Summary of 2015–2016 Field Investigation – Faro Creek Diversion Proposed Realignment Faro Mine Remediation Project

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This technical memorandum (TM) presents a summary of the investigation activities performed at the Faro Mine Complex (FMC) during 2015 and 2016 in support of the Faro Creek Diversion (FCD) improvements and realignment. Subsurface data collected during the investigation is presented and summarized. Interpretation of the data will be provided in the Comprehensive Design Road Map Report being prepared separately.

Improvements to the FCD are proposed because of the potential for erosion or slope failure of the northeast portion of the Faro Pit that could undermine the existing FCD and cause discharge from it into the Faro Pit. Various alternative diversion alignments have been evaluated in the past, generally entailing realignment of the West Valley Interceptor Ditch (WVID) and the FCD farther up the slope from the existing location. The current remediation design concept is to realign only the portion of the FCD that is at potential risk of failure, moving it upslope from its current alignment to an alignment outside of the potential pit slope failure zone (see Figure 1).

The purpose of the investigation was to collect data to increase the understanding of soil and rock characteristics, depth to bedrock, groundwater conditions, and the presence and distribution of permafrost. The field investigations summarized herein provide additional data required to support the conceptual design for realignment of the FCD outside of the potential failure zone around the northeast Faro Pit slope, and for increasing the capacity of the existing channel in other sections of the FCD.

Field Investigation

The field investigation program was conducted along the proposed FCD in October 2015 and March 2016. The scope of work included the following tasks:

- Conducting 21 geophysical survey transects across the existing and proposed WVID and FCD alignments
- Drilling three vertical boreholes along the proposed realignment and two vertical boreholes along the current alignment of the FCD, and installing an open standpipe piezometer and a thermistor casing in four of the five boreholes
- Drilling one borehole angled at 37 degrees (°) from vertical (53° dip) towards the Faro Pit to confirm interpretation of altered intrusive rock in the north pit slope failure
- Collecting soil samples and conducting geotechnical and geochemical laboratory tests

- Collecting rock core samples and conducting strength and soundness laboratory tests
- Conducting standard penetration tests (SPT) and collecting soil samples
- Installing thermistors and conducting temperature gradient monitoring to establish a baseline temperature profile

Subsurface Investigation

A subsurface investigation along the FCD alignment was conducted from March 3 to 18, 2016, and consisted of drilling six boreholes at the locations shown on Figure 1. The borehole drilling data are summarized in Table 1. Three of the boreholes, CH16-102-MW003 through CH16-102-MW005, were located along the proposed alignment of the FCD and were advanced to depths ranging from 13.6 to 19.2 metres below ground surface (mbgs) and at least 10 metres (m) into bedrock. Borehole CH16-102-MW006 was located adjacent to the existing FCD on the eastern side of the Faro Creek Valley. Borehole CH16-102-MW007 was located on the western side of the Faro Creek Valley, adjacent to the WVID. Borehole CH16-102-MW007 was advanced to a depth of approximately 16.8 mbgs, approximately 12.5 m into bedrock. Borehole CH16-102-MW006 was advanced to a depth of approximately 18.1 mbgs; bedrock was not encountered in this borehole. Borehole CH16-102-BH008 was located near the northeastern Faro Pit slope to investigate the extent of intrusive rock formations, and was drilled to a depth of 60.1 mbgs at an inclination of 53° from horizontal, slightly steeper than the upper portion of the northeastern Faro Pit slope. The boreholes were located where geophysical survey transects crossed the existing and proposed FCD alignments, to correlate the borehole data with the geophysical data.

The boreholes were advanced by Midnight Sun Drilling Inc. of Whitehorse, Yukon, by using a P1 Prospector drill rig equipped for drilling with overburden drilling eccentric (ODEX). A CRREL barrel was mobilized for use in frozen ground, and HQ-size diamond coring in rock. The CRREL barrel was not used in this drilling program as the conditions encountered did not permit it. The ODEX casing had an outside diameter of 152 millimetres (mm) (6 inches). Water used for HQ rock coring was taken from the FCD and either directly pumped to the rig, or pumped into a tank transported by a rubber-tracked Canycom carrier.

SPTs were performed every 1.5 m through the overburden, and were conducted in general accordance with ASTM International (ASTM) D1586, *Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils* (ASTM, 2011), using a 63.5-kilogram automatic trip hammer dropping 0.76 m (30 inches), and AW-sampling rods. A standard, 50.8-mm (2-inch) outside-diameter split-spoon sampler was used for all borings. Disturbed samples of soil were collected from the SPT split spoon.

All drilling and testing activities were performed under the direction of the subcontractor, BGC Engineering Inc. (BGC), assisted by experienced CH2M HILL Canada Limited (CH2M) field staff. Soil samples were field classified in general accordance with ASTM D2488, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)* (ASTM, 2009). Soil and rock materials and conditions encountered in the boreholes were recorded by BGC on borehole logs during drilling. The soil classification overview and borehole logs of materials and conditions encountered are presented in Attachment 1 and photographs taken during drilling are presented in Attachment 2.

Well and Thermistor Installation

Monitoring wells and thermistor ports were installed in the four boring locations on the existing FCD, the proposed FCD alignment, and the one boring on the WVID. Well construction diagrams are presented on the boring logs in Attachment 1. One boring, CH16-102-BH008, which was the inclined boring, was abandoned with grout following drilling. Well and thermistor installation data is summarized in Table 2. Monitoring wells were installed with 50-mm diameter Schedule 40 polyvinyl chloride (PVC)

with a 0.010-inch machine slotted screen. Thermistor ports were constructed with 25-mm diameter Schedule 40 PVC solid pipes. Wells at locations CH16-102-MW003 through CH16-102-MW005 were completed with 3.05-m (10-foot) screen lengths, and locations CH16-102-MW006 and CH16-102-MW007 were completed with 1.5-m screen lengths. The longer screens were installed in three wells due to an observed lack of water, to capture as much water as possible. Before installing the wells and thermistors, the rock cored section of the boreholes, if present, was backfilled with size 10/20 filter sand up to the depth of the well install. The annulus surrounding the well was also backfilled with 10/20 filter sand to a height of 0.3-m (1-foot) above the well screen. Bentonite chips or pellets were used to backfill the annulus around the well and thermistor casings above the filter sand, to approximately 0.6 m (2 feet) below ground surface.

All wells were completed with steel stick-up surface casings except for location CH16-102-MW007, which was completed with a 150-mm-diameter, flush-mounted steel casing. The boreholes were drilled during the winter, and pads were constructed for support of the drill rig using a mixture of soil and snow. The drill pad material was excavated down to the native ground so that the well surface casing could be set in concrete in the native ground.

An RST Instruments, Inc., Model EL380013P thermistor string was deployed temporarily into each of the ports in June 2016 to measure the ground temperature profile. After allowing the temperatures to equilibrate for at least 1 hour, readings were recorded for each thermistor bead by measuring the resistance between the connector pins with an ohmmeter. Temperatures were obtained by applying appropriate calibration calculations on the resistance results.

Geophysical Surveys

Supplemental subsurface data were obtained through geophysical surveys along the length of the FCD, and along the WVID, which encompasses both sides of the Faro Creek valley. Geophysical surveys were performed by Frontier Geosciences, Inc. (Frontier) of North Vancouver, British Columbia. Twenty-one geophysical transect lines were surveyed during October 2015. The lines were aligned perpendicular to the FCD and the WVID to characterize the subsurface conditions in an approximate 350-m-wide swath along these diversions. The spacing between survey lines varied between approximately 100 to 450 m.

Survey methods included seismic compressional-wave (P-wave) refraction, multi-electrode electrical resistivity (ER) combined with induced polarization (IP), and seismic shear-wave (S-wave) profiling using the multispectral analysis of surface waves (MASW) method.

The purpose of these surveys was to characterize subsurface conditions along the length of the FCD and the WVID, along with the adjacent area on each side of these diversions where realignment of the diversions may be performed. Information regarding zones of saturation, depth to bedrock, and variations in subsurface conditions can be estimated through geophysical results and verified through a comparison with borehole data.

The following geophysical surveys were selected for the following corresponding objectives:

- P-wave refraction to identify potential fracture/fault zones and evaluate depth to bedrock within the subject investigation areas
- ER/IP to identify of potential permafrost zones within the shallow subsurface
- MASW to compare shear wave velocity profiles with compression wave velocities and confirm estimates of depth to bedrock

Geophysical survey locations are shown on Figure 1. The transect locations were recorded by Frontier using a differential global positioning system (DGPS) with horizontal (X,Y) accuracies within 1 m. The accuracy of ground surface elevations (Z) recorded by Frontier using DGPS may vary significantly, and deviations may exceed 1 m. During post-processing, CH2M provided transect alignment survey results

(X,Y,Z) measured by Challenger Geomatics in Spring 2016 to Frontier for more accurate modeling results rather than relying on GPS data.

Geophysical reports submitted from Frontier with a description of methods, results, and subsurface cross sections are presented in Attachment 3.

Laboratory Analyses

Laboratory analyses for geotechnical and geochemical properties were conducted on soil and rock samples collected during the field investigation. Representative samples were selected from the borehole samples for testing based on the data required, material types, available amounts of material, and engineering judgment. The geotechnical and geochemical tests on soil were conducted by ALS Canada Ltd. of British Columbia, Canada. Strength and durability testing of rock cores were performed by Golder Associates Ltd. of British Columbia, Canada.

The following analysis methods were used:

- Geochemical testing:
  - pH (1:2 Soil:Water Extraction): *British Columbia Environmental Laboratory Manual* (Province of British Columbia, 2007)
  - Mercury (U.S. Environmental Protection Agency [EPA] 200.2/1631E)
  - Total metals (EPA 200.2/6020A)
- Geotechnical tests of soil samples:
  - Natural moisture content (ASTM D2216)
  - Gradation testing – sieve and hydrometer (ASTM D422, ASTM D1140)
- Strength and durability of rock core samples:
  - Uniaxial compressive strength (ASTM D7012)
  - Freeze-thaw durability of rock (ASTM D5312)

Geochemical test results for the soil samples are summarized in Table 3. Geotechnical laboratory test results for the soil and rock samples are summarized in Tables 4 and 5, respectively. The geochemical analytical laboratory reports are located in Attachment 4, and the geotechnical laboratory reports are included in Attachment 5.

Data validation was performed on the geochemical analytical data. A summary of the validation methodologies, issues encountered, and flags assigned to data are provided in *2016 Faro Creek Diversion Realignment Investigation Data Quality Evaluation Report*, included as Attachment 6.

Findings

Geotechnical Data

The area of the proposed FCD realignment is underlain by glacial till and colluvium overlying bedrock. The glacial till generally consists of dense silty sand with gravel and cobbles. The gravel and cobbles are subrounded and widely variable in size; the maximum size is not known because of the small diameter of the sampler used.

The subsurface material on the west side of the Faro Creek valley, adjacent to the upstream end of the WVID (CH16-102-MW007) consisted of sandy silt overlying bedrock at a depth of approximately 4.3 m. The bedrock consisted of schist with rock quality designations (RQD) less than 50 percent. Note that the

borehole was located on a road embankment, and some portion of the soil overlying bedrock consisted of fill material, estimated from site topography to be approximately 1 metre thick.

The soil observed in the area of the proposed FCD realignment along the top of the Faro Pit slope was glacial till consisting of silty sand and gravel materials. The bedrock was encountered between 2.4 and 5 mbgs as measured in the boreholes. Bedrock consisted of schist on the downstream end of the proposed realignment (CH16-102-MW003 and CH16-102-MW004), and felsic granite at the upstream end of the proposed realignment (CH16-102-MW005). Bedrock at borehole CH16-102-MW005 is mapped by the Yukon Geological Survey as having a blanket of calc-silicate rock over granite (Pigage, L.C., 2004). However, only granite was observed during drilling of the borehole. Schist bedrock is mapped on the downstream portion of the realignment area, as was observed during drilling of the boreholes. The bottom of the realigned FCD will be in the bedrock material observed in boreholes CH16-102-MW004 and CH16-102-MW005. The bottom of borehole CH16-102-MW003 was slightly above the proposed bottom of the realigned FCD, and it would be an assumption that the schist bedrock continues below the FCD at that location.

Frontier provided interpreted depth of overburden isopachs and top of bedrock elevation contours in a geophysical survey report (see Attachment 3), which are shown on Figure 1. The top of bedrock dips towards the natural Faro Creek drainage channel, according to the interpreted top of bedrock contours shown on Figure 1. The thickness of overburden soil increases on the upstream portion of the FCD realignment, approaching the natural Faro Creek drainage, as can be seen from the overburden thickness isopachs on Figure 1. The thickness of glacial till was greater than the depth drilled (18.14 m) at CH16-102-MW006 on the east side of the Faro Creek valley adjacent to the existing FCD. According to the interpreted overburden thickness isopachs, the depth to bedrock may be as much as 50 m. Further discussion and interpretation of depth to bedrock as it relates to the proposed FCD realignment will be provided in the Comprehensive Design Road Map Report being prepared separately.

A conceptual model of bedrock in the vicinity of the proposed FCD realignment was presented in cross section C-1 of the Faro Open Pit Stability Assessment (BGC, March 2016). Lithology from CH16-102-BH008 matches the intrusive igneous type of rock anticipated according to the subsurface model. The subsurface model assumes a zone of quartz monzonite, which changes to biotite schist further away from the Faro Pit, beneath the proposed FCD realignment. The bedrock contacts in the subsurface model are roughly parallel with the Faro Pit upper slope adjacent to the proposed FCD realignment. Subsurface data from borehole CH16-102-BH008 confirmed that an intensely sheared and altered zone within the quartz monzonite is confined to the Big Indian Fault Zone. The rock mass between the fault zone and Faro Pit is of higher quality than encountered in the altered rock zone.

The soil temperature profiles measured with thermistors in the ports at CH16-102-MW003 through CH16-102-MW007 are provided on Figure 2. These data show that locations CH16-102-MW005 and CH16-102-MW006 both had possibly frozen ground (-0.2 and -0.05° Celsius) at approximately 1 mbgs, and the other three locations all had temperatures greater than 0° Celsius. This correlates with the lack of evidence of frozen ground observed during the drilling program.

Geochemistry Data

The total metals concentrations are compared with elemental crustal abundance concentrations and median world soil concentrations to identify relative elevated concentrations. Concentrations of elemental crustal abundance are sourced from Price (1997) and presented as 10 times the average value in the continental crust. The median world soil concentrations are from Bowen (1979) as reported in the *Global Acid Rock Drainage Guide* (GARD Guide) (International Network for Acid Prevention [INAP], 2013) and are used to calculate a geochemical abundance index (GAI). The GARD Guide considers any GAI value greater than 3, which corresponds to 12 times the median world soil concentration, significant and

warrants further examination (INAP, 2013). Hence, the total metals results were compared to 12 times the median world soil concentrations.

Results from the total metals analyses are presented in Table 5. As expected for this area of the FMC, all samples were at background levels for metals. pH values were all near neutral, ranging from 7.50 to 7.80.

Hydrogeology

Water levels were measured in the installed wells on June 5, 2016, and the results are presented as part of Table 2. The groundwater level was between 5 to 8 m below the existing ground surface along the proposed FCD realignment. The groundwater level is above the bottom grade of the proposed realigned FCD. One location on the existing alignment was dry (CH16-102-MW006), and one location had only approximately 15 centimetres of water in the bottom of the well (CH16-102-MW003).

References

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Province of British Columbia. 2007. *British Columbia Environmental Laboratory Manual.*

Tables

Table 1. Faro FCD Realignment Borehole Data

Faro Mine Remediation Project

Location Name	Surveyed Location				Total Depth Drilled (m)	Dates Drilled	Approximate Depth to Bedrock (mbgs)	Borehole Dip/ Bearing
	NAD 83 CSRS UTM Zone 8		CVGD28					
	Northing	Easting	Ground Elevation (masl)	Top of PVC Casing Elevation (masl)				
CH16-102-MW003	6915302.20	585063.83	N/A	1305.62	13.62	3/5/16 to 3/6/16	2.44	90°
CH16-102-MW004	6915432.21	585019.01	1310.60	1311.36	17.98	3/6/16 to 3/11/16	3.96	90°
CH16-102-MW005	6915518.32	584968.91	1310.26	1311.11	19.20	3/11/16 to 3/13/16	5	90°
CH16-102-MW006	6915897.26	584967.16	N/A	1298.65	18.14	3/3/16 to 3/4/16	Not Encountered	90°
CH16-102-MW007	6915983.97	583962.10	1365.96	1365.85	16.76	3/17/16 to 3/18/16	4.27	90°
CH16-102-BH008	6915425.67	584923.20	1297.43	N/A	60.06	3/13/16 to 3/16/16	9	53°/230°

Notes:

Coordinates and Elevations are from a field survey by Challenger Geomatics Ltd., performed on March 23, 2016.

° = degree

CSRS = Canadian Spatial Reference System

CVGD28 = Canadian Vertical Geodetic Datum of 1928

m = metre

mbgs = metre below ground surface

masl = metre above sea level

mbTOC = metre below top of casing

NAD = North American Datum

PVC = polyvinyl chloride

UTM = Universal Transverse Mercator

Table 2. Faro FCD Monitoring Well and Thermistor Data

Faro Mine Remediation Project

Location Name	Total Depth Drilled (m)	Diameter of Borehole (cm)	Date Well Installed	Diameter of PVC Well Casing (cm)	Diameter of PVC Thermistor Casing (cm)	Well and Thermistor Depth (mbgs)	Well Screened Interval (mbgs)	Materials Screened	Jun-16		
									Measured Depth to Bottom of Well (mbTOC)	Depth to Water (mbTOC)	Potentiometric Elevation (masl)
CH16-102-MW003	13.62	15.2	3/6/2016	5.1	2.5	4.57	1.52 - 4.57	Colluvium & weathered schist bedrock	5.56	5.40	1300.22
CH16-102-MW004	17.98	15.2	3/11/2016	5.1	2.5	6.10	3.05 - 6.10	Till & weathered schist bedrock	6.96	5.66	1305.70
CH16-102-MW005	19.20	15.2	3/13/2016	5.1	2.5	8.53	5.49 - 8.53	Till (silt, sand, gravel)	9.6	8.63	1302.48
CH16-102-MW006	18.14	15.2	3/4/2016	5.1	2.5	18.14	16.31 - 17.83	Till (silt, sand, gravel)	18.45	dry	
CH16-102-MW007	16.76	15.2	3/18/2016	5.1	2.5	4.57	3.05 - 4.57	Till & weathered schist bedrock	4.13	1.23	1364.62
CH16-102-BH008	60.06	15.2	No installations, abandoned with grout								

Notes:

cm = centimetre

m = metre

masl = metre above sea level

mbgs = metre below ground surface

mbTOC = metre below top of casing

PVC = polyvinyl chloride

Table 3. Total Metals Analysis and General Chemical Parameter Results

Faro Mine Remediation Project

Sample ID				CH16-102-MW003_SOc		CH16-102-MW004_SOc		CH16-102-MW005_SOj		CH16-102-MW006_SOq		CH16-102-MW007_SOb		CH16-102-MW903_SOc	
Sample Interval (mbgs)		12x Median	10x Crustal	2.4 - 4		2.7 - 4.3		7.0 - 8.5		16.2 - 17.8		2.7 - 3.35		2.4 - 4	
Sample Date				3/5/2016		3/6/2016		3/12/2016		3/4/2016		3/17/2016		3/5/2016	
Geological Unit		Soil Content [a]	Abundance [b]												
Analyte	**Unit**			**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
Aluminum	mg/kg	**852,000**	823,000	29,600		32,300		10,500		9,070		26,100		28,200	
Antimony	mg/kg	**60**	2	0.1	U	0.3		0.3		0.4		0.2		0.1	U
Arsenic	mg/kg	**72**	18	3		5		6		5		5		3	
Barium	mg/kg	**6,000**	4,250	244		117		86		127		138		238	
Beryllium	mg/kg	**72**	30	1.89		0.82		0.96		0.58		1.18		1.76	
Bismuth	mg/kg	-	**0.085**	0.36		0.94		0.81		0.47		0.52		0.32	
Boron	mg/kg	-	**100**	5	U	5	U	5	U	5	U	5	U	5	U
Cadmium	mg/kg	**4.2**	1.5	0.0		2.6		0.3		0.3		0.4		0.0	
Calcium	mg/kg	180,000	**415,000**	50	U	50	U	50	U	50	U	50	U	50	U
Chromium	mg/kg	840	**1,020**	76.8		290.0		26.6		16.7		60.5		74.8	
Cobalt	mg/kg	96	**250**	27		44		8		6		18		26	
Copper	mg/kg	360	**600**	38		105		20		12		34		37	
Iron	mg/kg	480,000	**563,000**	59,800		44,900		19,700		16,200		45,700		58,100	
Lead	mg/kg	**420**	140	8		7		16		10		24		8	
Lithium	mg/kg	**300**	200	70		43		23		22		64		66	
Magnesium	mg/kg	60,000	**233,000**	12,800		18,800		20	U	20	U	13,200		12,300	
Manganese	mg/kg	**12,000**	9,500	613		304		248		241		462		613	
Mercury	mg/kg	0.72	**0.85**	0.01		0.01		0.01		0.01		0.01		0.01	U
Molybdenum	mg/kg	**24**	12	1.14		9.29		1.21		0.86		0.86		1.09	
Nickel	mg/kg	600	**840**	55.8		381.0		25.5		13.8		61.8		52.9	
Phosphorus	mg/kg	9,600	**10,500**	525		910		468		493		1,270		477	
Potassium	mg/kg	168,000	**208,500**	13,000		2,130		2,640		1,420		6,470		12,700	
Selenium	mg/kg	**4.8**	0.5	0.20	U	2.38		0.20	U	0.56		0.20	U	0.20	U
Silver	mg/kg	-	**0.75**	0.1	U	0.4		0.1		0.1	U	0.2		0.1	U
Sodium	mg/kg	60,000	**235,500**	50	U	50	U	50	U	50	U	50	U	50	U
Strontium	mg/kg	3,000	**3,700**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Sulphur	mg/kg	**8,400**	3,500	1,100		900		600		1,800		700		1,100	
Thallium	mg/kg	**108**	8.5	0.53		0.30		0.23		0.17		0.50		0.51	
Tin	mg/kg	**48**	23	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Titanium	mg/kg	-	**56,500**	2,080.0		598.0		466.0		486.0		923.0		1,900.0	
Uranium	mg/kg	24	**27**	1.56		7.55		2.35		1.56		1.08		1.45	
Vanadium	mg/kg	1,080	**1,200**	79.0		80.3		25.9		27.9		54.2		76.1	
Zinc	mg/kg	**1,080**	700	92		189		68		57		98		89	
Zirconium	mg/kg			6		5		6		6		5		6	
Moisture	percent	-	-			9.3									
pH (1:2 soil:water)	pH Units	-	-	7.50		7.50		7.57		7.80		7.61			

Notes:

[a] 12x the Median world soil content retrieved from Bowen, H.J.M. (1979) Environmental Chemistry of the Elements. Academic Press, London

[b] Values from Price, W.A. 1997. Draft *Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Mine Sites in British Columbia* (Appendix 3).

12x Median World Soil Content values and 10x Continental Crustal Abundance values that are bolded and underlined indicate the highest value between the two.

Laboratory data has been validated by CH2M before importing to EquIS. This summary table has been through QA/QC.

Values indicated in black text with a grey background were identified at concentrations that are greater than 12x the Median World Soil Content.

Values indicated in white text with a grey background were identified at concentrations that are greater than 10x the crustal abundance.

Values indicated in white text with a black background were identified at concentrations that are greater than both 12x the Mediam World Soil Content ***and*** 10x the crustal abundance.

$CaCO_3$ = calcium carbonate

ID = identification number

J = This analyte was present but the reported value may not be accurate or precise

mbgs = metre below ground surface

mg/kg = milligram per kilogram

NT = not tested

QA/QC = Quality Assurance and Quality Control

R = Data rejected

RCTA = Rose Creek Tailings Area

U = This analyte was analyzed for but not detected at the specified detection limit

Table 4. Geotechnical Laboratory Test Results - Faro Creek Diversion Soil Samples

Faro Mine Reclamation Project

Borehole	Depth (m) ASTM Standard	Moisture Content (%) D2216	Liquid Limit D4318	Plasticity Index D4318	Clay Content (%) D422	Silt Content (%) D422	Fine Sand Content (%) D422	Medium Sand Content (%) D422	Coarse Sand Content (%) D422	Gravel Content (%) D422	Percent Passing No. 200 sieve D1140	USCS Classification D2487	USCS Description D2487
CH16-102-MW003_SOa	0.9 - 1.3	2.8			10.9	14.1	22.1	43.4	2.7	6.9		SM	Silty sand
CH16-102-MW003_SOb	1.2 - 2.4	6.7	28	5	5.9	8.5	11.0	16.4	17.5	40.7		SM	Silty sand with gravel
CH16-102-MW004_SOb	2.7 - 3.4	5.0											
CH16-102-MW004_SOc	2.7 - 4.3	9.3	26	5	8.4	12.7	13.8	16.2	15.8	33.2		SC-SM	Silty clayey sand with gravel
CH16-102-MW005_SOa	0.91 - 1.5	8.6									28.2		
CH16-102-MW005_SOb	0.9 - 2.4		22	4	13.8	14.2	18.8	29	14.4	9.9		SC-SM	Silty clayey sand
CH16-102-MW005_SOd	2.4 - 4.0		23	4	8.5	10.1	12.9	22.4	21.4	24.7		SC-SM	Silty clayey sand with gravel
CH16-102-MW006_SOe	4.1 - 5.6	6.0	20	5	6.8	7.7	9.4	27.8	12	36.4		SC-SM	Silty clayey sand with gravel
CH16-102-MW006_SOi	7.2 - 8.7	6.7	22	4	9.8	18.3	17.0	20.1	9.2	25.6		SC-SM	Silty clayey sand with gravel
CH16-102-MW007_SOa	1.2 - 1.8	33.9	87	22	18.1	41.5	15.6	10.7	3.5	10.7		MH	Sandy elastic silt
CH16-102-MW007_SOc	0 - 2.7		59	19	17.6	32.7	18.3	15.6	8.6	7.3		MH	Sandy elastic silt

Notes:
% = percent
m =metre
MH = Elastic Silt
SC = Clayey Sand
SM = Silty Sand
USCS = Unified Soil Classification System

Table 5. Geotechnical Laboratory Test Results - Faro Creek Diversion Rock Samples

Faro Mine Reclamation Project

Borehole and Sample ASTM #	Depth Interval for Sample (m)	Moisture Content (%) D7012	Dry Density (kg/m^3) D7012	Specimen Length/Diameter Ratio D7012	Uniaxial Compressive Strength (MPa) D7012	Average Percent Loss D5312	Performance Description
CH16-102-MW003_RKc	9.98-10.21	0.41	2859	2.1	31.7	0.09	Slight propogation or formation of fractures under repeated freeze/thaw cycles
CH16-102-MW004_RKg	15.47-15.72	0.37	2663	2.1	38.2	0.09	Slight propogation or formation of fractures under repeated freeze/thaw cycles
CH16-102-MW005_RKc	15.70-15.93	0.46	2572	2.1	113.9	0.18	Slight propogation or formation of fractures under repeated freeze/thaw cycles
CH16-102-MW007_RKd	10.95-11.07	0.30	2759	2.0	55.1		Not available

Notes:

% = percent

m = metre

m3 = cubic metre

kg = kilogram

MPa= 1x10^6 Pascal

Figures



VICINITY MAP



Legend

- Borehole
- Monitoring Well
- Proposed FCD Realignment
- Top of Bedrock Elevation Contours (m) (From Geophysical Interpretation)
- Waterbody

Isopachs - Overburden Thickness above Bedrock (m)

- 0
- 10
- 20
- 30
- 40
- 50
- 60
- 70
- 80

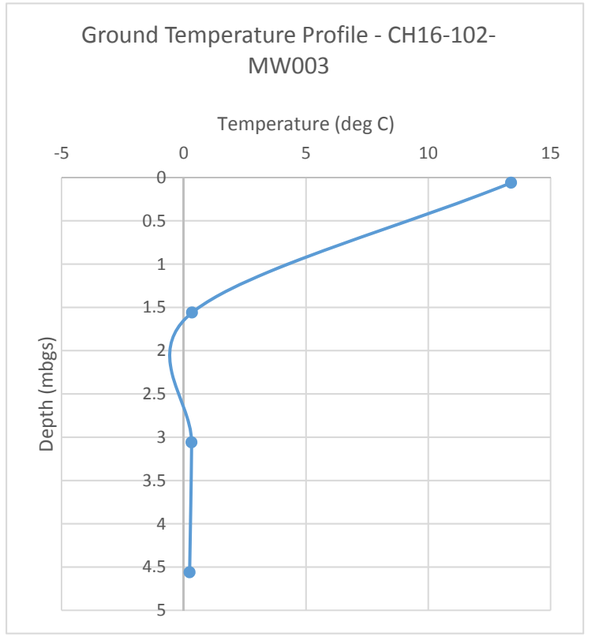
Note:
Bedrock contours and overburden isopaches are reproduced from report on Multi-Electrode Resistivity, Seismic Refraction, and Multi-spectral Analysis of Surface Waves Surveys. Prepared by Frontier Geosciences Inc. Dated October, 2015.

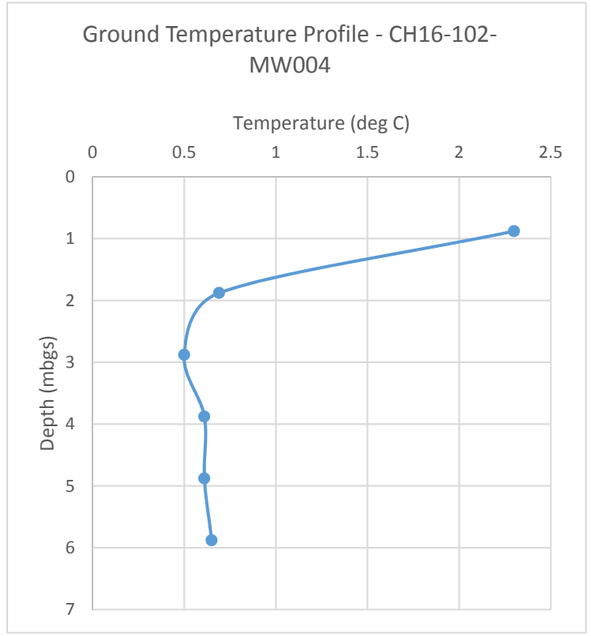
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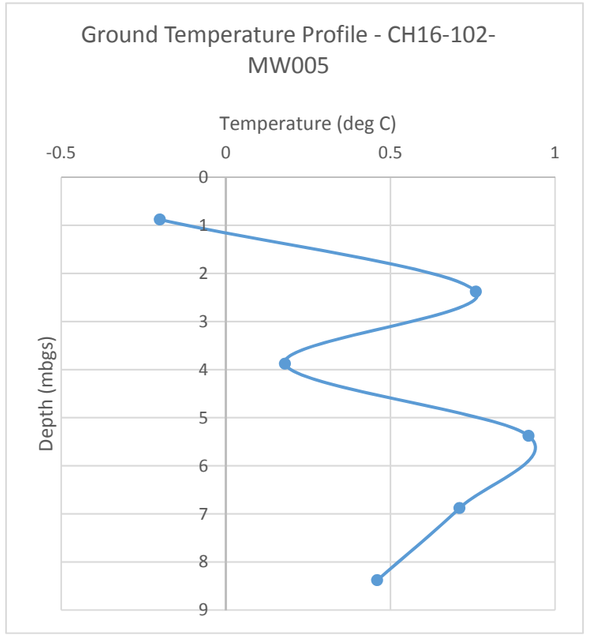
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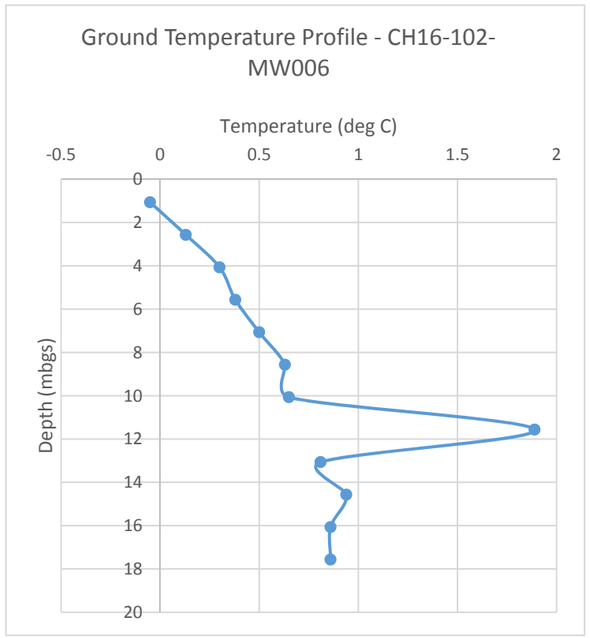
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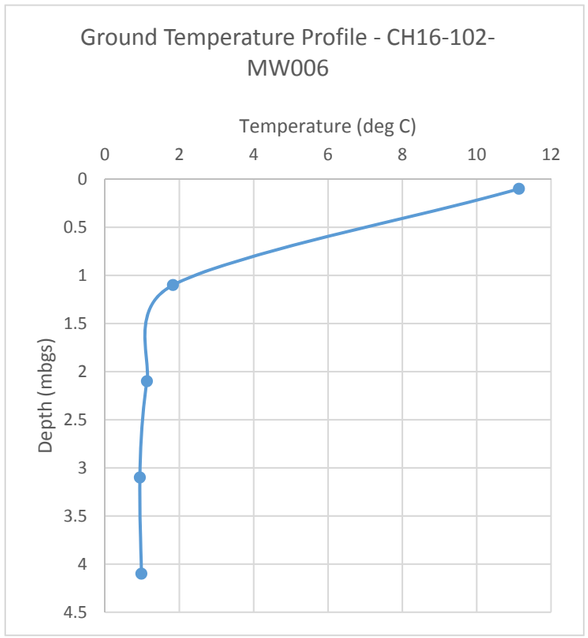
FIGURE 1
Field Investigation Locations
Faro Mine Remediation Project











Note:

mbgs = metre below ground surface

FIGURE 2

Ground Temperature Profiles Along the Faro Creek Diversion Realignment

Faro Mine Remediation Project

Attachment 1
Borehole Logs

KEY TO SOIL BORING LOGS

SAMPLE TYPES AND ABBREVIATIONS

TERM	EXPLANATION
BU	Bulk Sample
SS	STANDARD PENETRATION TEST SPLIT SPOON SAMPLE (ASTM D1586)
CA	SPLIT SPOON SAMPLE, 2.5-INCH INSIDE DIAMETER (ASTM D3550)
ST	3-INCH SHELBY TUBE, PUSHED
N	NUMBER OF BLOWS TO DRIVE SAMPLER 1 FOOT
SPT	STANDARD PENETRATION TEST
USCS	UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487)
LL	LIQUID LIMIT (ASTM D4318)
PI	PLASTICITY INDEX (ASTM D4318)
Cu	Uniformity Coefficient
Cc	Coefficient of Gradation
w_c	WATER CONTENT (%)

GENERAL NOTES

1) THE BORING LOGS AND RELATED INFORMATION DEPICT SUBSURFACE CONDITIONS AND WATER LEVELS ONLY AT THE SPECIFIC LOCATIONS AND DATES INDICATED. SOIL CONDITIONS AND WATER LEVELS OCCURRING AT OTHER LOCATIONS MAY DIFFER FROM THE CONDITIONS OCCURRING AT THESE BORING LOCATIONS. THE PASSAGE OF TIME MAY RESULT IN A CHANGE IN THE CONDITIONS AT THESE LOCATIONS.

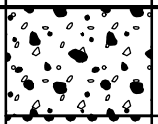
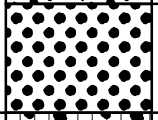
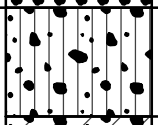
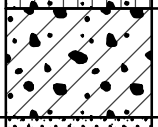
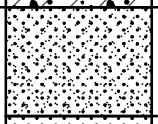
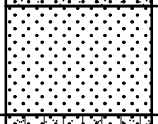
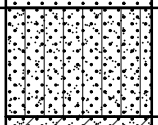
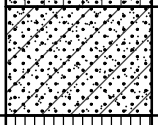
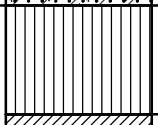
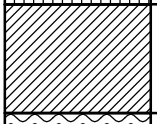
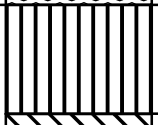
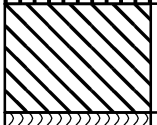
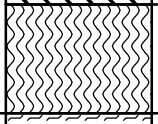
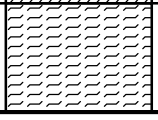
2) DRILLING OF SOIL BORINGS WAS DIRECTED BY CH2M HILL GEOTECHNICAL PERSONNEL. THE SUBSURFACE MATERIALS FROM THE BORINGS WERE CLASSIFIED IN APPROXIMATE ACCORDANCE WITH ASTM D4288 (VISUAL-MANUAL PROCEDURE FOR DESCRIPTION OF SOILS, AND ADJUSTED BASED ON LABORATORY TEST RESULTS WHERE NECESSARY.

SOIL PROPERTIES BASED ON STANDARD PENETRATION TEST

SPT N BLOWS/FT.	**DENSITY**[a] (fairly reliable)	**SPT N BLOWS/FT.**	**CONSISTENCY**[a] (rather unreliable)
0-4	VERY LOOSE	<2	VERY SOFT
4-10	LOOSE	2-4	SOFT
10-30	MEDIUM	4-8	MEDIUM
30-50	DENSE	8-15	STIFF
>50	VERY DENSE	15-30	VERY STIFF
		>30	HARD

[a] Peck, R. B., Hanson, W.E., and Thornburn, T.H. 1974. Foundation Engineering. John Wiley and Sons, Inc., New York.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-MW003	SHEET 1 OF 3

SOIL BORING LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 13.62 m

ELEVATION : 1305.64 m | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 2.44 m

NORTHING: 6915302.2 EASTING: 585063.83 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 7.32 m

WATER LEVELS: Not Measured | START : 3/5/2016 END : 3/6/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW EXISTING GRADE AND ELEVATION (m)	INTERVAL (m)	RECOVERY (%)	STANDARD PENETRATION TEST RESULTS Per 150mm (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS	WELL DIAGRAM
1305.6						Start with 0.91m ODEX run through compacted snow and brush drill pad and frozen topsoil (Nbn)	2" PVC Well; 1" PVC Thermistor; Bentonite
1 / 1304.6	0.92		28-40-50/125mm (90/275mm)	**WELL GRADED GRAVEL WITH SAND (GW-GM)**, light gray to brown (oxidized), dry, dense (SPT blow counts may be inflated due to coarse particles), about 60% fine to coarse gravel, weathered and fragmented, subangular to subrounded gravel, 30% fine to coarse sand, 10% low plastic fines (weathered remnant), maximum size ~75mm across, homogeneous, most gravel clasts are biotite schist [colluvium]			Sand
2 / 1303.6	1.34					ODEX cuttings appear uniform, brown	
	2.44 ~~2.50~~		50/50mm (50/50mm)	**NO RECOVERY**		ODEX cuttings appear light brown and dusty clasts appear weathered biotite schist, fine sandy powder contains lots of muscontite/biotite flakes, pulverized, weathered bedrock?	
3 / 1302.6							Well Screen
4 / 1301.6	3.96 3.99		50/25mm (50/25mm)	**NO RECOVERY**		Will ODEX 1.5m to confirm rock consistency then consider ODEX progress is slow - cuttings light brown and very dusty into run (4.3m) cuttings turn gray, chips around margin of borehole appear fresh biotite schist Bypassing SPT at 5.5m bgs will set five more feet of casing (and drop 1' stick-up) to ensure good seal and start coring at 7.3m	
5 / 1300.6							
6 / 1299.6							
7 / 1298.6							
8 / 1297.6				Begin Rock Coring at 7.32 m bgs See the next sheet for the rock core log			
9 / 1296.6							
10							

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-MW003	SHEET 2 OF 3

ROCK CORE LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 13.62 m

ELEVATION : 1305.64 m North: 6915302.2 East: 585063.83 | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 2.44 m

NORTHING: 6915302.2 EASTING: 585063.83 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 7.32 m

WATER LEVELS: Not Measured | START : 3/5/2016 | END : 3/6/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW SURFACE AND ELEVATION (m)	CORE RUN, TYPE, AND RECOVERY (%)	R Q D (%)	DISCONTINUITIES DESCRIPTION: DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	GRAPHIC LOG	LITHOLOGY: ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS: SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
1305.6						
1 1304.6						
2 1303.6						
3 1302.6						
4 1301.6						
5 1300.6						
6 1299.6						
7 1298.6						
7.32	R1-HQ 100	0	7.317-7.53m: Slightly rough, moderately weathered (orange discoloration), semi-undulating, no infilling observed 7.53-9.055m: As previous, orientation varies from horizontal to 76mm from horizontal - orange discoloration but no infill		7.317 - 7.53 m: **SCHIST**, dark gray, muscovite/biotite/quartz, medium texture, slightly weathered (discolored discontinuities), R4 (broke along foliation plane), large quartz grains ~19mm across obscured between foliations 7.53 - 9.055 m: **SCHIST**, as above, lightly weathered	HQ3 core - smooth progress Smooth progress
8 1297.6	R2-HQ 100	58				
9.06			9.055-10.579m: As previous, fewer discontinuities (8) still discolored, slightly rough, semi-undulating surfaces		9.055 - 10.579 m: **SCHIST**, as above, some pale green mineralization 9.329 - m: - quartz veins 50mm thick at 9.33m bgs	Smooth drilling
9 1296.6						
10	R3-HQ 100	77				

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-MW003	SHEET 3 OF 3

ROCK CORE LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 13.62 m

ELEVATION : 1305.64 m North: 6915302.2 East: 585063.83 | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 2.44 m

NORTHING: 6915302.2 EASTING: 585063.83 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 7.32 m

WATER LEVELS: Not Measured | START : 3/5/2016 | END : 3/6/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW SURFACE AND ELEVATION (m)	CORE RUN, TYPE, AND RECOVERY (%)	R Q D (%)	DISCONTINUITIES: DESCRIPTION — DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	GRAPHIC LOG	LITHOLOGY — ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS — SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
1295.6						
10.58						
11 1294.6	R4-HQ 100	55	10.671-10.884m: Zone of tight fractures observed, recovered quartz chunks implies veins broken surfaces discolored orange, some light brown/gray clay infilling, trace calcite precipitation, no slickensides observed		10.58 - 12.104 m: **SCHIST**, as above, slightly weathered and fresh	smooth progress, change in cuttings, color - fracture zone with clay infill
12 1293.6			11.067 and 11.768m: 2 quartz veins 38-51mm thick observed, cross-cutting foliation planes			
12.10			12.104-13.628m: ~10 discontinuities, orange discoloration as previous, one broken interval		12.1 - 13.628 m: **SCHIST,** as above, purple color in addition to dark gray/green	Smooth drilling
13 1292.6	R5-HQ 100	73	12.957m: ~51mm wide (surrounding quartz vein)			
13.63					Boring terminated at 13.62 m	
14						
15						
16						
17						
18						
19						
20						

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-MW004	SHEET 1 OF 3

SOIL BORING LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 17.98 m

ELEVATION : 1311.37 m | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 3.96 m

NORTHING: 6915432.21 EASTING: 585019.01 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 7.32 m

WATER LEVELS: Not Measured | START : 3/6/2016 END : 3/11/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW EXISTING GRADE AND ELEVATION (m)	INTERVAL (m)	RECOVERY (%)	STANDARD PENETRATION TEST RESULTS Per 150mm (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS	WELL DIAGRAM
1311.4						ODEX run through compacted snow and brush drill pad and frozen top soil (Nbn) 0.3m of casing left sticking up as part of ODEX drilling procedure	2" PVC Well 1" PVC Thermistor
1 1310.4	1.22						
	1.83		12-50/50mm (50/50mm)	**POORLY GRADED SAND WITH GRAVEL AND SILT (SP-SM)**, light brown, moist (unfrozen), ~65% fine to medium, subangular sand, 25% subangular to subrounded gravel, 10% low plastic fines, maximum size 25mm across (observed) in spoon, abrupt increase in blow counts suggests coarser material (cobbles/boulders) may be present, homogeneous [TILL]		ODEX run is slow, material is strong, dust and clasps, large boulder or bedrock last 15cm of run (2.6m) punched back into brown sand from cuttings infer ~1.5m boulder of gray/green calc-silicate	Bentonite
2 1309.4	2.74						
3 1308.4	3.35		18-21-17 (38)	**WELL GRADED GRAVEL WITH SILT AND SAND (GW-GM)**, light gray to brown to orange (oxidized zones) to black, moist (unfrozen), dense, ~50% fine to coarse gravel, subangular to subrounded gravel of mixed lithology, 35% fine to coarse sand, 15% low plastic fines, trace cobbles and boulders (inferred), maximum size 1.5m (boulder during ODEX run), gravel clasts appear moderately to highly weathered, homogeneous [TILL]		Abruptly hit solid material 15cm into run (~1.4m)	Sand
4 1307.4	4.27						
	4.54		32-50/125mm (50/125mm)	**COMPLETELY TO HIGHLY WEATHERED SCHIST (BEDROCK OR BOULDER?),** upper 13cm of sample completely weathered to red/orange clay/silt foliation planes appear pressured, lower 15cm of sample highly weathered but intact schist chunks muscovite grains visible along foliation planes [weathered bedrock]		Last 30cm of ODEX run (3.96m to 4.27m) cuttings turn orange-brown	Screen
5 1306.4	5.79						
	5.82		50/50mm (50/50mm)	**WEATHERED BEDROCK CHIPS**, dark gray with orange discoloration on some surfaces - moderately weathered schist		4.5m more to confirm then consider coring, ODEX cuttings uniform gray, very dusty, bedrock, driller not encounter with more competent hole at 6.4m, driller will set casing and start coring at 7.3m Thermistor and well installed to 6.1m End of ODEX run at 7.3m - rig break down leads to standyby	
6 1305.4							
7 1304.4				Begin Rock Coring at 7.32 m bgs See the next sheet for the rock core log			
8 1303.4							
9 1302.4							
10							

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-MW004	SHEET 2 OF 3

ROCK CORE LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 17.98 m

ELEVATION : 1311.37 m North: 6915432.21 East: 585019.01 | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 3.96 m

NORTHING: 6915432.21 EASTING: 585019.01 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 7.32 m

WATER LEVELS: Not Measured | START : 3/6/2016 | END : 3/11/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW SURFACE AND ELEVATION (m)	CORE RUN, TYPE, AND RECOVERY (%)	R Q D (%)	DISCONTINUITIES DESCRIPTION: DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	GRAPHIC LOG	LITHOLOGY: ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS: SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
1311.4						
1 1310.4						
2 1309.4						
3 1308.4						
4 1307.4						
5 1306.4						
6 1305.4						
7 1304.4						
	7.32					
	R01-HQ 88	0	7.317-8.232m: Low-angle (15-20°, discontinuties observed parallel to foliation planes (planar), slightly rough, discolored corings weathered surfaces, no infilling observed, separation <1mm		7.317 - 8.232 m: **SCHIST**, fine grained, dark gray/black, slightly and faintly weathered (discolored joint surfaces), medium strong, foliations	1.5m run broke at 8.23m, had to pull out early, not competent
8 1303.4	8.23					
	R02-HQ 72	0	8.232-8.841m: As above, joints observed, cross foliation: 5+ unique orientations resulting in blocky structure (polyhedral), orange discoloraton observed on all surfaces, near planar, slightly rough		8.232 - 8.841 m: **SCHIST**, as above, blocky structure, blocks <50mm thick	
	8.84		8.841-9.756m: As above, heavily fracture		8.841 - 9.756 m: **SCHIST**, as above polyhedral blocks 12mm-38mm thick	Difficult drilling due to blocky structure
9 1302.4	R03-HQ 100	0				
	9.76					
10						

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-MW004	SHEET 3 OF 3

ROCK CORE LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 17.98 m

ELEVATION : 1311.37 m North: 6915432.21 East: 585019.01 | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 3.96 m

NORTHING: 6915432.21 EASTING: 585019.01 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 7.32 m

