed under the current drilling budget. The reconciliation indicated that drilling costs were on budget with the exception of the larger than anticipated costs for deployment and use of the rig mats, which proved critical to accessing any of the drill locations.

Vic Enns arrived on site and an update meeting was held to review the observations to date and to discuss the approach to finalizing the program. The sequence of holes agreed upon was to, first, complete P03-08 as planned on the south side of the Intermediate Impoundment. If this drill hole proves to be relatively shallow, as anticipated, and is completed quickly on Wednesday as anticipated, then a final hole, P03-09 located downgradient of the Cross Valley Dam near non-functional well X19, will be completed as well.

This would complete the program with nine drill locations completed, as per the workplan, even including the extra costs incurred for continuous deployment and utilization of the rig mats.

Next Activities

The next scheduled drill location will be Hole P03-08, located on the south side of the Intermediate Impoundment along the internal dyke that is exposed due to the lowered pond water level. This drill location should be completed before the end of the day on Wednesday such that the drill rig can mobilize to downgradient location P03-09 and the rig mats can be demobed from the site.

The final hole, P03-09, would be anticipated to be completed on Thursday, ending the drill program.

(via email)

Eric Denholm, Senior Mining Consultant

Distribution: Bud McAlpine
Dana Haggar
Martin Guilbeault
Shannon Glenn
Valerie Chort
Vic Enns

Appendix G

Project Health and safety Protocol

1. Introduction

This Site Specific Health and Safety Plan (HASP) is applicable for all on-site environmental work at the Faro and Vangorda Plateau mine sites to be performed in 2003 as part of the Rose Creek tailings hydrogeology investigation.

The purpose of the HASP is to provide reasonable protection to workers from foreseeable health and safety hazards as outlined below. This HASP also intends to limit the dissemination of potentially contaminated soil to the town of Faro.

Adherence to this HASP is a requirement of any and all contracts for on-site work awarded by Deloitte & Touche LLP (in their capacity as Interim Receiver for Anvil Range Mining Corp.) ("Deloitte&Touche") or Gartner Lee Limited ("Gartner Lee") as part of these environmental projects.

This HASP applies to, but is not limited to, the drillers and drillers helpers, environmental engineers and technicians, supervisors, government or other visitors to the work sites and mine employees who may visit the work sites.

A qualified first aid attendant will be available at the Faro guardhouse for the duration of these projects. This person will be utilized as the initial response to any incident requiring first aid.

2. Hazard Assessment

The health and safety hazards that are likely to be encountered at the Faro and Vangorda Plateau mine sites relate to the physical condition of the work areas, the nature of working with and around heavy equipment, and the chemical contamination of some surficial materials and some surface water.

The possible effects of the physical and chemical hazards are magnified by the remote location of the mine sites.

The physical hazards that may be encountered include the following:

- injury related to walking and carrying equipment over tailings, waste rock and steep slopes of tailings, soil or rock;
- wildlife encounters, and especially bears;
- windblown tailings injuring skin or eyes;
- heavy equipment operation at the drills, float trucks and support vehicles;

- safety hazards in mine buildings and areas that may be visited for supplies;
- vehicle damage or personal injury related to steep drop offs near open pits and rock dumps;
- vehicle damage or personal injury due to rock falls or slides from overhanging rock faces rock slopes;
- vehicle damage or personal injury related to collision with other traffic or fixed obstacles.

The chemical hazards that may be encountered include the following:

- sickness related to ingestion of contaminated water or soils/tailings;
- inhalation of tailings dust or oxidation products;
- transport of contaminated soil or tailings to the town of Faro where it may be disseminated to the public.

All of the mine and creek water on the mine sites is subject to the presence of harmful bacteria that precludes the use of this water for drinking or washing regardless of the compliance for some chemical parameters.

3. Health and Safety Plan

The following health and safety requirements are to be adhered to by all workers for the projects described above. Refusal to adhere to will be cause for dismissal and expulsion from the property at the sole discretion of the mine manager or his designate.

Fitness for Work

1. Project personnel will work and act in a safe, professional and responsible manner while on the mine site.

2. Any worker arriving for work intoxicated, under the influence of illegal drugs or otherwise physically unfit for work will be refused access to the mine site at the sole discretion of the mine manager or his designate.

Check-In Procedure and Mine Access

3. All personnel will check in and out at the Faro guardhouse upon arrival to and departure from the mine sites in a manner acceptable to the Guardhouse attendant even when working in the tailings area.

4. All access to the Vangorda Plateau mine site will be via the Faro guardhouse unless specifically authorized by the mine manager or his designate.

5. Project personnel will not enter or travel to areas of the mine site that are not specifically part of the project area unless authorized by the mine manager or his designate.

Personal Protective Equipment

6. All personnel will wear appropriate footwear (steel toe safety boots) when in the vicinity of the drills, other heavy equipment or when inside the mine security area. All personnel will wear hard hats at all times in the tailings or mine areas except when inside a vehicle; safety glasses will be worn when in the vicinity of the drills, other heavy equipment or as instructed by the mine manager or his designate.

7. Paper dust masks and safety goggles will be worn when wind blown dust is deemed to be an annoyance or a health hazard in cases of operating drills or wind blown tailings; the mine manager or his designate will have final authority regarding the wearing of dust masks and goggles.

8. Protective disposable rubber gloves will be worn while collecting samples of water, sediment or tailings samples on the mine site or in the tailings area.

9. Project personnel will dress appropriately for the prevailing weather conditions including sunglasses and other appropriate protection from solar radiation. Shirts with sleeves and long pants must be worn at all times.

Wildlife Protection

10. If a worker is working at a distance of greater than 50 metres from an unlocked vehicle, then that worker must be in possession of bear spray, bear bangers or a similar protective device.

11. Project personnel will remove all garbage or other debris from project work areas to designated disposal locations at the end of each work shift and shall maintain work areas in a neat manner that does not attract bears or other wildlife.

Working Alone

12. Field personnel will not work alone without first notifying a responsible party of their intentions. The responsible party could be a fellow field personnel or the Faro guardhouse attendant. They will check in with the responsible party at the start and completion of the work; and will not work alone for a period of longer than 2 hours without checking in. If a pre-arranged contact time is missed, then the responsible party will stop work immediately and initiate a search for the missing person.

Working Near Heavy Equipment

13. No worker will assist with the operation of heavy equipment or otherwise work directly on heavy equipment without the specific consent and only under the direction of the equipment operator.

14. All workers will follow the directions of equipment operators when working in the immediate vicinity of heavy equipment.

Vehicle Safety

15. Vehicles will not be parked in locations where the risk of rock falls or crumbling edges is present.

16. Vehicles will be operated on a safe and professional manner at all times within the mine and tailings areas.

17. Vehicle operators will obey posted speed limits on public roads within and in the vicinity of the town of Faro and will obey the following speed limits in the mine area:
    - public road from Town of Faro to minesite: 90 km/hr or as otherwise posted
    - Vangorda haul road from Faro crusher area to Grum "hotline": 80 km/hr
    - all other mine roads including tailings area access road: 50 km/hr

18. Vehicle operators will slow to 20 km/hr or come to a stop, as appropriate for safety, when passing through the Faro security gate.

Prevention of Chemical Contamination

19. Smoking is not allowed while working on the tailings impoundments; this restriction also applies to vehicles parked on the tailings impoundments.

20. Workers will wash their hands and face in clean water prior to eating. Clean water can be obtained from the Faro guardhouse or the town of Faro; creek water may not be used for washing due to the possible presence of bacteria.

21. Project personnel will not drink or wash in water from mine seeps, local creeks, lakes or ponds.

22. Project personnel will not collect or eat berries or other vegetation in the immediate vicinity of the mine site or tailings areas.

Prevention of Contaminant Transport to Town of Faro

23. Workers will make reasonable attempts to prevent the transport of contaminated materials to the town of Faro by leaving dirty coveralls and boots at the minesite when appropriate and by washing hands before departing the mine site.

24. Workers will wash and change clothes prior to entering the restaurant or other public locations in the town of Faro if the worker's clothes, hands or other items are dirty from working at the minesite or tailings area.

25. Project vehicles will be kept reasonably clean during the project; it will be the responsibility of the primary operator of a vehicle to maintain the vehicle in a clean and professional manner.

4. Notification Procedure

All health and safety incidents must be reported to the mine manager or his designate even if they did not require or result in a response action.

In the case of a medical or first aid incident, the first contact should be with the Faro Guardhouse where a qualified first aid attendant is on duty 24 hours per day. The guardhouse attendant will then take control of the incident including further notifications.

Faro Mine Guardhouse: 994-2600

In the event that notification to the Faro guardhouse is not possible or is otherwise unachievable, then the following public response numbers apply:

Police:	994-5555 or 1-867-667-5555
Fire:	994-2222
Ambulance:	994-4444

To report a health and safety incident, the following numbers apply:

Mine Manager (Dana Haggar) home office:		994-2647
Maintenance Manager (Mike Bryson) home office:		994-2578
Guest House (Town of Faro):		994-2459
Deloitte & Touche	Toronto Office:	416-601-6147
Gartner Lee Limited:	Whitehorse Office:	867-633-6474
	Yellowknife Office:	867-873-5808

The undersigned have reviewed the Worker Health and Safety Plan for 2001 Environmental Work at the Faro mine and agree to adhere to all of the conditions therein.

NAME (printed)	SIGNATURE	ORGANIZATION	DATE