WATER LEVELS: Not Measured | START : 3/6/2016 | END : 3/11/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW SURFACE AND ELEVATION (m)	CORE RUN, TYPE, AND RECOVERY (%)	R Q D (%)	DISCONTINUITIES DESCRIPTION: DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	GRAPHIC LOG	LITHOLOGY: ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS: SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
1301.4	R04-HQ 65	0	9.756-10.366m: As above, fewer discontinuties, two sets observed, low parallel to bedding and vertical, both discolored, planar, slightly rough, <1mm as above		9.756 - 10.366 m: **SCHIST**, as above, larger blocks < 76mm thick, rock blocks medium strong to strong	
10.37			10.366-11.89m: As above (polyhedral blocks) from 10.366-11.128m then decrease in discontinuties frequency to 1.5-3m, some clay infill observed 1-2mm thick in wider, more weathered gaps		10.37 - 11.89 m: **SCHIST**, as above, increasing quality with depth, foliations appear wavy, alternating dark and light bands <1mm thick	Lower 76cm appears competent
11 1300.4	R05-HQ 100	33				
11.89			11.89-13.415m: Fewer discontinuties as lower 0.76m above, no clay infill observed, walls appear discolored, slightly rough to rough, planar to undulating, some cross-joints ppear undulaitng and stair-stepped (~12.652 and 13.11m)		11.89 - 13.415 m: **SCHIST**, thinly foliated, as above, strong, steep-angled discontinutues greatly reduce RQD	Competent
12 1299.4	R06-HQ 100	20				
13 1298.4						
13.42			13.415-14.939m: As above, some mineraliztion observed at 14.329m (calcite?) discontinuties ranging in orientation from near horizontal to vertical		13.42 - 14.939 m: **SCHIST**, as above, glittering mica grains can be seen across exterior, foliation planes appear warped and folded	Competent
14 1297.4	R07-HQ 100	48				
14.94			14.939-16.463m: Above few discontinuties mineralization at 16.311m, 19mm quartz vein at 15.701m, less discoloration on joint surfices (dull brown vs. orange)		14.94 - 16.463 m: **SCHIST**, mica grains visible on discontinuity surfaces, faintly weathered	Competent
15 1296.4	R08-HQ 100	51				
16 1295.4						
16.46			16.463-17.988m: As above, discontinuties predominately along foliation planes (15-30°, thin quartz vein (<19mm) at 17.378m cross-cutting foliations discontinuties surfaces, rough, semi-undulating to planar, dull red/brown, no infill		16.46 - 17.988 m: **SCHIST**, as above, fine grained, thinly foliated	Competent
17 1294.4	R09-HQ 100	78				
18 17.99					Boring terminated at 17.98 m	
19						
20						

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-MW005	SHEET 1 OF 3

SOIL BORING LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 19.2 m

ELEVATION : 1311.13 m | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 5 m

NORTHING: 6915518.32 EASTING: 584968.91 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 11.59 m

WATER LEVELS: Not Measured | START : 3/11/2016 END : 3/13/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW EXISTING GRADE AND ELEVATION (m)	INTERVAL (m)	RECOVERY (%)	STANDARD PENETRATION TEST RESULTS Per 150mm (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS	WELL DIAGRAM
1311.1				**COMPACTED SNOW AND BRUSH**			2" PVC Well 1" PVC Thermistor
	0.92			**FROZEN TOPSOIL**			
1 1310.1			32-23-13-13 (36)	**SILTY SAND WITH GRAVEL (SM)**, brown, moist (frozen Nbn), ~50% fine to coarse, subangular sand, 30% fine to coarse subrounded gravel, 20% low plastic fines, maximum size 25mm, homogeneous [TILL]			
	1.52			**POORLY-GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, brown, moist (unfrozen), approximately 70% fine to medium sand, 20% fine subrounded gravel, 10% low plastic fines, maximum size 1/2", homogeneous, compact (SPT inflated by frozen ground and gravel)			
2 1309.1							
	2.44		15-14-32-23 (46)				Bentonite
3 1308.1	3.05			**SILTY SAND WITH GRAVEL AND COBBLES (SM)**, brown, moist (unfrozen), dense, approximately 45% fine to coarse subangular sand, 25% fine to coarse subrounded gravel, 15% weathered cobbles (76mm of SPT sample - felsic granites), 15% low plastic fines, maximum size > 76mm, homogeneous [TILL]		ODEX cuttings contain 40-50% gravel and angular cobble fragments, most of which are schist	
4 1307.1	3.96		12-12-11-17 (23)	**SILTY SAND WITH GRAVEL (SM)**, brown, moist (unfrozen), compact, approximately 50% fine to coarse subangular sand, 35% fine to coarse subangular gravel, 15% low plastic fines, maximum size 38cm, homogeneous [TILL]			
	4.57					ODEX cuttings appear dusty and light brown, all chips appear to be schist	
5 1306.1	5.49		14-13-15-18 (28)	**SCHIST**, light gray to brown, dry (moist for approximately 25mm at 3.1m) approximately 40% subangular gravel (highly to moderately weathered schist), 20% fine to coarse sand, 10% fines (weathered rock remnants), compact (soft due to weathering), homogeneous, maximum size 44mm [TILL - weathered schist bedrock transition?]			Sand
6 1305.1	6.10					ODEX cuttings appear darker brown (moist) uniform chip lithology (schist), some chips appear coated in soil (moist)	
7 1304.1	7.01		29-38-46-50 (84)	**SCHIST,** as above, light gray to red-brown, gravel clasts of pure quartz and granodiorite observed up to 64mm across, last 25mm of sample contains thin lens of moist silty fine sand < 2m - likely product of rock weathering, dense, homogeneous [TILL]			Screen
	7.62					ODEX cuttings appear uniform light brown, gravel pieces coated with silty fines, lithology of rock chips leaning towards felsic granite/grandodiorite	
8 1303.1	8.54						
	8.66		50/125mm (50/125mm)	three chips of granodiorite recovered, lightly coated with brown fines, maximum size approximate 25mm			
9 1302.1						ODEX cuttings appear light brown/gray and very dusty - either felsic granite boulder or bedrock	
10							

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-MW005	SHEET 2 OF 3

SOIL BORING LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 19.2 m

ELEVATION : 1311.13 m | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 5 m

NORTHING: 6915518.32 EASTING: 584968.91 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 11.59 m

WATER LEVELS: Not Measured | START : 3/11/2016 END : 3/13/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW EXISTING GRADE AND ELEVATION (m)	INTERVAL (m)	RECOVERY (%)	STANDARD PENETRATION TEST RESULTS Per 150mm (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS	WELL DIAGRAM
1301.1						Bypassing SPT, will drill another 1.5m with ODEX to confirm (10.06m to 10.67m) position in bedrock and not a boulder ODEX cuttings very dusty, light brown/gray, confirm felsic granite (quartz monzonite?) bedrock	
11 1300.1							
				Begin Rock Coring at 11.59 m bgs See the next sheet for the rock core log			
12 1299.1							
13 1298.1							
14 1297.1							
15 1296.1							
16 1295.1							
17 1294.1							
18 1293.1							
19 1292.1							
20							

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-MW005	SHEET 3 OF 3

ROCK CORE LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 19.2 m

ELEVATION : 1311.13 m North: 6915518.32 East: 584968.91 | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 5 m

NORTHING: 6915518.32 EASTING: 584968.91 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 11.59 m

WATER LEVELS: Not Measured | START : 3/11/2016 | END : 3/13/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW SURFACE AND ELEVATION (m)	CORE RUN, TYPE, AND RECOVERY (%)	R Q D (%)	DISCONTINUITIES DESCRIPTION: DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	GRAPHIC LOG	LITHOLOGY: ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS: SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
1301.1						
11 1300.1						
	11.59					
12 1299.1	R01-HQ 75	0	11.585-12.348m: Highly fractured, >20 discontinuities/fracture, poor recovery, rock broken into <38mm polyhedral blocks, some quartz blocks preserved up to 19mm thick, quartz veins observed, fresh surfaces appear white/light gray 12.348-13.11m: 5-10 discontinuties per 30cm, weathered brown/orange surfaces, planar/semi-undulating/stair stepped faces, rough to slightly rough, no infill observed, <1 mm tight - oriented horizontal to near-vertical		11.59 - 13.11 m: **FELSIC GRANITE**, high fractured, slightly weathered, brown-orange weathered surface, (pale orange cuttings), medium strong	Drilling is noisy - lots of grinding and bouncing Not competent
13 1298.1	13.11					
14 1297.1	R02-HQ 100	37	13.11-14.634m: Semi-undulating discontinuties observed from near-horizontal (very persistant) to vertical (unpersistance) walls appear rough, stained brown-orange, no infilling observed		13.11 - 14.634 m: **FELSIC GRANITE**, slightly weathered, light gray/white with rust staining on surface, medium strong to strong, medium-grained, crystals of quartz, plagioclase and biotite observed	Slow and steady - approach smooth progress Competent
	14.63					
15 1296.1	R03-HQ 100	60	14.634-16.159m: Discontinuties as above, fewer of them vertical discontnuties present, terminate at horizontal sets		14.63 - 16.159 m: **FELSIC GRANITE**, as above, orange staining present on joint surfaces and in patches on core surface	Smooth, competent
16 1295.1	16.16					
17 1294.1	R04-HQ 100	49	16.159-17.683m: As above, some silty clay infill observed within layer		16.16 - 17.683 m: **FELSIC GRANITE**, as above, quartz veins observed that slowed the drilling down, at 17.4m - 76mm thick, at 17.5m - 38mm thick rock is strong to very strong	Slow progress - some rumbling through quartz veins Competent
	17.68					
18 1293.1	R05-HQ 100	8	17.683-19.207m: As above, near-vertical undulating discontinuties more evident - snake in and out of core run, discolored orange surfaces, thin clay infilling <1mm between some rough walls as previous		17.68 - 19.207 m: **FELSIC GRANITE**, as above, less biotite (trace)	Faster drilling - may have popped a few more of the near-vertical discontinuities Competent
19 1292.1	19.21					
20					Boring terminated at 19.2 m	

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-MW006	SHEET 1 OF 2

SOIL BORING LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 18.14 m

ELEVATION : 1298.69 m | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : N/A

NORTHING: 6915897.26 EASTING: 584967.16 | DRILLING METHOD AND EQUIPMENT : Solid-Stem Auger, ODEX | CASED TO: 18.14 m

WATER LEVELS: Not Measured | START : 3/3/2016 END : 3/4/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW EXISTING GRADE AND ELEVATION (m)	INTERVAL (m)	RECOVERY (%)	STANDARD PENETRATION TEST RESULTS Per 150mm (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS	WELL DIAGRAM
1298.7	0.92			**SILTY SAND (SM)**, brown to brownish orange, frozen (Nbn), compacted snow and brush, fine to coarse sand, low plastic silt/clay, [disturbed till and snow drill pad]		Solid-stem auger to 2.44 m	2" PVC Well 1" PVC thermistor
1 1297.7				**SANDY SILT (ML)**, brown, moist (unfrozen), approximately 60% fines with low plasticity, 30% fine to coarse sand, 10% subrounded gravel and cobbles, maximum size 10cm across, homogeneous [TILL]			
2 1296.7	2.44						
			7-9-8 (17)	**SANDY SILT (ML)** - transitioning to **SILTY SAND (SM)**, brown, moist (unfrozen), compact, approximately 60% fine to coarse angular sand, 30% silty low plastic fines, 10% subrounded gravel and cobbles, maximum size 25mm across (limited by spoon diameter), homogeneous [TILL]		2.44 m: Begin ODEX	
3 1295.7	3.05					Gravel in recovered ODEX cuttings appeared subrounded to subangular, cuttings appeared uniform brown	
4 1294.7	4.12						
	4.73		16-13-12 (25)	**SILTY SAND (SM)**, as above, transition back to **SANDY SILT (ML)**, approximately 60% low plastic fines, 30% fine to coarse sand, 10% gravel [TILL]		Sample at 15:03	
5 1293.7	5.64					ODEX cuttings appeared uniform brown with similar composition as described above	
			11-19-22 (41)	**SANDY SILT WITH GRAVEL (ML)**, brown, moist (unfrozen), hard, approximately 55% low plastic fines, 30% fine to coarse sand, 15% subrounded to subangular gravel, maximum size 38mm across, homogeneous [TILL]		Material similar to previous, slight change in relative abundance	
6 1292.7	6.25						
7 1291.7	7.17						
	7.77		21-35-23 (58)	**SANDY SILT WITH GRAVEL (ML)**, similar to previous, encountered cobble of weathered schist 76mm across at 7.47m, cobbles <5% in material as whole [TILL]		Sample at 17:10	
8 1290.7	8.69			ODEX cuttings: appear uniform brown, subangular to subrounded gravel pieces, no cobbles preserved, sand and fines as above			← Bentonite
9 1289.7	8.99		23-50/125mm (50/125mm)	**SANDY SILT WITH GRAVEL (ML)**, material as above, no cobbles penetrated with spoon [TILL]		Sample at 18:00	
10						End for the day. March 3, 2016	

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-MW006	SHEET 2 OF 2

SOIL BORING LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 18.14 m

ELEVATION : 1298.69 m | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : N/A

NORTHING: 6915897.26 EASTING: 584967.16 | DRILLING METHOD AND EQUIPMENT : Solid-Stem Auger, ODEX | CASED TO: 18.14 m

WATER LEVELS: Not Measured | START : 3/3/2016 END : 3/4/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW EXISTING GRADE AND ELEVATION (m)	INTERVAL (m)	RECOVERY (%)	STANDARD PENETRATION TEST RESULTS Per 150mm (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS	WELL DIAGRAM
1288.7	10.21						
	10.52		27-50/100mm (50/100mm)	**SANDY SILT WITH GRAVEL (ML)** brown, moist (unfrozen), slight change in relative abundance, approximately 50% low plastic fines, 35% fine to coarse sand, 15% gravel and cobbles (inferred from stop/start in blow counts), homogeneous [TILL]			
11 1287.7				ODEX cuttings: **SILTY SAND WITH GRAVEL (SM)**, brown, moist (unfrozen), approximately 50% fine to coarse subangular sand, 30% subangular to subrounded gravel (likely includes broken cobbles), 20% low plastic silty fines,			
	11.74 11.83		50/100mm (50/100mm)	**NO RECOVERY**			
12 1286.7				ODEX cuttings: as above, slight change in relative abundance: **SILTY SAND WITH GRAVEL(SM)**, about 45% sand, 35% gravel (and broken cobbles), 20% silt fines			
13 1285.7	13.26						
	13.45		35-50/25mm (50/25mm)	**SILTY SAND WITH GRAVEL (SM)**, brown, moist (unfrozen), very dense, approximately 50% fine to coarse sand, 30% subangular to subrounded gravel, 20% low plastic silty fines, homogeneous [TILL]		First 2" advanced in first three blows, then spoon settled over something	
14 1284.7	14.79						
	14.94		50 (50/150mm)	**SILTY SAND WITH GRAVEL (SM)**, brown, moist (unfrozen), very dense, SPT sampler encountered coarse gravel clast larger than split spoon [TILL]			
15 1283.7				ODEX cuttings: as above, **SILTY SAND WITH GRAVEL (SM)**, well-graded, about 45% sand, 35% gravel, 20% silt fines			
16 1282.7	16.31						Sand
	16.92		20-27-34 (61)	**SILTY SAND WITH GRAVEL (SM)**, dark brown, moist (unfrozen) to wet (upper 10cm of sample), dense, approximately 55% fine to coarse subangular sand, 30% low plastic silty fines, 15% subrounded to subangular gravel, maximum size 37mm across, homogeneous [TILL]			
17 1281.7				ODEX cuttings: appear more gravel-rich: **SILTY SAND WITH GRAVEL (SM)**, about 50% well graded sand, 30% gravel, 20% silt fines			Well Screen
	17.84						
18 1280.7	18.14		21-50 (50/150mm)	Upper 10cm of sample: **SILTY SAND WITH GRAVEL (SM)**, as above. Lower 20cm of sample: stratified, approximately 50mm rust-banded **POORLY-GRADED FINE SAND (SP)**, approximately 25mm light gray **POORLY-GRADED COARSE SAND (SP)**, approximately 125mm light brown/gray **POORLY-GRADED FINE SAND** (SP), with trace gravel			
19				Bottom of Boring at 18.14 m bgs on			
20							

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-MW007	SHEET 1 OF 3

SOIL BORING LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 16.76 m

ELEVATION : 1365.90 m | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 4.27 m

NORTHING: 6915983.97 EASTING: 583962.1 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 7.62 m

WATER LEVELS: Not Measured | START : 3/17/2016 END : 3/18/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW EXISTING GRADE AND ELEVATION (m)	INTERVAL (m)	RECOVERY (%)	STANDARD PENETRATION TEST RESULTS Per 150mm (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS	WELL DIAGRAM
1365.9				0-1.22 m - **ODEX** cuttings: dark , moist, fine-grained, organic odour, trace angular gravel, approximately 15cm cobble impacted by hammer 0-0.91 m - [Re-worked topsoil - TILL - drill pad] 0.91-1.22 m - [Native topsoil]		ODEX, 30cm casing stickup	2" PVC Well 1" PVC Thermistor
1 1364.9	1.22						
	1.83		2-2-3-5 (5)	**SANDY SILT (ML)**, brown, moist (unfrozen), soft to firm, approximately 40% silt, 30% clay, 30% fine sand, trace angular gravel up to 1cm across, low plasticity, not sensitive, bands of different colored soil, upper 15cm dark brown, 10cm light brown, 2.5cm dark, organic-rich brown/black, rootlets throughout [TOP SOIL]			Bentonite
2 1363.9						ODEX bit sank with very little hammering - material is soft, approximately halfway through run (1.98 m), began to encounter more resistance	
	2.74						
3 1362.9			6-8-9-8 (17)	**SILTY SAND WITH GRAVEL (SM)**, red-brown, moist (unfrozen), compact, approximately 50% fine sand, 30% silty fines, 20% subangular gravel up to 4cm across, odourless, homogeneous [TILL]			Sand
	3.35						
4 1361.9							Screen
	4.27						
	4.80		15-35-35-50/75mm (70)	**WEATHERED SCHIST** (bedrock or boulder), upper 13cm of sample is wet, water was observed flowing out of back end of sample tube, moderately to slightly weathered, brown/orange discoloration, foliation planes preserved, muscovite/biotite grains intact on foliation surfaces [SCHIST ROCK]		Water observed in hole bottom following SPT sampling ODEX run advances more slowly, very dusty [BEDROCK] will advance 1.5m of casing (5.79-7.62 m), push-in stickup then begin coring (to ensure good seal)	
5 1360.9							
6 1359.9							
7 1358.9							
8 1357.9				Begin Rock Coring at 7.62 m bgs See the next sheet for the rock core log			
9 1356.9							
10							

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-MW007	SHEET 2 OF 3

ROCK CORE LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 16.76 m

ELEVATION : 1365.90 m North: 6915983.97 East: 583962.1 | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 4.27 m

NORTHING: 6915983.97 EASTING: 583962.1 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 7.62 m

WATER LEVELS: Not Measured | START : 3/17/2016 | END : 3/18/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW SURFACE AND ELEVATION (m)	CORE RUN, TYPE, AND RECOVERY (%)	R Q D (%)	DISCONTINUITIES DESCRIPTION: DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	GRAPHIC LOG	LITHOLOGY: ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS: SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
1365.9						
1 1364.9						
2 1363.9						
3 1362.9						
4 1361.9						
5 1360.9						
6 1359.9						
7 1358.9						
	7.62					
8 1357.9	R01-HQ 80	0	7.622-9.146m: Near horizontal (foliation planes) to steep (approximately 60°), slightly rough, discolored (orange), tight aperture (<1.5 mm), no infill observed, planar to semi-undulating		7.622 - 9.146 m: **WEATHERED SCHIST**, Slight to faintly weathered, orange staining visible on discontinuities surfaces foliated, medium strong, breaks along foliation planes (undulating, generally horizontal), dark gray/indigo	Good fluid return
9 1356.9	9.15					
	R02-HQ 100 9.60	0	9.146-9.604m: As above		9.146 - 9.604 m: **WEATHERED SCHIST**, As above	Run blocked at 9.60 m, water refill
10			9.604-10.671m: As above, moist near-horizontal along foliation planes			

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-MW007	SHEET 3 OF 3

ROCK CORE LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 16.76 m

ELEVATION : 1365.90 m North: 6915983.97 East: 583962.1 | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 4.27 m

NORTHING: 6915983.97 EASTING: 583962.1 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 7.62 m

WATER LEVELS: Not Measured | START : 3/17/2016 | END : 3/18/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW SURFACE AND ELEVATION (m)	CORE RUN, TYPE, AND RECOVERY (%)	R Q D (%)	DISCONTINUITIES: DESCRIPTION — DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	GRAPHIC LOG	LITHOLOGY: ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS: SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
1355.9	R03-HQ 81	31			9.604 - 10.671 m: **WEATHERED SCHIST**, As above, larger intact blocks, longest intact core: 13 cm	Upper zone caused blocks upon re-entry - smooth otherwise
10.67			10.67-12.195m: As above, at 12.04 m: 2.5 cm section of tight discontinuities with light brown clay infill		10.671 - 12.195 m: **WEATHERED SCHIST**, As above, more intact, faintly weathered, strong (R4)	Smooth
11 1354.9	R04-HQ 100	40				
12 1353.9	12.20		12.2-13.72m: As above, 1 cm wide quartz vein observed at approximately 12.22 m		12.195 - 13.72 m: **WEATHERED SCHIST**, As above	Smooth
13 1352.9	R05-HQ 100	42				
13.72			13.72-15.244m: As previous, little discoloration, some mineral precipitation < 3mm thick at 14.94 m on discontinuity surface		13.72 - 15.244 m: **WEATHERED SCHIST**, As previous - darkening dark/gray/black, some green/purple on dry surfaces visible, quartz veins with accessory minerals, light-colored bands (green) folded into dark rock at 14.02 m, 14.63 m, 14.66 m, pyrite and chalcopyrite observed near light mineral bands at 14.63 m	Smooth
14 1351.9	R06-HQ 100	18				
15 1350.9	15.24		15.24-16.768m: As above, little discoloration, some mineral precipitation throughout, soft and crumbly		15.244 - 16.768 m: Dark, foliated **SCHIST** as above, vein of harder (presumably slowed drilling progress, quartz-rich) material from 15.40-15.70 m - highly fractured in center, thinner veins of quartz (in-filled fractures) apparent below 15.70 m	
16 1349.9	R07-HQ 70	0				
16.77					Boring terminated at 16.76 m	
17						
18						
19						
20						

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-BH008	SHEET 1 OF 8

SOIL BORING LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 60.06 m

ELEVATION : 1297.43 m | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 9 m

NORTHING: 6915425.67 EASTING: 584923.2 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 17.37 m

WATER LEVELS: N/A | START : 3/13/2016 END : 3/16/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW EXISTING GRADE AND ELEVATION (m)	INTERVAL (m)	RECOVERY (%)	STANDARD PENETRATION TEST RESULTS Per 150mm (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS
1297.4	0.00			Snowpack (approximately 0.91 m stickup)		
	0.61			**SILTY SAND WITH GRAVEL (SM)**, light brown, moist (unfrozen), approximately 65% fine to coarse sand, 15% fine subrounded gravel, 20% silt fines, [FILL]		
1 1296.4						
2 1295.4						
3 1294.4				**SILTY SAND WITH GRAVEL (SM)**, light brown to gray, dry, approximately 60% fine to corse sand, 20% fine gravel, 20% silt fines		
	3.66					
4 1293.4				**WELL-GRADED SAND WITH SILT AND GRAVEL (SW-SM)**, light brown, moist, approximately 70% fine to coarse sand, 20% fine gravel, 10% silt fines [TILL/GLACIOFLUVIAL]		
5 1292.4	5.18					
				As above, subrounded gravel up to 25mm across (fine to coarse)		
6 1291.4						
	6.71					
7 1290.4				**WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM)**, as above, brown, moist, approximately 70% fine to coarse sand, majority fine to medium, 20% fine to coarse gravel, 10% silt fines, maximum size 32mm [TILL/GLACIOFLUVIAL]		
				Transition to dark brown, more moist (not wet)		
8 1289.4	8.23					
				WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM), as above		
9 1288.4				ROCK, ODEX Cuttings turn dusty, gray, **WELL GRADED GRAVEL (ROCK CHIPS) WITH SAND AND SILT**, light brown/gray, dry, approximately 65% subangular to angular rock chips (gravel/cobbles), 25% fine to coarse sand, 10% silt fines, maximum size >5 cm [BEDROCK?]		
	9.75					
10						

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-BH008	SHEET 2 OF 8

SOIL BORING LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 60.06 m

ELEVATION : 1297.43 m | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 9 m

NORTHING: 6915425.67 EASTING: 584923.2 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 17.37 m

WATER LEVELS: N/A | START : 3/13/2016 END : 3/16/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW EXISTING GRADE AND ELEVATION (m)	INTERVAL (m)	RECOVERY (%)	STANDARD PENETRATION TEST RESULTS Per 150mm (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS
1287.4				**ROCK**, rock chips with sand and silt, as above		
11 1286.4	11.28					
				ROCK, gravel and bedrock chips with sand and silt, as above		
12 1285.4	12.80			**ROCK**, ODEX Cuttings get very dusty - ODEX maintains speed, cuttings are silt and sand size, approximately 70% fine sand (or pulverized rock), 25% silty fines with rock dust, 5% fine angular gravel, light gray, dry [WEATHERED/PULVERIZED BEDROCK]		
13 1284.4				**ROCK**, as above, dusty gray cuttings of silt and sand size [WEATHERED/PULVERIZED ROCK]		
14 1283.4	14.33					
				ROCK, material as above, driller notes material is a little stiffer, few more angular, fine gravel clasts observed [WEATHERED/PULVERIZED BEDROCK]		
15 1282.4	15.85					
16 1281.4				**ROCK**, ODEX cuttings are silt and sand, material as above, powdery, driller notes material is hard-bedrock-and coreable		
17 1280.4						
				Begin Rock Coring at 17.37 m below ground surface See the next sheet for the rock core log		
18 1279.4						
19 1278.4						
20						

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-BH008	SHEET 3 OF 8

ROCK CORE LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 60.06 m

ELEVATION : 1297.43 m North: 6915425.67 East: 584923.2 | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 9 m

NORTHING: 6915425.67 EASTING: 584923.2 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 17.37 m

WATER LEVELS: Not Measured | START : 3/13/2016 | END : 3/16/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW SURFACE AND ELEVATION (m)	CORE RUN, TYPE, AND RECOVERY (%)	R Q D (%)	DISCONTINUITIES DESCRIPTION: DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	GRAPHIC LOG	LITHOLOGY: ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS: SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
1287.4						
11 1286.4						
12 1285.4						
13 1284.4						
14 1283.4						
15 1282.4						
16 1281.4						
17 1280.4						
	17.37					
18 1279.4	R01-HQ 100	35			17.373 - 18.897 m: **IGNEOUS ROCK**, Homogeneous, approximately 10% quartz as dark isolated crystals, remainder likely feldspars - monzonite?, rock is grey, slightly weathered, orange-brown staining, medium strong, crumbly	Smooth progress, 1.22 m stickup from ground to clamp
	18.90					
19 1278.4			18.897-20.421m: As above, generally fewer discontinuities, approximately 11 and crumbled zone 30cm long 18.90-19.20 m, no calcite infilling observed, surfaces stained orange to black		18.897 - 20.421 m: **IGNEOUS ROCK**, homogeneous, as above, monzonite	Light rattling throughout, generally smooth, some fluid loss
	R02-HQ 100	23				
20						

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-BH008	SHEET 4 OF 8

ROCK CORE LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 60.06 m

ELEVATION : 1297.43 m North: 6915425.67 East: 584923.2 | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 9 m

NORTHING: 6915425.67 EASTING: 584923.2 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 17.37 m

WATER LEVELS: Not Measured | START : 3/13/2016 | END : 3/16/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW SURFACE AND ELEVATION (m)	CORE RUN, TYPE, AND RECOVERY (%)	R Q D (%)	DISCONTINUITIES: DESCRIPTION — DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	GRAPHIC LOG	LITHOLOGY — ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS — SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
1277.4						
	20.42					
	R03-HQ 80	30	20.421-21.945m: As above, vertical fractures appear to terminate at angled horizontal fractures, rough, planar to semi-undulating walls		20.421 - 21.945 m: **IGNEOUS ROCK**, As above, monzonite, gray with white speckles, less orange staining, still slightly weathered, medium strong, crumbly	As above
21 1276.4						
	21.95					
22 1275.4	R04-HQ 90	9	21.945-23.469m: As above, some joints appear smooth, weathered walls containing some residual clay, fracture zone 25mm wide at 22.555 m, potential slickensides at 22.40 m, slickensided face at run bottom		21.945 - 23.469 m: **IGNEOUS ROCK**, As above phenocrysts of quartz, white feldspar and more apparent (< 3mm across)	As above
23 1274.4						
	23.47					
24 1273.4	R05-HQ 100	49	23.469-24.993m: As previous, slickensided shear zone 4cm thick at 24.688 m with orange clay infill between fractures, slickensided face at run bottom		23.469 - 24.993 m: **IGNEOUS ROCK**, As above, orange staining persists - medium strong, slightly weathered	As previous
25	24.99					
1272.4	R06-HQ 100	0	24.993-25.908m: Rough, stained, semi-undulating, discontinuities as previous, slickensides at 24.993 m, sand and clay filled shear zones: 6mm thick at 25.146 m and 25.755-25.908m, fractures horizontal to near-vertical		24.993 - 25.908 m: **IGNEOUS ROCK**, As above	Blockage at 25.91 m prevents collection of full run
	25.91					
26 1271.4	R07-HQ 86	0	25.908-26.517m: As above, potential slickensides at 26.212m, thin calcite and gray clay infill <1mm		25.908 - 26.517 m: **IGNEOUS ROCK**, As above	Lost approximately 15cm of material in blockage
	26.52					
27 1270.4	R08-HQ 100	12	26.517-28.041m: Discontinuities semi-undulating to planar, slightly rough to rough, horizontal to near-vertical, orange to black discolorations, slickensides at 27.889 m		26.517 - 28.041 m: **IGNEOUS ROCK**, As above, staining appears more localized around discontinuities, larger concentration of phenocrysts with depth from 10-15% to 15-20%	Smooth - a little slower than previous
28	28.04					
1269.4	R09-HQ 100	43	28.041-29.565m: As above, discontinuities appear mostly 30-50° from horizontal, joints appear rough, no slickensides observed, last 6 moderately weathered and crumbled, minor calcite precipitation on some discontinuity surfaces		28.041 - 29.565 m: **IGNEOUS ROCK**, As above	Smooth
29 1268.4						
	29.57					Smooth
30						

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-BH008	SHEET 5 OF 8

ROCK CORE LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 60.06 m

ELEVATION : 1297.43 m North: 6915425.67 East: 584923.2 | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 9 m

NORTHING: 6915425.67 EASTING: 584923.2 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 17.37 m

WATER LEVELS: Not Measured | START : 3/13/2016 | END : 3/16/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW SURFACE AND ELEVATION (m)	CORE RUN, TYPE, AND RECOVERY (%)	R Q D (%)	DISCONTINUITIES — DESCRIPTION — DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	GRAPHIC LOG	LITHOLOGY — ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS — SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
1267.4	R10-HQ 100	44	29.565-31.089m: As previous, first 30cm (29.565 -29.870m) dense fracture zone 6cm across, fractures with sand and gravel sized blocks 4cm across at 30.33m, no slickensides observed		29.565 - 31.089 m: **IGNEOUS ROCK**, As above, monzonite/quartz monzonite - orange discolorations concentrated around joints, slightly weathered, medium strong	
31 1266.4	31.09					
	R11-HQ 100	10	31.089-32.613m: As previous, occasional thin clay infill, calcite precipitation, 31.09-31.24m: blocky and fractured, 32.16-32.46m: high angle fracture zone, tight aperture fractures, minor clay infill		31.089 - 32.613 m: **IGNEOUS ROCK**, As above, gray with orange staining	Smooth, poor fluid return (gradual increase in fluid loss with depth)
32 1265.4	32.61					
33 1264.4	R12-HQ 100	41	32.613-34.137m: As previous, slightly rough to rough, horizontal to 30-50°, no slickensides observed		32.613 - 34.137 m: **IGNEOUS ROCK**, As above, 20% phenocrysts, medium strong, gray with orange staining	Smooth
34 1263.4	34.14					
35 1262.4	R13-HQ 100	12	34.137-35.661m: As previous, high fracture density with sand and gravel sized blocks and clay infill 34.442-34.899 m (fault zone?), slickensides observed in last 15cm, some calcite precipitation on discontinuity walls throughout		34.137 - 35.661 m: **IGNEOUS ROCK**, As above	Smooth
	35.66					
36 1261.4	R14-HQ 100	37	35.661-37.185m: As previous, no slickensides or fault/shear zones observed, 35.661-35.966 m: more broken up, approximately 15 discontinuities, rough walls, no clay infill observed		35.661 - 37.185 m: **IGNEOUS ROCK**, As previous, gray quartz monzonite with orange staining around discontinuities	Smooth
37 1260.4	37.19					
38 1259.4	R15-HQ 100	0	37.185-38.252m: Rough discolored fractures 0-60° orientation, at 37.429 m: fracture with sand - clay infill (weathered remnants), no slickensides observed		37.185 - 38.252 m: **IGNEOUS ROCK**, As previous	Blockage at 1.1m into run
	38.25					
	R16-HQ 100	0	38.252-38.709m: As above		38.252 - 38.709 m: **IGNEOUS ROCK**, As previous	Remaining piece
	38.71					
39 1258.4	R17-HQ 100	48	38.709-40.233m: As above, fracture zone with weathered sand-size blocks and clay infill, at 39.624 m: 15cm long at intersection of 3 discontinuities, no slickensides observed		38.709 - 40.233 m: **IGNEOUS ROCK**, As previous, phenocryst up to 19mm across observed	Smooth
40						

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-BH008	SHEET 6 OF 8

ROCK CORE LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 60.06 m

ELEVATION : 1297.43 m North: 6915425.67 East: 584923.2 | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 9 m

NORTHING: 6915425.67 EASTING: 584923.2 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 17.37 m

WATER LEVELS: Not Measured | START : 3/13/2016 | END : 3/16/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW SURFACE AND ELEVATION (m)	CORE RUN, TYPE, AND RECOVERY (%)	R Q D (%)	DISCONTINUITIES — DESCRIPTION — DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	GRAPHIC LOG	LITHOLOGY — ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS — SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
1257.4	40.23					
	R18-HQ 100	43	40.233-41.757m: Fewer fractures/discontinuities slightly rough to rough, discolored surfaces from horizontal to undulating vertical, no slickensides observed, longest intact core: 38cm		40.233 - 41.757 m: **IGNEOUS ROCK**, As previous	Smooth
41 1256.4	41.76					
42 1255.4	R19-HQ 100	62	41.757-43.281m: Rough, planar to semi-undulating, discolored change to black, horizontal to near-vertical (undulating) some weathered sand and clay infill, <3mm aperture		41.757 - 43.281 m: **IGNEOUS ROCK**, As previous, gray quartz monzonite, 20% phenocrysts up to 19mm across	Smooth, recovered 4cm extra
43 1254.4	43.28					
	R20-HQ 100	40	43.281-44.805m: As above, no infill observed, tight apertures		43.281 - 44.805 m: **IGNEOUS ROCK**, As previous	Smooth
44 1253.4	44.81					
45 1252.4	R21-HQ 100	27	44.805-46.329m: As above		44.805 - 46.329 m: **IGNEOUS ROCK**, As previous, phenocrysts up to across 25mm across	Smooth, slower
46 1251.4	46.33					
	R22-HQ 95	29	46.329-47.853m: As above, 46.33-46.63m: broken and crumbled, 46.786-47.091m: large chunk missing - half of vertical fracture, 46.786m: vein of milky quartz (?) infills fracture - stiffer than surrounding rock mass		46.329 - 47.853 m: **IGNEOUS ROCK**, As above, 10cm zone of quartz infillied discontinuities at 46.79 m, may be chert/agate?	Generally smooth, some rattling
47 1250.4	47.85					
48 1249.4	R23-HQ 100	70	47.853-49.377m: As previous, no slickensides observed, crumbly fracture zone 46cm across at 48.524m, longest intact core: 43cm		47.853 - 49.377 m: **IGNEOUS ROCK**, As previous, up to 25-30% phenocrysts	Smooth
49 1248.4	49.38					
			49.377-50.901m: As previous, some minor clay infill observed, longest intact core: 24cm		49.377 - 50.901 m: **IGNEOUS ROCK**, As previous	Smooth
50						

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-BH008	SHEET 7 OF 8

ROCK CORE LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 60.06 m

ELEVATION : 1297.43 m North: 6915425.67 East: 584923.2 | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 9 m

NORTHING: 6915425.67 EASTING: 584923.2 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 17.37 m

WATER LEVELS: Not Measured | START : 3/13/2016 | END : 3/16/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW SURFACE AND ELEVATION (m)	CORE RUN, TYPE, AND RECOVERY (%)	R Q D (%)	DISCONTINUITIES: DESCRIPTION — DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	GRAPHIC LOG	LITHOLOGY — ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS — SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
1247.4	R24-HQ 100	64				
50.90						
51 1246.4			50.901-52.425m: As previous, discontinuities 15° to near vertical, near vertical fractures are undulating		50.901 - 52.425 m: **IGNEOUS ROCK**, As previous	Smooth
	R25-HQ 100	53				
52 1245.4						
52.43						
			52.425-53.949m: As previous, discontinuities appear rough, stained dark reddish brown, some minor clay infill		52.425 - 53.949 m: **IGNEOUS ROCK**, As previous	Smooth
53 1244.4	R26-HQ 100	30				
53.95						
54 1243.4			53.949-55.473m: As previous		53.949 - 55.473 m: **IGNEOUS ROCK**, As previous	Smooth, water recovery has been poor most of the way down - getting worse with depth - must add water between runs - water can be seen on pit face
	R27-HQ 100	30				
55 1242.4						
55.47						
			55.473-56.997m: As above, discontinuities appear very tight, rock appears intact but contains hairline discontinuities, rough and discolored as previous, fewer in general		55.473 - 56.997 m: **IGNEOUS ROCK**, As previous, less staining	Smooth
56 1241.4	R28-HQ 100	70				
57.00						
57 1240.4			56.997-58.521m: As previous, joints 5°-60° undulating to semi-undulating, wider aperture in some than previous < 3mm, rough and stained		56.997 - 58.521 m: **IGNEOUS ROCK**, As previous	Smooth
	R29-HQ 100	27				
58 1239.4						
58.52						
			58.521-60.045m: As previous, near-vertical undulating discontinuities greatly reduce RQD from 58.521-59.740m, 59.436-60.045m: appears uniformally stained		58.521 - 60.045 m: **IGNEOUS ROCK**, As previous, slightly to moderately weathered from 59.59 to 60.05m	Smooth
59 1238.4	R30-HQ 100	0				
60						

PROJECT NUMBER:	BORING NUMBER:	
673709	CH16-102-BH008	SHEET 8 OF 8

ROCK CORE LOG

PROJECT : Faro Mine Remediation Project | LOCATION : Faro Creek Diversion | FINAL DEPTH OF HOLE : 60.06 m

ELEVATION : 1297.43 m North: 6915425.67 East: 584923.2 | DRILLING CONTRACTOR : Midnight Sun | DEPTH TO TOP OF ROCK : 9 m

NORTHING: 6915425.67 EASTING: 584923.2 | DRILLING METHOD AND EQUIPMENT : ODEX, HQ3 | CASED TO: 17.37 m

WATER LEVELS: Not Measured | START : 3/13/2016 | END : 3/16/2016 | LOGGER : C. Pederson/C. Blair

DEPTH BELOW SURFACE AND ELEVATION (m)	CORE RUN, TYPE, AND RECOVERY (%)	R Q D (%)	DISCONTINUITIES: DESCRIPTION — DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	GRAPHIC LOG	LITHOLOGY — ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS — SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
1237.4	60.05				Boring terminated at 60.06 m	
61						
62						
63						
64						
65						
66						
67						
68						
69						
70						

Attachment 2
Field Investigation Photographs

CH16-102-BH008

2016-03-13 14:53:27

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Rig set up at 55° angle



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-13_145327.jpg

CH16-102-BH008

2016-03-13 14:54:17

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Odex cuttings 5-10 feet, sample SOa collected at 1600



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-13_145418.jpg

CH16-102-BH008

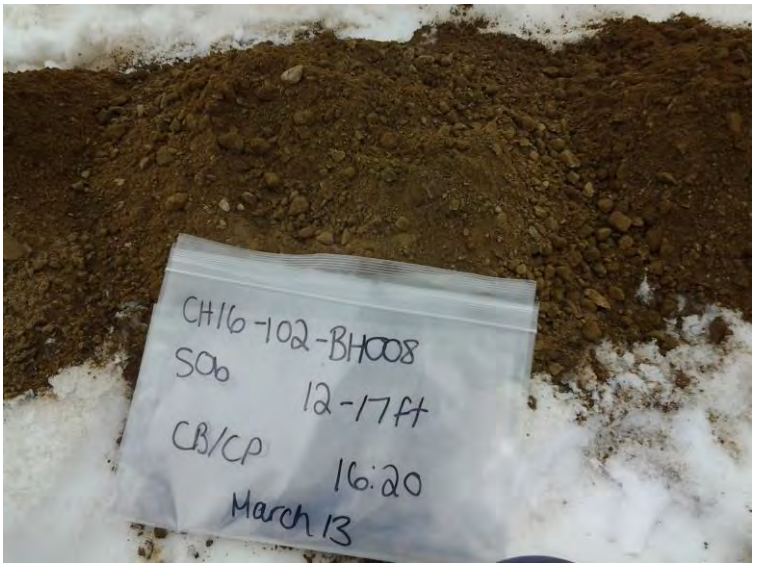
2016-03-13 16:10:09

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Odex cuttings 12-17 feet, sample SOb collected at 1620



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-13_161010.jpg

CH16-102-BH008

2016-03-13 16:28:08

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Odex cuttings 17-22 feet, same material as above, no sample collected



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-13_162808.jpg

CH16-102-BH008

2016-03-13 16:34:54

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Odex cuttings 22-27 feet, sample SOc collected at 1640



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-13_163455.jpg

CH16-102-BH008

2016-03-13 17:18:10

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Odex cuttings 27-32 feet, sample SOd collected at 1655



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-13_171810.jpg

CH16-102-BH008

2016-03-13 17:18:58

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Odex cuttings 37-42 feet, sample SOe collected at 1725



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-13_171858.jpg

CH16-102-BH008

2016-03-13 17:34:45

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Odex cuttings 42-47 feet, same material as above, no sample collected



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-13_173445.jpg

CH16-102-BH008

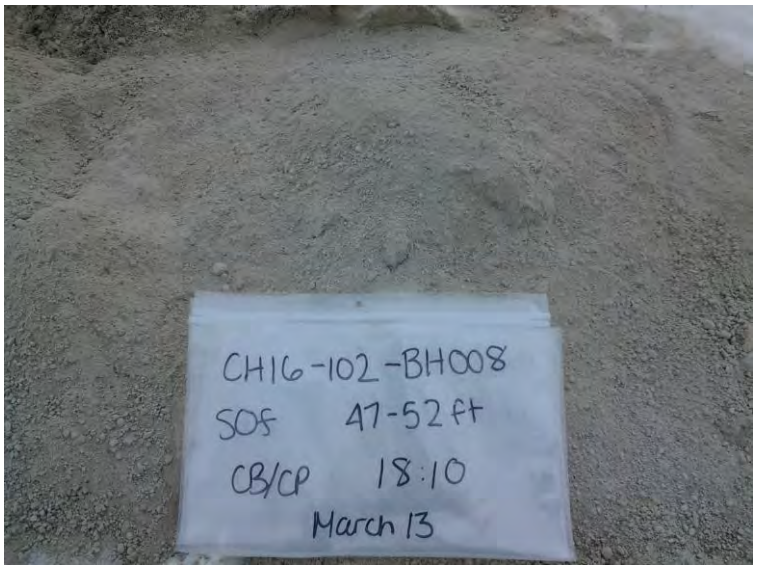
2016-03-13 17:55:20

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Odex cuttings 47-52 feet, sample SOf collected at 1810



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-13_175520.jpg

CH16-102-BH008

2016-03-14 13:09:58

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 1-HQ 57-62 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_130958.jpg



CH16-102-BH008

2016-03-14 13:10:56

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 1-HQ 57-58 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_131056.jpg



CH16-102-BH008

2016-03-14 13:11:50

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 1-HQ 58-59 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_131150.jpg



CH16-102-BH008

2016-03-14 13:12:20

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 1-HQ 59-60 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_131221.jpg



CH16-102-BH008

2016-03-14 13:12:34

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 1-HQ 60-61 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_131234.jpg



CH16-102-BH008

2016-03-14 13:12:50

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 1-HQ 61-62 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_131250.jpg



CH16-102-BH008

2016-03-14 13:13:10

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 2-HQ 62-67 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_131310.jpg



CH16-102-BH008

2016-03-14 13:42:03

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 2-HQ 62-63 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_134203.jpg



CH16-102-BH008

2016-03-14 13:42:28

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 2-HQ 63-64 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_134228.jpg



CH16-102-BH008

2016-03-14 13:42:47

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 2-HQ 64-65 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_134247.jpg



CH16-102-BH008

2016-03-14 13:43:14

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 2-HQ 65-66 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_134335.jpg



CH16-102-BH008

2016-03-14 13:43:56

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 2-HQ 66-67 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_CH16-102-BH008_2016-03-14_134356.jpg



CH16-102-BH008

2016-03-14 13:44:38

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 3-HQ 67-72 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_134438.jpg



CH16-102-BH008

2016-03-14 14:10:59

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 3-HQ 67-68 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_141059.jpg



CH16-102-BH008

2016-03-14 14:12:09

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 3-HQ 68-69 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_141209.jpg



CH16-102-BH008

2016-03-14 14:12:28

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 3-HQ 69-70 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_141228.jpg



CH16-102-BH008

2016-03-14 14:12:48

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 3-HQ 70-end,only recovered 4 out of 5 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_141343.jpg



CH16-102-BH008

2016-03-14 14:14:18

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 4-HQ 72-77 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_141419.jpg



CH16-102-BH008

2016-03-14 14:46:25

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 4-HQ 72-73 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_144625.jpg



CH16-102-BH008

2016-03-14 14:46:45

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 4-HQ 73-74 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_144645.jpg



CH16-102-BH008

2016-03-14 14:47:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 4-HQ 74-75 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_144702.jpg



CH16-102-BH008

2016-03-14 14:47:24

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 4-HQ 75-76 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_144725.jpg



CH16-102-BH008

2016-03-14 14:47:40

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 4-HQ 76-77 feet , 90% recovery

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_144740.jpg



CH16-102-BH008

2016-03-14 14:48:03

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 5-HQ 77-82 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_144803.jpg



CH16-102-BH008

2016-03-14 15:21:36

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 5-HQ 77-78 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_152136.jpg



CH16-102-BH008

2016-03-14 15:21:55

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 5-HQ 78-79 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_152155.jpg



CH16-102-BH008

2016-03-14 15:22:13

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 5-HQ 79-80 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_152213.jpg



CH16-102-BH008

2016-03-14 15:22:32

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 5-HQ 80-81 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_152232.jpg



CH16-102-BH008

2016-03-14 15:22:48

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 5-HQ 81-82 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_152248.jpg



CH16-102-BH008

2016-03-14 15:23:15

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 6-HQ 82-85 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_152315.jpg



CH16-102-BH008

2016-03-14 16:05:35

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 6-HQ 82-83 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_160535.jpg



CH16-102-BH008

2016-03-14 16:06:03

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 6-HQ 83-84 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_160603.jpg



CH16-102-BH008

2016-03-14 16:06:43

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 6-HQ 84-85 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_160643.jpg



CH16-102-BH008

2016-03-14 16:07:05

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 7-HQ 85-87 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_160705.jpg



CH16-102-BH008

2016-03-14 16:21:55

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 7-HQ 85-86 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_162155.jpg



CH16-102-BH008

2016-03-14 16:22:09

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 7-HQ 86-87 feet, 86% recovery

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_162209.jpg



CH16-102-BH008

2016-03-14 16:22:49

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 8-HQ 87-92 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_162249.jpg



CH16-102-BH008

2016-03-14 16:58:40

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 8-HQ 87-88 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_165840.jpg



CH16-102-BH008

2016-03-14 16:59:09

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 8-HQ 88-89 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_165909.jpg



CH16-102-BH008

2016-03-14 16:59:31

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 8-HQ 89-90 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_165931.jpg



CH16-102-BH008

2016-03-14 16:59:50

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 8-HQ 90-91 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_165950.jpg



CH16-102-BH008

2016-03-14 17:00:06

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 8-HQ 91-92 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_170006.jpg



CH16-102-BH008

2016-03-14 17:00:23

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 9-HQ 92-97 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_170023.jpg



CH16-102-BH008

2016-03-14 17:28:44

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 9-HQ 92-93 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_172844.jpg



CH16-102-BH008

2016-03-14 17:29:39

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 9-HQ 93-94 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_172940.jpg



CH16-102-BH008

2016-03-14 17:29:58

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 9-HQ 94-95 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_172958.jpg



CH16-102-BH008

2016-03-14 17:30:18

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 9-HQ 95-96 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_173019.jpg



CH16-102-BH008

2016-03-14 17:30:36

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 9-HQ 96-97 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_173036.jpg



CH16-102-BH008

2016-03-14 17:30:55

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 10-HQ 97-102 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_173056.jpg



CH16-102-BH008

2016-03-14 17:57:40

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 10-HQ 97-98 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_175740.jpg



CH16-102-BH008

2016-03-14 17:58:12

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 10-HQ 98-99 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_175812.jpg



CH16-102-BH008

2016-03-14 17:58:37

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 10-HQ 99-100 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_175837.jpg



CH16-102-BH008

2016-03-14 17:58:53

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 10-HQ 100-101 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_175854.jpg



CH16-102-BH008

2016-03-14 17:59:09

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 10-HQ 101-102 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_175909.jpg



CH16-102-BH008

2016-03-14 17:59:29

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 11-HQ 102-107 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_175929.jpg



CH16-102-BH008

2016-03-14 18:22:37

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 11-HQ 102-103 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_182237.jpg



CH16-102-BH008

2016-03-14 18:23:05

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 11-HQ 103-104 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_182306.jpg



CH16-102-BH008

2016-03-14 18:23:40

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 11-HQ 104-105 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_182340.jpg



CH16-102-BH008

2016-03-14 18:23:56

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 11-HQ 105-106 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_182356.jpg



CH16-102-BH008

2016-03-14 18:24:10

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 11-HQ 106-107 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-14_182410.jpg



CH16-102-BH008

2016-03-15 09:52:01

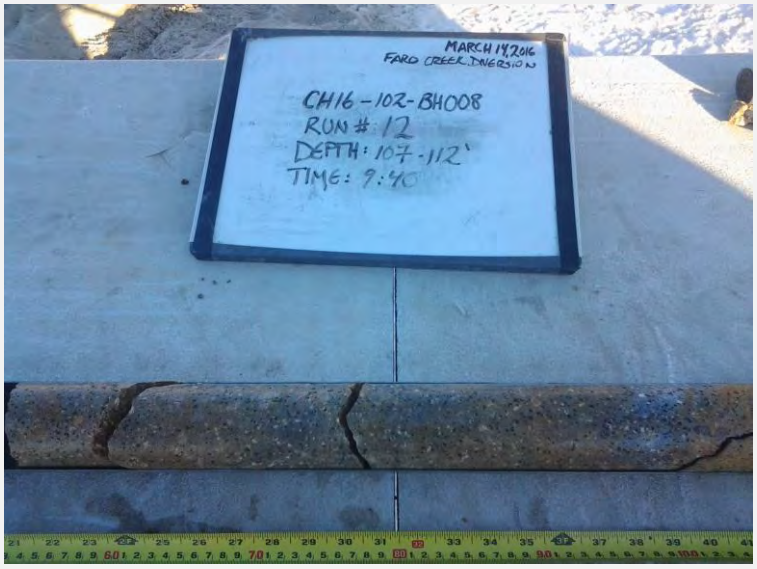
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 12-HQ, 107-112 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_095202.jpg



CH16-102-BH008

2016-03-15 09:52:41

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 12-HQ, 107-108 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_095241.jpg



CH16-102-BH008

2016-03-15 09:53:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 12-HQ, 108-109 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_095302.jpg



CH16-102-BH008

2016-03-15 09:53:17

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 12-HQ, 109-110 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_095317.jpg



CH16-102-BH008

2016-03-15 09:53:35

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 12-HQ, 110-111 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_095335.jpg



CH16-102-BH008

2016-03-15 09:53:48

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 12-HQ, 111-112 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_095348.jpg



CH16-102-BH008

2016-03-15 09:54:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 13-HQ, 112-117 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_095402.jpg



CH16-102-BH008

2016-03-15 10:24:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 13-HQ, 112-113 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_102402.jpg



CH16-102-BH008

2016-03-15 10:24:52

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 13-HQ, 113-114 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_102452.jpg



CH16-102-BH008

2016-03-15 10:25:14

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 13-HQ, 114-115 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_102514.jpg



CH16-102-BH008

2016-03-15 10:25:28

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 13-HQ, 115-116 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_102528.jpg



CH16-102-BH008

2016-03-15 10:25:47

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 13-HQ, 116-117 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_102548.jpg



CH16-102-BH008

2016-03-15 10:26:06

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 14-HQ, 117-122 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_102606.jpg



CH16-102-BH008

2016-03-15 11:01:07

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 14-HQ, 117-118 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_110107.jpg



CH16-102-BH008

2016-03-15 11:01:25

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 14-HQ, 118-119 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_110125.jpg



CH16-102-BH008

2016-03-15 11:01:43

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 14-HQ, 119-120 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_110143.jpg



CH16-102-BH008

2016-03-15 11:02:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 14-HQ, 120-121 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_110202.jpg



CH16-102-BH008

2016-03-15 11:02:22

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 14-HQ, 121-122 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_110222.jpg



CH16-102-BH008

2016-03-15 11:02:54

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 15-HQ, 122-125.5 feet stats, short run due to core blocking up bit



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_CH16-102-BH008_2016-03-15_110254.jpg

CH16-102-BH008

2016-03-15 11:54:30

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 15-HQ, 122-123 feet



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_115430.jpg

CH16-102-BH008

2016-03-15 11:55:16

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 15-HQ, 123-124 feet



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_115516.jpg

CH16-102-BH008

2016-03-15 11:55:34

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 15-HQ, 124-125 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_115534.jpg



CH16-102-BH008

2016-03-15 11:56:08

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 15-HQ, 125-125.5 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_115608.jpg



CH16-102-BH008

2016-03-15 11:57:14

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 16-HQ, 125.5-127 stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_115714.jpg



CH16-102-BH008

2016-03-15 12:08:43

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 16-HQ, 125.5-126.5

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_120843.jpg



CH16-102-BH008

2016-03-15 12:09:12

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 16-HQ, 126.5-127

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_120912.jpg



CH16-102-BH008

2016-03-15 12:09:30

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 17-HQ, 127-132 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_120930.jpg



CH16-102-BH008

2016-03-15 12:36:18

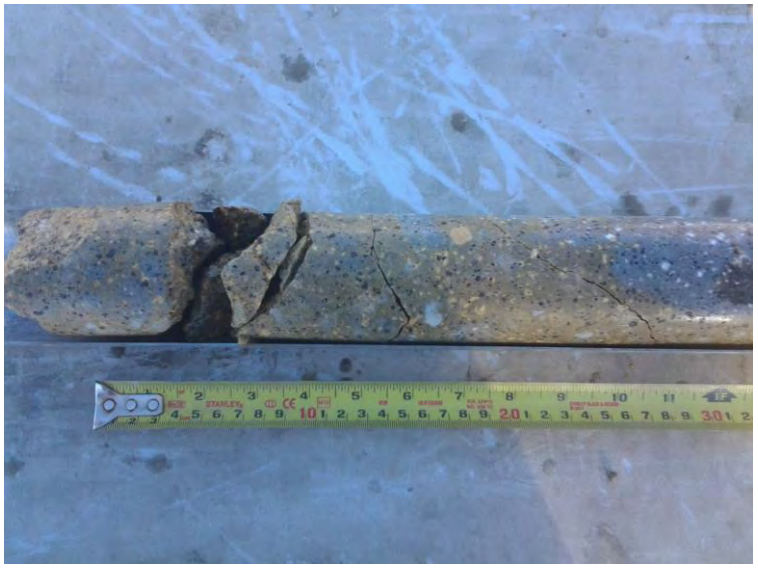
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 17-HQ, 127-128 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_123619.jpg



CH16-102-BH008

2016-03-15 12:36:44

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 17-HQ, 128-129 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_123644.jpg



CH16-102-BH008

2016-03-15 12:37:04

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 17-HQ, 129-130 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_CH16-102-BH008_2016-03-15_123705.jpg



CH16-102-BH008

2016-03-15 12:37:20

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 17-HQ, 130-131 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_123721.jpg



CH16-102-BH008

2016-03-15 12:37:37

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 17-HQ, 131-132 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_123737.jpg



CH16-102-BH008

2016-03-15 12:38:07

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 18-HQ, 132-137 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_123807.jpg



CH16-102-BH008

2016-03-15 13:03:52

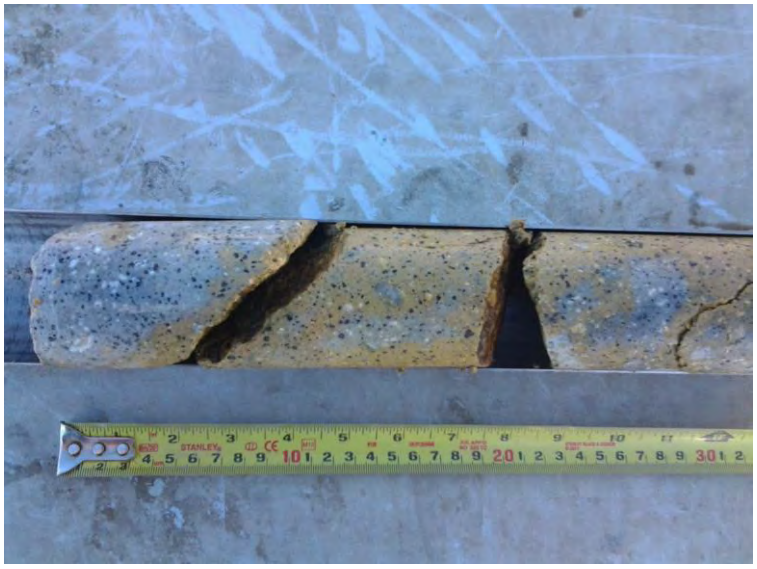
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 18-HQ, 132-133 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_130352.jpg



CH16-102-BH008

2016-03-15 13:04:10

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 18-HQ, 133-134 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_130410.jpg



CH16-102-BH008

2016-03-15 13:04:29

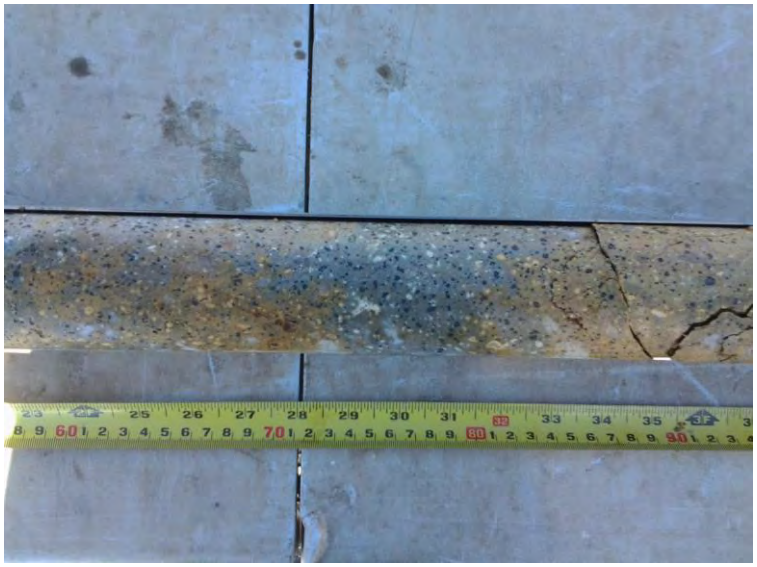
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 18-HQ, 134-135 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_130429.jpg



CH16-102-BH008

2016-03-15 13:04:43

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 18-HQ, 135-136 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_130444.jpg



CH16-102-BH008

2016-03-15 13:05:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 18-HQ, 136-137 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_130502.jpg



CH16-102-BH008

2016-03-15 13:05:15

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 19-HQ, 137-142 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_130515.jpg



CH16-102-BH008

2016-03-15 13:40:41

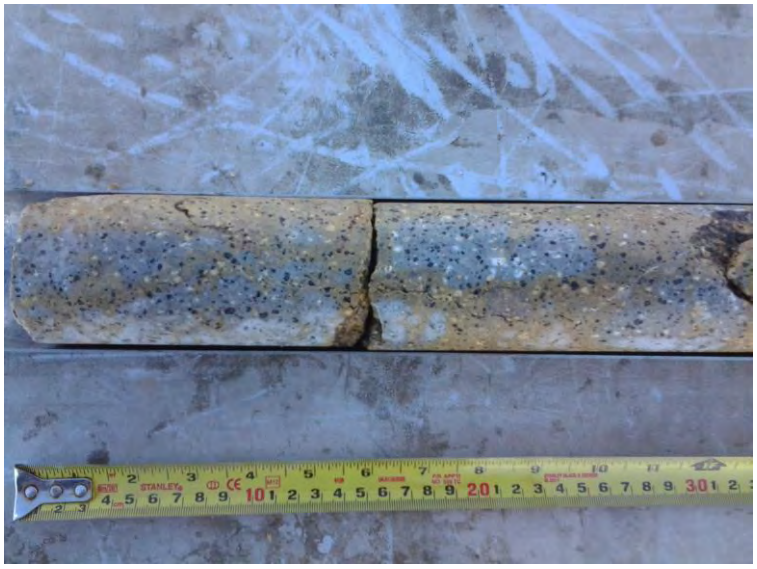
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 19-HQ, 137-138 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_134041.jpg



CH16-102-BH008

2016-03-15 13:41:18

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 19-HQ, 138-139 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_134118.jpg



CH16-102-BH008

2016-03-15 13:41:35

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 19-HQ, 139-140 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_134135.jpg



CH16-102-BH008

2016-03-15 13:41:54

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 19-HQ, 140-141 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_134154.jpg



CH16-102-BH008

2016-03-15 13:42:07

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 19-HQ, 141-142 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_CH16-102-BH008_2016-03-15_134208.jpg



CH16-102-BH008

2016-03-15 13:42:22

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 20-HQ, 142-147 feet stats, time should be 1420

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_CH16-102-BH008_2016-03-15_134222.jpg



CH16-102-BH008

2016-03-15 14:25:38

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 20-HQ, 142-143 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_142538.jpg



CH16-102-BH008

2016-03-15 14:26:05

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 20-HQ, 143-144 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_142605.jpg



CH16-102-BH008

2016-03-15 14:26:20

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 20-HQ, 144-145 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_142620.jpg



CH16-102-BH008

2016-03-15 14:26:35

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 20-HQ, 145-146 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_142635.jpg



CH16-102-BH008

2016-03-15 14:26:55

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 20-HQ, 146-147 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_CH16-102-BH008_2016-03-15_142655.jpg



CH16-102-BH008

2016-03-15 15:07:05

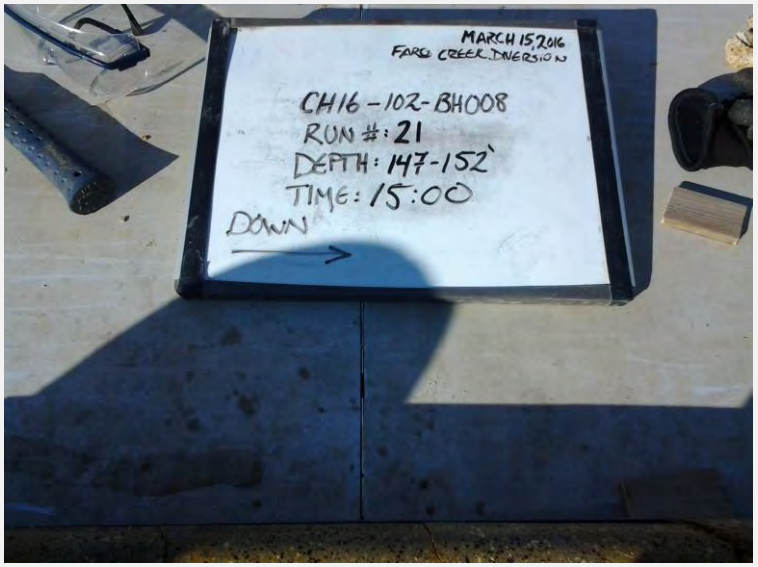
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 21-HQ 147-152 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_150705.jpg



CH16-102-BH008

2016-03-15 15:16:46

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 21-HQ 147-148 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_CH16-102-BH008_2016-03-15_151646.jpg



CH16-102-BH008

2016-03-15 15:17:16

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 21-HQ 148-149 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_151716.jpg



CH16-102-BH008

2016-03-15 15:17:31

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 21-HQ 149-150 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_151731.jpg



CH16-102-BH008

2016-03-15 15:17:46

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 21-HQ 150-151 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_151746.jpg



CH16-102-BH008

2016-03-15 15:18:11

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 21-HQ 151-152 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_151811.jpg



CH16-102-BH008

2016-03-15 15:18:29

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 22-HQ 152-157 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_151829.jpg



CH16-102-BH008

2016-03-15 15:50:11

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 22-HQ 152-153 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_155012.jpg



CH16-102-BH008

2016-03-15 15:50:31

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 22-HQ 153-154 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_155031.jpg



CH16-102-BH008

2016-03-15 15:50:48

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 22-HQ 154-155 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_155048.jpg



CH16-102-BH008

2016-03-15 15:51:04

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 22-HQ 155-156 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_155104.jpg



CH16-102-BH008

2016-03-15 15:51:21

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 22-HQ 156-157 feet, recovery only 97%

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_155121.jpg



CH16-102-BH008

2016-03-15 15:52:04

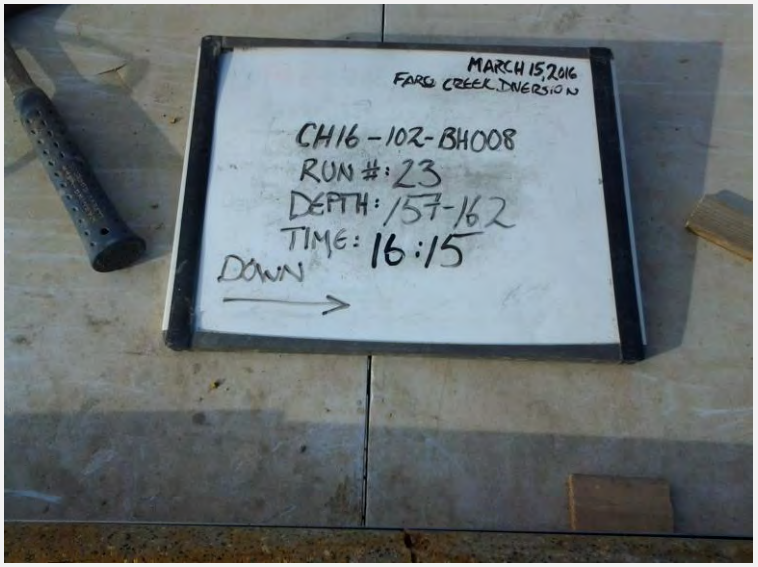
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 23-HQ 157-162 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_155204.jpg



CH16-102-BH008

2016-03-15 16:22:02

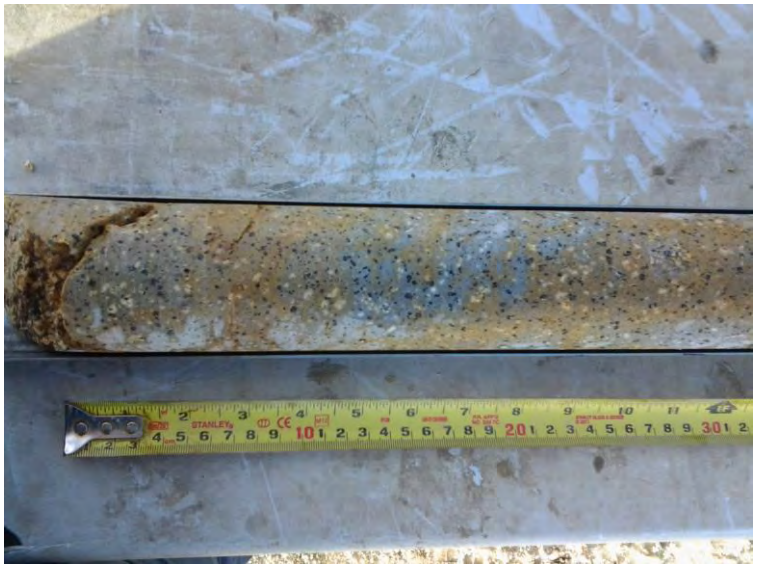
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 23-HQ 157-158 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_162203.jpg



CH16-102-BH008

2016-03-15 16:23:10

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 23-HQ 158-159 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_162310.jpg



CH16-102-BH008

2016-03-15 16:23:28

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 23-HQ 159-160 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_162328.jpg



CH16-102-BH008

2016-03-15 16:23:44

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 23-HQ 160-161 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_162344.jpg



CH16-102-BH008

2016-03-15 16:23:56

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 23-HQ 161-162 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_162357.jpg



CH16-102-BH008

2016-03-15 16:24:09

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 24-HQ 162-167 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_162409.jpg



CH16-102-BH008

2016-03-15 16:57:01

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 24-HQ 162-163 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_165701.jpg



CH16-102-BH008

2016-03-15 16:57:17

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 24-HQ 163-164 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_165717.jpg



CH16-102-BH008

2016-03-15 16:57:30

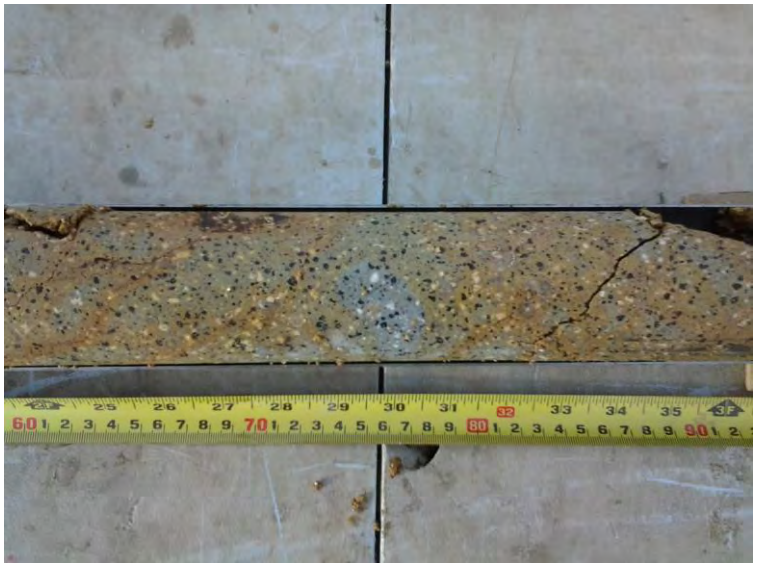
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 24-HQ 164-165 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_165730.jpg



CH16-102-BH008

2016-03-15 16:57:44

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 24-HQ 165-166 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_165744.jpg



CH16-102-BH008

2016-03-15 16:57:57

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 24-HQ 166-167 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_165757.jpg



CH16-102-BH008

2016-03-15 16:58:10

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 25-HQ 167-172 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_165811.jpg



CH16-102-BH008

2016-03-15 17:25:24

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 25-HQ 167-168 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_172524.jpg



CH16-102-BH008

2016-03-15 17:25:44

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 25-HQ 168-169 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_172544.jpg



CH16-102-BH008

2016-03-15 17:26:01

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 25-HQ 169-170 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_172601.jpg



CH16-102-BH008

2016-03-15 17:26:17

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 25-HQ 170-171 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_172617.jpg



CH16-102-BH008

2016-03-15 17:26:30

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 25-HQ 171-172 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-15_172630.jpg



CH16-102-BH008

2016-03-16 10:14:22

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 26-HQ, 172-177 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_101422.jpg



CH16-102-BH008

2016-03-16 10:15:04

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 26-HQ, 172-173 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_101504.jpg



CH16-102-BH008

2016-03-16 10:15:33

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 26-HQ, 173-174 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_101534.jpg



CH16-102-BH008

2016-03-16 10:15:48

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 26-HQ, 174-175 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_101548.jpg



CH16-102-BH008

2016-03-16 10:16:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 26-HQ, 175-176 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_101602.jpg



CH16-102-BH008

2016-03-16 10:16:14

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 26-HQ, 176-177 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_101615.jpg



CH16-102-BH008

2016-03-16 10:16:27

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 27-HQ, 177-182 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_101627.jpg



CH16-102-BH008

2016-03-16 10:44:48

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 27-HQ, 177-178 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_104448.jpg



CH16-102-BH008

2016-03-16 10:45:04

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 27-HQ, 178-179 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_104504.jpg



CH16-102-BH008

2016-03-16 10:45:19

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 27-HQ, 179-180 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_104519.jpg



CH16-102-BH008

2016-03-16 10:45:37

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 27-HQ, 180-181 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_104537.jpg



CH16-102-BH008

2016-03-16 10:45:50

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 27-HQ, 181-182 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_104550.jpg



CH16-102-BH008

2016-03-16 10:46:10

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 28-HQ, 182-187 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_104610.jpg



CH16-102-BH008

2016-03-16 11:22:37

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 28-HQ, 182-183 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_112237.jpg



CH16-102-BH008

2016-03-16 11:22:57

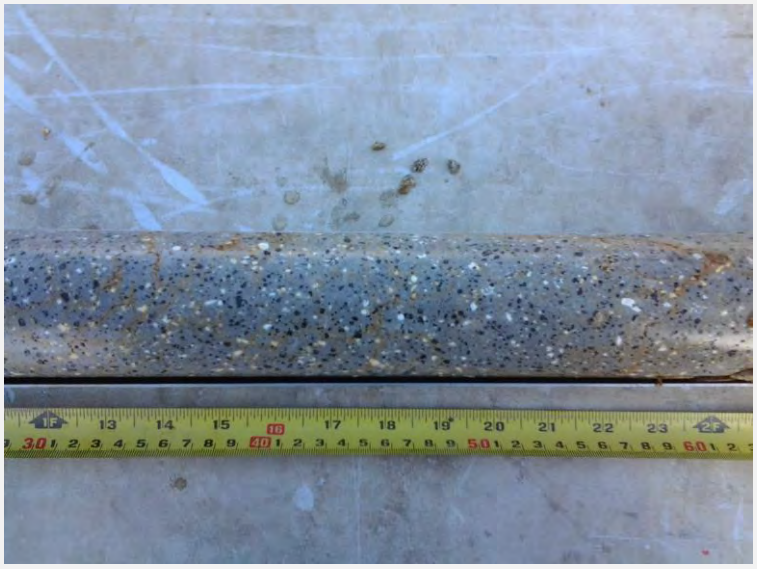
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 28-HQ, 183-184 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_112257.jpg



CH16-102-BH008

2016-03-16 11:23:14

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 28-HQ, 184-185 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_112315.jpg



CH16-102-BH008

2016-03-16 11:23:44

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 28-HQ, 185-186 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_112344.jpg



CH16-102-BH008

2016-03-16 11:24:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 28-HQ, 186-187 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_112403.jpg



CH16-102-BH008

2016-03-16 11:24:23

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 29-HQ, 187-192 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_112423.jpg



CH16-102-BH008

2016-03-16 11:50:17

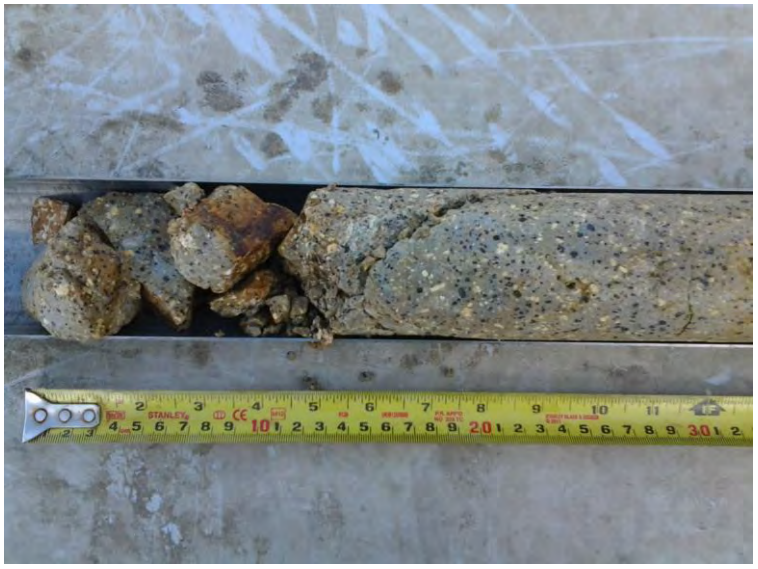
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 29-HQ, 187-188 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_115018.jpg



CH16-102-BH008

2016-03-16 11:50:34

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 29-HQ, 188-189 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_115034.jpg



CH16-102-BH008

2016-03-16 11:50:46

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 29-HQ, 189-190 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_115047.jpg



CH16-102-BH008

2016-03-16 11:51:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 29-HQ, 190-191 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_115102.jpg



CH16-102-BH008

2016-03-16 11:51:17

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 29-HQ, 191-192 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_115117.jpg



CH16-102-BH008

2016-03-16 11:51:36

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 30-HQ, 192-197 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_115136.jpg



CH16-102-BH008

2016-03-16 12:16:30

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 30-HQ, 192-193 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_121631.jpg



CH16-102-BH008

2016-03-16 12:16:51

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 30-HQ, 193-194 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_121651.jpg



CH16-102-BH008

2016-03-16 12:17:08

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 30-HQ, 194-195 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_121708.jpg



CH16-102-BH008

2016-03-16 12:17:26

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 30-HQ, 195-196 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_121726.jpg



CH16-102-BH008

2016-03-16 12:17:43

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584917.5729 6915423.91

Core run 30-HQ, 196-197 feet, bottom of hole

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-BH008_2016-03-16_121743.jpg



CH16-102-MW003

2016-03-05 01:00:40

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Odex cuttings 8-13 feet, sample SOc taken at 1125

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_010040.jpg



CH16-102-MW003

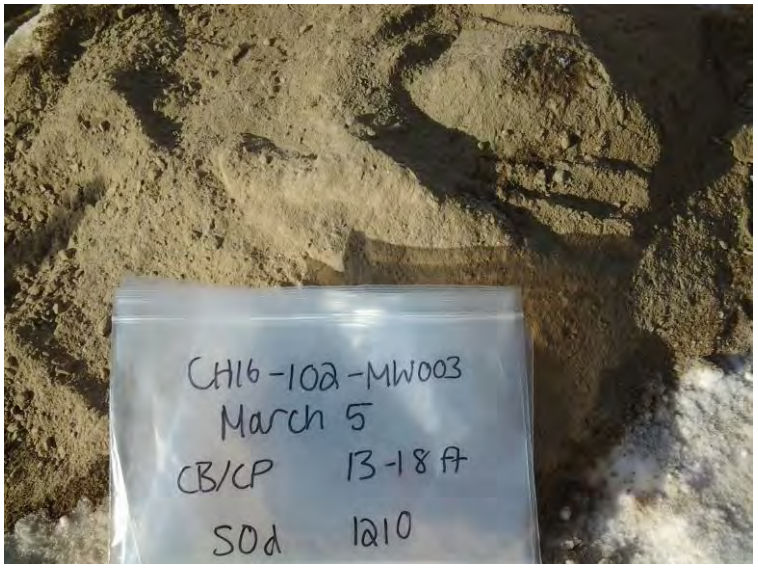
2016-03-05 01:37:18

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Odex cuttings 13-18 feet, sample SOd taken at 1210



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_013718.jpg

CH16-102-MW003

2016-03-05 04:05:04

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Switching head for coring



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_040504.jpg

CH16-102-MW003

2016-03-05 06:30:44

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 1-HQ, 24-24.7 feet, at 1620



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_063044.jpg

CH16-102-MW003

2016-03-05 06:32:38

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 2-HQ, 24.7-29.7 feet, at 1710

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_063239.jpg



CH16-102-MW003

2016-03-05 07:19:40

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 2-HQ, 24.7-25.7 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_071940.jpg



CH16-102-MW003

2016-03-05 07:20:16

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 2-HQ, 25.7-26.7 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_072017.jpg



CH16-102-MW003

2016-03-05 07:20:40

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 2-HQ, 26.7-27.7 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_072040.jpg



CH16-102-MW003

2016-03-05 07:21:07

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 2-HQ, 27.7-28.7 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_072107.jpg



CH16-102-MW003

2016-03-05 07:22:18

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 2-HQ, 28.7-29.7 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_072218.jpg



CH16-102-MW003

2016-03-05 07:22:38

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 3-HQ stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_072239.jpg



CH16-102-MW003

2016-03-05 07:53:09

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 3-HQ 29.7-30.7

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_075309.jpg



CH16-102-MW003

2016-03-05 07:53:31

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 3-HQ 30.7-31.7 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_075331.jpg



CH16-102-MW003

2016-03-05 07:53:54

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 3-HQ 31.7-32.7 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_075354.jpg



CH16-102-MW003

2016-03-05 07:54:27

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 3-HQ 32.7-33.7 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_075428.jpg



CH16-102-MW003

2016-03-05 07:55:05

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 3-HQ 33.7-34.7 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_075505.jpg



CH16-102-MW003

2016-03-05 12:37:53

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

SPT 01 3-4.4 feet, sample SOa collected at 1030

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_243754.jpg



CH16-102-MW003

2016-03-05 12:40:34

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Rig set up

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_244034.jpg



CH16-102-MW003

2016-03-05 12:41:01

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Odex cuttings 3-8 feet, sample SOb taken at 1045

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-05_244102.jpg



CH16-102-MW003

2016-03-06 01:05:30

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 5-HQ 39.7-40.7 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-06_010530.jpg



CH16-102-MW003

2016-03-06 01:06:06

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 5-HQ 40.7-41.7 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-06_010606.jpg



CH16-102-MW003

2016-03-06 01:06:31

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 5-HQ 41.7-42.7 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-06_010631.jpg



CH16-102-MW003

2016-03-06 01:06:56

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 5-HQ 42.7-43.7 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-06_010656.jpg



CH16-102-MW003

2016-03-06 01:07:14

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 5-HQ 43.7-44.7 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-06_010715.jpg



CH16-102-MW003

2016-03-06 08:11:27

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Completed well and monument

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-06_081128.jpg



CH16-102-MW003

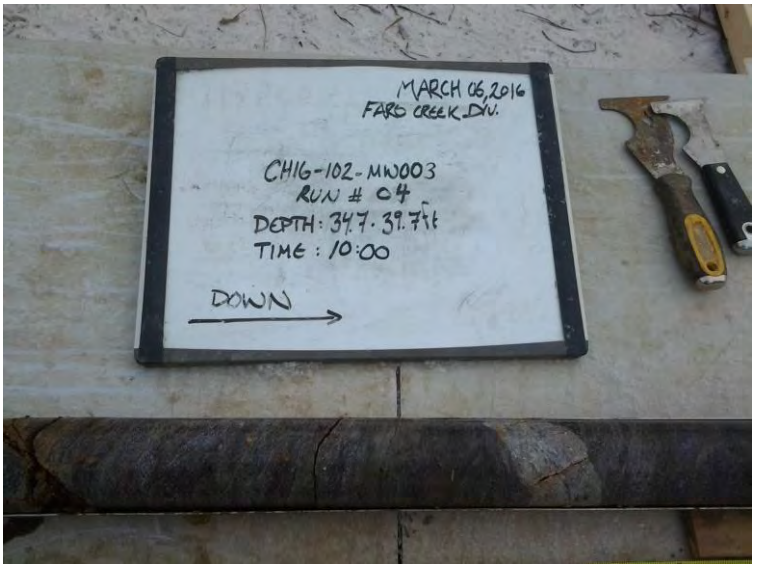
2016-03-06 12:15:58

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 4-HQ stats



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-06_241558.jpg

CH16-102-MW003

2016-03-06 12:17:44

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 4-HQ 34.7-5.7 ft



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-06_241745.jpg

CH16-102-MW003

2016-03-06 12:18:06

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 4-HQ 35.7-36.7 ft



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-06_241806.jpg

CH16-102-MW003

2016-03-06 12:18:33

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 4-HQ 36.7-37.7 ft

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-06_241833.jpg



CH16-102-MW003

2016-03-06 12:19:15

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 4-HQ 37.7-38.7 ft

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-06_241915.jpg



CH16-102-MW003

2016-03-06 12:19:50

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 4-HQ 38.7-39.7 ft

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-06_241950.jpg



CH16-102-MW003

2016-03-06 12:20:13

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Core run 5-HQ stats



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW003_2016-03-06_242013.jpg

CH16-102-MW003

2016-03-06 13:54:41

Field Team R. Di Panfilo

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585057.0 6915300.0 1.8

CH16-102-MW003



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/FCD ALIGNMENT_2016-03-06_135442.jpg

CH16-102-MW003

2016-06-05 15:07:10

Field Team A. Campbell, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Monitoring well.



https://deliver.ch2m.com/sites/TM1/Photos_2016_04-07/CH16-102-MW003_2016-06-05_150710.jpg

CH16-102-MW003

2016-06-05 15:08:00

Field Team A. Campbell, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585077.3281 6915307.2

Monitoring well.

https://deliver.ch2m.com/sites/TM1/Photos_2016_04-07/CH16-102-MW003_2016-06-05_150800.jpg



CH16-102-MW004

2016-03-06 05:26:11

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

SPT 01 4-4.6 feet,sample SOa taken at 1515

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-06_052612.jpg



CH16-102-MW004

2016-03-06 05:27:34

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

SPT 02 9-11 feet,sample SOb taken at 1605

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-06_052734.jpg



CH16-102-MW004

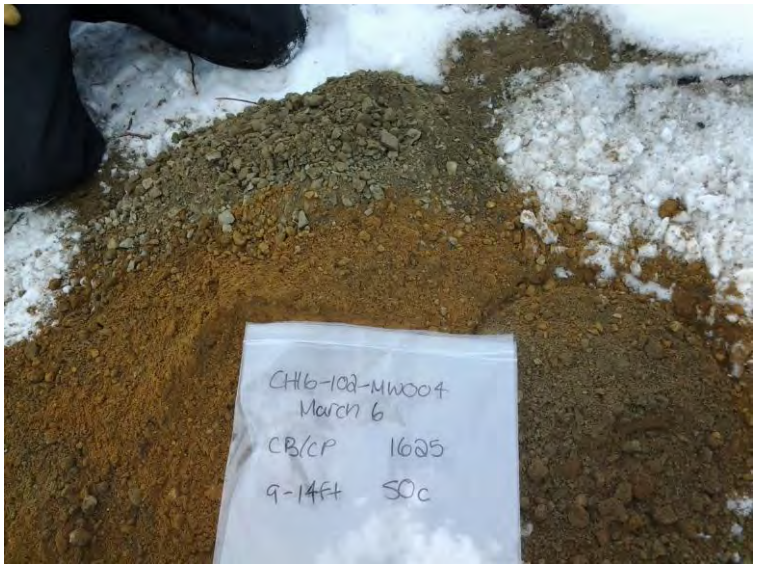
2016-03-06 06:17:33

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Odex cuttings 9-14 feet,sample SOc taken at 1625



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-06_061733.jpg

CH16-102-MW004

2016-03-06 06:33:41

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

SPT 03 14-14.9 feet,sample SOd taken at 1635



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-06_063341.jpg

CH16-102-MW004

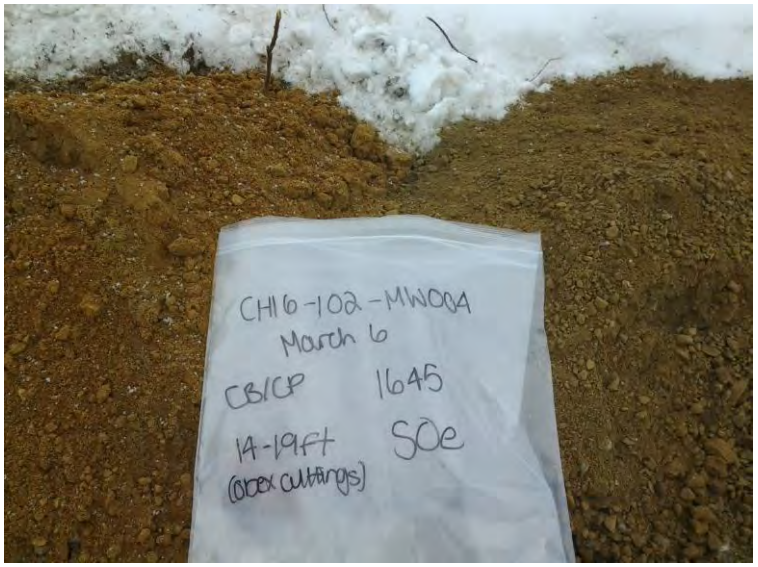
2016-03-06 06:50:28

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Odex cuttings 14-19 feet,sample SOe taken at 1645



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-06_065029.jpg

CH16-102-MW004

2016-03-06 07:12:57

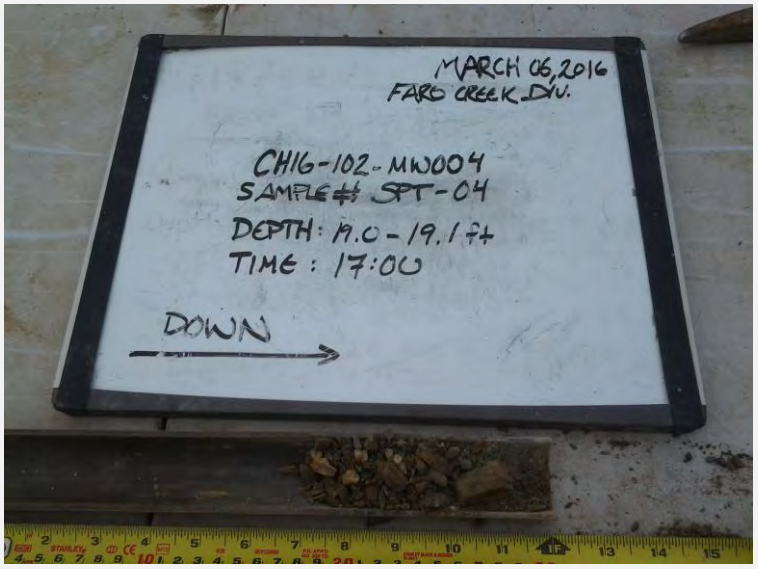
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

SPT 04 19-19.1 feet,sample SOf taken at 1700

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-06_071258.jpg



CH16-102-MW004

2016-03-06 07:33:08

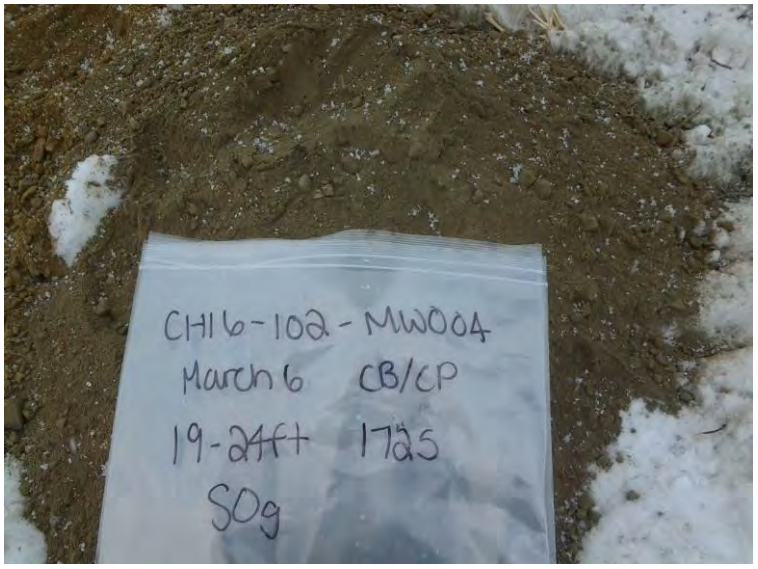
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Odex cuttings 19-24 feet,sample SOg taken at 1725

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-06_073308.jpg



CH16-102-MW004

2016-03-11 09:03:54

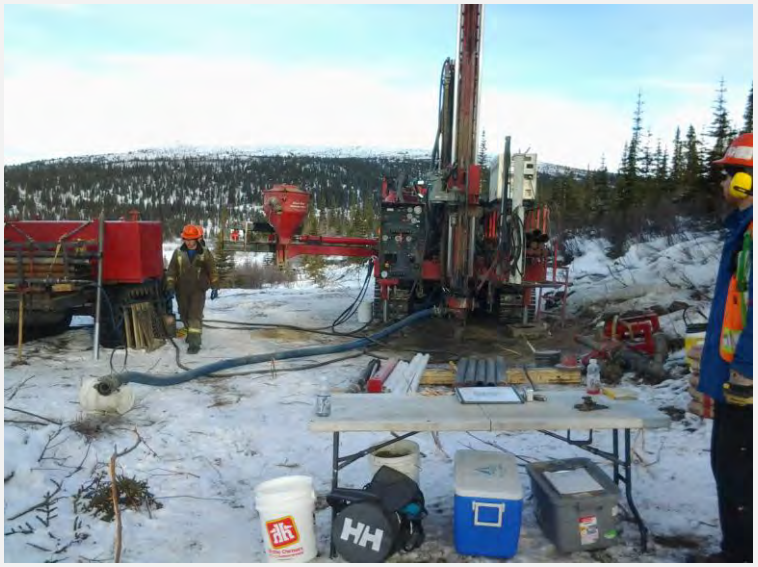
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Rig set up for coring

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_090354.jpg



CH16-102-MW004

2016-03-11 09:37:07

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 1-HQ, 24-27 feet overall



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_093707.jpg

CH16-102-MW004

2016-03-11 09:40:08

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 1-HQ, 24-25 feet



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_094009.jpg

CH16-102-MW004

2016-03-11 09:40:37

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 1-HQ, 25-26 feet



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_094037.jpg

CH16-102-MW004

2016-03-11 09:41:04

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 1-HQ, 26-27 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_094105.jpg



CH16-102-MW004

2016-03-11 10:00:45

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 2-HQ, 27-29 feet overall

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_100045.jpg



CH16-102-MW004

2016-03-11 10:01:31

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 2-HQ, 27-28 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_100132.jpg



CH16-102-MW004

2016-03-11 10:02:05

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 2-HQ, 28-29 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_100205.jpg



CH16-102-MW004

2016-03-11 10:02:32

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 3-HQ, 29-32 feet overall

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_CH16-102-MW004_2016-03-11_100232.jpg



CH16-102-MW004

2016-03-11 10:39:37

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 3-HQ, 29-30 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_CH16-102-MW004_2016-03-11_103937.jpg



CH16-102-MW004

2016-03-11 10:40:07

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 3-HQ, 30-31 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_104007.jpg



CH16-102-MW004

2016-03-11 10:40:42

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 3-HQ, 31-32 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_104042.jpg



CH16-102-MW004

2016-03-11 10:41:03

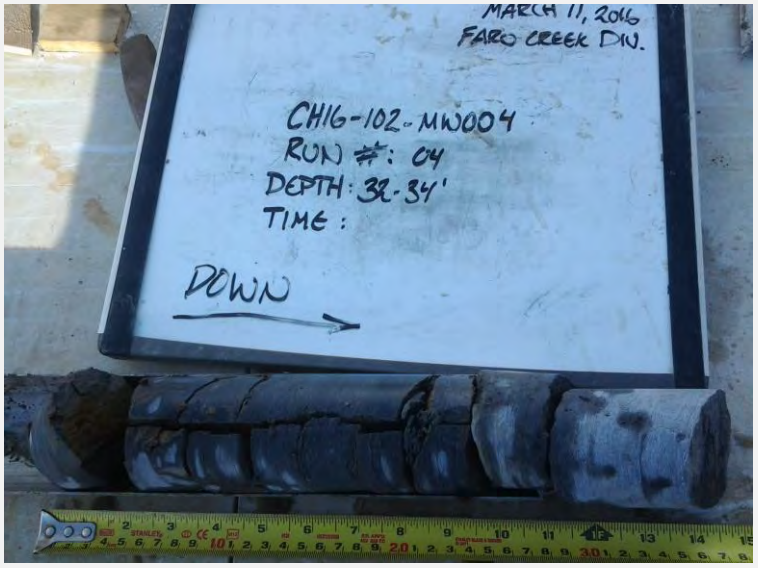
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 4-HQ, 32-34 feet, recovered 15 inches

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_104104.jpg



CH16-102-MW004

2016-03-11 10:59:58

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 5-HQ, 34-39 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_105958.jpg



CH16-102-MW004

2016-03-11 11:20:24

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 5-HQ, 34-35 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_112024.jpg



CH16-102-MW004

2016-03-11 11:20:51

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 5-HQ, 35-36 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_112051.jpg



CH16-102-MW004

2016-03-11 11:21:10

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 5-HQ, 36-37 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_112110.jpg



CH16-102-MW004

2016-03-11 11:21:32

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 5-HQ, 37-38 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_112133.jpg



CH16-102-MW004

2016-03-11 11:21:54

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 5-HQ, 38-39 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_112154.jpg



CH16-102-MW004

2016-03-11 11:22:16

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 6-HQ, 39-44 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_112216.jpg



CH16-102-MW004

2016-03-11 11:43:14

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 6-HQ, 39-40 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_114314.jpg



CH16-102-MW004

2016-03-11 11:43:57

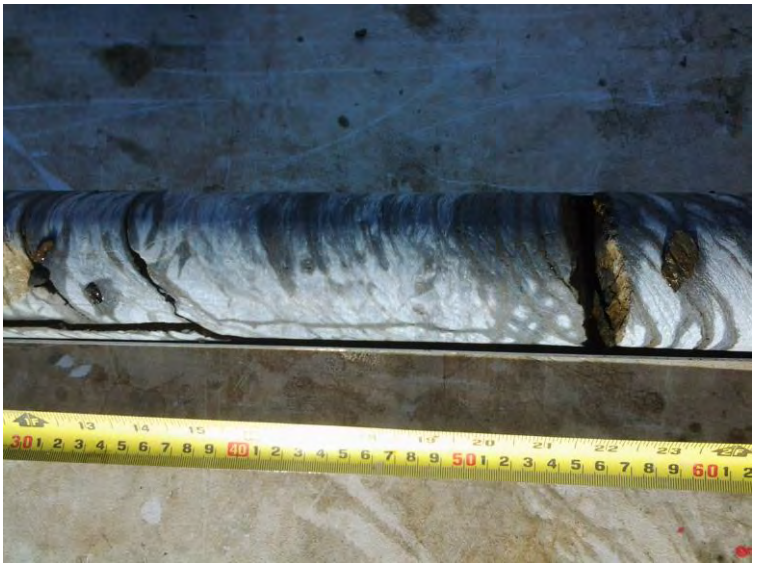
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 6-HQ, 40-41 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_114357.jpg



CH16-102-MW004

2016-03-11 11:45:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 6-HQ, 41-42 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_114502.jpg



CH16-102-MW004

2016-03-11 11:46:16

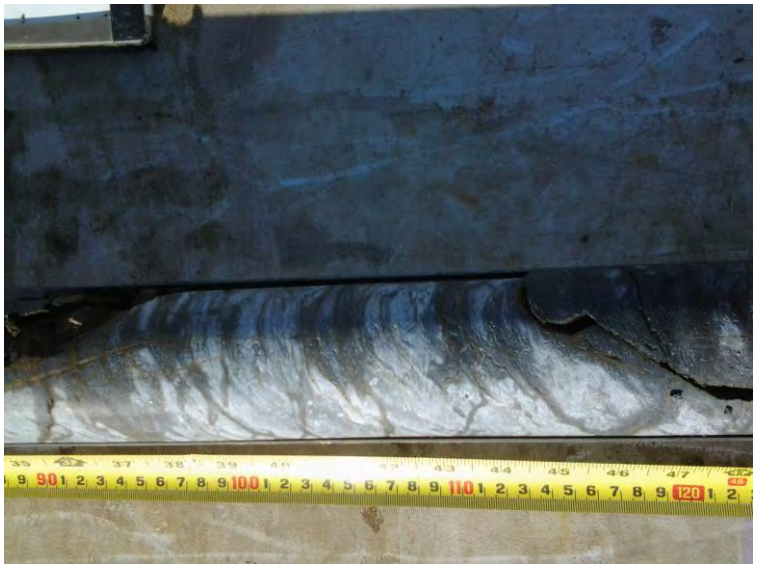
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 6-HQ, 42-43 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_114616.jpg



CH16-102-MW004

2016-03-11 11:46:53

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 6-HQ, 43-44 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_114653.jpg



CH16-102-MW004

2016-03-11 11:48:05

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 7-HQ, 44-49 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_114806.jpg



CH16-102-MW004

2016-03-11 12:13:35

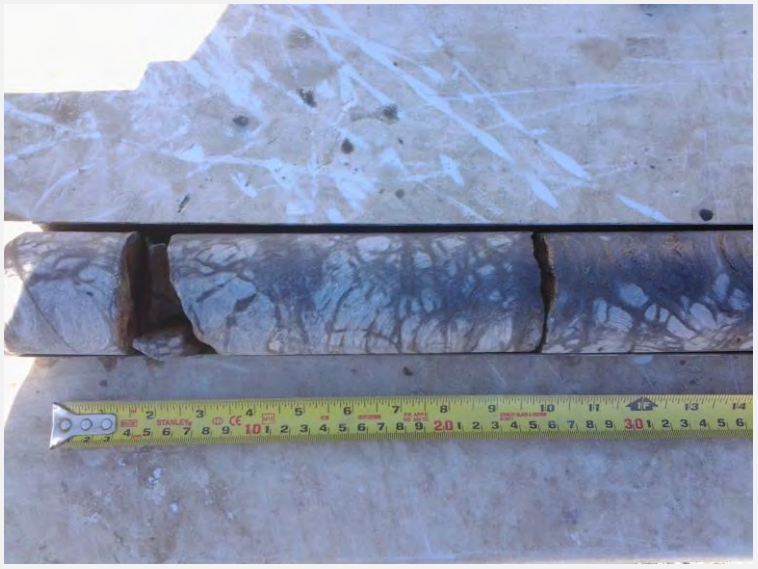
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 7-HQ, 44-45 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_121336.jpg



CH16-102-MW004

2016-03-11 12:14:03

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 7-HQ, 45-46 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_121404.jpg



CH16-102-MW004

2016-03-11 12:14:30

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 7-HQ, 46-47 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_121431.jpg



CH16-102-MW004

2016-03-11 12:14:51

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 7-HQ, 47-48 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_121452.jpg



CH16-102-MW004

2016-03-11 12:15:09

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 7-HQ, 48-49 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_121509.jpg



CH16-102-MW004

2016-03-11 12:15:26

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

The view

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_121527.jpg



CH16-102-MW004

2016-03-11 12:41:06

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 8-HQ stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_124107.jpg



CH16-102-MW004

2016-03-11 12:41:50

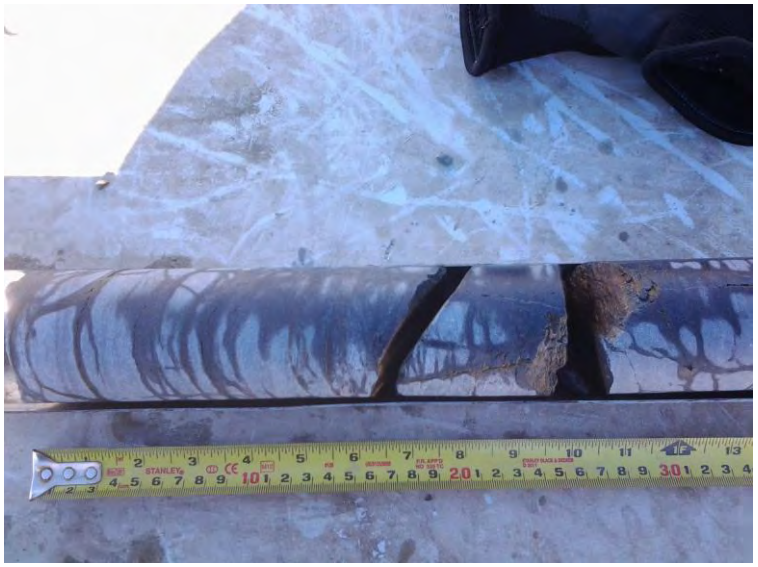
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 8-HQ, 49-50 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_124151.jpg



CH16-102-MW004

2016-03-11 12:42:27

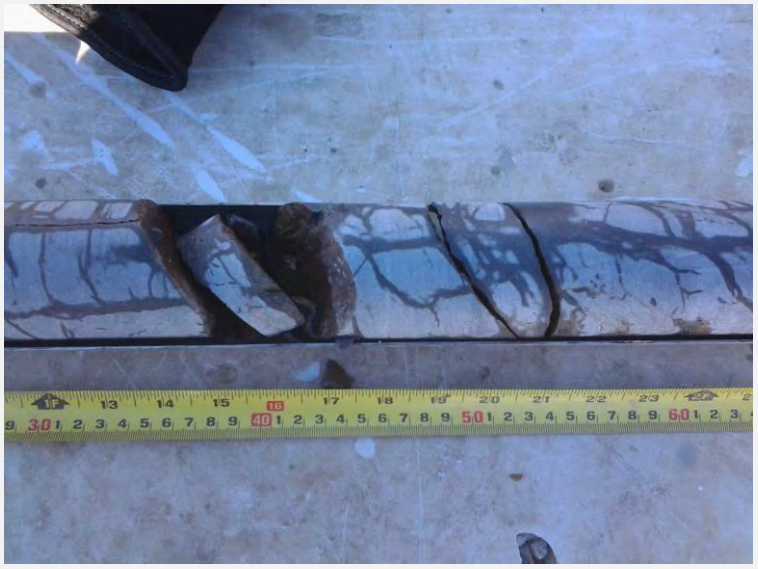
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 8-HQ, 50-51 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_124227.jpg



CH16-102-MW004

2016-03-11 12:43:03

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 8-HQ, 51-52 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_124303.jpg



CH16-102-MW004

2016-03-11 12:43:32

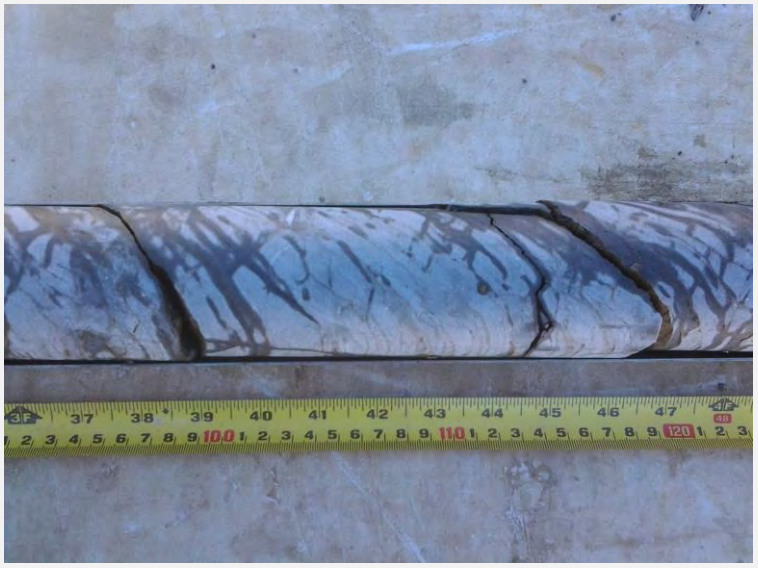
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 8-HQ, 52-53 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_124332.jpg



CH16-102-MW004

2016-03-11 12:43:55

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 8-HQ, 53-54 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_124355.jpg



CH16-102-MW004

2016-03-11 12:44:18

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 9-HQ, 54-59 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_124418.jpg



CH16-102-MW004

2016-03-11 13:16:08

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 9-HQ, 54-55 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_131608.jpg



CH16-102-MW004

2016-03-11 13:16:36

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 9-HQ, 55-56 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_131636.jpg



CH16-102-MW004

2016-03-11 13:16:51

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 9-HQ, 56-57 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_131651.jpg



CH16-102-MW004

2016-03-11 13:17:21

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 9-HQ, 57-58 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_131722.jpg



CH16-102-MW004

2016-03-11 13:17:41

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Core run 9-HQ, 58-59 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW004_2016-03-11_131742.jpg



CH16-102-MW004

2016-06-05 15:10:56

Field Team A. Campbell, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585012.3976 6915430.614

Monitoring well.

https://deliver.ch2m.com/sites/TM1/Photos_2016_04-07/CH16-102-MW004_2016-06-05_151057.jpg



CH16-102-MW005

2016-03-11 17:19:34

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

SPT 3-5 ft, sample SOa collected at 1715

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-11_171934.jpg



CH16-102-MW005

2016-03-11 17:23:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Odex cuttings 3-8 ft, sample SOb collected at 1735

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-11_172302.jpg



CH16-102-MW005

2016-03-11 17:36:06

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

SPT 8-10 ft, sample SOc collected at 1740

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-11_173607.jpg



CH16-102-MW005

2016-03-11 17:46:40

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Odex cuttings 8-13 ft, sample SOd collected at 1800

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-11_174640.jpg



CH16-102-MW005

2016-03-11 17:58:46

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

SPT 13-15 ft, sample SOe collected at 1810



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-11_175847.jpg

CH16-102-MW005

2016-03-12 10:02:24

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Odex cuttings 13-18 feet, sample SOf taken at 0955



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_100225.jpg

CH16-102-MW005

2016-03-12 10:06:13

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Rig set up



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_100613.jpg

CH16-102-MW005

2016-03-12 10:06:40

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

SPT 18-20 feet, sample SOg taken at 1015



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_100640.jpg

CH16-102-MW005

2016-03-12 10:16:50

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Odex cuttings 18-23 feet, sample SOh taken at 1025



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_101650.jpg

CH16-102-MW005

2016-03-12 10:50:21

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

SPT 23-25 feet, sample SOi taken at 1040



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_105021.jpg

CH16-102-MW005

2016-03-12 10:51:11

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Odex cuttings 23-28 feet, sample SOj taken at 1100



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_105111.jpg

CH16-102-MW005

2016-03-12 11:07:06

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

SPT 28-28.4 feet, no sample taken



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_110706.jpg

CH16-102-MW005

2016-03-12 11:27:08

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Odex cuttings 28-33 feet, sample SOk taken ast 1145



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_112708.jpg

CH16-102-MW005

2016-03-12 13:28:19

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 1-HQ 38-43 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_132820.jpg



CH16-102-MW005

2016-03-12 14:21:14

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 1-HQ 38-39 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_142232.jpg



CH16-102-MW005

2016-03-12 14:23:06

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 1-HQ 39-40 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_142306.jpg



CH16-102-MW005

2016-03-12 14:23:34

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 1-HQ 40-41 feet



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_142334.jpg

CH16-102-MW005

2016-03-12 14:23:55

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 1-HQ 41-end of core. Recovery 73%, assume lost from bottom



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_142356.jpg

CH16-102-MW005

2016-03-12 14:24:43

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 2-HQ 43-48 feet stats



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_142443.jpg

CH16-102-MW005

2016-03-12 15:30:41

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 2-HQ 43-44 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_153041.jpg



CH16-102-MW005

2016-03-12 15:32:07

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 2-HQ 44-45 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_153207.jpg



CH16-102-MW005

2016-03-12 15:32:26

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 2-HQ 45-46 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_153226.jpg



CH16-102-MW005

2016-03-12 15:32:47

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 2-HQ 46-47 feet



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_153247.jpg

CH16-102-MW005

2016-03-12 15:33:06

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 2-HQ 47-48 feet



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_153306.jpg

CH16-102-MW005

2016-03-12 15:33:24

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 3-HQ 48-53 stats



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_153324.jpg

CH16-102-MW005

2016-03-12 15:59:45

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 3-HQ 48-49 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_155945.jpg



CH16-102-MW005

2016-03-12 16:00:52

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 3-HQ 49-50 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_160052.jpg



CH16-102-MW005

2016-03-12 16:01:30

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 3-HQ 50-51 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_160130.jpg



CH16-102-MW005

2016-03-12 16:02:06

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 3-HQ 51-52 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_160206.jpg



CH16-102-MW005

2016-03-12 16:02:29

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 3-HQ 52-53 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_160229.jpg



CH16-102-MW005

2016-03-12 16:02:47

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 4-HQ 53-58 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_CH16-102-MW005_2016-03-12_160247.jpg



CH16-102-MW005

2016-03-12 16:57:26

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 4-HQ 53-54 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_CH16-102-MW005_2016-03-12_165726.jpg



CH16-102-MW005

2016-03-12 16:58:03

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 4-HQ 54-55 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_CH16-102-MW005_2016-03-12_165804.jpg



CH16-102-MW005

2016-03-12 16:58:26

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 4-HQ 55-56 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_CH16-102-MW005_2016-03-12_165826.jpg



CH16-102-MW005

2016-03-12 16:58:47

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 4-HQ 56-57 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_CH16-102-MW005_2016-03-12_165847.jpg



CH16-102-MW005

2016-03-12 17:01:14

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 4-HQ 57-58 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_170114.jpg



CH16-102-MW005

2016-03-12 17:01:51

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 5-HQ 58-63 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_170151.jpg



CH16-102-MW005

2016-03-12 17:22:13

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 5-HQ 58-59 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_172213.jpg



CH16-102-MW005

2016-03-12 17:22:30

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 5-HQ 59-60 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_172230.jpg



CH16-102-MW005

2016-03-12 17:22:51

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 5-HQ 60-61 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_172251.jpg



CH16-102-MW005

2016-03-12 17:23:10

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 5-HQ 61-62 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_172310.jpg



CH16-102-MW005

2016-03-12 17:23:23

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Core run 5-HQ 62-63 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW005_2016-03-12_172323.jpg



CH16-102-MW005

2016-06-05 15:11:17

Field Team A. Campbell, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Monitoring well.

https://deliver.ch2m.com/sites/TM1/Photos_2016_04-07/CH16-102-MW005_2016-06-05_151117.jpg



CH16-102-MW005

2016-06-05 15:12:46

Field Team A. Campbell, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584966.2194 6915514.717

Monitoring well.



https://deliver.ch2m.com/sites/TM1/Photos_2016_04-07/CH16-102-MW005_2016-06-05_151246.jpg

CH16-102-MW006

2016-03-03 03:25:00

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

Drillset up with auger flights tomake sure ground is suitable for crrel



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-03_032500.jpg

CH16-102-MW006

2016-03-03 03:32:54

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

Cuttings from auger, 0-3 feet, sample a



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-03_033254.jpg

CH16-102-MW006

2016-03-03 03:45:56

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

Cuttings from auger, 3-8 feet, sample b



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-03_034556.jpg

CH16-102-MW006

2016-03-03 03:50:59

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

SPT 8-10 feet, sample SOc collected 1310



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_CH16-102-MW006_2016-03-03_035100.jpg

CH16-102-MW006

2016-03-03 04:22:32

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

SPT 13.5-15.5 feet, sample SOd collected 1500



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-03_042232.jpg

CH16-102-MW006

2016-03-03 05:21:35

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

Odex cuttings 13.5-18.5 feet, sample SOe collected 1545



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-03_052135.jpg

CH16-102-MW006

2016-03-03 05:57:07

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

SPT 18.5-20.5 feet, sample SOf collected 1605



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-03_055708.jpg

CH16-102-MW006

2016-03-03 06:16:13

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

Odex cuttings 18.5-23.5 feet, sample SOg collected 1645



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_CH16-102-MW006_2016-03-03_061613.jpg

CH16-102-MW006

2016-03-03 07:17:57

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

SPT 23.5-25.5 feet, sample SOh collected at 1710



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-03_071758.jpg

CH16-102-MW006

2016-03-03 07:19:24

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

Odex cuttings 23.5-28.5 feet, sample SOi collected at 1730



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-03_071924.jpg

CH16-102-MW006

2016-03-03 07:39:58

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

SPT 28.5-29.5 feet, sample SOj collected at 1800



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-03_073958.jpg

CH16-102-MW006

2016-03-03 23:21:50

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

SPT 33.5-34.3 feet, sample SOk collected at 0900



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-03_232150.jpg

CH16-102-MW006

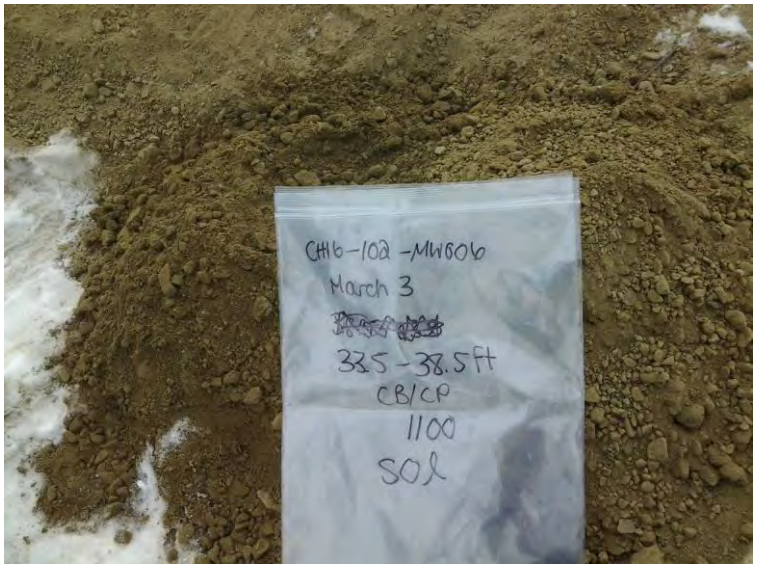
2016-03-03 23:25:23

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

Odex cuttings 33.5-38.5 feet, sample SOk collected at 1100



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-03_232524.jpg

CH16-102-MW006

2016-03-04 01:14:17

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

SPT 43.5-44 feet, sample SOm collected at 1230



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-04_011418.jpg

CH16-102-MW006

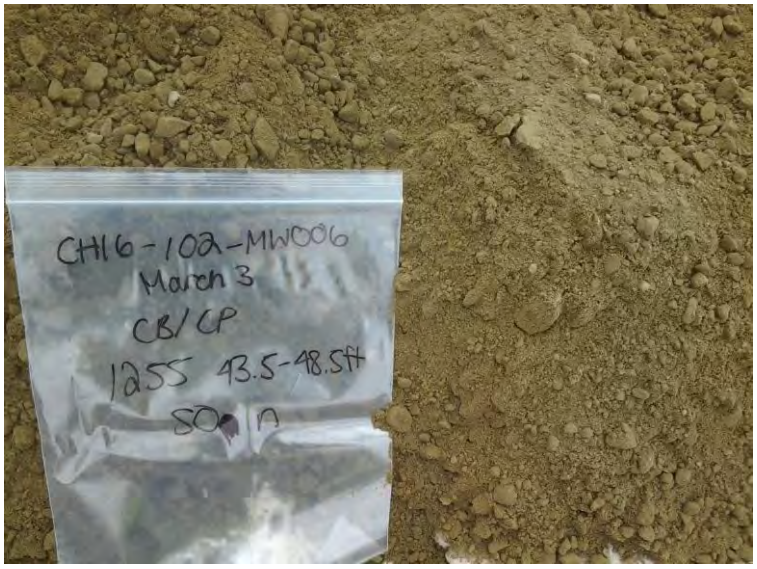
2016-03-04 02:40:34

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

Odex cuttings 43.5-48.5 feet, sample SOn collected at 1255



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-04_024034.jpg

CH16-102-MW006

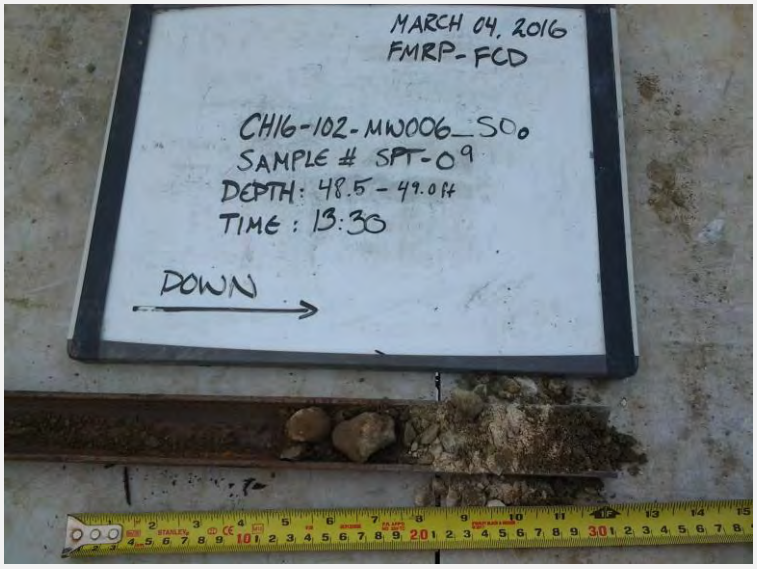
2016-03-04 03:10:37

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

SPT 48.5-49 feet, sample SOo collected at 1330



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-04_031037.jpg

CH16-102-MW006

2016-03-04 03:46:30

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

SPT 53.5-55.3 feet, sample SOp collected at 1455



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-04_034630.jpg

CH16-102-MW006

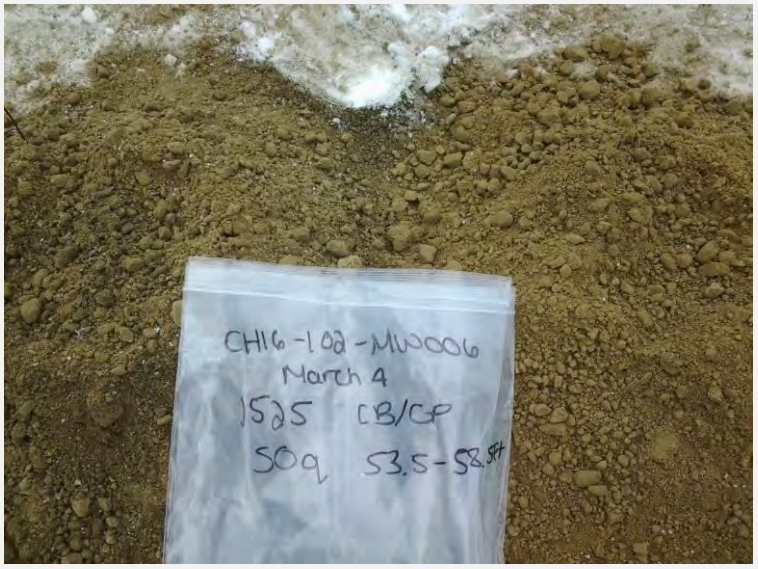
2016-03-04 05:07:09

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

Odex cuttings 53.5-58.5 feet, sample SOq collected at 1525



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-04_050710.jpg

CH16-102-MW006

2016-03-04 05:36:56

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996

SPT 58.5-59.5 feet, sample SOr collected at 1625



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW006_2016-03-04_053656.jpg

CH16-102-MW006

2016-03-05 13:25:27

Field Team R. Di Panfilo

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

585027.0 6915272.0 32.0

CH16-102-MW006



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/FCD ALIGNMENT_FCD ALIGNMENT_2016-03-05_132527.jpg

CH16-102-MW006

2016-06-05 10:32:11

Field Team A. Campbell, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584962.4272 6915902.996 6.0

Monitoring well. Looking northwest standing water / seepage on ground surface in this area.



https://deliver.ch2m.com/sites/TM1/Photos_2016_04-07/CH16-102-MW006_2016-06-05_103211.jpg

CH16-102-MW007

2016-03-17 13:26:04

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

SPT 4-6 feet, sample SOa collected at1310



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-17_132605.jpg

CH16-102-MW007

2016-03-17 13:27:19

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

SPT 9-11 feet, sample SOb collected at 1330



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-17_132719.jpg

CH16-102-MW007

2016-03-17 13:47:21

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Odex cuttings 0-9 feet, sample SOc collected at 1345



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-17_134721.jpg

CH16-102-MW007

2016-03-17 14:00:10

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

SPT 14-15.75 feet, sample SOd collected at 1350



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-17_140010.jpg

CH16-102-MW007

2016-03-17 14:05:56

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Odex cuttings 14-19 feet, sample SOe collected at 1405



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-17_140556.jpg

CH16-102-MW007

2016-03-17 14:14:44

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Odex cuttings 19-24 feet, sample SOf collected at 1420



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-17_141444.jpg

CH16-102-MW007

2016-03-18 10:29:24

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 1-HQ 25-26 feet



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_102924.jpg

CH16-102-MW007

2016-03-18 10:30:15

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 1-HQ 26-27 feet



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_103015.jpg

CH16-102-MW007

2016-03-18 10:30:32

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 1-HQ 27-28 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_103032.jpg



CH16-102-MW007

2016-03-18 10:30:45

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 1-HQ 28 to end of run, recovery only 80%

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_103045.jpg



CH16-102-MW007

2016-03-18 10:31:20

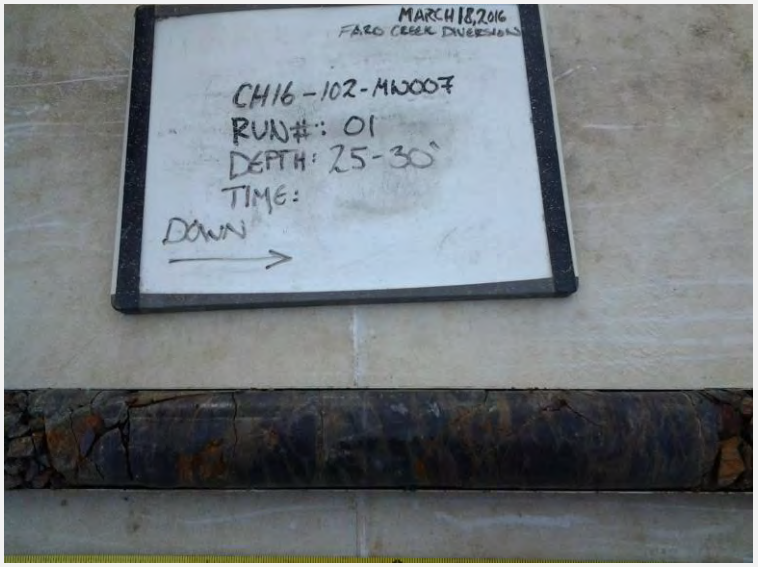
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 1-HQ 28 - 30 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_103120.jpg



CH16-102-MW007

2016-03-18 10:31:50

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 2-HQ 30-31.5 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_103150.jpg



CH16-102-MW007

2016-03-18 10:41:33

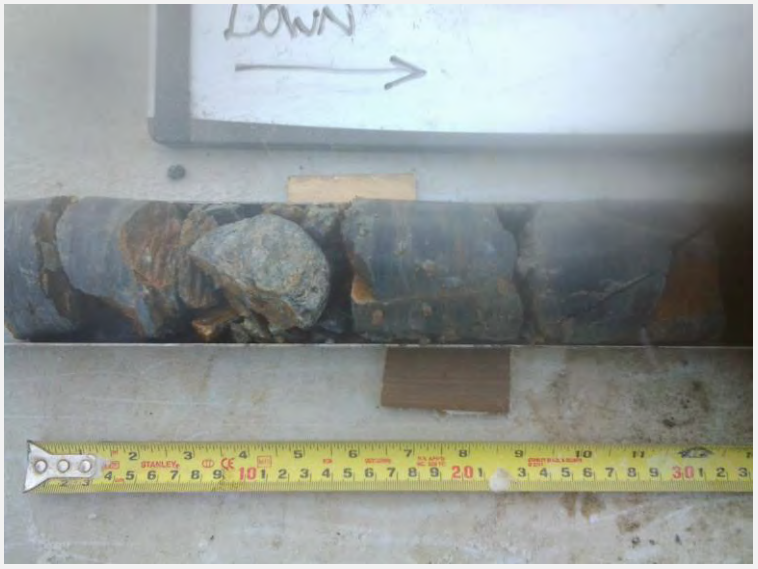
Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 2-HQ 30-31 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_104133.jpg



CH16-102-MW007

2016-03-18 10:41:53

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 2-HQ 31-31.5 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_104154.jpg



CH16-102-MW007

2016-03-18 10:42:10

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 3-HQ 31.5-35 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_104211.jpg



CH16-102-MW007

2016-03-18 11:37:51

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 3-HQ 31.5-32.5 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_113751.jpg



CH16-102-MW007

2016-03-18 11:39:48

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 3-HQ 32.5-33.5 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_113948.jpg



CH16-102-MW007

2016-03-18 11:40:47

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 3-HQ 33.5 toend of run



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_114047.jpg

CH16-102-MW007

2016-03-18 11:41:20

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 4-HQ 35-40 feet stats



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_CH16-102-MW007_2016-03-18_114120.jpg

CH16-102-MW007

2016-03-18 12:01:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 4-HQ 35-36 feet



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_120103.jpg

CH16-102-MW007

2016-03-18 12:01:37

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 4-HQ 36-37 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_120137.jpg



CH16-102-MW007

2016-03-18 12:02:28

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 4-HQ 37-38 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_120228.jpg



CH16-102-MW007

2016-03-18 12:02:42

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 4-HQ 38-39 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_120243.jpg



CH16-102-MW007

2016-03-18 12:02:59

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 4-HQ 39-40 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_120259.jpg



CH16-102-MW007

2016-03-18 12:03:12

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 5-HQ 40-45 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_120313.jpg



CH16-102-MW007

2016-03-18 12:17:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 5-HQ 40-41 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_121703.jpg



CH16-102-MW007

2016-03-18 12:17:20

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 5-HQ 41-42 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_121721.jpg



CH16-102-MW007

2016-03-18 12:17:37

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 5-HQ 42-43 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_121737.jpg



CH16-102-MW007

2016-03-18 12:17:51

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 5-HQ 43-44 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_121751.jpg



CH16-102-MW007

2016-03-18 12:18:15

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 5-HQ 44-45 feet



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_121815.jpg

CH16-102-MW007

2016-03-18 12:18:32

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 6-HQ 45-50 feet stats



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_121832.jpg

CH16-102-MW007

2016-03-18 12:43:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 6-HQ 45-46 feet



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_CH16-102-MW007_2016-03-18_124302.jpg

CH16-102-MW007

2016-03-18 12:43:37

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 6-HQ 46-47 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_CH16-102-MW007_2016-03-18_124338.jpg



CH16-102-MW007

2016-03-18 12:43:57

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 6-HQ 47-48 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_124358.jpg



CH16-102-MW007

2016-03-18 12:44:17

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 6-HQ 48-49 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_124418.jpg



CH16-102-MW007

2016-03-18 12:44:55

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 6-HQ 49-50 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_124455.jpg



CH16-102-MW007

2016-03-18 12:46:32

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 6-HQ close up of interesting section

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_124633.jpg



CH16-102-MW007

2016-03-18 12:52:46

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 7-HQ 50-55 feet stats

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_125246.jpg



CH16-102-MW007

2016-03-18 13:09:02

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 7-HQ 50-51 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_130902.jpg



CH16-102-MW007

2016-03-18 13:09:28

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 7-HQ 51-52 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_130928.jpg



CH16-102-MW007

2016-03-18 13:09:46

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 7-HQ 52-53 feet

https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_CH16-102-MW007_2016-03-18_130947.jpg



CH16-102-MW007

2016-03-18 13:10:57

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 7-HQ 53 feet to bottomof run, recovery only 70%



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_CH16-102-MW007_2016-03-18_131057.jpg

CH16-102-MW007

2016-03-18 14:01:19

Field Team C. Pederson, C. Blair

Coordinates (UTM NAD83 Zone 8N) Accuracy (m +/-

584596.3871 6916083.4

Core run 1-7 overview



https://deliver.ch2m.com/sites/TM1/Photos_2016_0103/CH16-102-MW007_2016-03-18_140119.jpg

Attachment 3
Frontier Geosciences Inc.
Geophysical Report

CH2M HILL CANADA LIMITED

REPORT ON

MULTI-ELECTRODE RESISTIVITY, SEISMIC REFRACTION AND MULTI-SPECTRAL ANALYSIS OF SURFACE WAVES SURVEYS

FARO CREEK DIVERSION

FARO MINE REMEDIATION PROJECT

FARO, YUKON

by

Cliff Candy, P.Geo.

Beth Friesen, B.Sc.

October, 2015 **PROJECT FGI-1415-FC**

Frontier Geosciences Inc. 237 St. Georges Avenue, North Vancouver, B.C., Canada V7L 4T4
Tel: 604.987.3037 Fax: 604.984.3074

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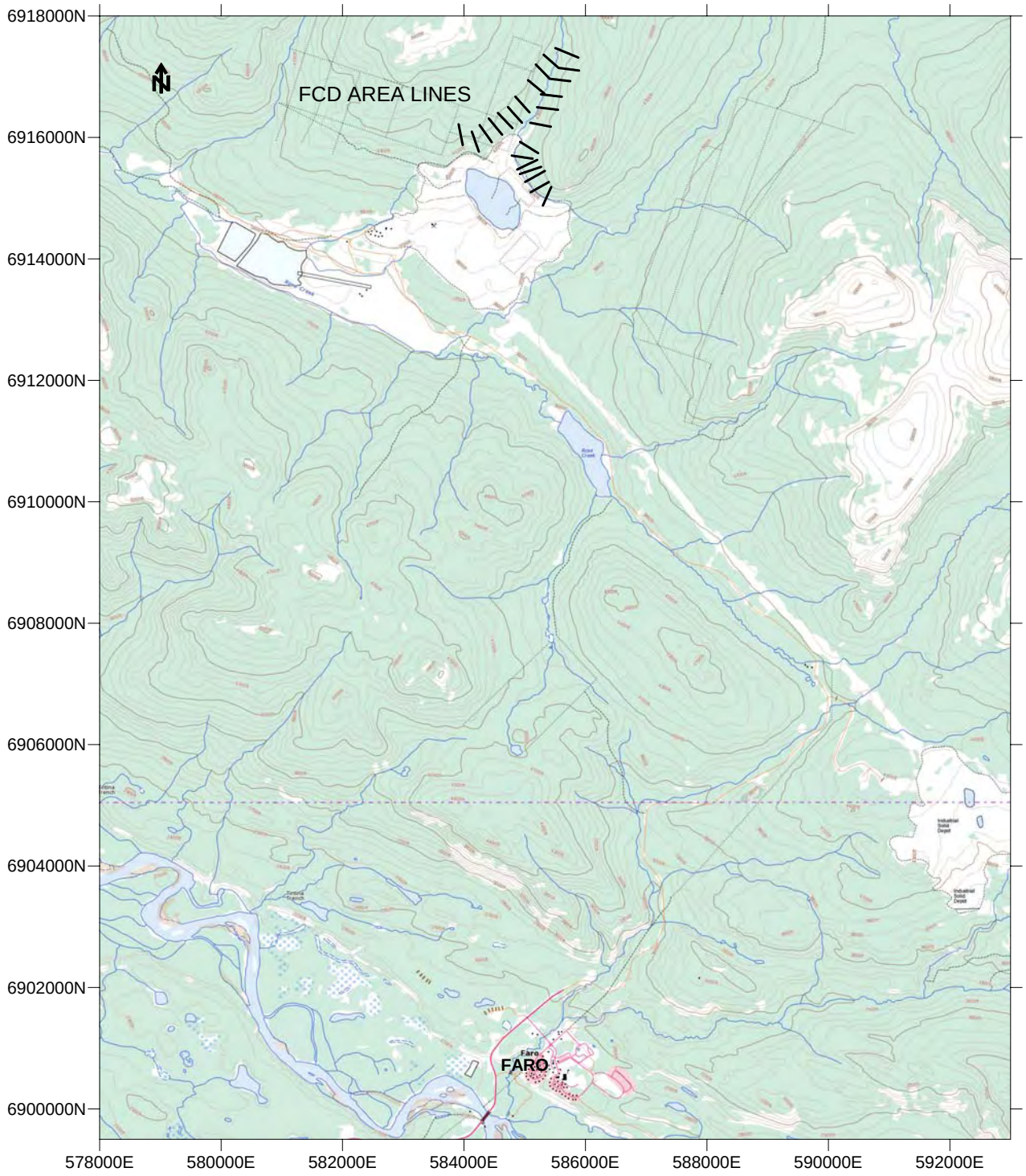
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1. INTRODUCTION

In the periods of October 1 to 7, and October 10 to 26, 2015, Frontier Geosciences Inc. carried out multi-electrode resistivity, seismic refraction and multi-spectral analysis of surface waves surveys for CH2M Hill Canada Limited at the Faro Mine near Faro, Yukon. The site area is located approximately 12 km north of the town of Faro, and approximately 200 km northeast of Whitehorse, Yukon. A Survey Location Plan of the area is shown at a scale of 1:100,000 in Figure 1.

The purpose of the geophysical surveys was to characterize subsurface conditions as part of the Faro Mine remediation project. Additional geophysical investigations were carried out by Frontier Geosciences Inc. at selected survey areas within the Faro Mine Site and discussed in separate reports. A Site Plan of the Faro Creek Diversion (FCD) Area is presented at 1:10,000 scale in Figure 2 in the Appendix.

In all, 21 separate geophysical traverses were completed in the ID Spillway Area. A total of approximately 7650 metres of detailed resistivity, compressional wave and surface wave surveying was carried out in the survey area.



CH2MHILL

FARO MINE REMEDIATION PROJECT

GEOPHYSICAL SURVEY

FARO CREEK DIVERSION SURVEY LOCATION PLAN

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:100,000	FIG. 1

2. THE MULTI-ELECTRODE RESISTIVITY SURVEY

2.1 Equipment

The purpose of electrical surveying is to determine the subsurface resistivity distribution by making detailed measurements along survey lines laid out on the ground surface. From these measurements, the true resistivity of the subsurface can be estimated. Ground resistivity is related to various geological parameters such as the sulphide, clay mineral and fluid content, porosity and degree of water saturation in weathered material layering and the underlying materials.

The surface multi-electrode imaging resistivity/I.P. survey was carried out using a full waveform resistivity/I.P. system designed and developed by Frontier Geosciences Inc. The instrument has eight receiver channels, allowing measurements on multiple electrodes to proceed simultaneously, which significantly speeds up the data collection process allowing dense and detailed resistivity and I.P. profiles to be obtained.

During multi-electrode surveying, a central switching system is used to address the array of electrodes. This switching is accomplished using a multiplexer that directs the signals from any of the field electrodes to the eight input channels of the receiver. Similarly, a system of high voltage relays in the central switching system allows the transmitter to utilise any pair of electrodes for current injection. By means of a command file programmed in the receiver, electrode arrays including Schlumberger, Wenner, dipole-dipole, pole-dipole and pole-pole, or multiple combinations of arrays, may be chosen for execution.

The high resolution, full waveform receiver records the entire waveform for eight channels simultaneously. With the full 24 bit waveform available for processing, self-potential drift, transient effects, and several other noise sources are accurately identified and removed from the signal. This results in full waveform data acquisition, providing high resolution information in lower signal level situations such as higher current electrode spacings and corresponding deeper penetration in a dipole-dipole survey, or in geologic settings with unfavourable signal-to-noise levels.

In addition to resistivity measurements, Induced Polarisation readings were collected simultaneously. This measurement records the degree to which the earth materials tend to retain an apparent voltage after removal of the transmitted voltage. The effect is termed Induced Polarisation (I.P.) and has its origins in the electrolytic nature of groundwater and the conductive nature of certain minerals. The system measures the I.P. effect in the time domain by determining the residual decay voltage after the current is switched off. The time domain unit of measurement of chargeability is milliseconds. The I.P. effect is caused by two different mechanisms: membrane and electrode polarisation effects. The membrane polarisation effect is usually created by clay minerals present in the earth. The electrode polarisation effect is largely caused by conductive materials such as sulphides in the rock and (usually) to a lesser extent by graphite. This effect is the basis for application of the I.P. method in surveys for the detection of metallic minerals, such as disseminated sulphides.

2.2 Survey Procedure

Cable layouts for each system were identical, consisting of six 70-metre receiver cables laid out along the survey line and connected to the multiplexing switchbox controller. The switchbox controller allows the electrodes to be in either standby, current or measuring potential modes. Each individual cable consists of 14 electrode takeouts at a spacing of 5 metres, with a full array covering approximately 420 metres.

The system was configured to permit two different data acquisition procedures. The first procedure, typically the initial array of a new line, collects data files encompassing the full sequence of measurements. After the full array reading, three cables were detached from the rear of the receiver line, and three cables were attached to the front of the receiver line, effectively shifting the array 210 metres along the survey line by ‘rolling’ the array. The computer system was shifted to the same relative position within the rolled array, and the process repeated.

Prior to the full survey data collection, an electrode test was carried out along the array to identify and correct any poor electrode contacts. Data quality was monitored in the field through a full-panel display of received waveforms. If the data was suspect, individual channels could be displayed at enhanced scale for closer inspection and field processing.

2.3 Data Processing

The data were downloaded from the instruments and filtered by plotting the apparent resistivity pseudosection for the dipole–dipole array and removing outliers. The remaining values are converted into the input file format for the cell-based inversion method in the RES2DINV program developed by M. H. Loke. In general, 95% of the input data have current measurements greater than the commonly recommended 20 mA minimum. This software utilises a finite difference modelling approach to calculate the resistivity values that best fit the observed data. The model parameters are the resistivity values of the model cell, while the data is the measured apparent resistivity and apparent Induced Polarisation values. The mathematical link between the model parameters and the model response is provided by the finite-difference or finite-element methods. In all optimisation methods, an initial model is modified in an iterative manner so that the difference between the model response and the data values is reduced.

To increase the accuracy of the modelling process, the elevation of each electrode was incorporated into the input data file.

3. THE SEISMIC SURVEY METHODS

3.1 Equipment

The seismic refraction investigation was carried out using two Geometrics, Geode, 24 channel, signal enhancement seismographs and Oyo Geo Space, 10 Hz geophones. Geophone intervals along the multicored seismic cables were maintained at 5 metres in order to ensure high resolution data on subsurface layering and the basal bedrock surface. Energy input was provided by a seismic shotgun firing blank, black powder, 8 gauge industrial shells into hand-excavated shotholes. Shot initiation or zero time was established by metal to metal contact of a striking hammer contacting the firing pin of the shotgun.

3.2 Survey Procedure

For each spread, the seismic cable was stretched out in a straight line and the geophones implanted. Up to 14 separate 'shots' were then initiated: one at either end of the geophone array, up to ten at intermediate locations along the seismic cable, and one off each end of the line, to ensure adequate coverage of the basal layer. The shots were triggered individually and arrival times for each geophone were recorded digitally in the seismograph. For quality assurance, in field inspection of raw data after each shot was carried out, with additional shots recorded if first arrivals were unclear. Data recorded during field surveying operations was generally of good quality.

Throughout the survey, notes were recorded regarding seismic line positions in relation to topographic and geological features in the area. Individual geophone locations were labelled on pin flags in the field. Relative elevations on the seismic lines were recorded by chain and inclinometer with absolute elevations taken from Lidar data provided by CH2M Hill Canada Limited. Geophysical survey lines 102-8 to 102-21 were surveyed from the west to east. Lines 102-1 to 102-7 were surveyed from the south to the north, but were reoriented to maintain a consistent viewing perspective.

3.3 Data Reduction and Processing

3.3.1 Seismic Refraction Interpretive Method

The final interpretation of the seismic data was arrived at using the method of differences technique. This method utilises the time taken to travel to a geophone from shotpoints located to either side of the geophone. Using the total time, a small vertical time is computed which represents the time taken to travel from the refractor up to the ground surface. This time is then multiplied by the velocity of each overburden layer to obtain the thickness of each layer at that point. For quality control, interpreted data is internally compared to estimated bedrock depths based on critical distances, resistivity results, and confirmed site geology.

3.3.2 Multi-Spectral Analysis of Surface Waves (MASW)

Interpretation of the MASW data involves a wavefield transformation of the seismogram record. This converts the seismogram from a multichannel shot gather to a dispersion curve that shows the phase velocity of the signal as a function of frequency. The fundamental event is picked on the dispersion curve and this data is inputted into the Geopsy modelling program. The resulting model reveals the shear wave layer velocity structure, and is plotted at the centre of each shot array. The individual models produced were then gridded together to produce a shear wave velocity depth section along the survey lines. The depth sections were compared with the seismic refraction results and the ratio of shear to compressional wave velocities were checked for quality control.

4. GEOPHYSICAL RESULTS

4.1 General

The resistivity/I.P. and overlapping seismic lines are arranged in segments perpendicular to, and intersecting with the existing mine road. The results of the resistivity/I.P. inversions, seismic refraction, and MASW inversions are all shown at a scale of 1:1,000 in Figures 3 to 46 and Figures 49 to 69 in the Appendix. A bedrock elevation contour plan and a sediment thickness isopach plan, derived from the seismic refraction interpretation are shown at 1:10,000 scale in Figures 47 and 48 in the Appendix.

4.2 Discussion

4.2.1 Resistivity Results

The results of the interpretations of the inverted resistivity data along lines RL-102-01 to RL-102-21 display a generally resistive environment with maximum resistivities less than 2500 ohm-m. Within this range, zones of higher resistivities are shown in red whereas less resistive, more conductive materials are shown in green and blue. Typical resistivities and chargeabilities of common earth materials (adapted from Palacky, 1987) are shown in Table 1 and Table 2 below.

Table 1: Typical resistivities of common earth materials.

Material	Resistivity (ohm-m)	Material	Resistivity (ohm-m)
Massive sulphides	0.01 - 1	Clays	5 - 100
Saltwater	< 1	Sand and gravel	700 - 10,000
Fresh water	1 - 100	Shales	7 - 70
Permafrost	800 - 100,000	Metamorphic rocks	10 - 2000

Table 2: Typical chargeabilities of common earth materials.

Material	Chargeability (ms)	Material	Chargeability (ms)
8 - 20 % sulphides	1000 - 2000	Shale	50 - 100
2 - 8 % sulphides	500 - 1000	Granite, Granodiorite	10 - 50
Sandstone, siltstone	100 - 500	Schists	5 - 20
Dense volcanics	100 - 500	Ground water	0

Palacky, G.J., 1987, Resistivity characteristics of geologic targets, in Nabighian, M.N.,ed., Electromagnetic Methods in Applied Geophysics Theory: Tulsa, OK.,Society of Exploration Geophysicists, v.1

The results from resistivity lines RL-102-01 to RL-102-07 are shown in Figures 3 through 9 in the Appendix. These lines are located in the western region of the survey area. Resistivities range from 50 ohm-m to over 4000 ohm-m. The resistivity profiles for lines RL-102-02 to RL-102-07 all display a resistive basement below the average 20 metres of interpreted overburden identified in the seismic refraction results. Lines RL-102-02 and RL-102-03 both show surficial high resistivity responses at 240NW to 360NW and from 120NW to 160NW, respectively. These surficial high resistivity zones are likely related to ground surface conditions rather than shallow rock. Resistivity lines RL-102-01 and RL-102-07 exhibit a more conductive environment than their neighboring lines. The northwestern end of line RL-102-01, which is highly conductive is most likely due to wet, swampy ground conditions observed in the field.

The chargeability profiles for the lines in the western area show a trend of increasing chargeability with depth. Chargeabilities between 25 msec and 50 msec typically indicate the onset of bedrock and are in general agreement with the interpreted seismic refraction basal layer. A maximum chargeability of approximately 200 msec is shown on line RL-102-05 between 90NW and 160NW.

The northeastern region of the Faro Creek Diversion survey area includes lines RL-102-08 to RL-102-14 and are shown in Figures 10 to 18 in the Appendix. Resistivity lines RL-102-09 and RL-102-10 were surveyed as two segments (A and B), due to a change in line orientation from southeast to east. Lines RL-102-08 to RL-102-11, all show a similar characteristic layered resistivity profile. The surficial layer is mainly conductive with some isolated higher resistivity zones. The surficial higher resistivity zones are isolated from the resistive basement by an underlying more conductive layer. The basement, with resistivities typically higher than 600 ohm-m is indicative of bedrock and agrees with the interpreted seismic refraction bedrock interface. Line RL-102-09 has a conductive zone extending to depth between 160SE and 200SE. The interpreted seismic refraction data also indicates a significant increase in depth to bedrock, and the two results are likely related to each other although there is a slight offset as the refraction data shows the deepest bedrock occurs at 205SE. Resistivity lines RL-102-12, RL-102-13, and RL-102-14 all run from a lower elevation in the west to a higher elevation in the east. The resulting resistivity profiles show a more conductive area at the western end of the line corresponding to thick saturated overburden interpreted in the seismic refraction data. As the elevation increases both the interpreted bedrock elevation and resistivity values increase.

The chargeability profiles for the lines in the northeastern area show low chargeability responses near the surface with values between 5 msec to 30 msec, corresponding to sands and gravels. Resistivity line RL-102-14 displays an exceptional response at the western end where chargeabilities reach up to 100 msec in an area corresponding to conductive overburden. This area of high chargeability may be due to clay content in the overburden. The other areas of higher chargeability are mainly underlying the surficial low chargeability layer and most likely represent bedrock.

Resistivity lines RL-102-15 to RL-102-21 are located in the southeastern region of the Faro Creek Diversion survey area. As with the lines to the north, these profiles also show a layered configuration of a discontinuous conductive layer alternating laterally with high surficial resistivity zones over a resistive basement. The resistivity profiles display lower resistivities in the southwest end of the lines where interpreted thickness of overburden is greatest. Resistivity line RL-102-21 shows low resistivity responses at the start of the traverse, similar to the neighboring line, and also at the end. The lower resistivity shown at the northeast end of the line corresponds to a dip and decrease in velocity of the interpreted seismic refraction bedrock.

The chargeability profiles show values ranging from 5 msec to 180 msec. Typically the profiles exhibit a lower chargeability at surface and increasing chargeability with depth. Resistivity line RL-102-20 displays low chargeabilities which corresponds to interpreted shallow resistive, high velocity bedrock, possibly granitic. In contrast, line RL-102-18 displays high chargeabilities at the southwest end where the resistivities and interpreted seismic velocities are both lower suggesting a highly weathered and/or fractured bedrock.

4.2.2 Seismic Refraction Results

The results from the 21 seismic refraction crossline interpretations show the survey area is underlain by up to four distinct velocity layers. The shallow surficial layer with velocities ranging from 330 m/s to 550 m/s is consistent with surface exposures of loose surficial silty sands and gravel. This layer is relatively shallow, averaging 2 metres in thickness with a maximum thickness of approximately 10 metres interpreted on line SL-102-21 at 50NE.

Underlying the shallow surficial layer, an upper intermediate layer is interpreted with velocities in the range of 650 m/s to 1250 m/s. The velocity range is consistent with more compact overburden of unsaturated sands, gravels, clays and silts. Although this layer is relatively thin over most of the site area with an average thickness of 5 metres, line SL-102-16 displays a much greater thickness, reaching 24 metres at approximately 55E.

Below the upper intermediate velocity layer, a second, higher velocity layer is interpreted in most of the survey area. The velocities for this layer have a fairly wide range, from 1300 m/s to 2650 m/s. The velocities at the lower end of the range, typically below 1700 m/s are indicative of compact saturated silts, sands and gravels. The middle range velocities, of which the majority of the interpretation displays, is between 1700 m/s and 2500 m/s, and is indicative of more compact saturated sands, gravels with more coarse content, and till. The highest interpreted velocities, greater than 2500 m/s indicate till, frozen or partially frozen gravels, and broken and/or highly weathered bedrock. While the average thickness of this layer is approximately 13 metres, the interpreted results show a highly variable range from less than a metre to 79 metres at 205SE on line SL-102-09A.

The basal layer with a velocity range of 3000 m/s to 5600 m/s is the interpreted competent bedrock surface. Two lines, SL-102-05 and SL-102-06 display small intervals of an interpreted low velocity basal layer. A narrow zone of low velocity within the basal layer may indicate an area of severe weathering or a shear zone. The average depth to bedrock in the Faro Creek Diversion survey area is approximately 20 metres.

A bedrock elevation contour map is shown at a scale of 1:10,000 in Figure 47 in the Appendix. The contours are based on the interpreted seismic refraction data and as there is no geophysical tie line, the contours between geophysical lines are interpolated data points which may or may not accurately represent the true subsurface. The map shows the bedrock elevation generally following topography, higher ground elevation typically corresponds with a higher bedrock elevation. One notable difference to this trend is apparent in the northern portion of the survey area. From approximately 6916800N to 6917200N the alignment of the lowest bedrock elevation, and area of thickest overburden, is oriented north while the topographical low continues to the northeast.

4.2.3 MASW Results

The results for the MASW investigation are shown in Figures 49 to 69 in the Appendix. Calculated velocities range from approximately 200 m/s at the surface to greater than 1300 m/s at depth. The MASW profile for SL-102-04 displays the typical layered velocity with velocities less than 500 m/s corresponding to the slow, slightly compact surficial layer. Shear wave velocities between 500 m/s and 1000 m/s represent an intermediate layer of more compact overburden and possibly highly weathered bedrock when velocities exceed 850 m/s. The onset of competent bedrock is typically identified by the 1000 m/s contour. On the MASW profile for line SL-102-13, shown in Figure 61 in the Appendix, a relatively high shallow shear wave velocity is apparent from 180E to 240E. This higher velocity zone corresponds to a high compressional wave velocity zone interpreted in the seismic refraction data. MASW profile SL-102-16 exhibits some of the lowest shear wave velocities at the west end of the profile. The low velocities extend to approximately 30 metres depth before exceeding 500 m/s. Over the Faro Creek Diversion survey area the MASW velocity contours are in good agreement with the interpreted seismic refraction, and continuously increase in velocity with depth.

5. LIMITATIONS

The multi-electrode resistivity/I.P. method results in repeatable measurements of the geoelectric section. The methods are successful providing adequate contrasts exist in the subsurface in electrical resistivity and chargeability between distinct geological materials. Conductors identified in resistivity surveying are diverse and depending on geological settings, may include mineralisation, graphite, argillite, shear or fault zones, clay beds, marl, saturated materials, clay shale, clay till, mineralised leachate and zones of salt water intrusion. Electrically resistive materials include but are not limited to sand and gravel, dry soils, glacial moraine, coarse glacial till, permafrost, underground voids and competent bedrock. Also affecting resistivity are the degree of saturation of materials and the porosity, the concentration of dissolved electrolytes, the temperature and the amount and composition of colloids. With few exceptions, no unique resistivity value defines a specific geological material.

Sources of I.P. response include almost all the sulphides, oxides such as magnetite, graphite and clay materials. Penetration depths may be affected by the presence of highly conductive surficial materials that may partially mask deeper geological layering. In addition, the resolution of the resistivity and I.P. methods decreases exponentially with depth. Given the diffuse nature of the methods, resolution is inherently poorer at depth. The survey results can also be influenced by electrode coupling, presence of noise such as SP, capacitive coupling, electromagnetic coupling and the presence of power lines.

In the modelling process, a number of limitations constrain modelling of subsurface resistivity and chargeability. For instance, due to non-uniqueness, more than one model can produce the same response that agrees with the observed data. The resulting model thus depends to a significant extent on the constraints used and will closely approximate the true subsurface conditions only if the constraints closely correspond to actual subsurface conditions.

The depths to subsurface boundaries derived from seismic refraction surveys are generally accepted as accurate to within ten percent of the true depths to the boundaries. In some cases, unusual geological conditions may produce false or misleading data points with the result that computed depths to subsurface boundaries may be less accurate. In seismic refraction surveying difficulties with a 'hidden layer' or a velocity inversion may produce erroneous depths. The first condition is caused by the inability to detect the existence of a layer because of insufficient velocity contrasts or layer thicknesses. A velocity inversion exists when an underlying layer has a lower velocity than the layer directly above it.

The interpreted depths shown on drawings are to the closest interface location, which may not be vertically below the measurement point if the refractor dip direction departs significantly from the survey line location.

Seismic refraction surveys conducted in permafrost areas can have limited results due to the physical properties of frozen subsurface layers. Permafrost layers may produce seismic velocities similar to underlying bedrock velocities, with no differentiation possible based on seismic results only. Permafrost layers, and massive ground ice, can display seismic velocities greater than the underlying material, and produce a velocity inversion. In this case, the maximum depth of investigation would be the surface of the highest velocity layer, as critical refraction cannot occur when a higher velocity layer overlies a lower velocity.

The multi-spectral analysis of surface waves (MASW) method is carried out in the Active or Passive mode with the Active mode generally the most accurate for evaluation of shallow, shear wave velocities. The method entails collection of data over a full seismic spread. Limitations include reflection and scattering of surface and body waves due to extreme surface topography and inhomogeneous conditions in the subsurface such as boulder concentrations or isolated soil lenses with contrasting properties. At the near surface, shear wave velocities may be overstated and in shallow overburden environments results may have higher uncertainty than in areas of thicker overburden. The method is generally accepted as an effective means of determining shear wave velocities of geological units.

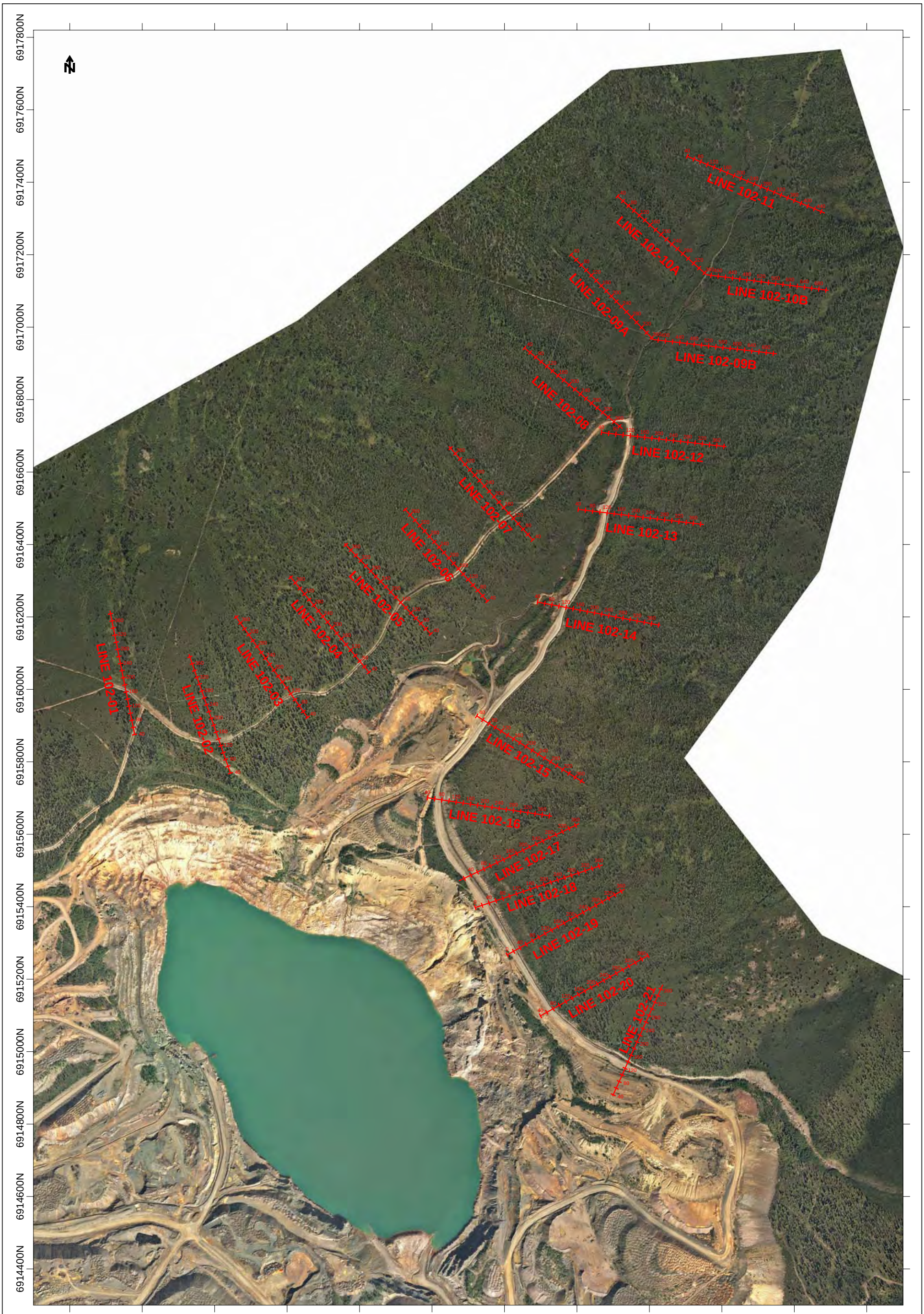
A range of errors from digitizing, velocity modelling and data gridding are expected. High reliance was placed on limited geological information in a complex geological environment. Some uncertainty is present in correlating reflectors between profiles where there is a lack of cross points.

The information in this report is based upon geophysical measurements and field procedures and our interpretation of the data. The results are interpretive in nature and are considered to be a reasonably accurate presentation of existing subsurface conditions within the limitations of the methods employed.

For: Frontier Geosciences Inc.

Beth Friesen, B.Sc.

Cliff Candy, P.Geo



40 80 120 RESISTIVITY / SEISMIC LINE

0 100 200 300 400 METRES

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

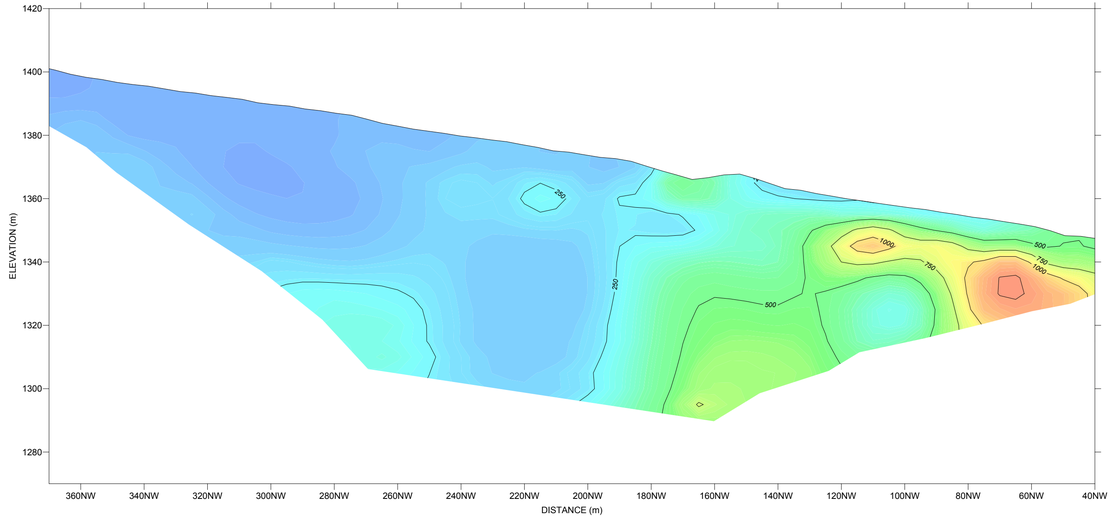
GEOPHYSICAL SURVEY

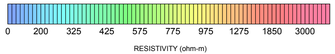
FARO CREEK DIVERSION SITE PLAN

FRONTIER GEOSCIENCES INC.

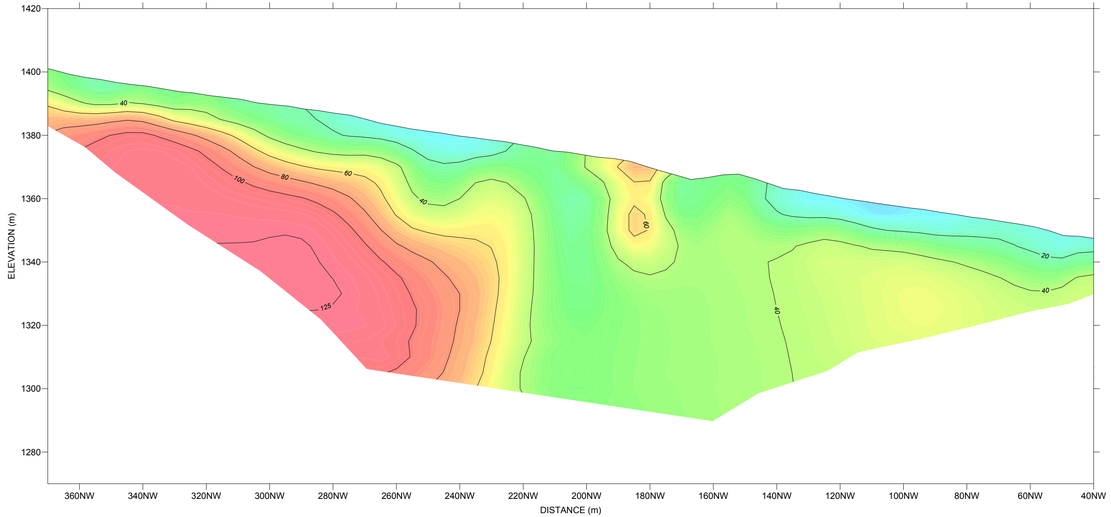
DATE: OCT. 2015	SCALE 1:10,000	FIG. 2

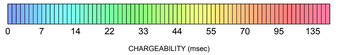
RL-102-01 RESISTIVITY PROFILE

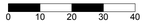




RL-102-01 CHARGEABILITY PROFILE







NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

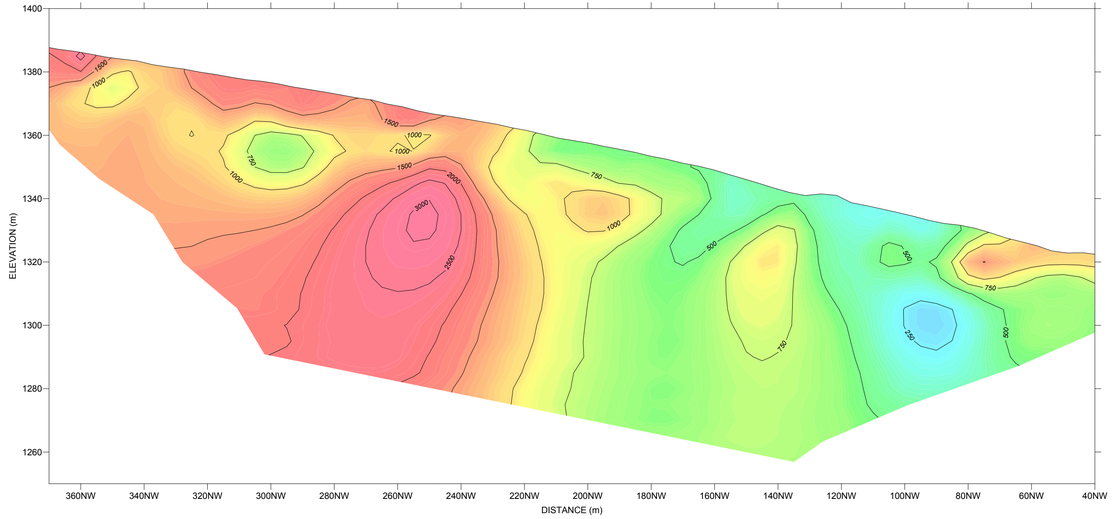
RESISTIVITY/CHARGEABILITY SURVEY

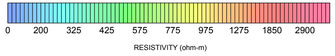
INVERTED RESISTIVITY
AND CHARGEABLITY PROFILES
RL-102-01

FRONTIER GEOSCIENCES INC.

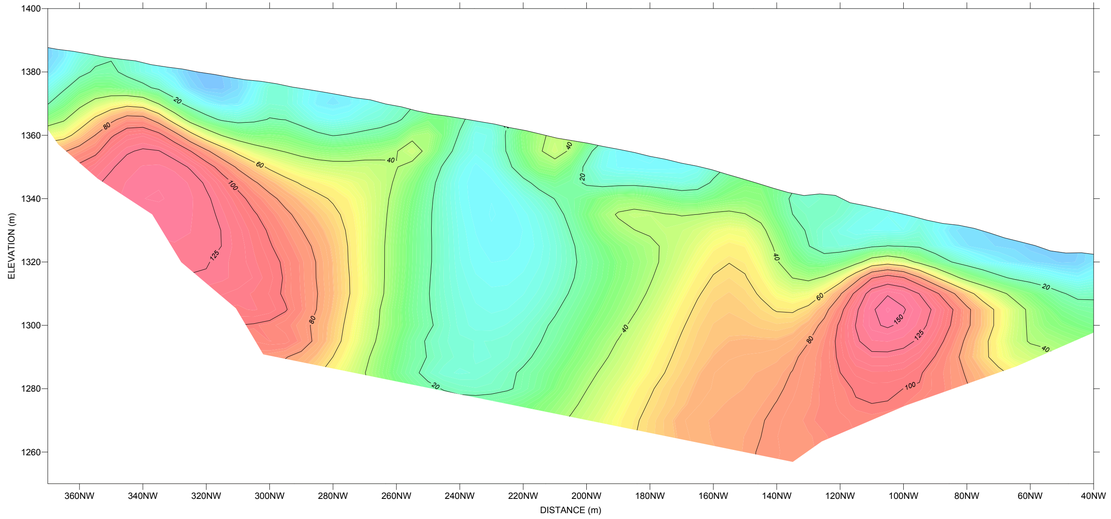
DATE: OCT. 2015	SCALE 1:1,000	FIG. 3

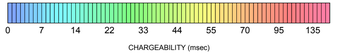
RL-102-02 RESISTIVITY PROFILE

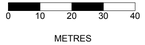




RL-102-02 CHARGEABILITY PROFILE







NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

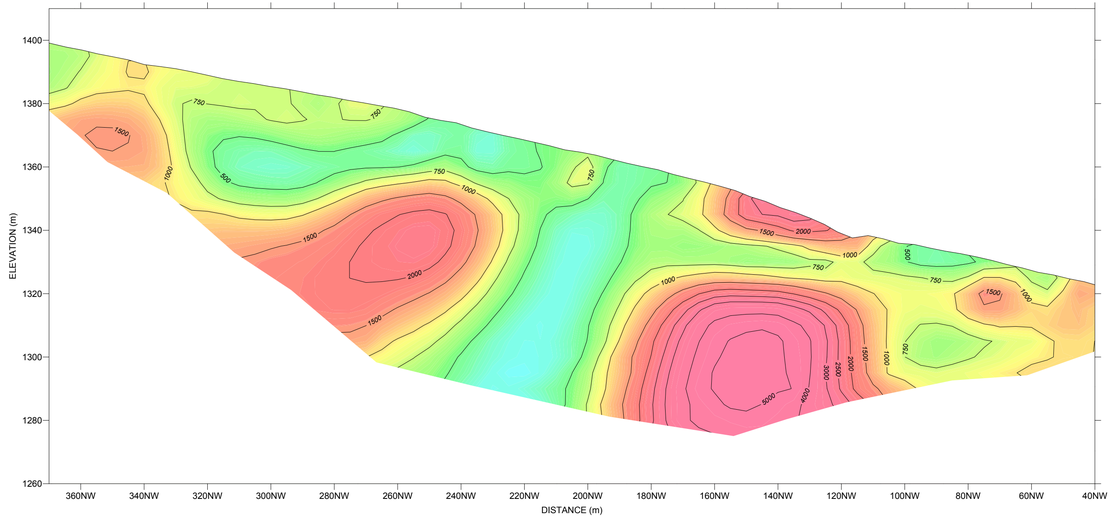
RESISTIVITY/CHARGEABILITY SURVEY

INVERTED RESISTIVITY
AND CHARGEABLITY PROFILES
RL-102-02

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 4

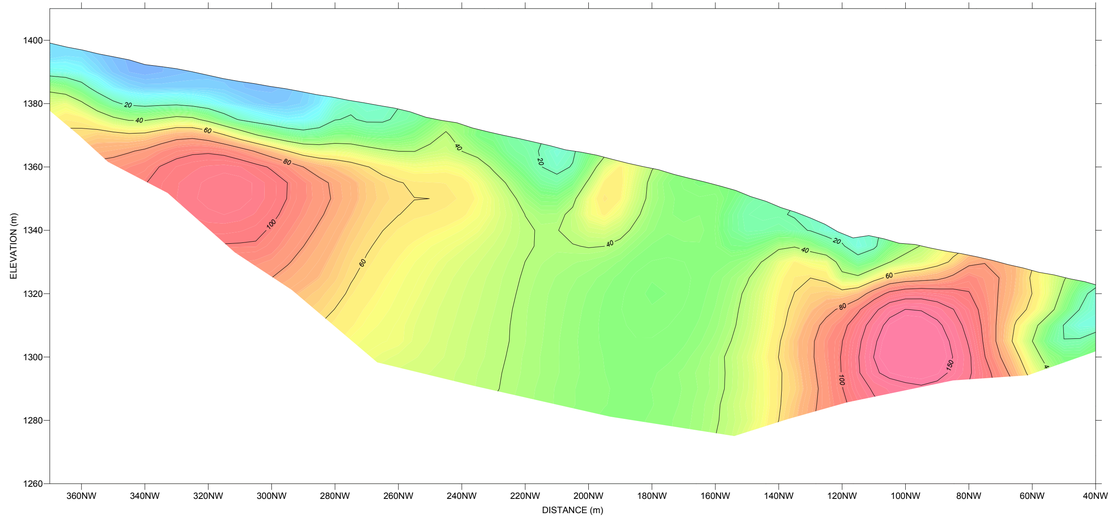
RL-102-03 RESISTIVITY PROFILE



RESISTIVITY (ohm-m)

0 200 325 425 575 775 975 1275 1850 3000

RL-102-03 CHARGEABILITY PROFILE



CHARGEABILITY (msec)

0 7 14 22 33 44 55 70 95 135

METRES

0 10 20 30 40

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

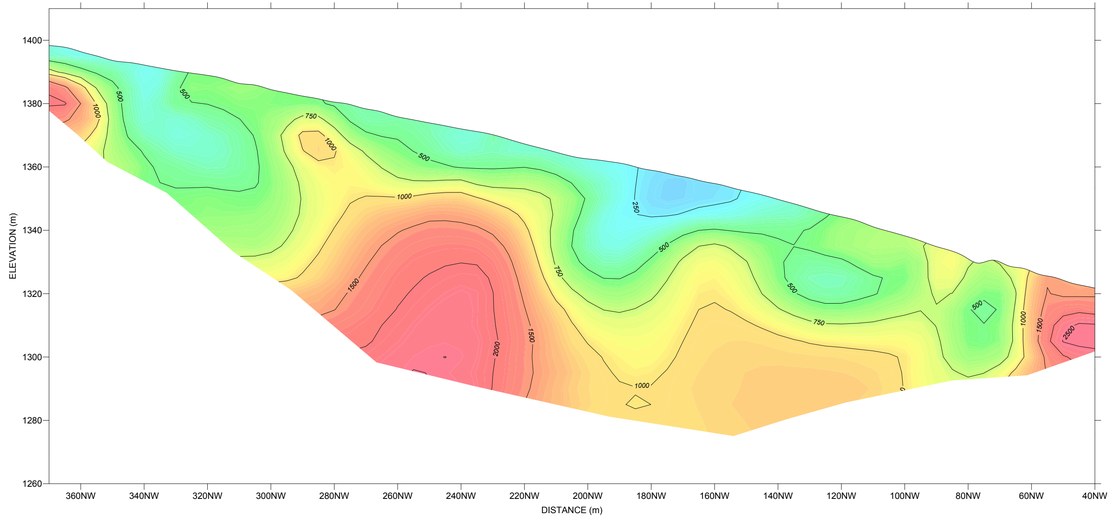
RESISTIVITY/CHARGEABILITY SURVEY

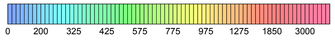
INVERTED RESISTIVITY
AND CHARGEABLITY PROFILES
RL-102-03

FRONTIER GEOSCIENCES INC.

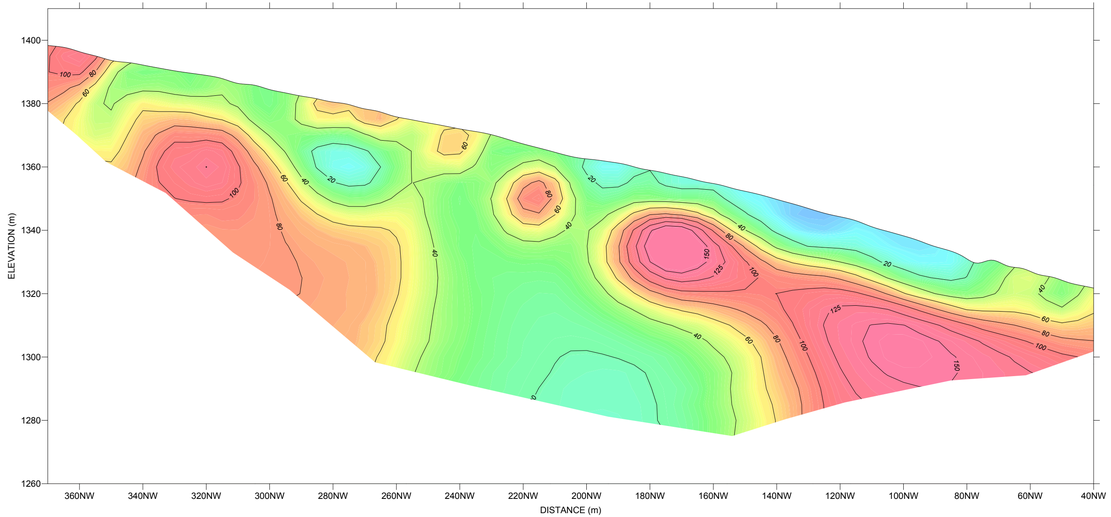
DATE: OCT. 2015	SCALE 1:1,000	FIG. 5

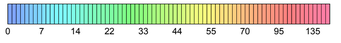
RL-102-04 RESISTIVITY PROFILE

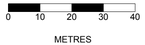




RL-102-04 CHARGEABILITY PROFILE



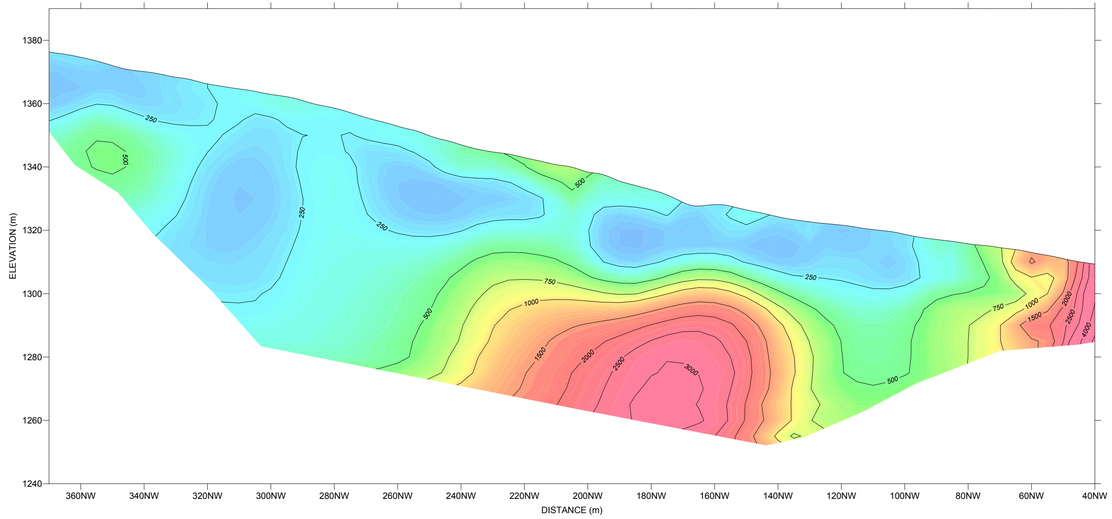




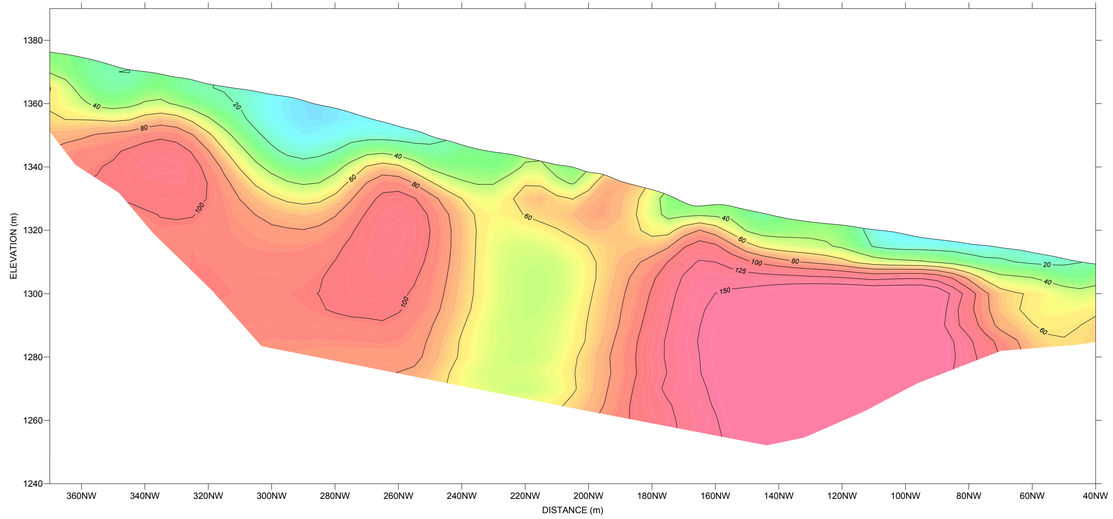
NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

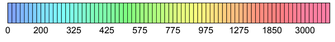
CH2MHILL FCD AREA, FARO MINE REMEDIATION PROJECT		
RESISTIVITY/CHARGEABILITY SURVEY		
INVERTED RESISTIVITY AND CHARGEABLITY PROFILES RL-102-04		
FRONTIER GEOSCIENCES INC.		
DATE: OCT. 2015	SCALE 1:1,000	FIG. 6

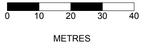
RL-102-05 RESISTIVITY PROFILE

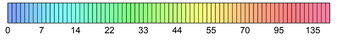


RL-102-05 CHARGEABILITY PROFILE









NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

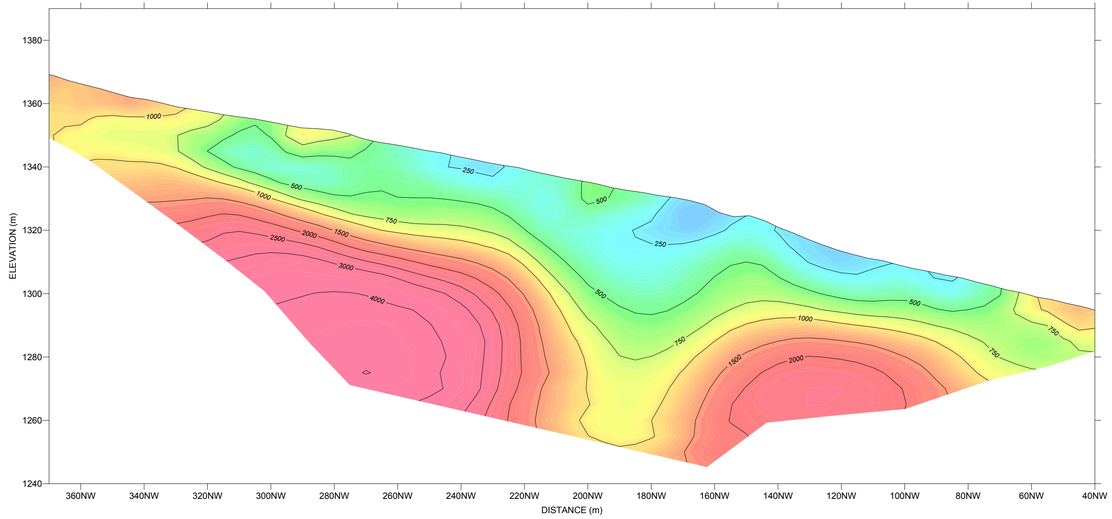
RESISTIVITY/CHARGEABILITY SURVEY

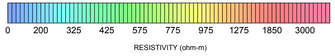
INVERTED RESISTIVITY
AND CHARGEABLITY PROFILES
RL-102-05

FRONTIER GEOSCIENCES INC.

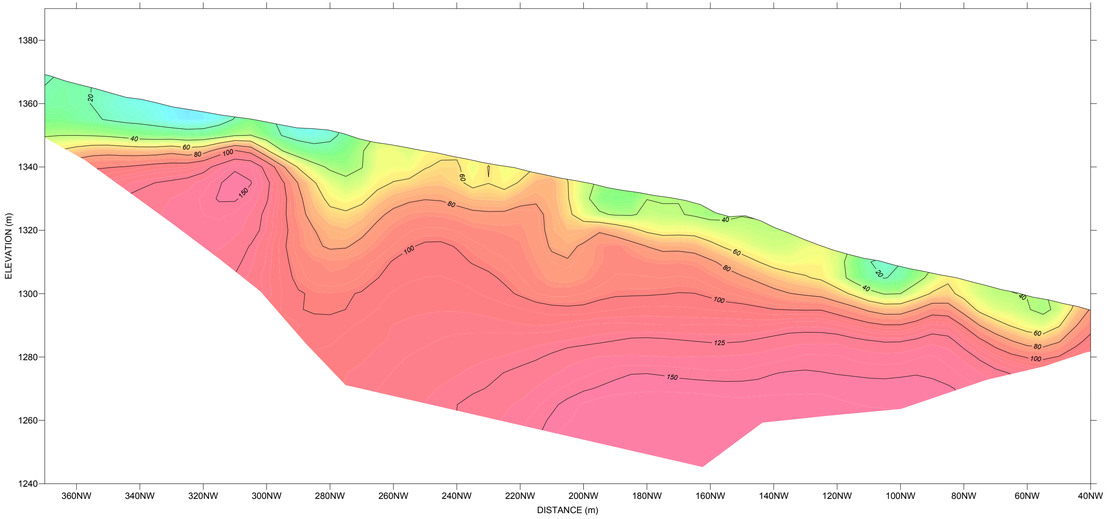
DATE: OCT. 2015	SCALE 1:1,000	FIG. 7

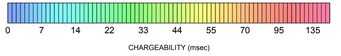
RL-102-06 RESISTIVITY PROFILE

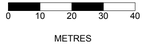




RL-102-06 CHARGEABILITY PROFILE







NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

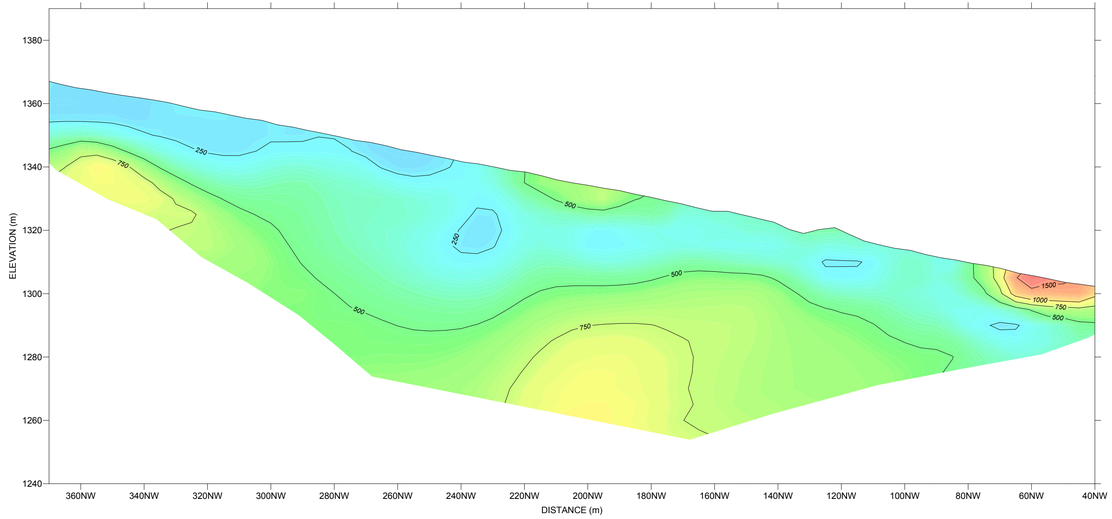
RESISTIVITY/CHARGEABILITY SURVEY

INVERTED RESISTIVITY
AND CHARGEABLITY PROFILES
RL-102-06

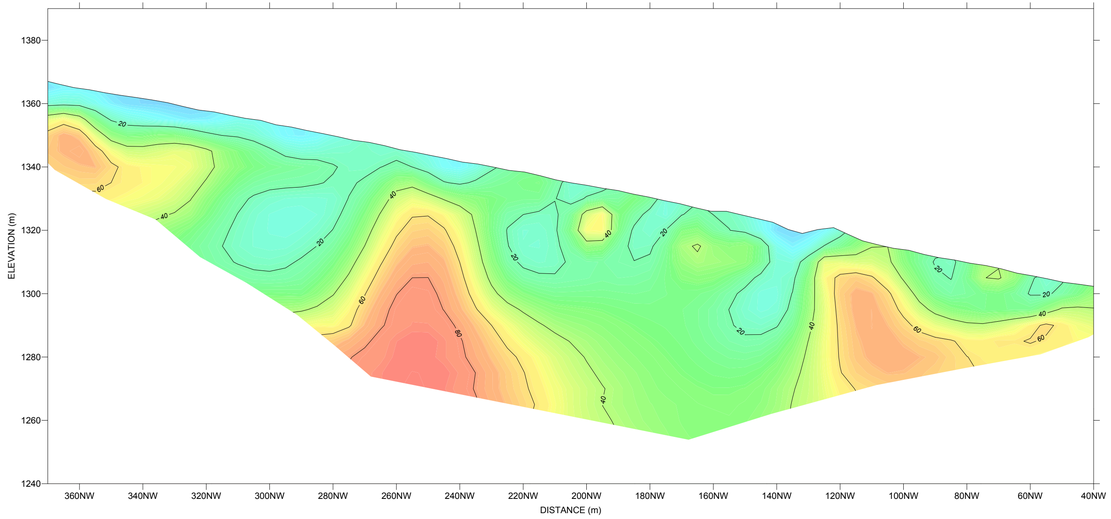
FRONTIER GEOSCIENCES INC.

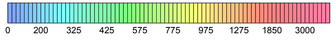
DATE: OCT. 2015	SCALE 1:1,000	FIG. 8

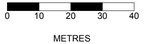
RL-102-07 RESISTIVITY PROFILE

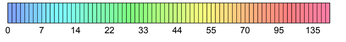


RL-102-07 CHARGEABILITY PROFILE







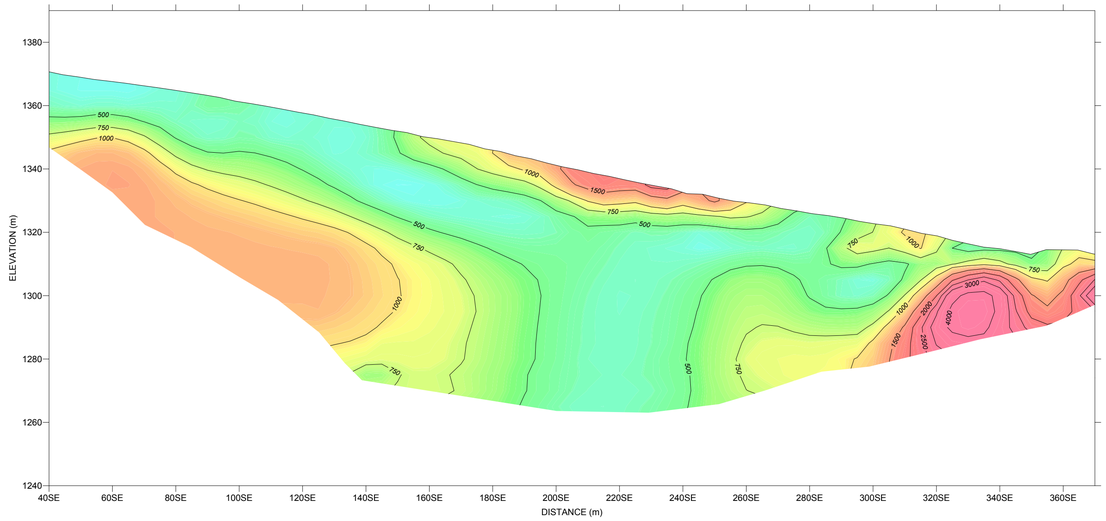


NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

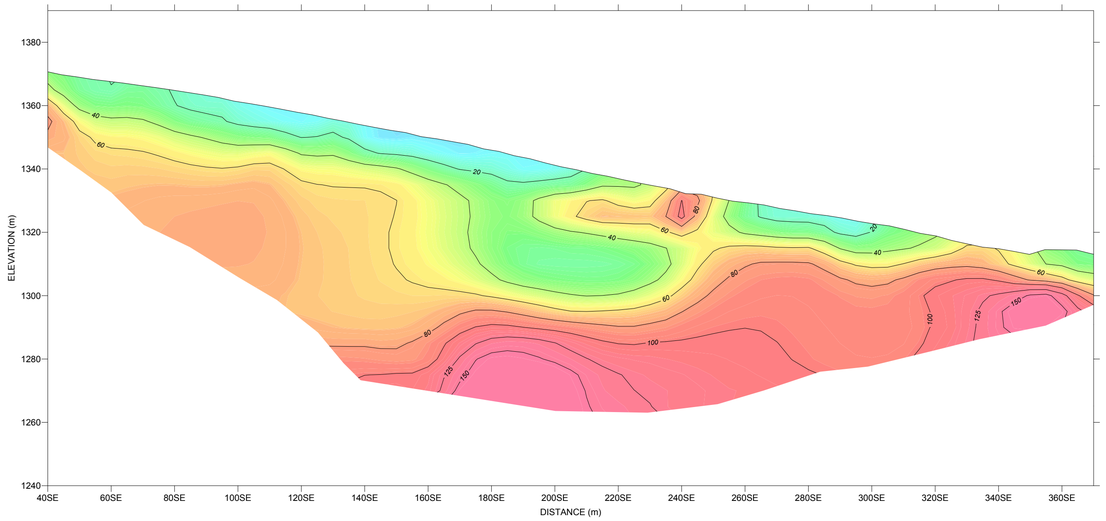
CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT
RESISTIVITY/CHARGEABILITY SURVEY
INVERTED RESISTIVITY AND CHARGEABLITY PROFILES RL-102-07
FRONTIER GEOSCIENCES INC.

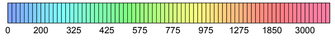
DATE: OCT. 2015	SCALE 1:1,000	FIG. 9

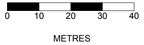
RL-102-08 RESISTIVITY PROFILE

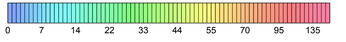


RL-102-08 CHARGEABILITY PROFILE









NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

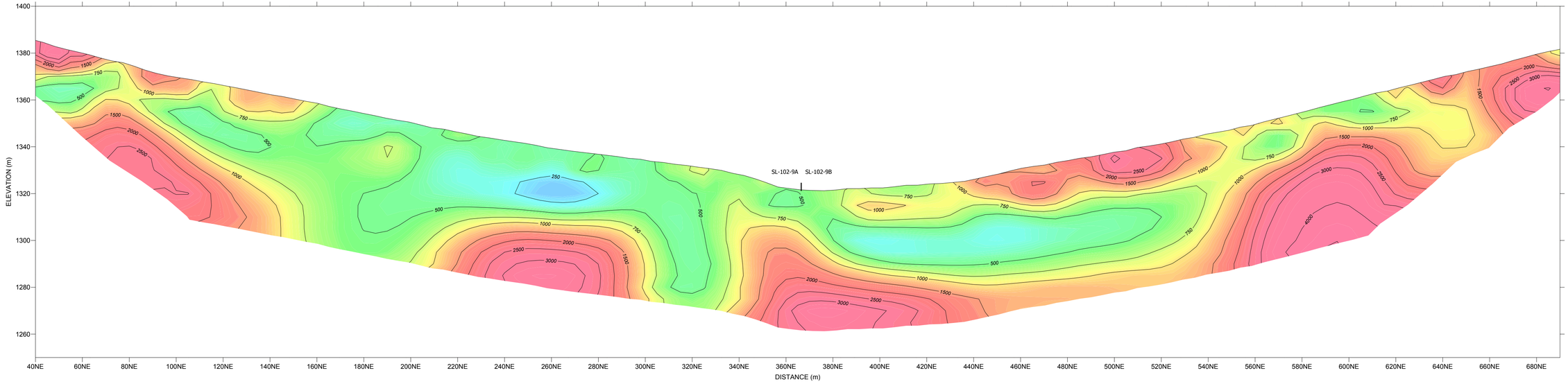
RESISTIVITY/CHARGEABILITY SURVEY

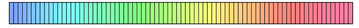
INVERTED RESISTIVITY
AND CHARGEABLITY PROFILES
RL-102-08

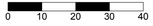
FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 10

RL-102-09A & RL-102-09B RESISTIVITY PROFILE



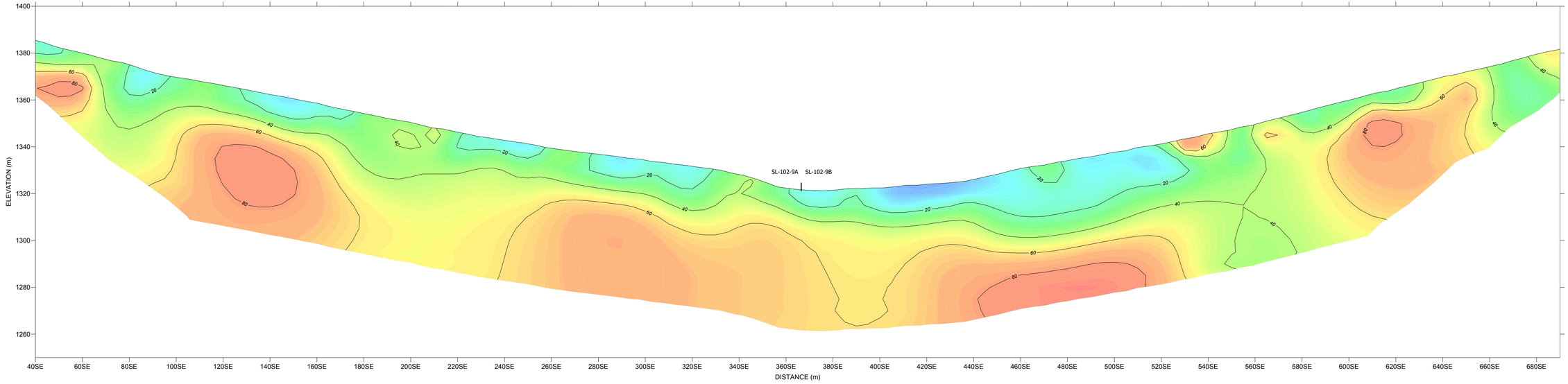


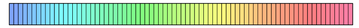


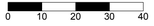
NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL FCD AREA, FARO MINE REMEDIATION PROJECT		
RESISTIVITY/CHARGEABILITY SURVEY		
INVERTED RESISTIVITY PROFILE RL-102-09A & RL-102-09B		
FRONTIER GEOSCIENCES INC.		
DATE: OCT. 2015	SCALE 1:1,000	FIG. 11

RL-102-09A & RL-102-09B CHARGEABILITY PROFILE







NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

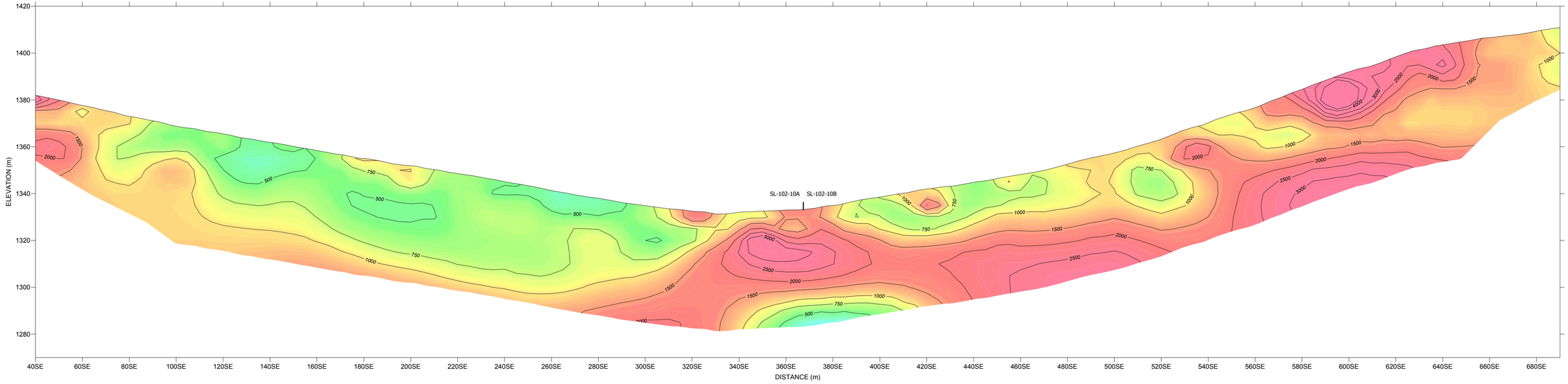
RESISTIVITY/CHARGEABILITY SURVEY

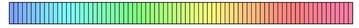
INVERTED
CHARGEABLITY PROFILE
RL-102-09A & RL-102-09B

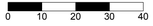
FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 12

RL-102-10A & RL-102-10B RESISTIVITY PROFILE





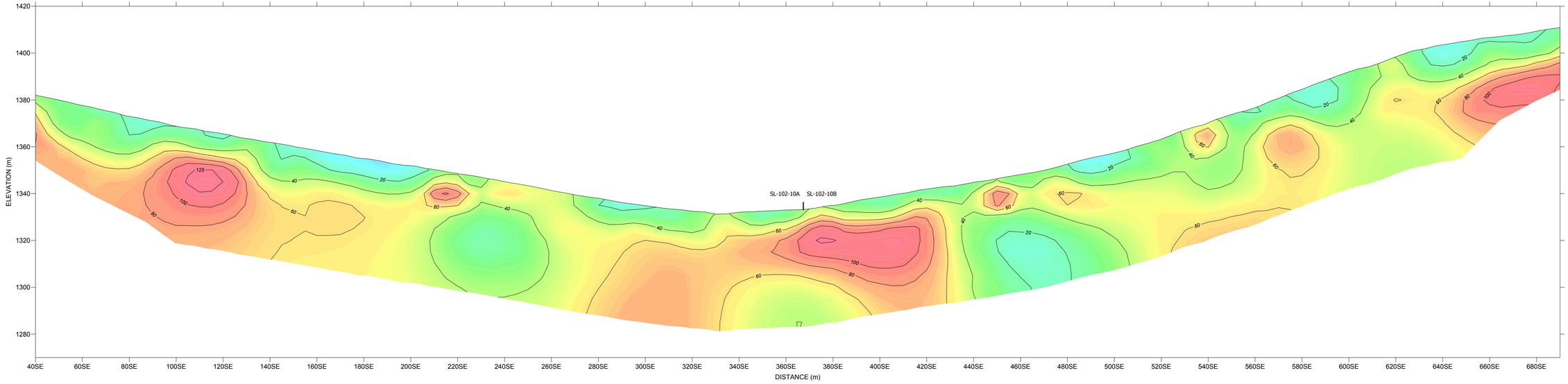


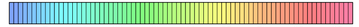
NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

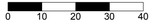
CH2MHILL FCD AREA, FARO MINE REMEDIATION PROJECT
RESISTIVITY/CHARGEABILITY SURVEY
INVERTED RESISTIVITY PROFILE RL-102-10A & RL-102-10B
FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 13

RL-102-10A & RL-102-10B CHARGEABILITY PROFILE





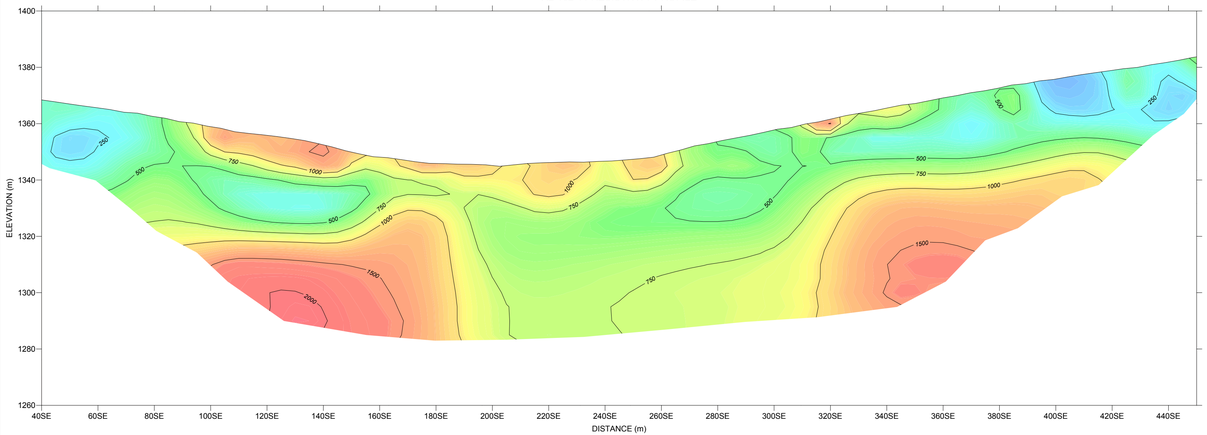


NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

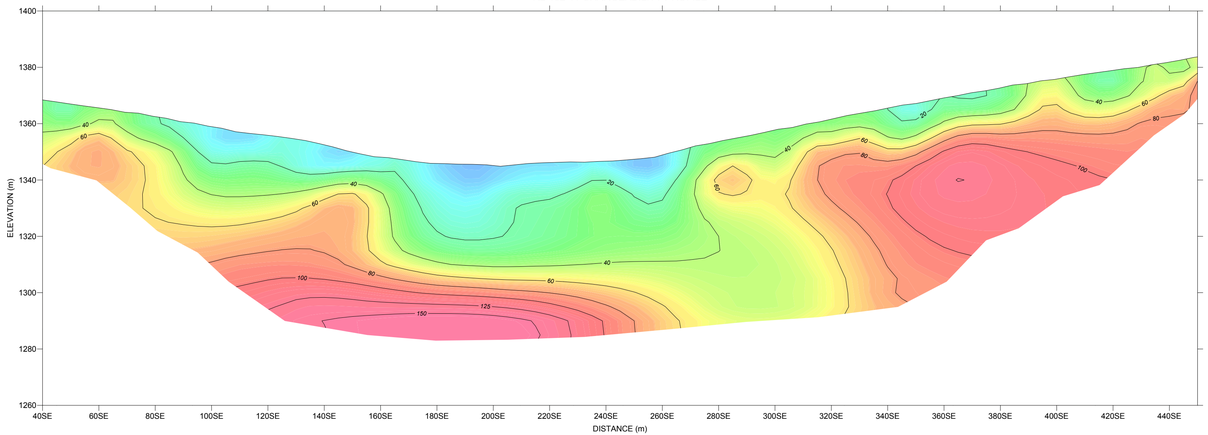
CH2MHILL FCD AREA, FARO MINE REMEDIATION PROJECT
RESISTIVITY/CHARGEABILITY SURVEY
INVERTED CHARGEABLITY PROFILE RL-102-10A & RL-102-10B
FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 14

RL-102-11 RESISTIVITY PROFILE



RL-102-11 CHARGEABILITY PROFILE









NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

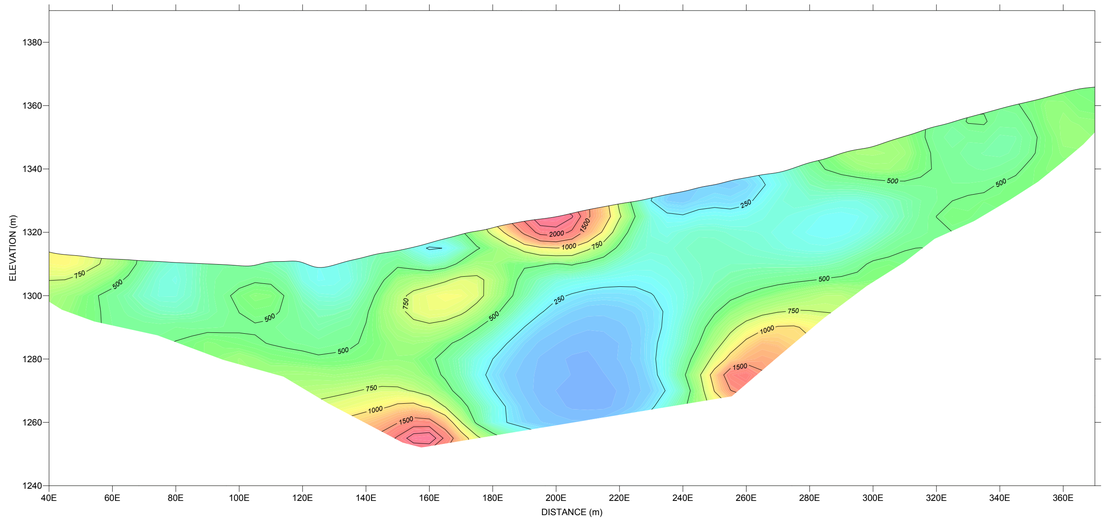
RESISTIVITY/CHARGEABILITY SURVEY

INVERTED RESISTIVITY
AND CHARGEABILITY PROFILES
RL-102-11

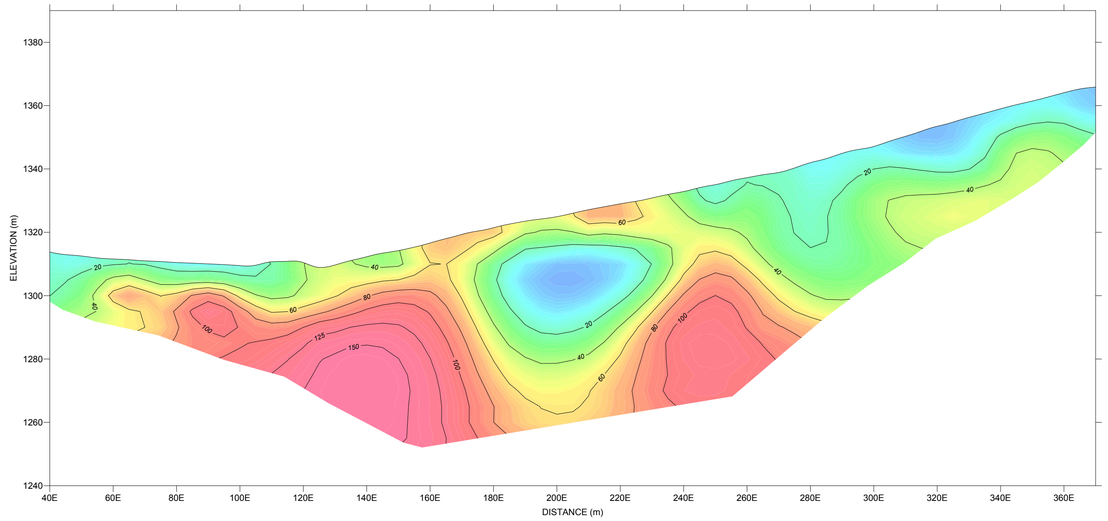
FRONTIER GEOSCIENCES INC.

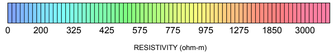
DATE: OCT. 2015	SCALE 1:1,000	FIG. 15

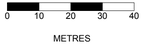
RL-102-12 RESISTIVITY PROFILE

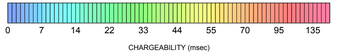


RL-102-12 CHARGEABILITY PROFILE









NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

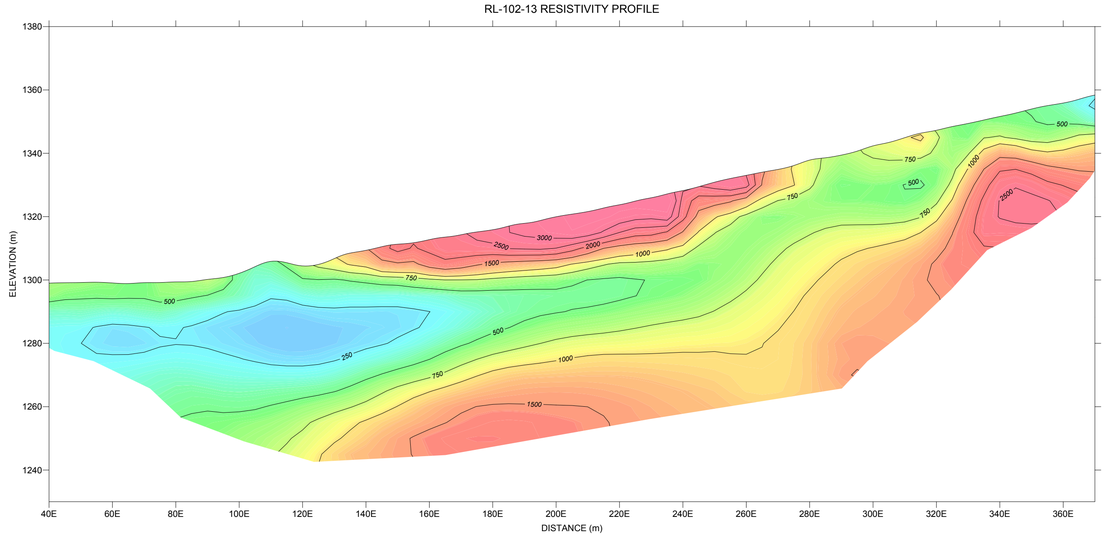
CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

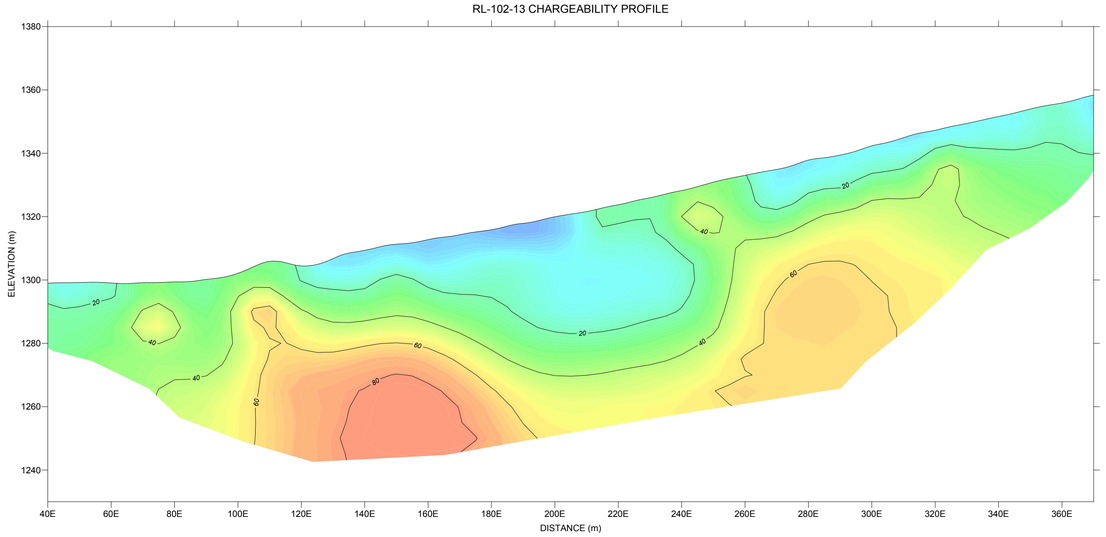
RESISTIVITY/CHARGEABILITY SURVEY

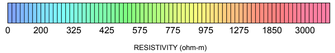
INVERTED RESISTIVITY
AND CHARGEABLITY PROFILES
RL-102-12

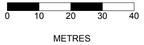
FRONTIER GEOSCIENCES INC.

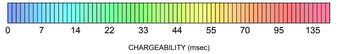
DATE: OCT. 2015	SCALE 1:1,000	FIG. 16











NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

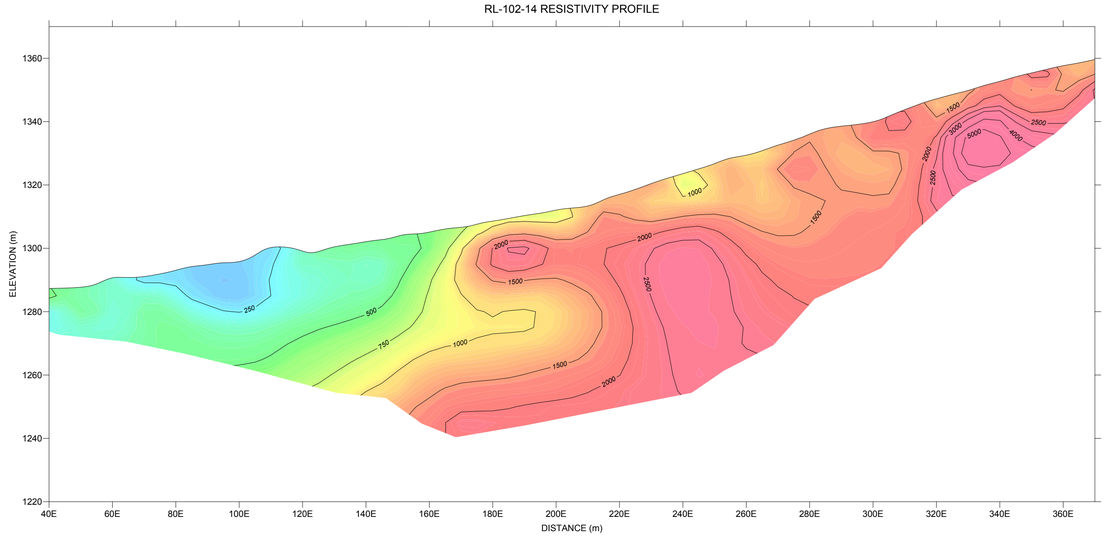
CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

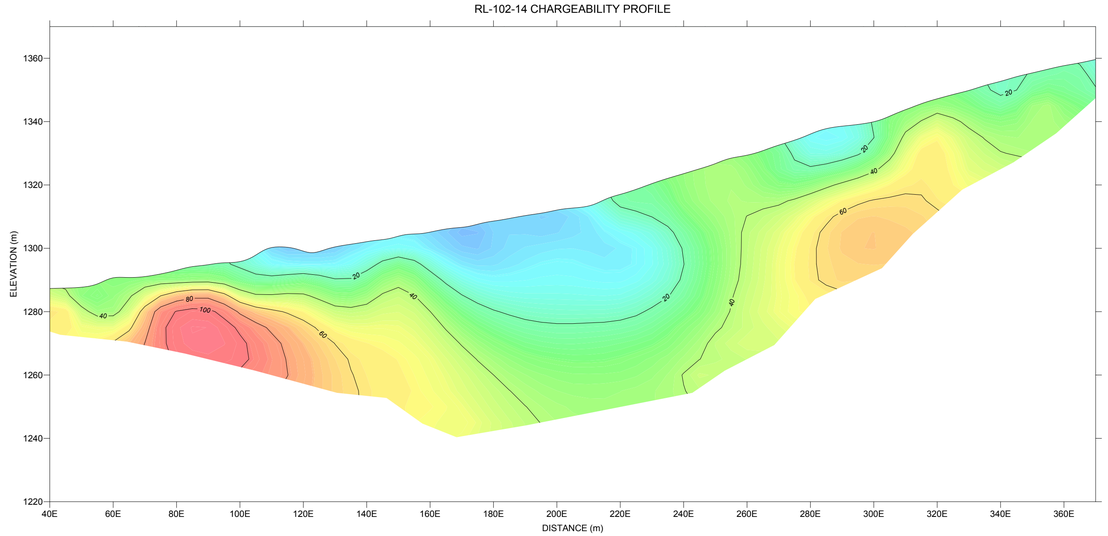
RESISTIVITY/CHARGEABILITY SURVEY

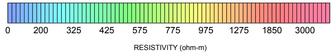
INVERTED RESISTIVITY
AND CHARGEABLITY PROFILES
RL-102-13

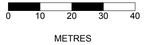
FRONTIER GEOSCIENCES INC.

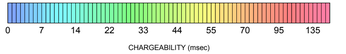
DATE: OCT. 2015	SCALE 1:1,000	FIG. 17











NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

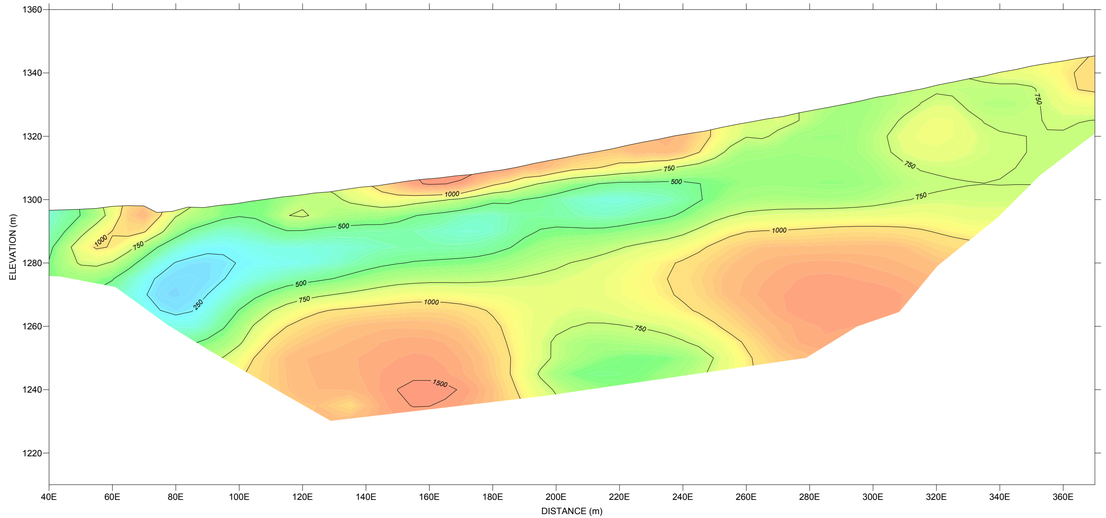
RESISTIVITY/CHARGEABILITY SURVEY

INVERTED RESISTIVITY
AND CHARGEABLITY PROFILES
RL-102-14

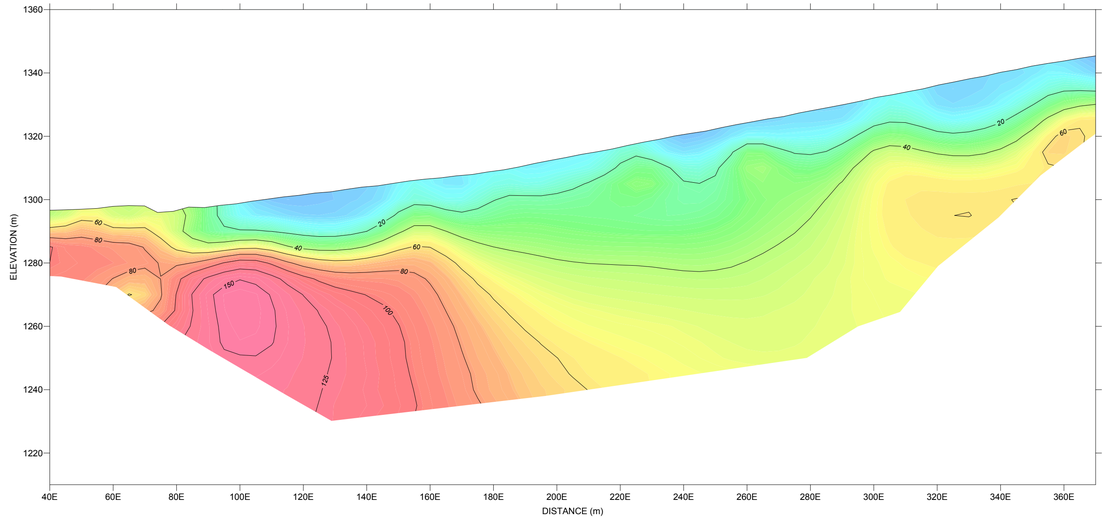
FRONTIER GEOSCIENCES INC.

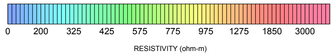
DATE: OCT. 2015	SCALE 1:1,000	FIG. 18

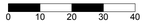
RL-102-15 RESISTIVITY PROFILE

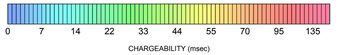


RL-102-15 CHARGEABILITY PROFILE





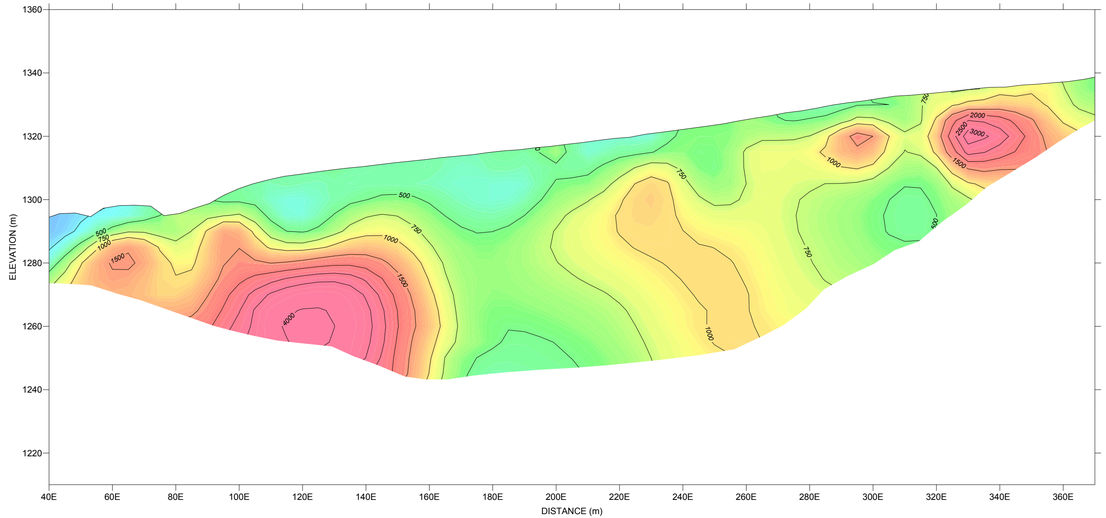




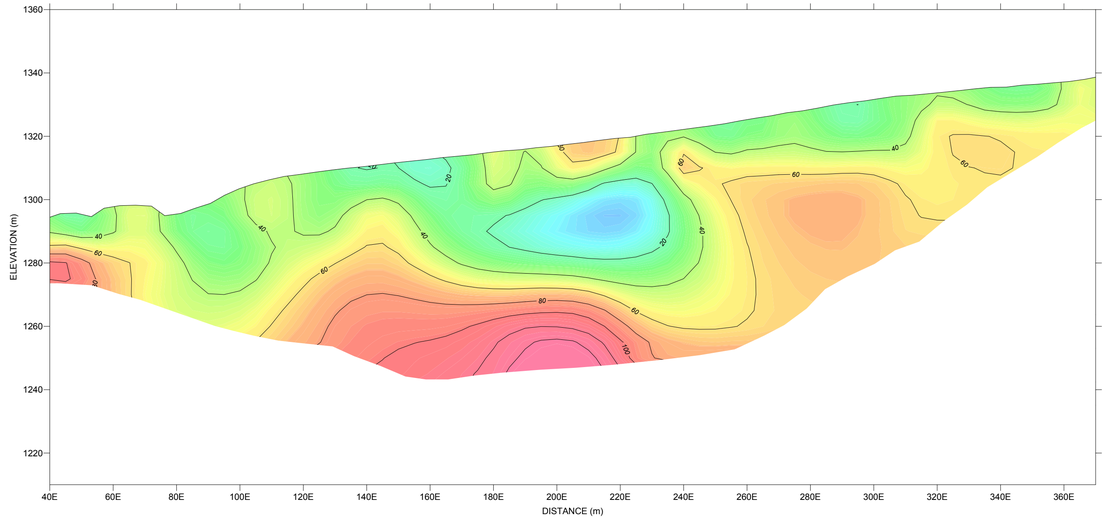
NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

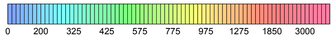
CH2MHILL FCD AREA, FARO MINE REMEDIATION PROJECT		
RESISTIVITY/CHARGEABILITY SURVEY		
INVERTED RESISTIVITY AND CHARGEABLITY PROFILES RL-102-15		
FRONTIER GEOSCIENCES INC.		
DATE: OCT. 2015	SCALE 1:1,000	FIG. 19

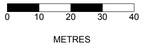
RL-102-16 RESISTIVITY PROFILE

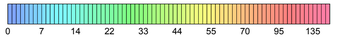


RL-102-16 CHARGEABILITY PROFILE





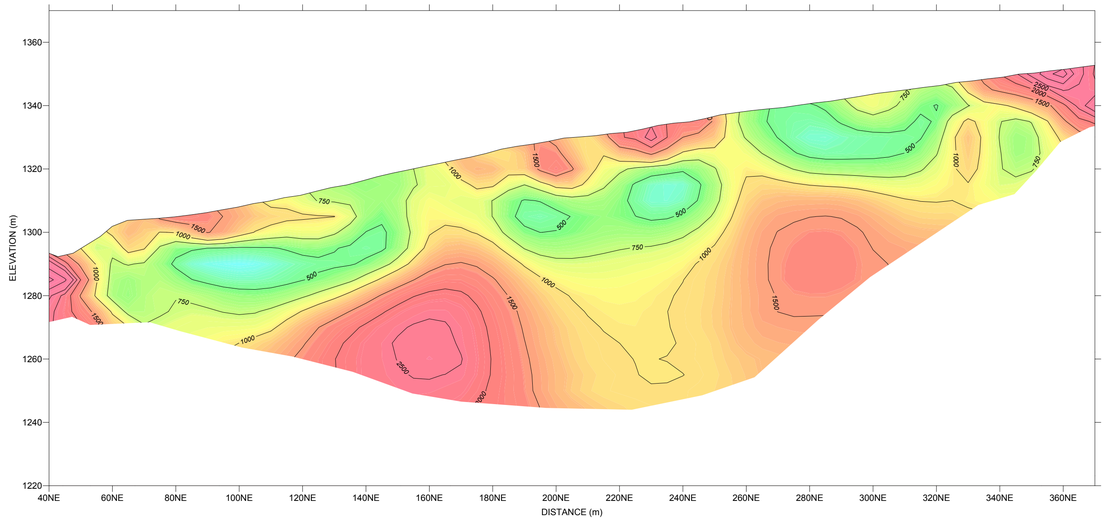




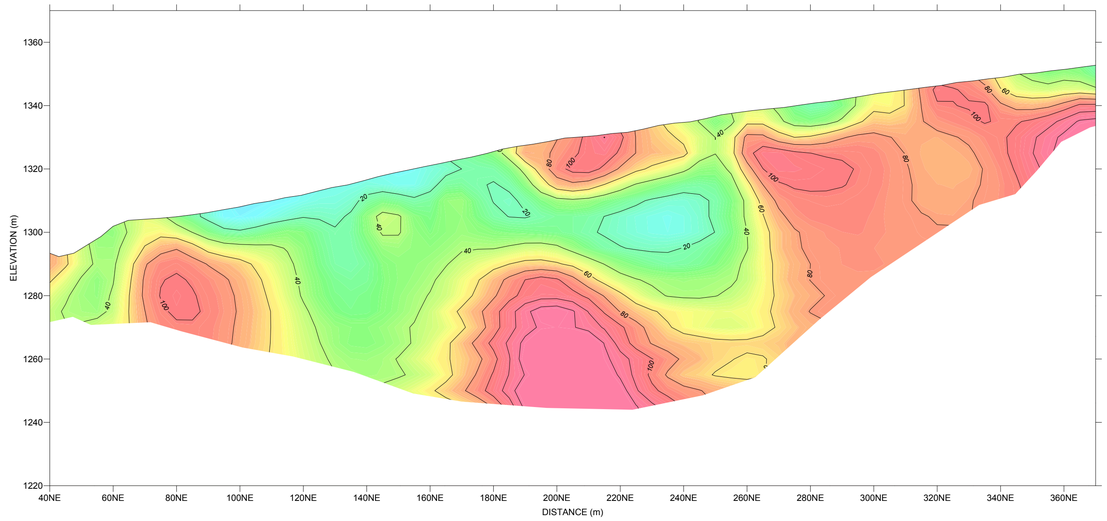
NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

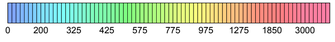
CH2MHILL FCD AREA, FARO MINE REMEDIATION PROJECT		
RESISTIVITY/CHARGEABILITY SURVEY		
INVERTED RESISTIVITY AND CHARGEABLITY PROFILES RL-102-16		
FRONTIER GEOSCIENCES INC.		
DATE: OCT. 2015	SCALE 1:1,000	FIG. 20

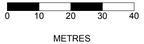
RL-102-17 RESISTIVITY PROFILE

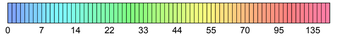


RL-102-17 CHARGEABILITY PROFILE





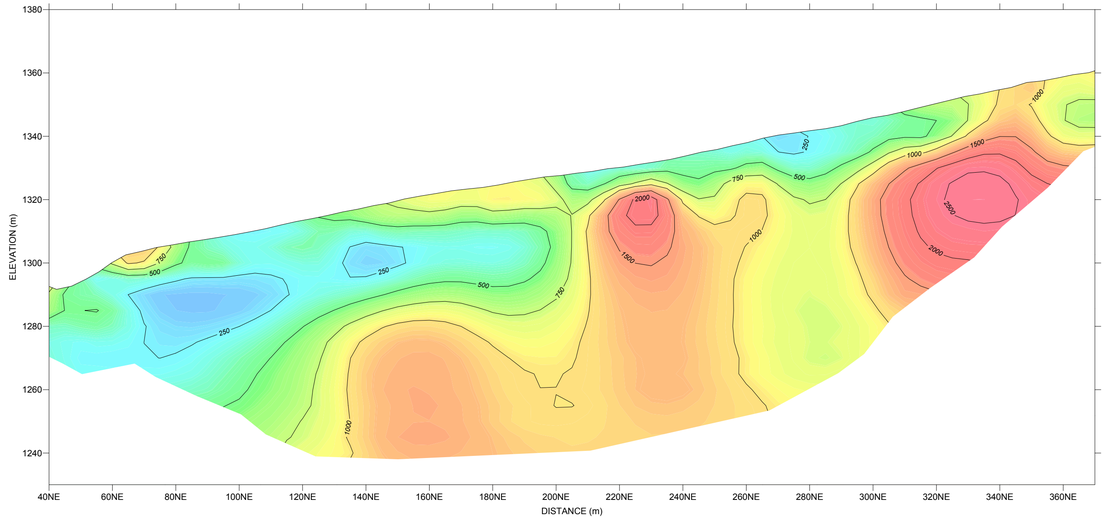




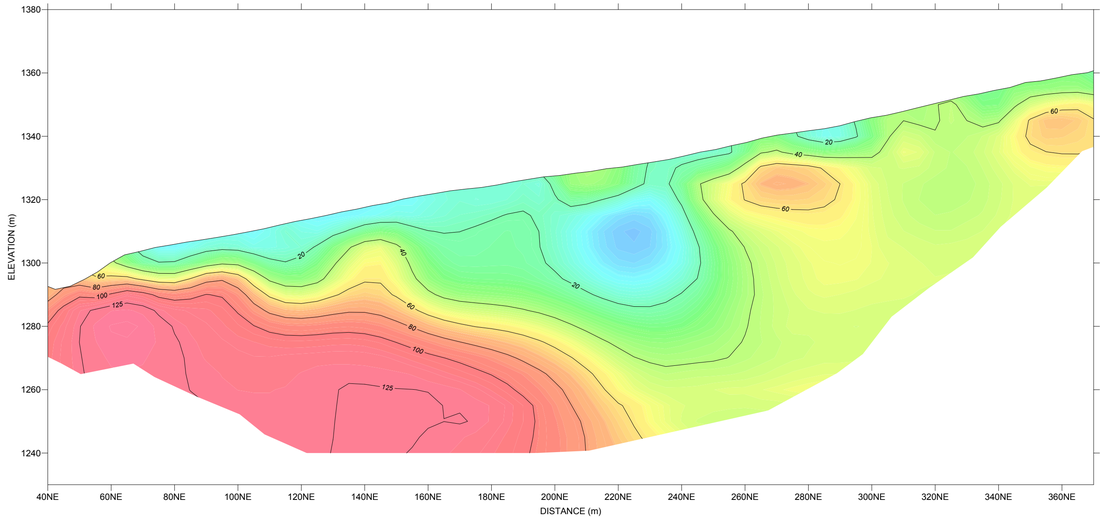
NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

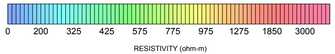
CH2MHILL FCD AREA, FARO MINE REMEDIATION PROJECT		
RESISTIVITY/CHARGEABILITY SURVEY		
INVERTED RESISTIVITY AND CHARGEABLITY PROFILES RL-102-17		
FRONTIER GEOSCIENCES INC.		
DATE: OCT. 2015	SCALE 1:1,000	FIG. 21

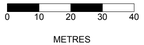
RL-102-18 RESISTIVITY PROFILE

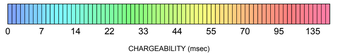


RL-102-18 CHARGEABILITY PROFILE









NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

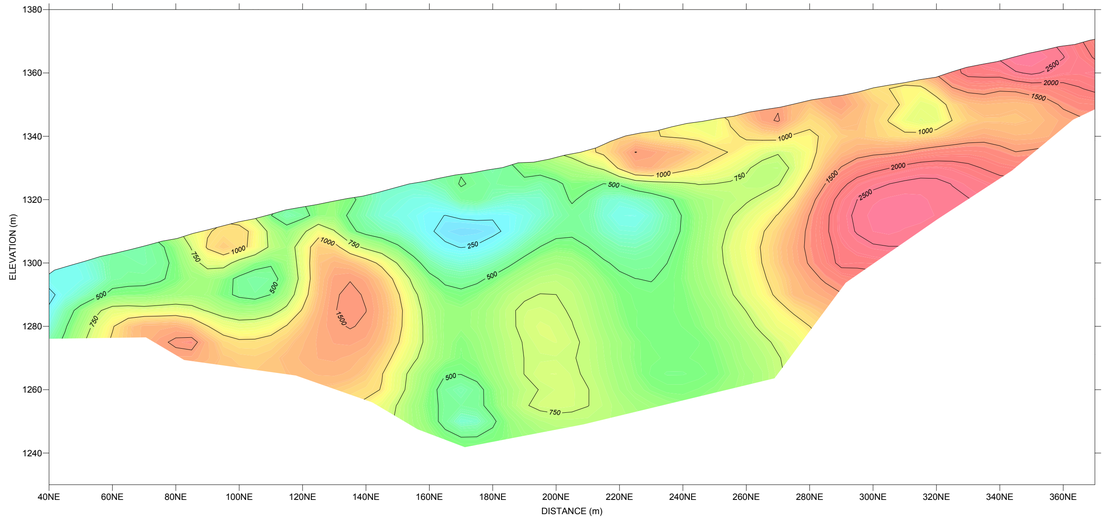
RESISTIVITY/CHARGEABILITY SURVEY

INVERTED RESISTIVITY
AND CHARGEABLITY PROFILES
RL-102-18

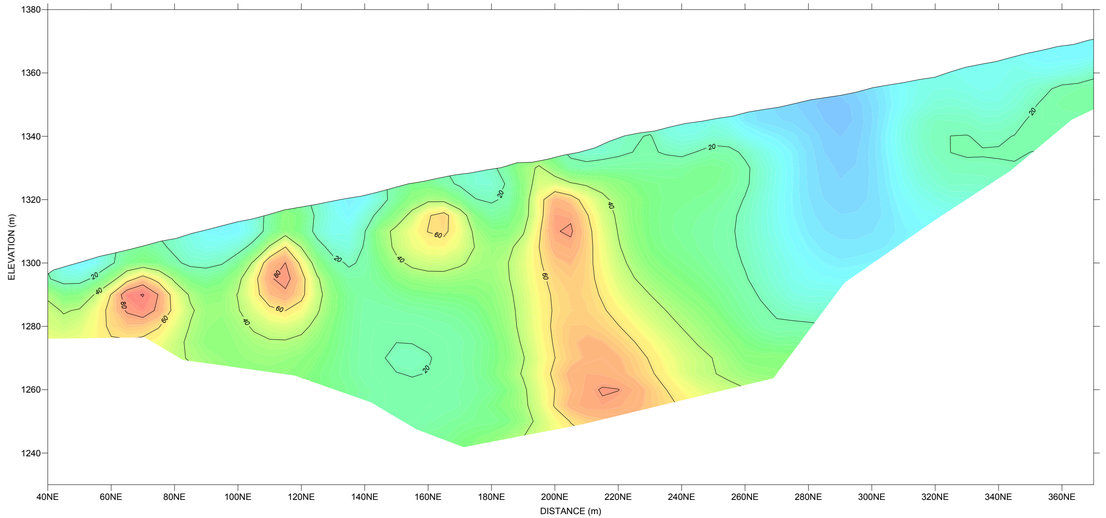
FRONTIER GEOSCIENCES INC.

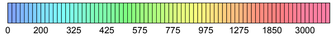
DATE: OCT. 2015	SCALE 1:1,000	FIG. 22

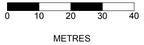
RL-102-19 RESISTIVITY PROFILE

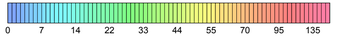


RL-102-19 CHARGEABILITY PROFILE









NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

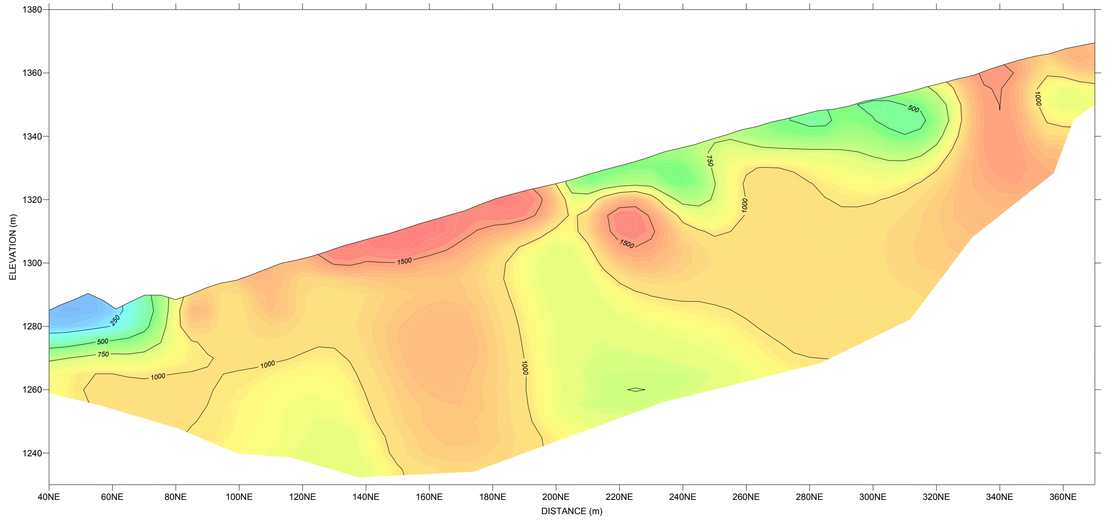
RESISTIVITY/CHARGEABILITY SURVEY

INVERTED RESISTIVITY
AND CHARGEABLITY PROFILES
RL-102-19

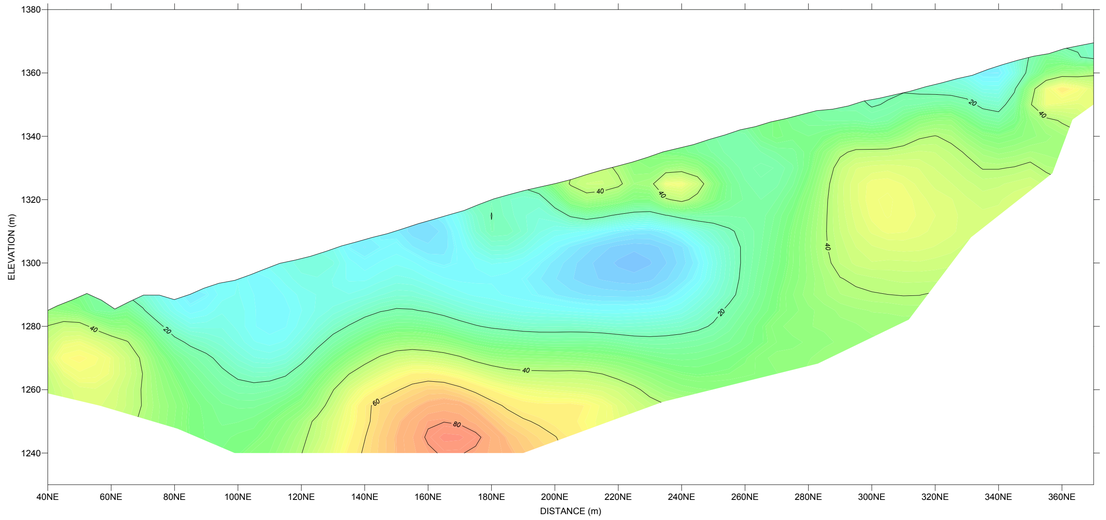
FRONTIER GEOSCIENCES INC.

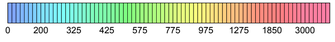
DATE: OCT. 2015	SCALE 1:1,000	FIG. 23

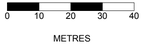
RL-102-20 RESISTIVITY PROFILE

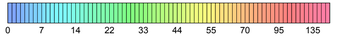


RL-102-20 CHARGEABILITY PROFILE









NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

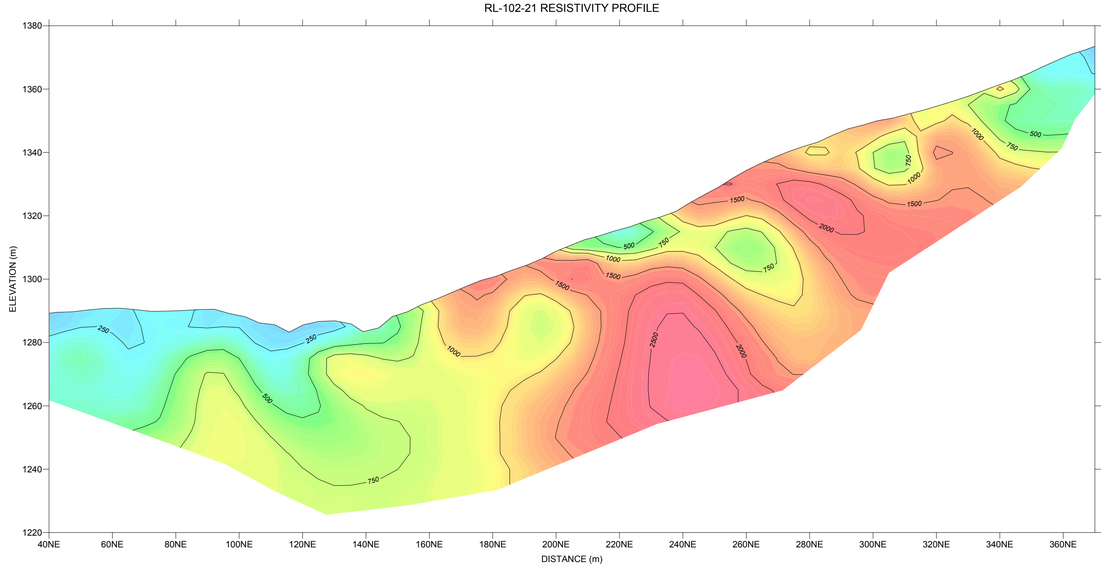
CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

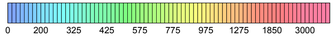
RESISTIVITY/CHARGEABILITY SURVEY

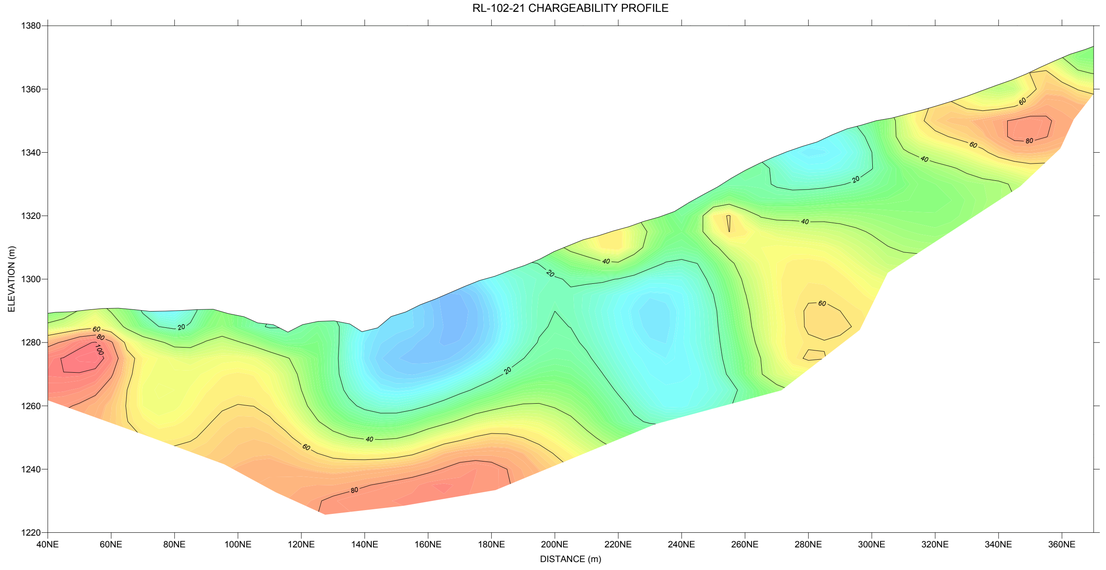
INVERTED RESISTIVITY
AND CHARGEABLITY PROFILES
RL-102-20

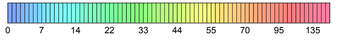
FRONTIER GEOSCIENCES INC.

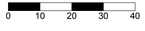
DATE: OCT. 2015	SCALE 1:1,000	FIG. 24











NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

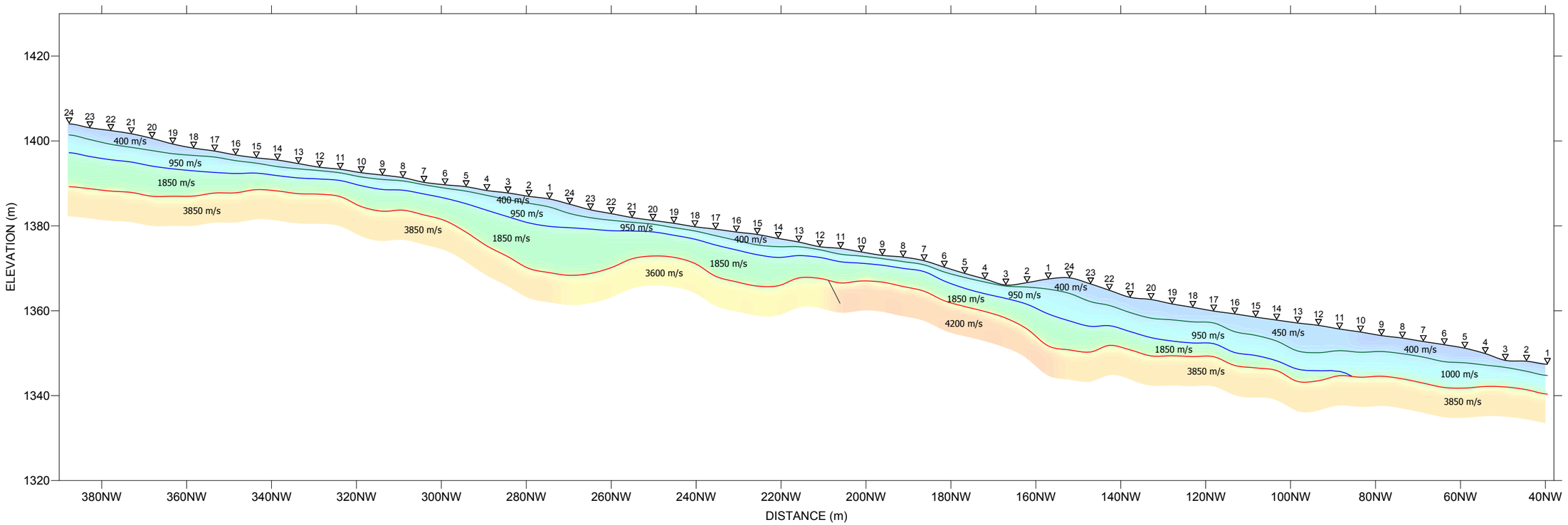
RESISTIVITY/CHARGEABILITY SURVEY

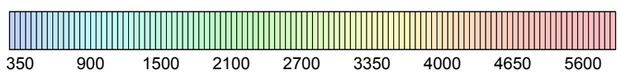
INVERTED RESISTIVITY
AND CHARGEABLITY PROFILES
RL-102-21

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 25

SL-102-01 SEISMIC REFRACTION PROFILE





P-WAVE VELOCITY (m/s)

FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

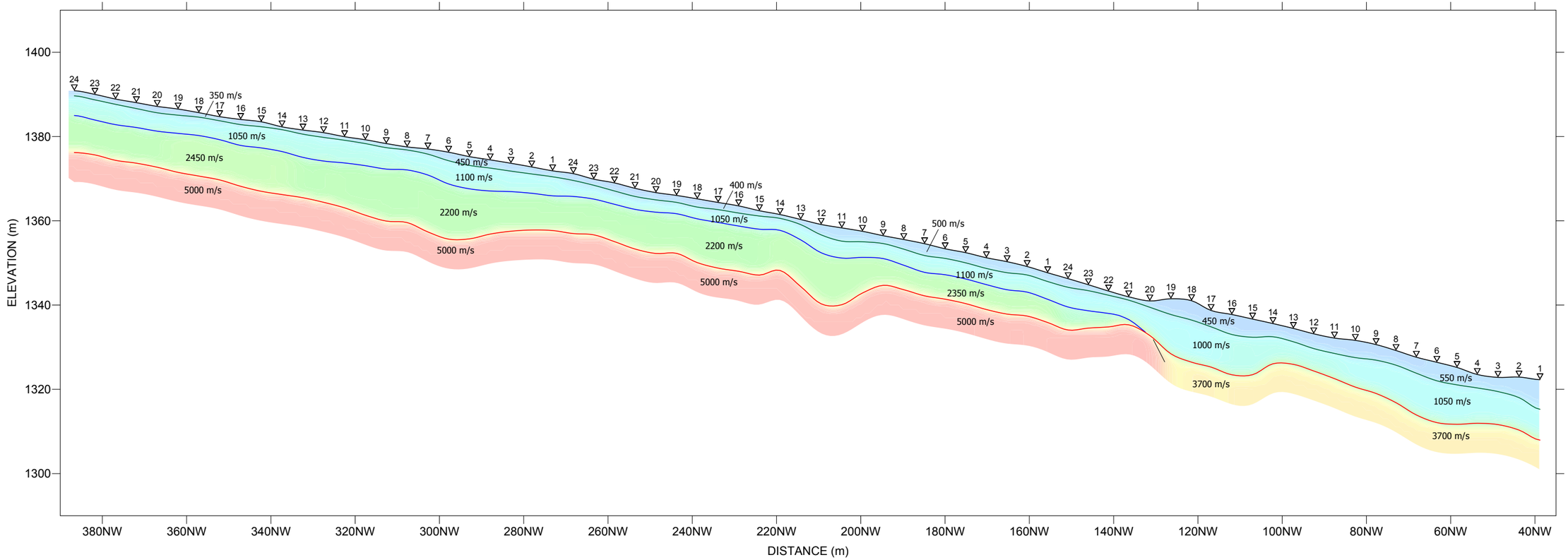
SEISMIC REFRACTION SURVEY

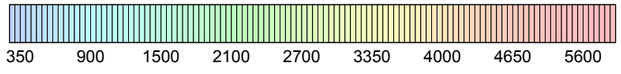
INTERPRETED DEPTH PROFILE
SL-102-01

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 26

SL-102-02 SEISMIC REFRACTION PROFILE





P-WAVE VELOCITY (m/s)

FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

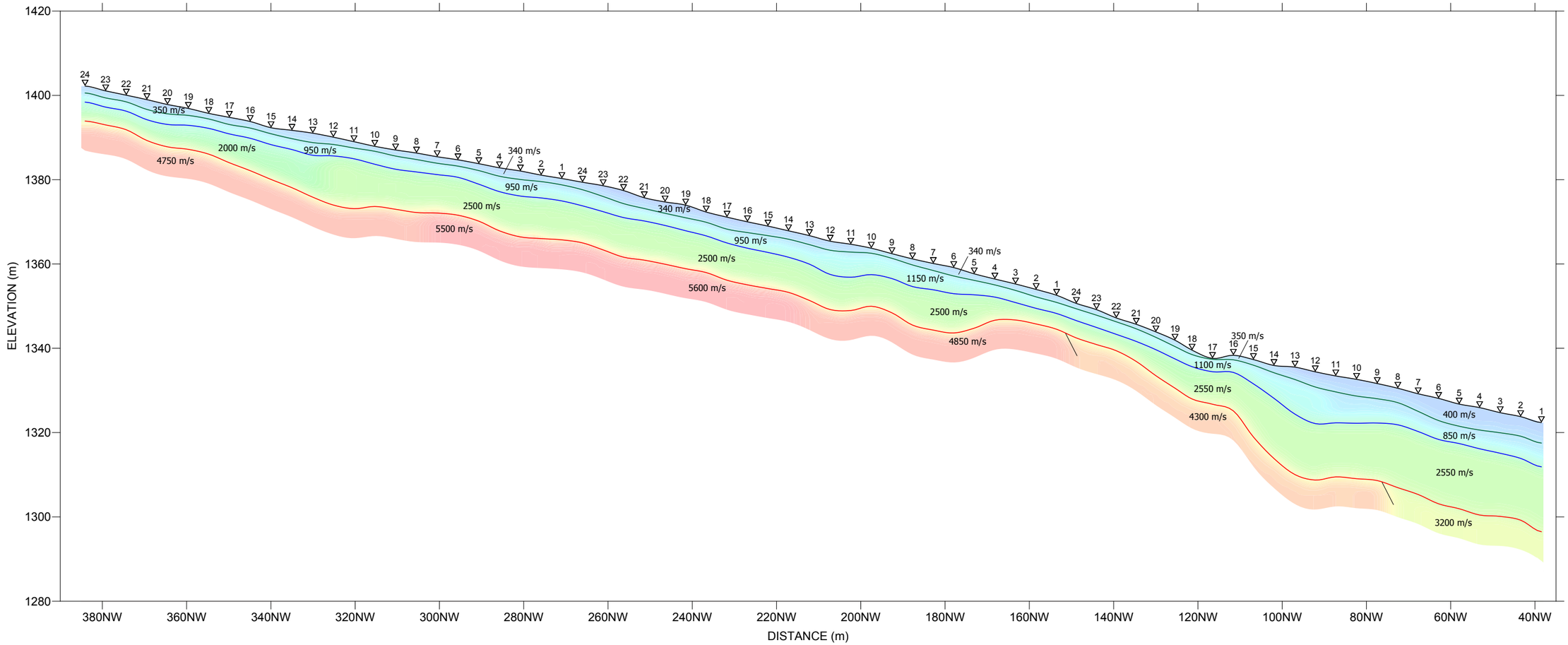
SEISMIC REFRACTION SURVEY

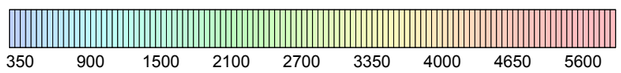
INTERPRETED DEPTH PROFILE
SL-102-02

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 27

SL-102-03 SEISMIC REFRACTION PROFILE

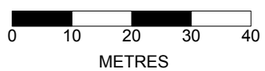




FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

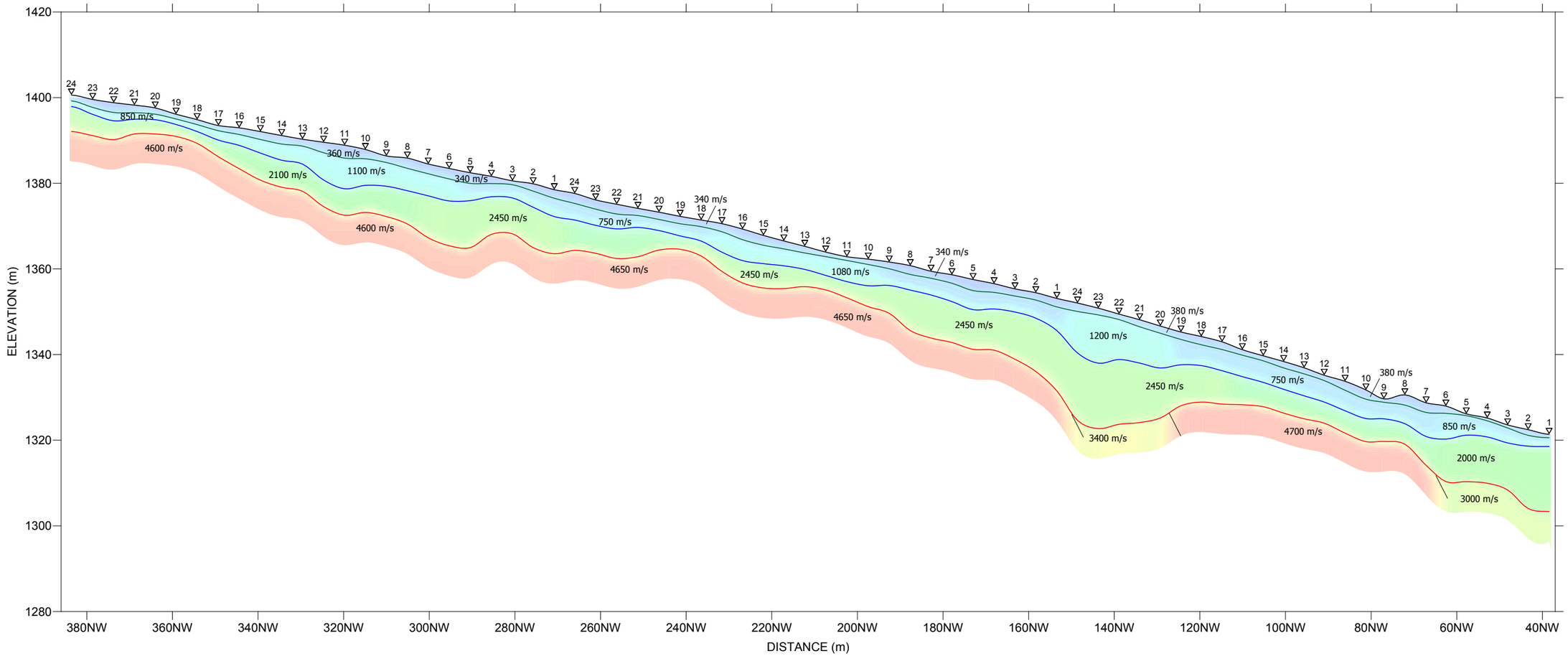
SEISMIC REFRACTION SURVEY

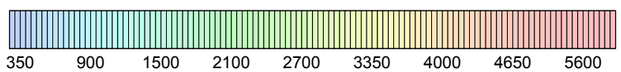
INTERPRETED DEPTH PROFILE
SL-102-03

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 28

SL-102-04 SEISMIC REFRACTION PROFILE

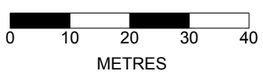




FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

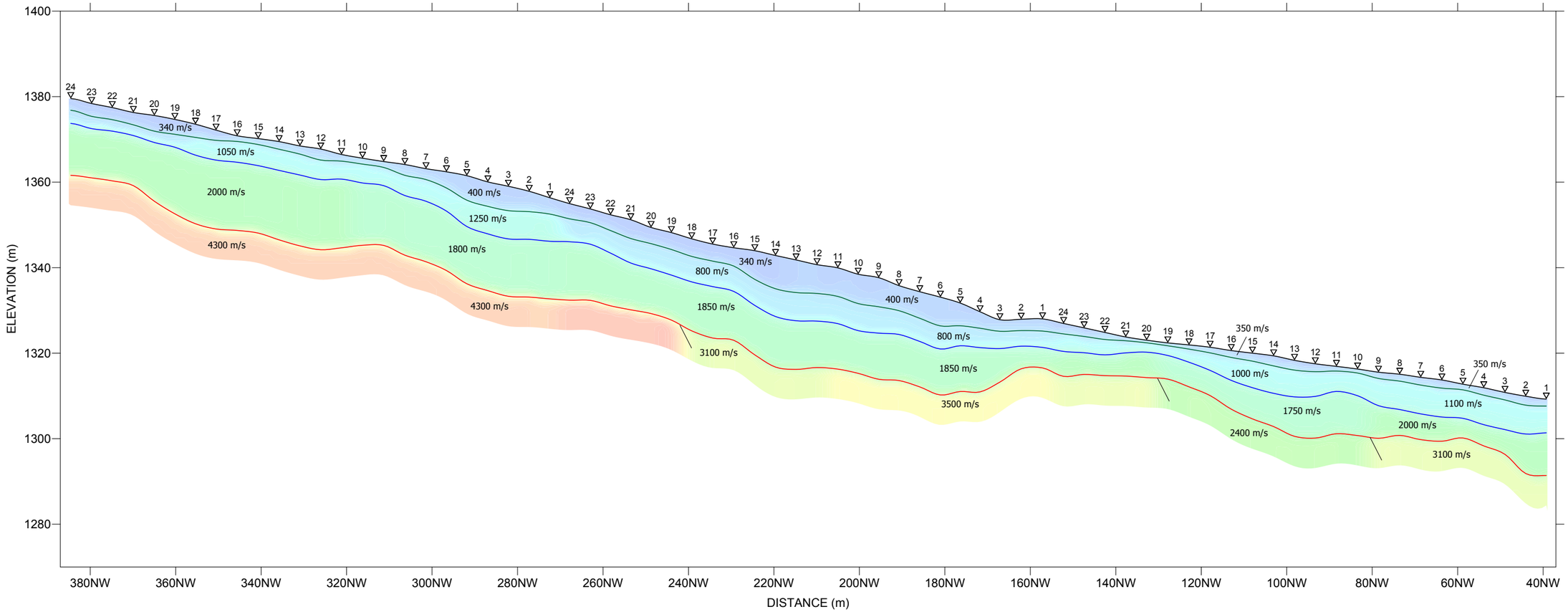
SEISMIC REFRACTION SURVEY

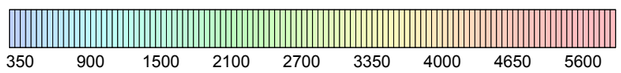
INTERPRETED DEPTH PROFILE
SL-102-04

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 29

SL-102-05 SEISMIC REFRACTION PROFILE

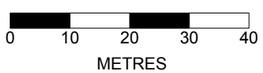




FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

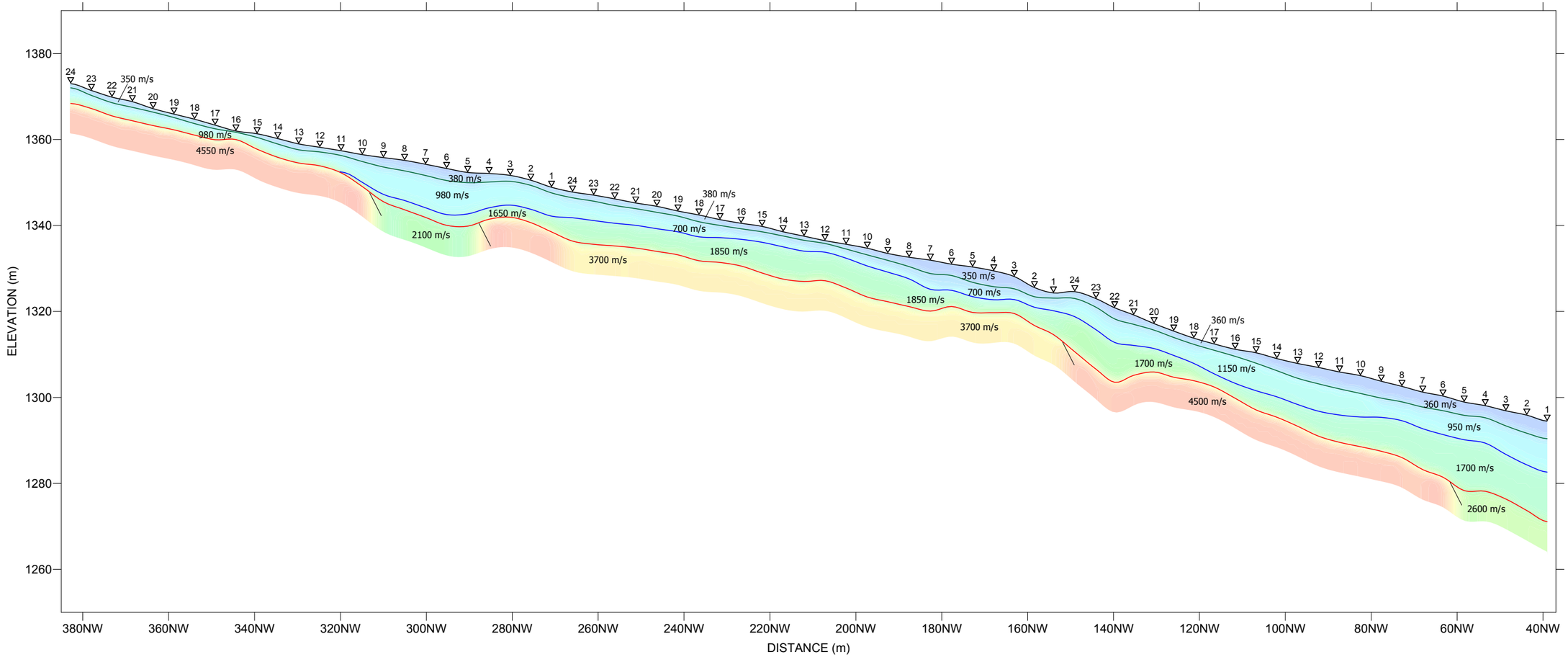
SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH PROFILE
SL-102-05

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 30

SL-102-06 SEISMIC REFRACTION PROFILE



350 900 1500 2100 2700 3350 4000 4650 5600

P-WAVE VELOCITY (m/s)

FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER

0 10 20 30 40

METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

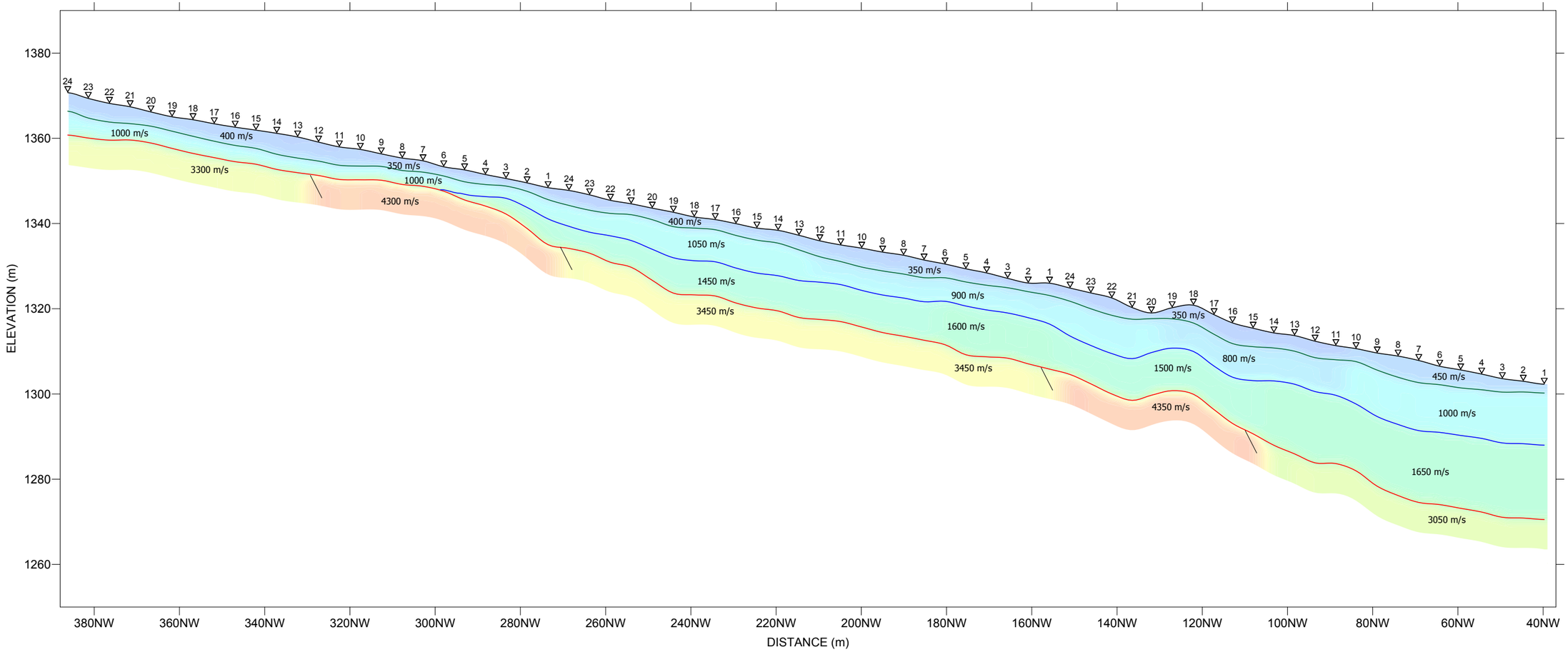
SEISMIC REFRACTION SURVEY

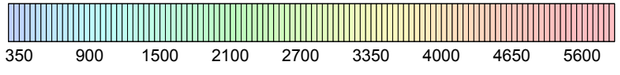
INTERPRETED DEPTH PROFILE
SL-102-06

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 31

SL-102-07 SEISMIC REFRACTION PROFILE





FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

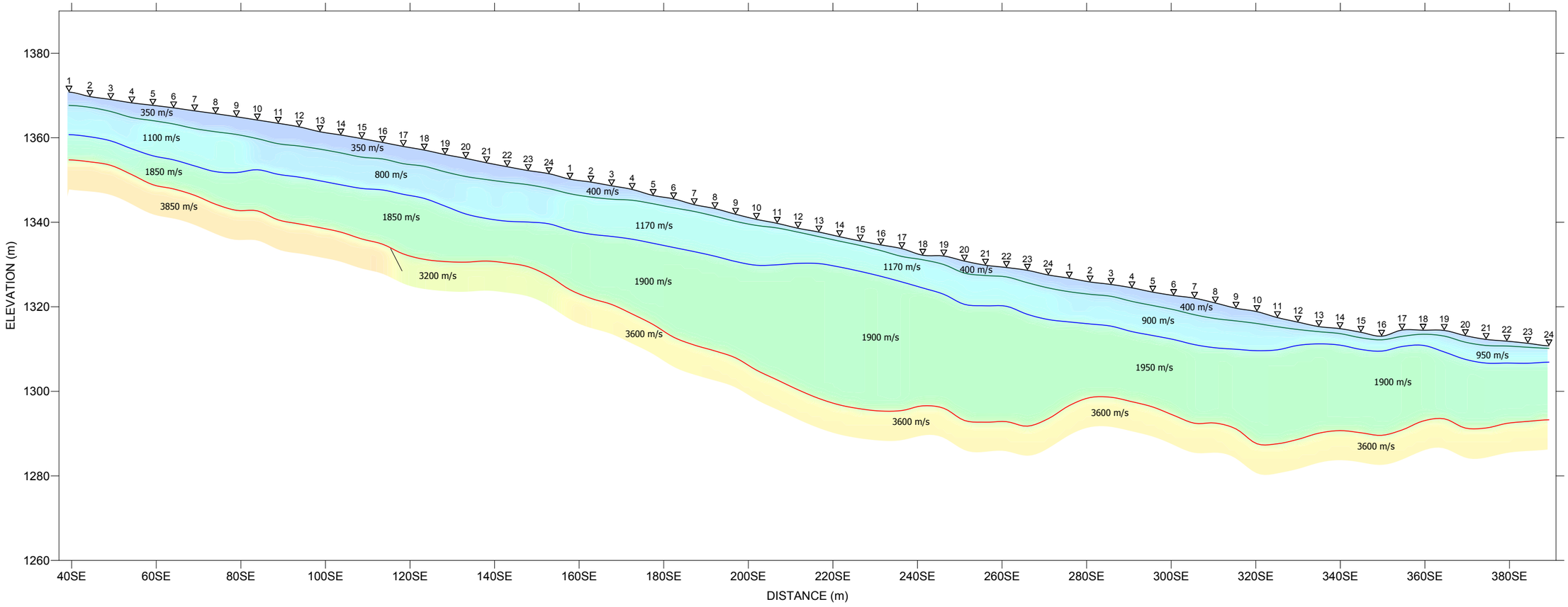
SEISMIC REFRACTION SURVEY

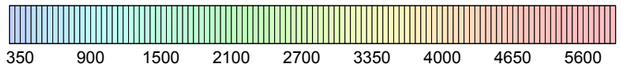
INTERPRETED DEPTH PROFILE
SL-102-07

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 32

SL-102-08 SEISMIC REFRACTION PROFILE

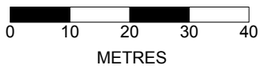




FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

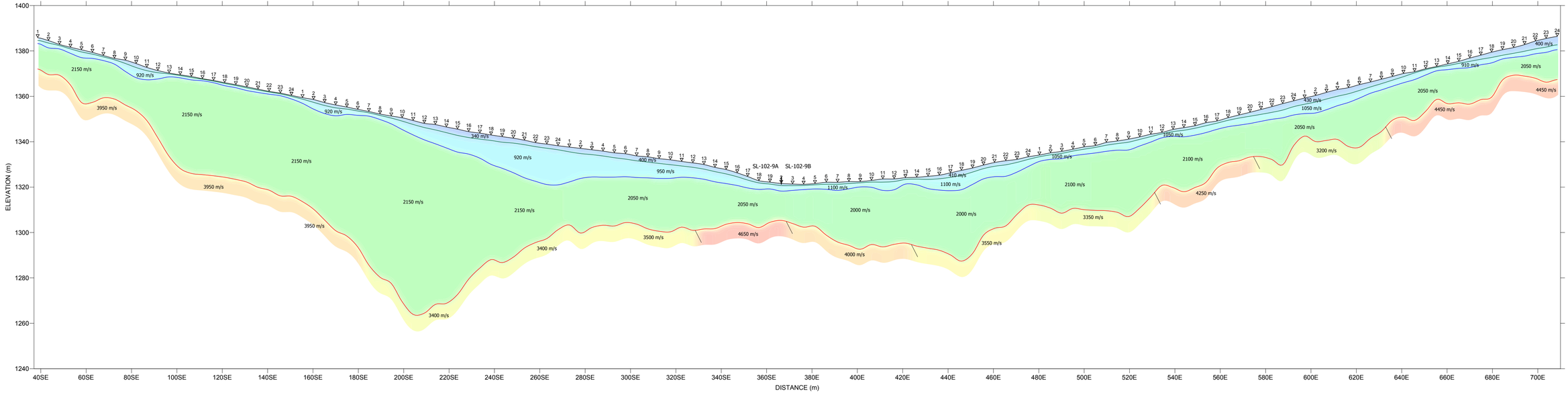
SEISMIC REFRACTION SURVEY

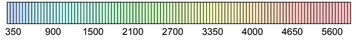
INTERPRETED DEPTH PROFILE
SL-102-08

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 33

SL-102-09A & SL-102-09B SEISMIC REFRACTION PROFILE







FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

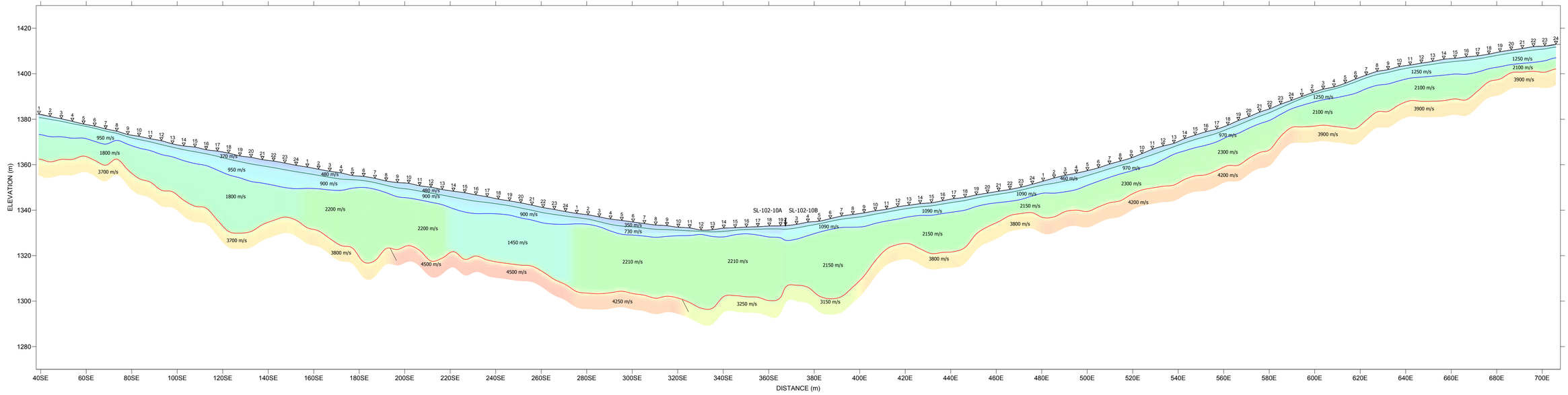
SEISMIC REFRACTION SURVEY

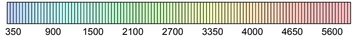
INTERPRETED DEPTH PROFILE
SL-102-09A & SL-102-09B

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 34

SL-102-10A & SL-102-10B SEISMIC REFRACTION PROFILE







FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

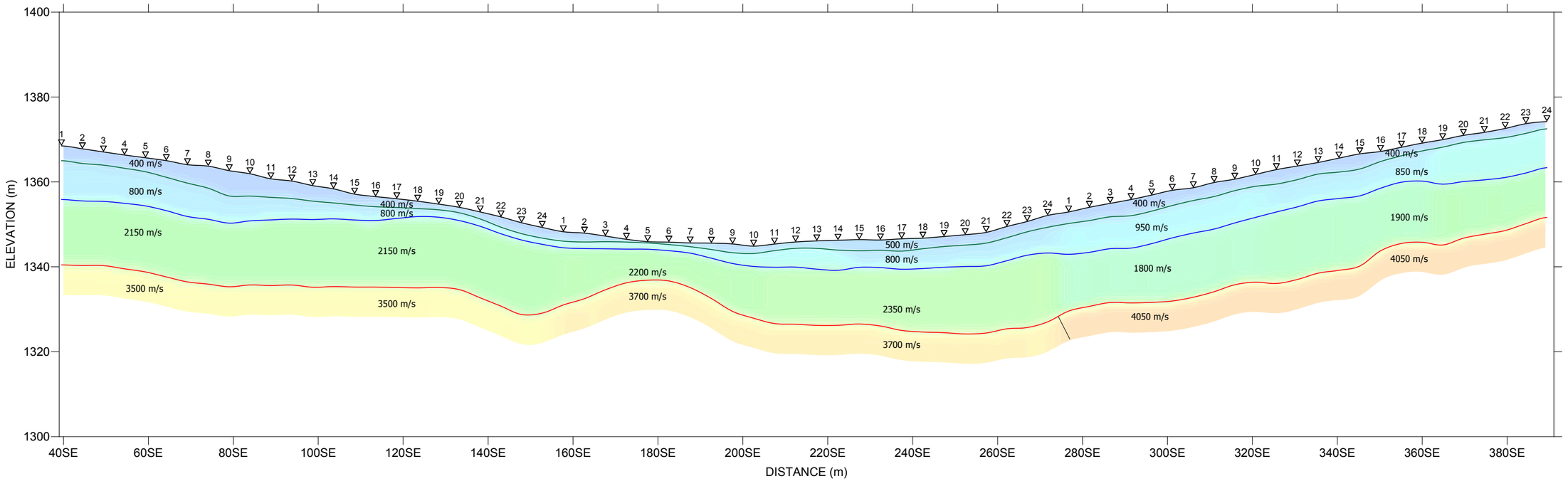
SEISMIC REFRACTION SURVEY

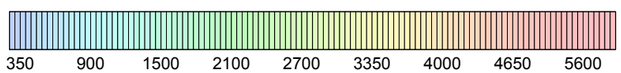
INTERPRETED DEPTH PROFILE
SL-102-10A & SL-102-10B

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 35

SL-102-11 SEISMIC REFRACTION PROFILE

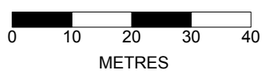




FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

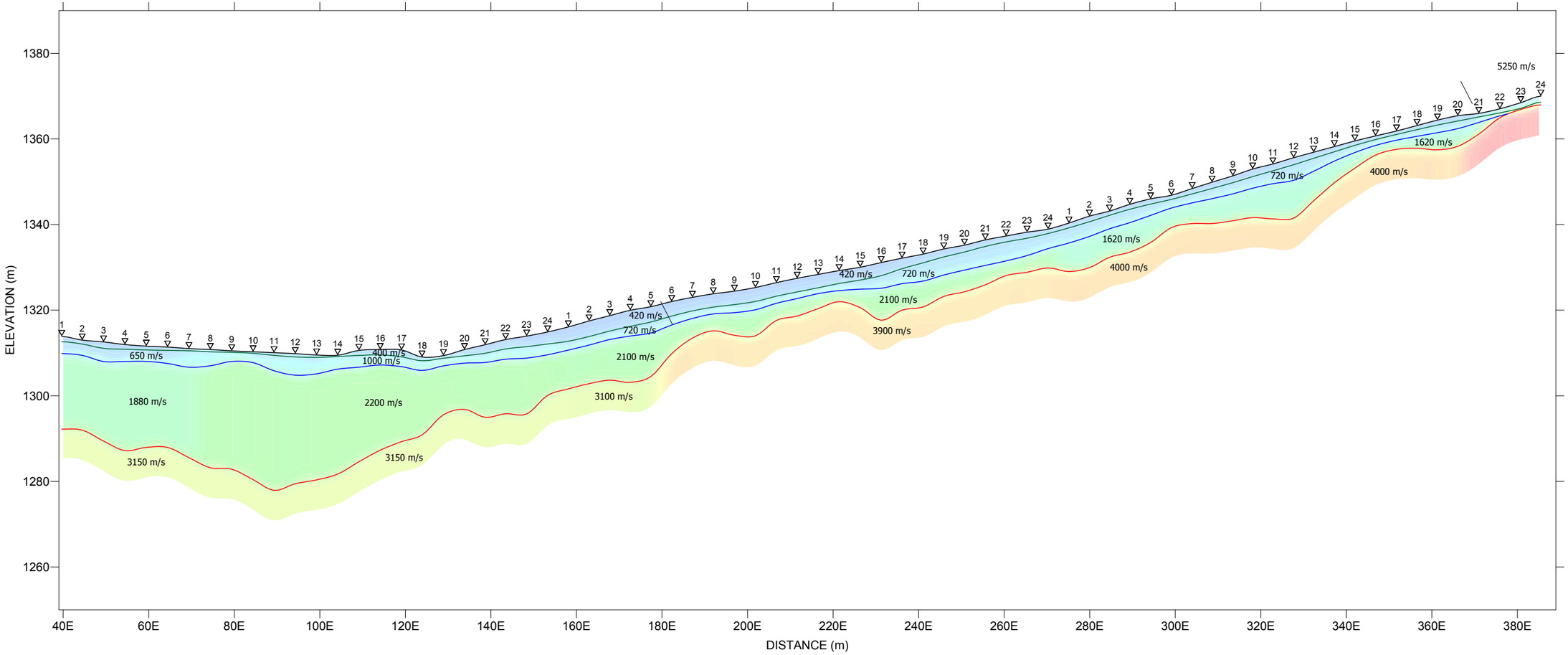
SEISMIC REFRACTION SURVEY

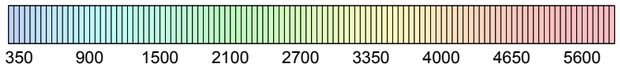
INTERPRETED DEPTH PROFILE
SL-102-11

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 36

SL-102-12 SEISMIC REFRACTION PROFILE



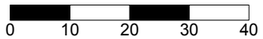


P-WAVE VELOCITY (m/s)

FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

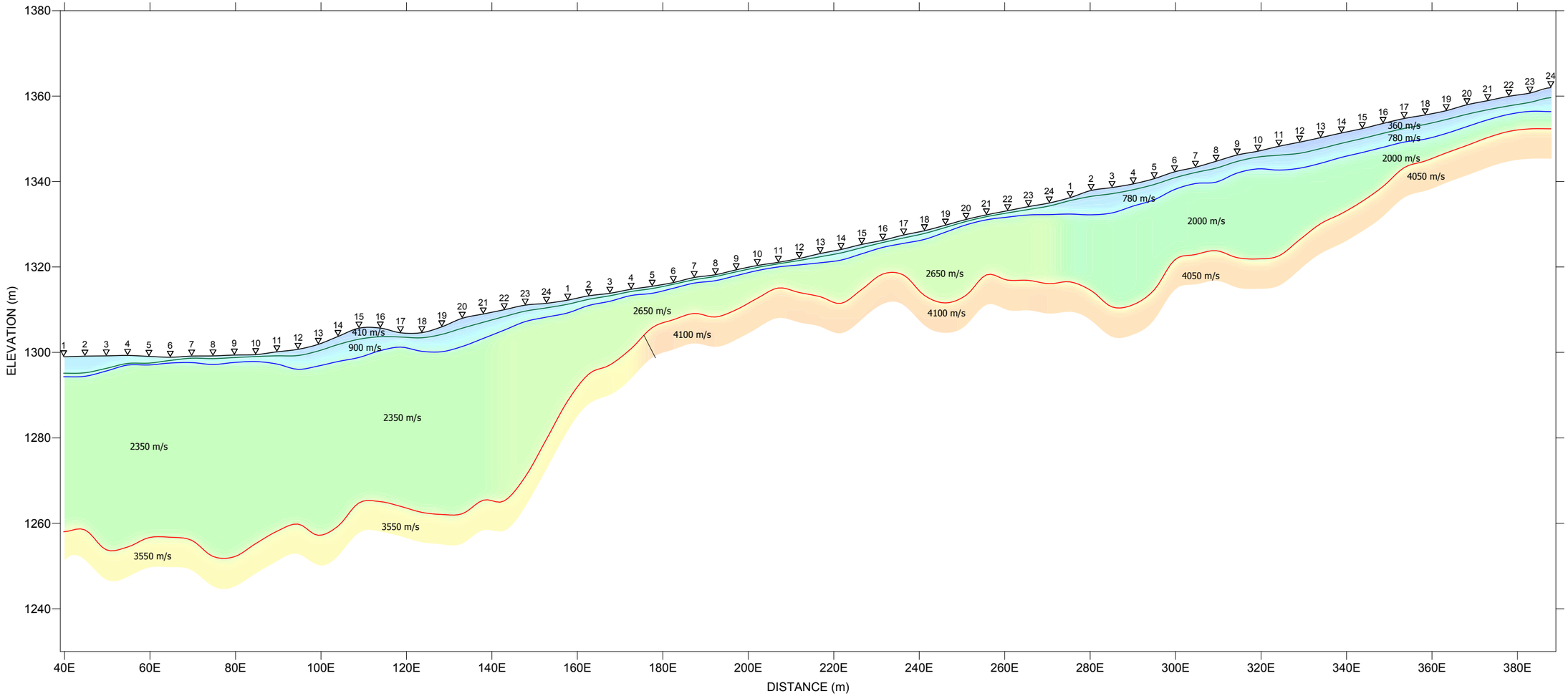
SEISMIC REFRACTION SURVEY

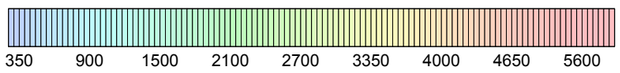
INTERPRETED DEPTH PROFILE
SL-102-12

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 37

SL-102-13 SEISMIC REFRACTION PROFILE



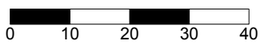


P-WAVE VELOCITY (m/s)

FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

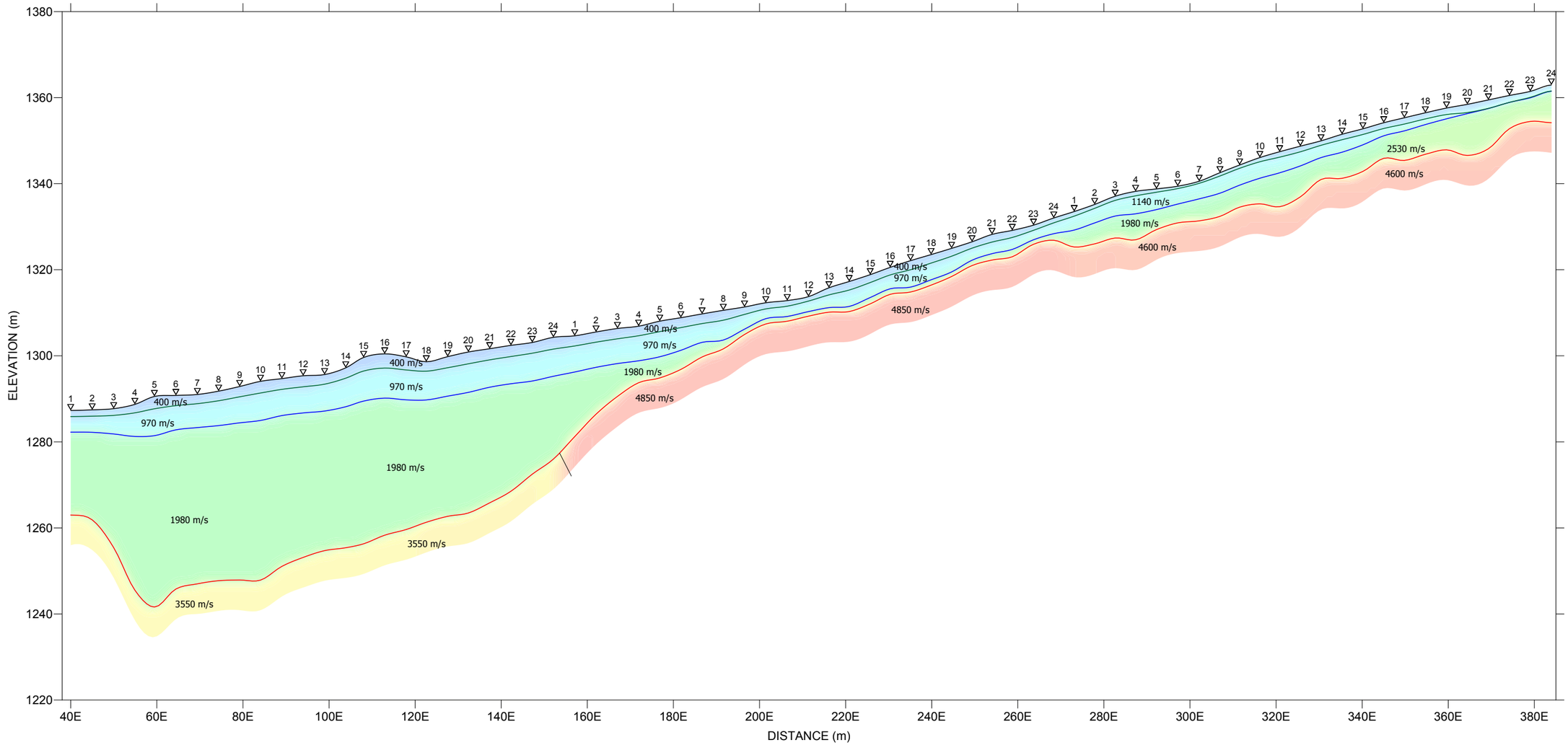
SEISMIC REFRACTION SURVEY

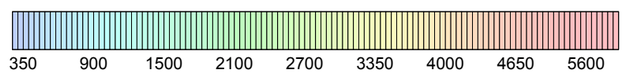
INTERPRETED DEPTH PROFILE
SL-102-13

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 38

SL-102-14 SEISMIC REFRACTION PROFILE

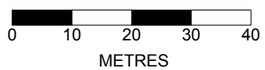




FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

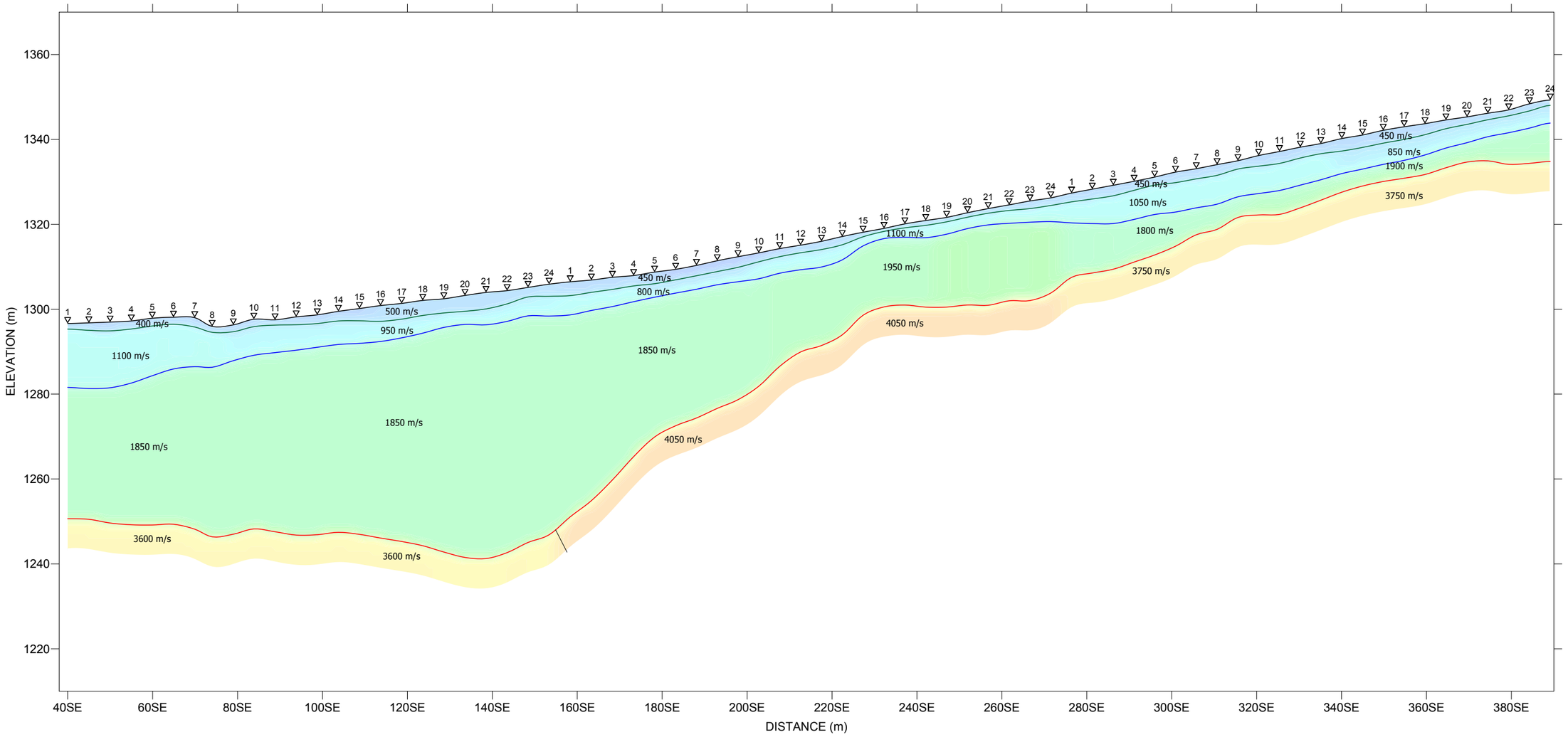
SEISMIC REFRACTION SURVEY

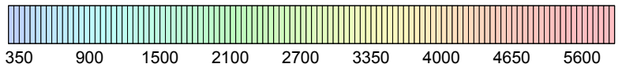
INTERPRETED DEPTH PROFILE
SL-102-14

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 39

SL-102-15 SEISMIC REFRACTION PROFILE

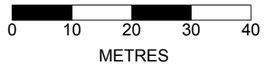




FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

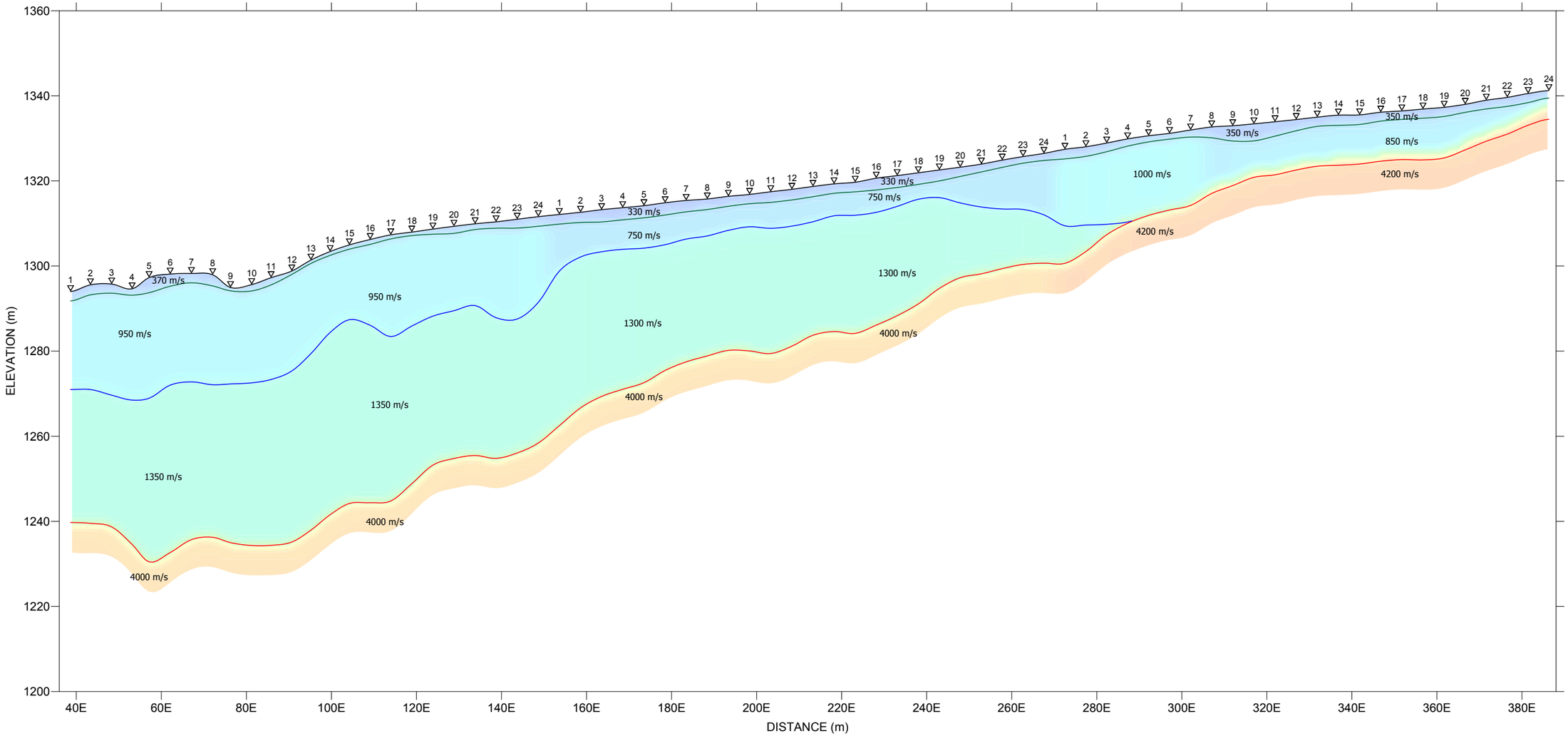
SEISMIC REFRACTION SURVEY

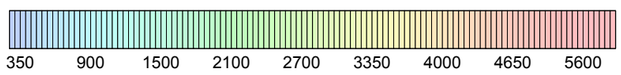
INTERPRETED DEPTH PROFILE
SL-102-15

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 40

SL-102-16 SEISMIC REFRACTION PROFILE

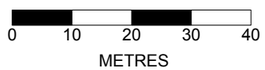




FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

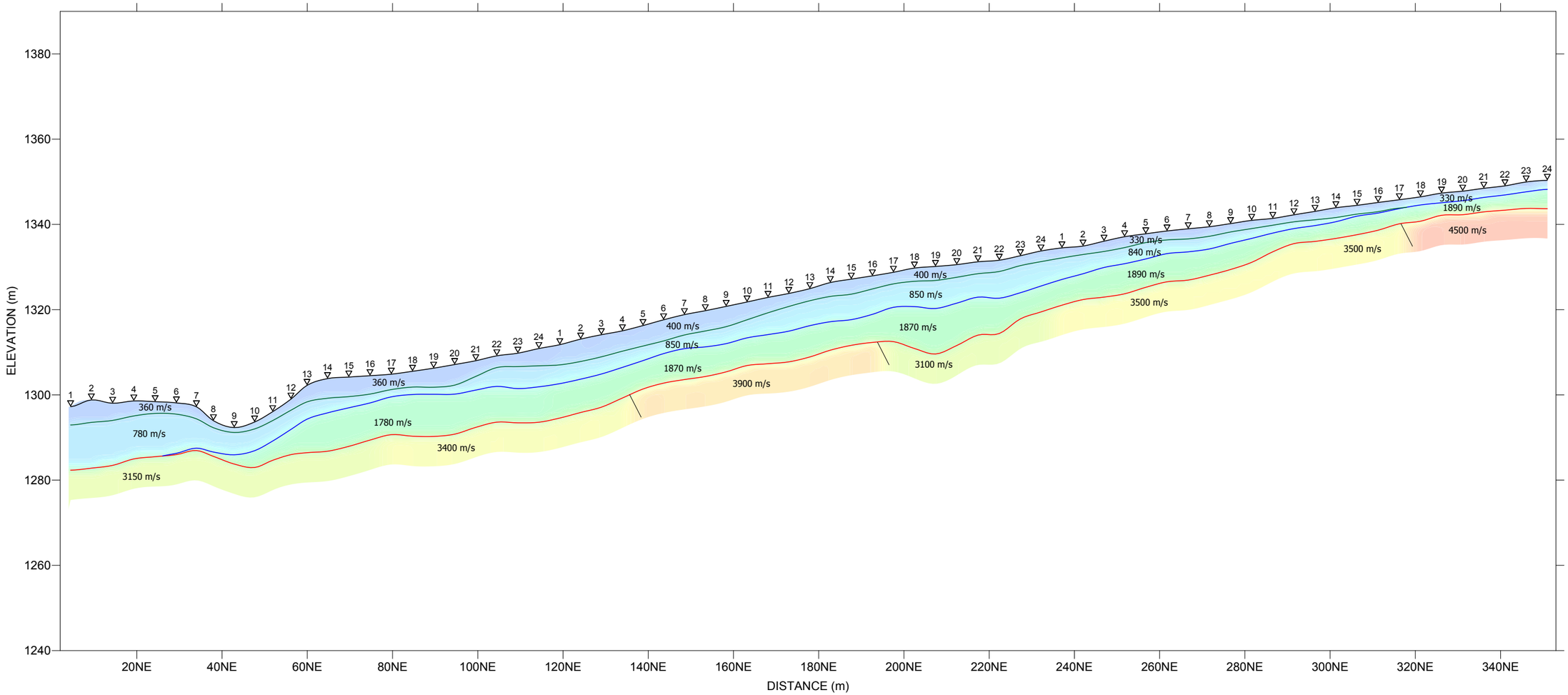
SEISMIC REFRACTION SURVEY

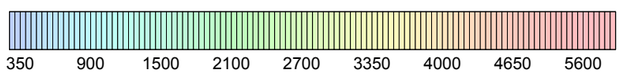
INTERPRETED DEPTH PROFILE
SL-102-16

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 41

SL-102-17 SEISMIC REFRACTION PROFILE





P-WAVE VELOCITY (m/s)

FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

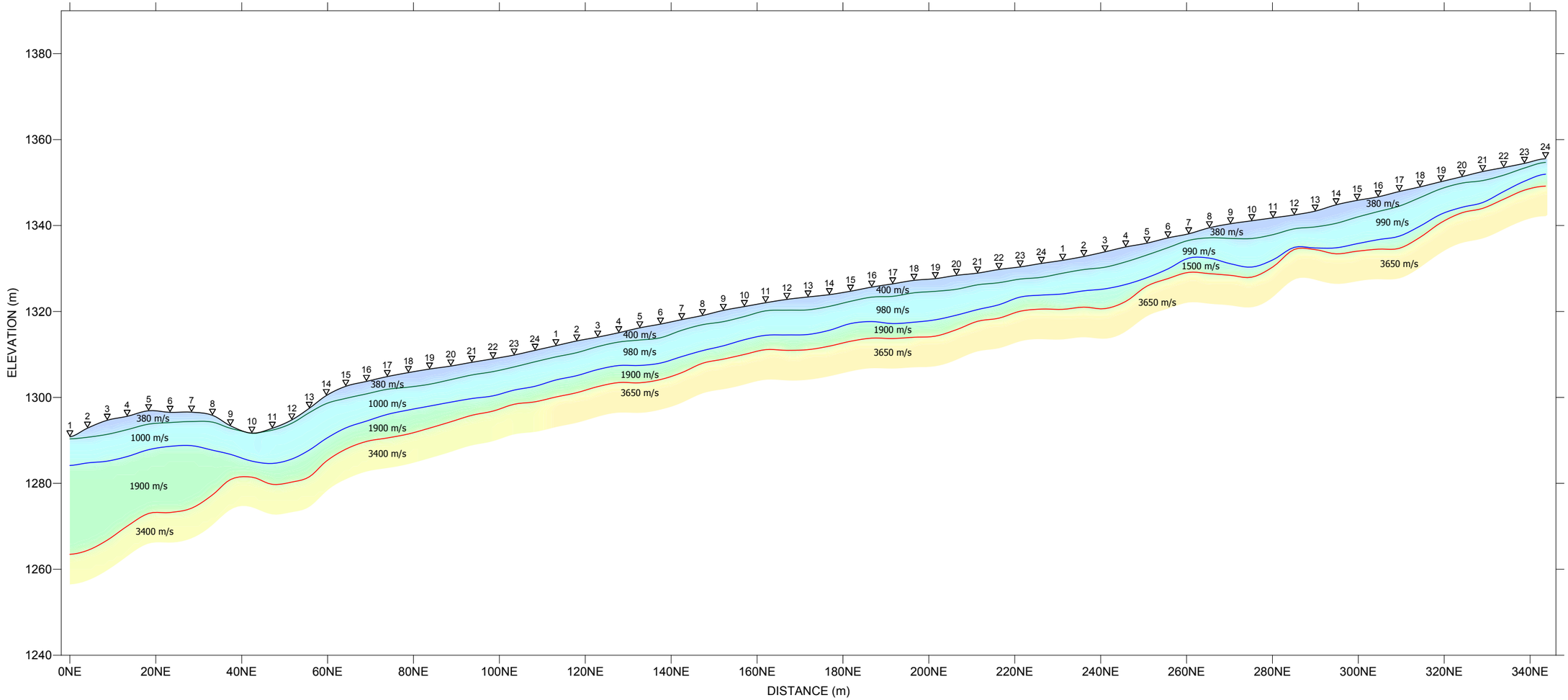
SEISMIC REFRACTION SURVEY

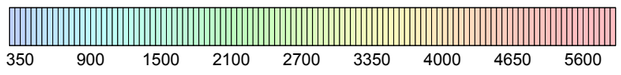
INTERPRETED DEPTH PROFILE
SL-102-17

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 42

SL-102-18 SEISMIC REFRACTION PROFILE





P-WAVE VELOCITY (m/s)

FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

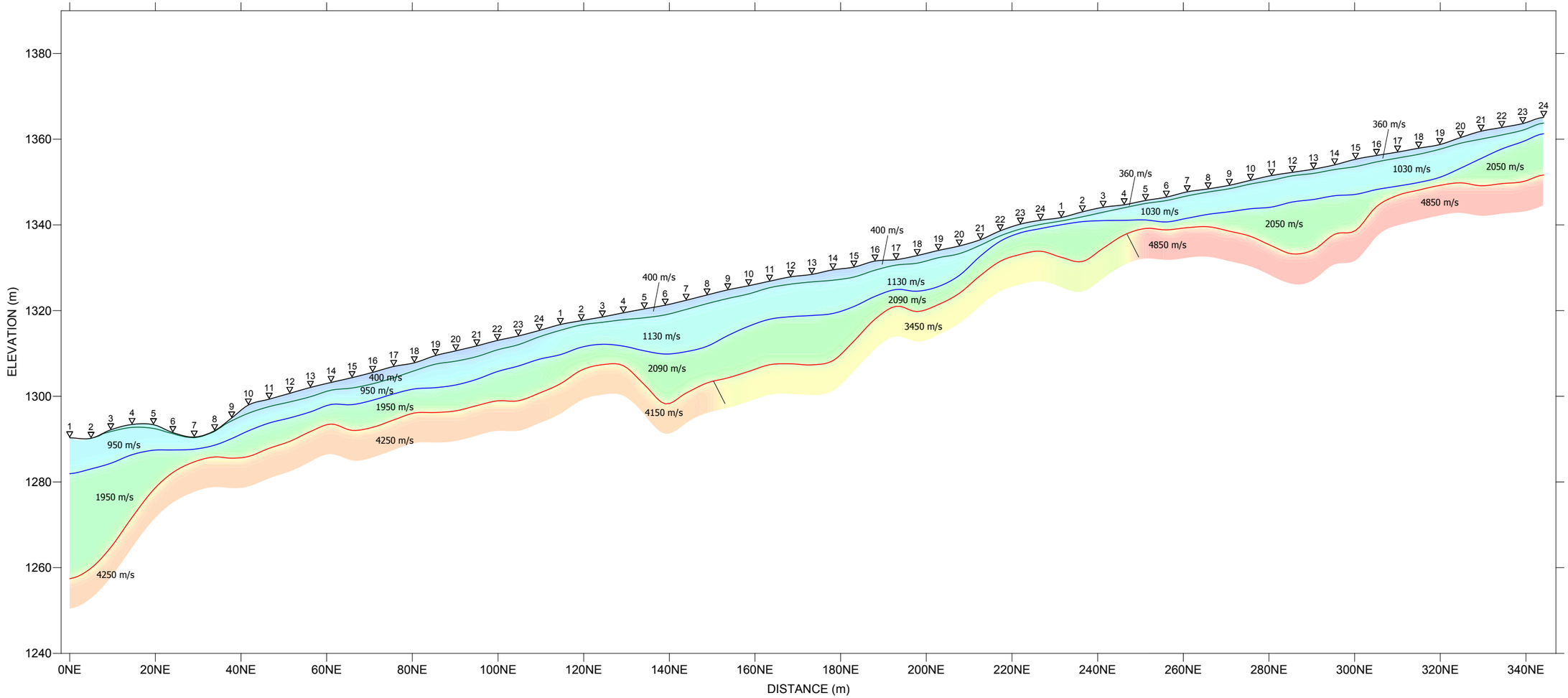
SEISMIC REFRACTION SURVEY

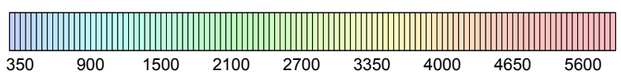
INTERPRETED DEPTH PROFILE
SL-102-18

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 43

SL-102-19 SEISMIC REFRACTION PROFILE





P-WAVE VELOCITY (m/s)

FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

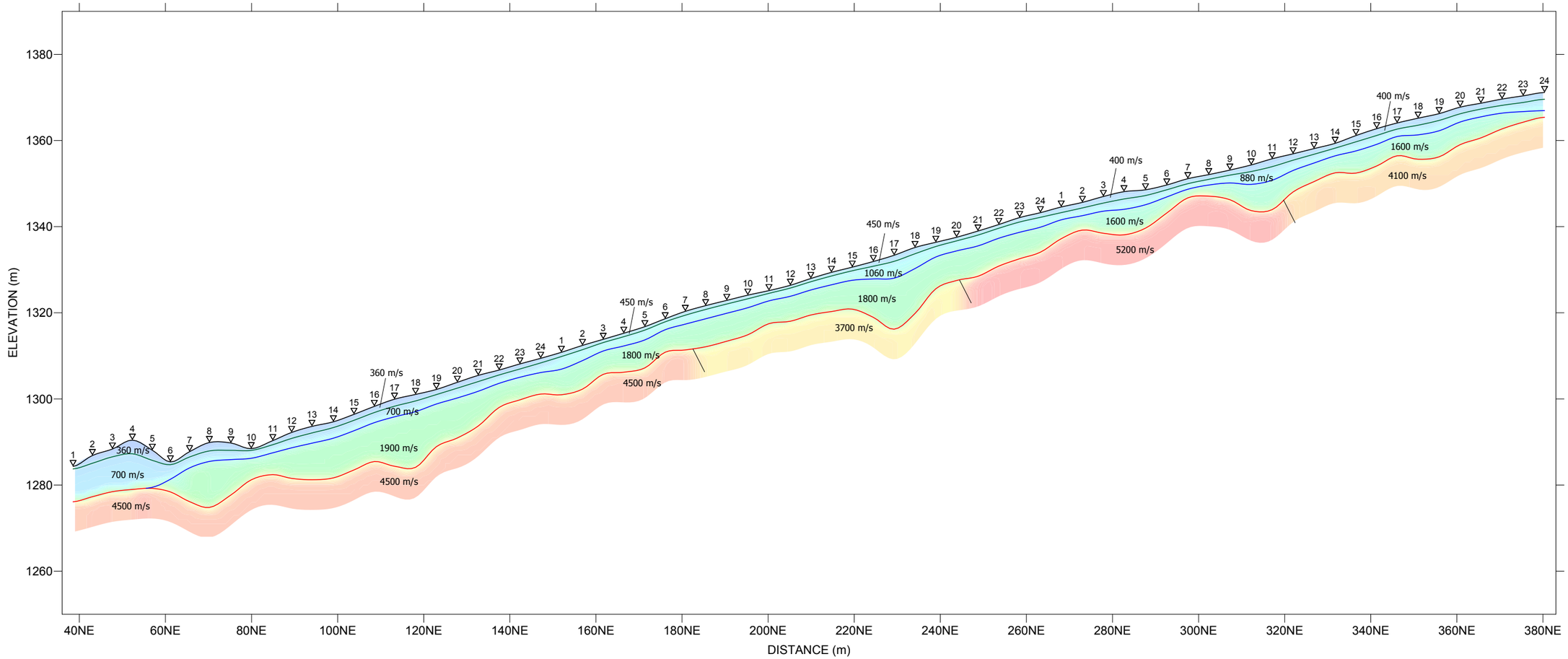
SEISMIC REFRACTION SURVEY

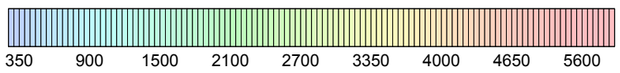
INTERPRETED DEPTH PROFILE
SL-102-19

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 44

SL-102-20 SEISMIC REFRACTION PROFILE

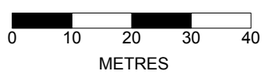




FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

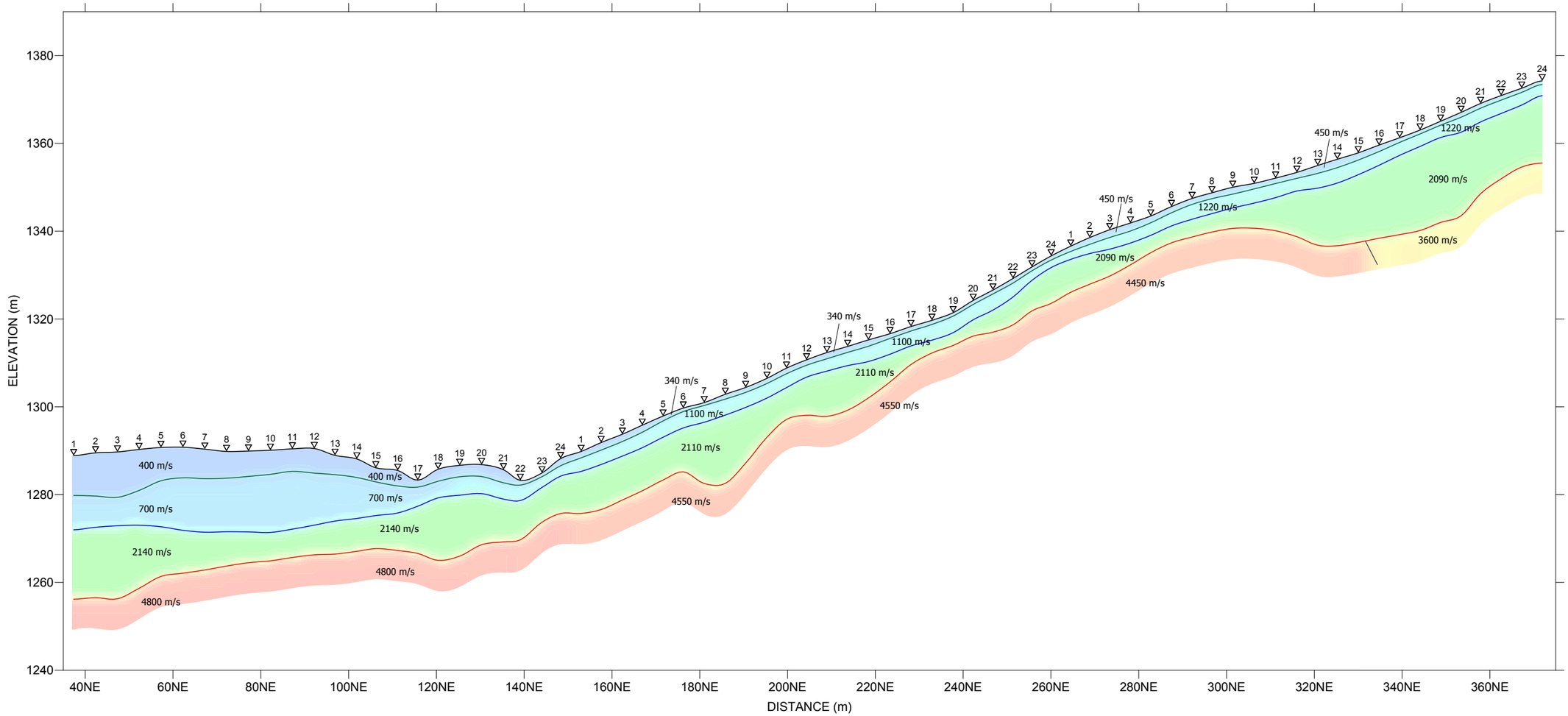
SEISMIC REFRACTION SURVEY

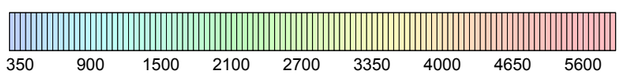
INTERPRETED DEPTH PROFILE
SL-102-20

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 45

SL-102-21 SEISMIC REFRACTION PROFILE



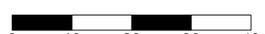


P-WAVE VELOCITY (m/s)

FIRST SEISMIC VELOCITY LAYER

SECOND SEISMIC VELOCITY LAYER

SEISMIC BASAL VELOCITY LAYER



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

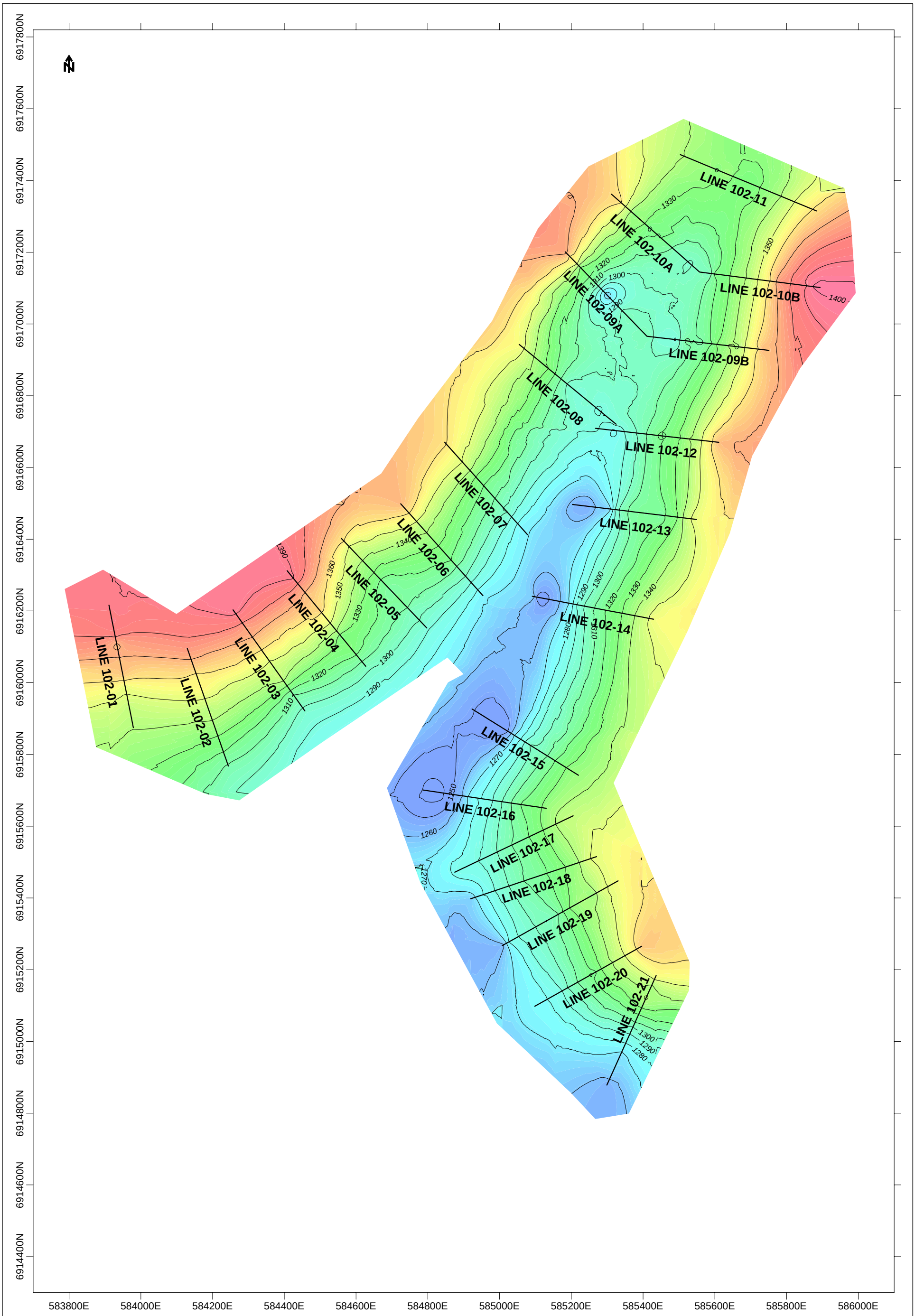
FCD AREA, FARO MINE REMEDIATION PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH PROFILE
SL-102-21

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 46



CH2MHILL

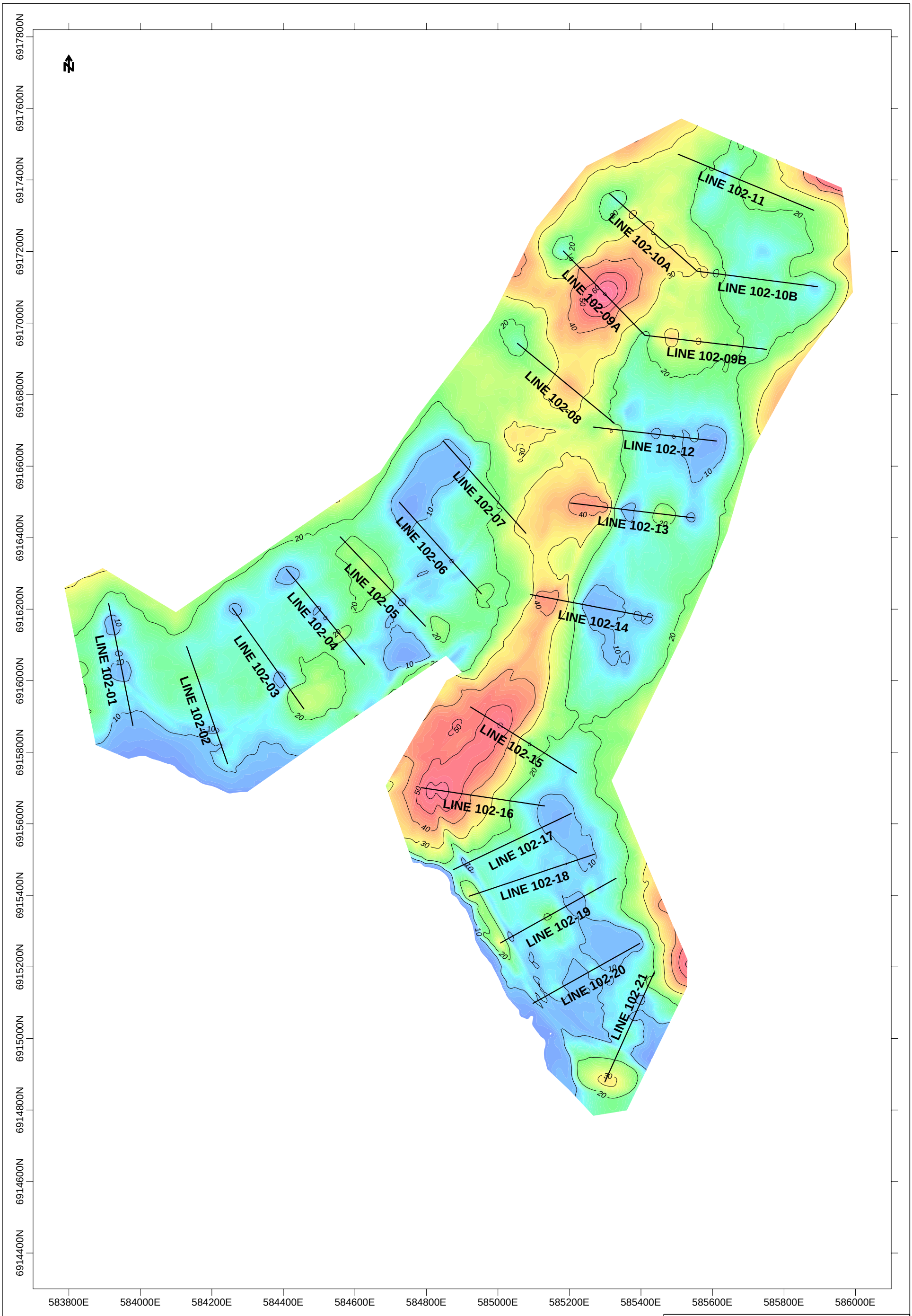
FCD AREA, FARO MINE REMEDIATION PROJECT

GEOPHYSICAL SURVEY

BEDROCK ELEVATION CONTOUR PLAN

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:10,000	FIG. 47



CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

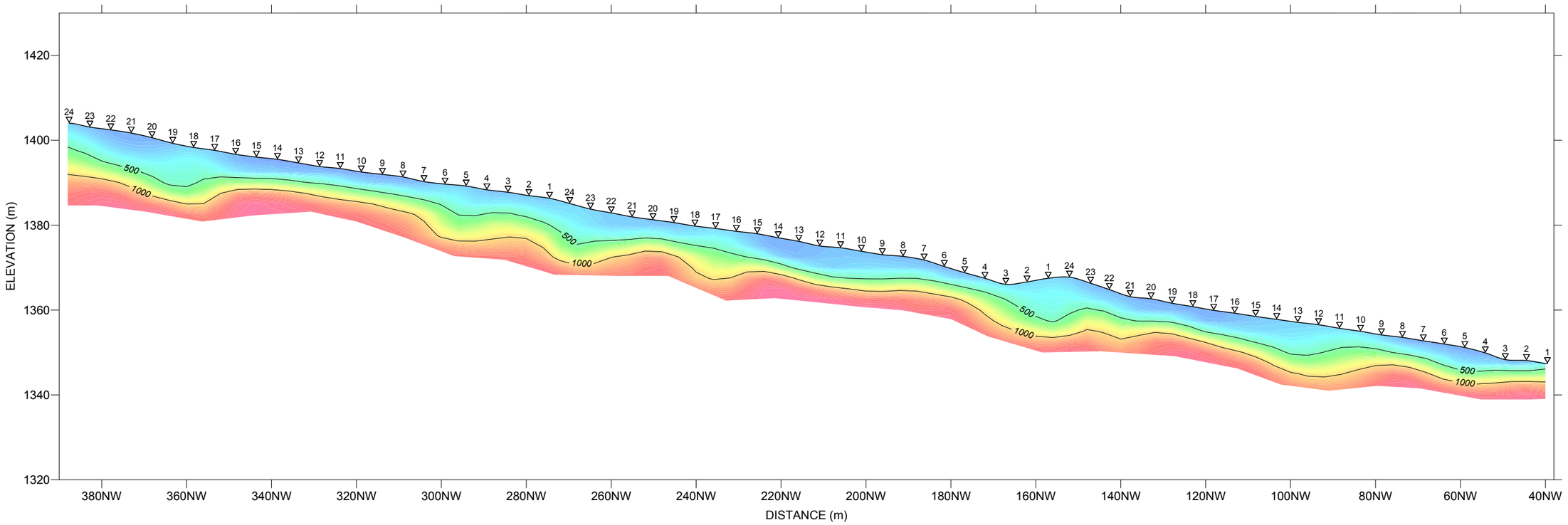
GEOPHYSICAL SURVEY

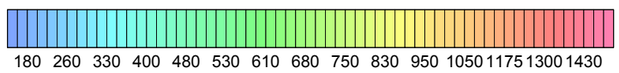
SEDIMENT THICKNESS ISOPACH PLAN

FRONTIER GEOSCIENCES INC.

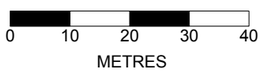
DATE: OCT. 2015	SCALE 1:10,000	FIG. 48

SL-102-01 MASW PROFILE





S-WAVE VELOCITY (m/s)



NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

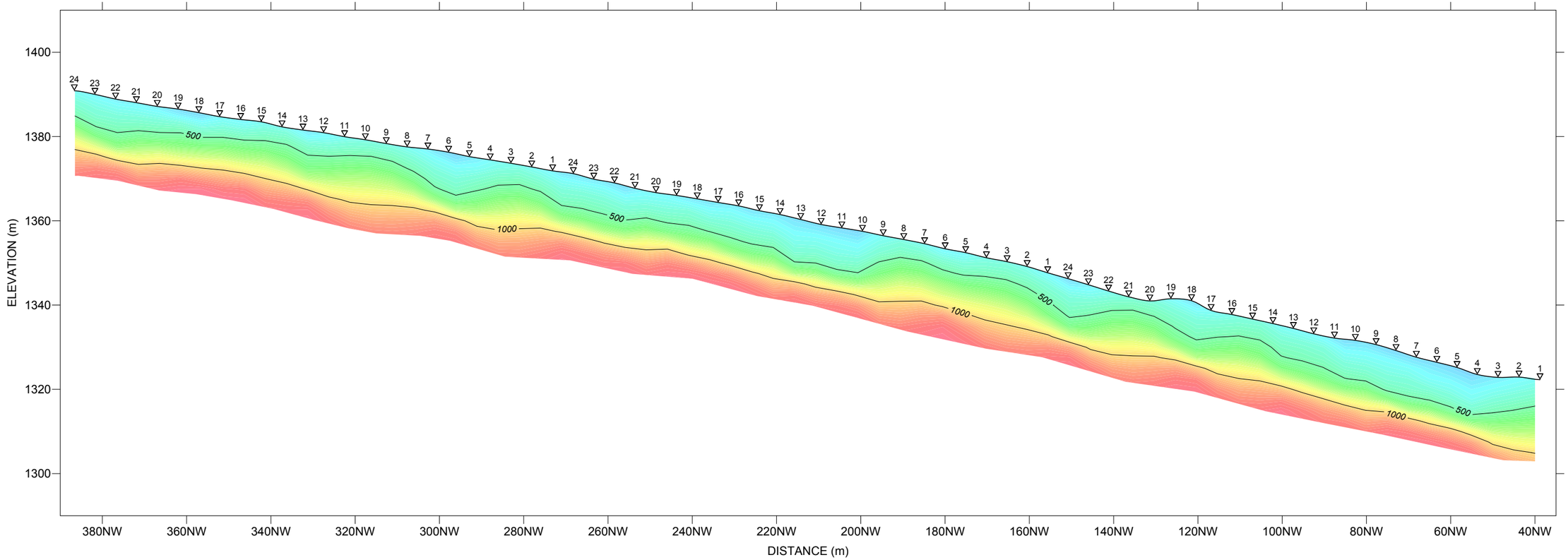
MASW SURVEY

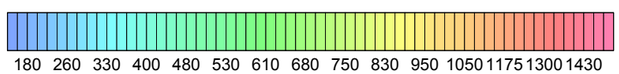
INTERPRETED MASW PROFILE
SL-102-01

FRONTIER GEOSCIENCES INC.

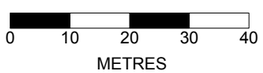
DATE: OCT. 2015	SCALE 1:1,000	FIG. 49

SL-102-02 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

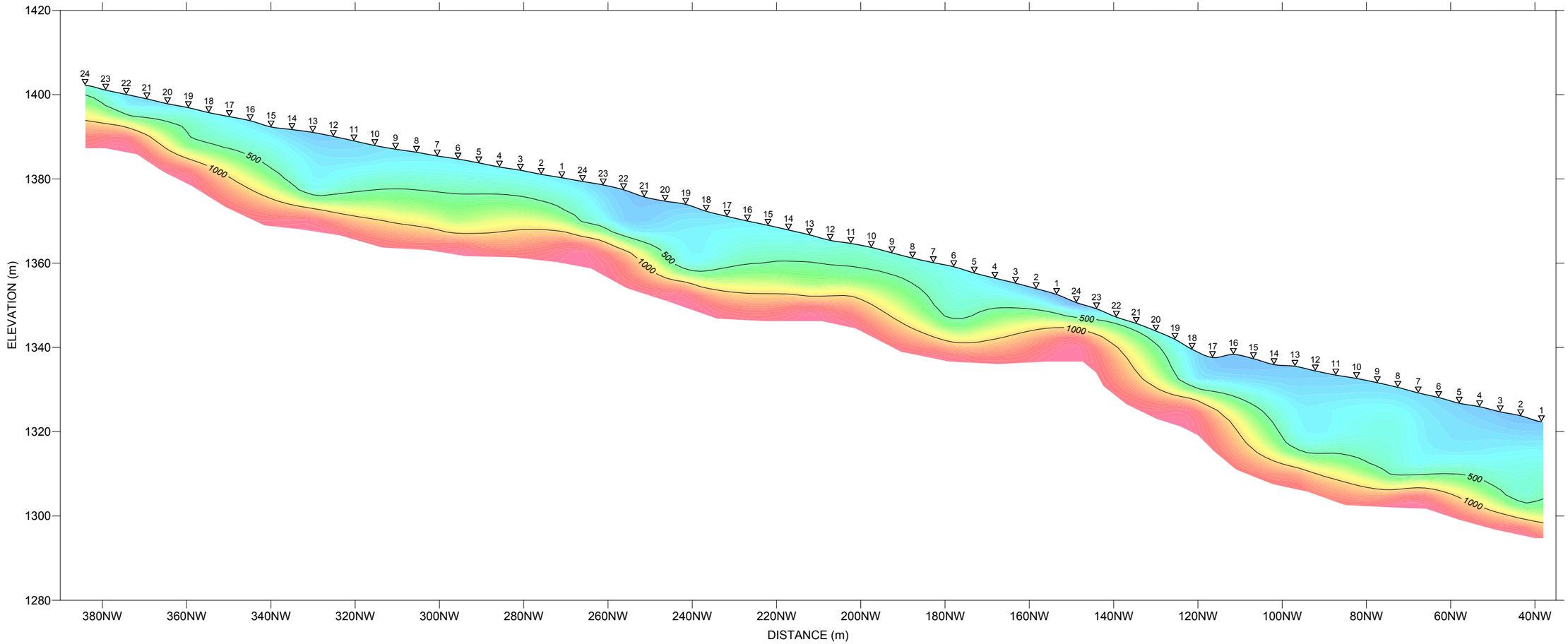
MASW SURVEY

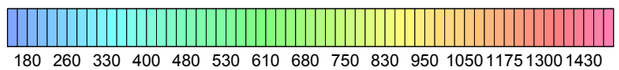
INTERPRETED MASW PROFILE
SL-102-02

FRONTIER GEOSCIENCES INC.

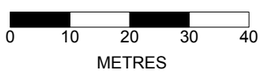
DATE: OCT. 2015	SCALE 1:1,000	FIG. 50

SL-102-03 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

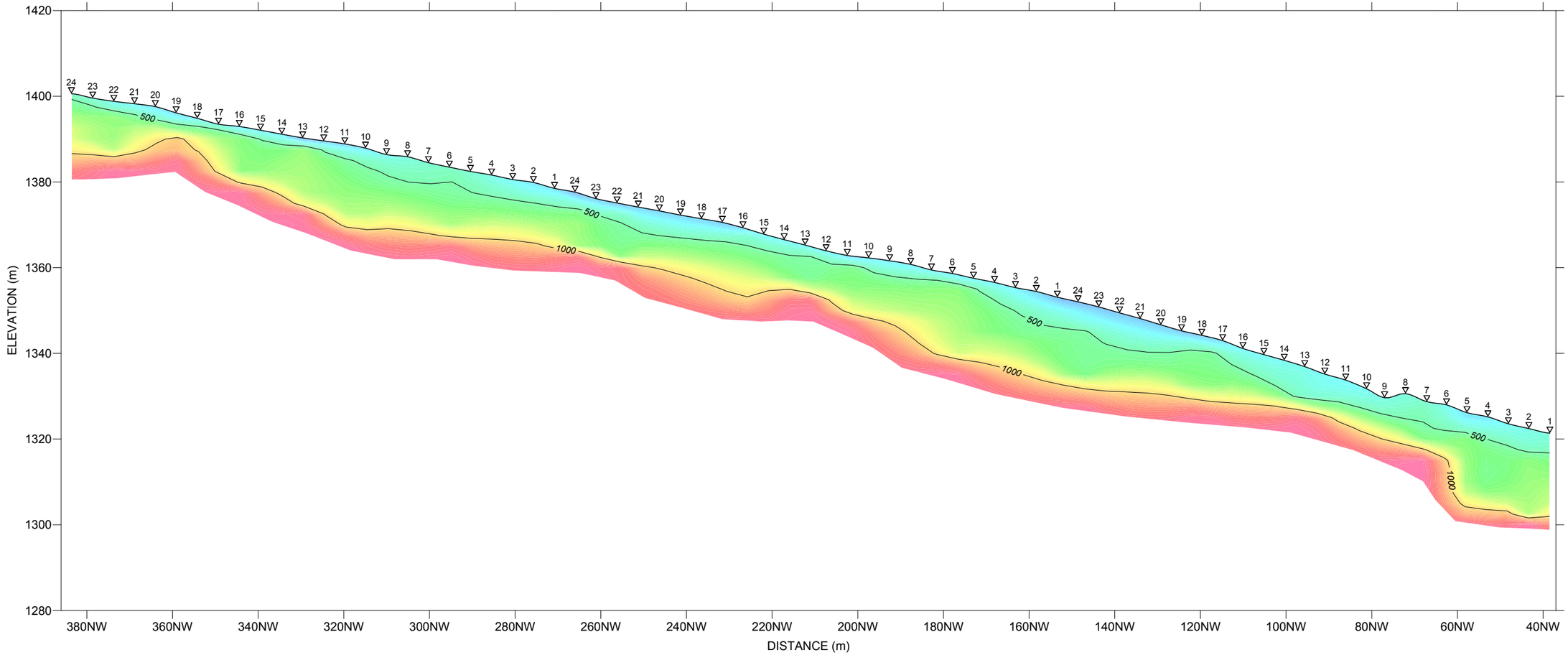
MASW SURVEY

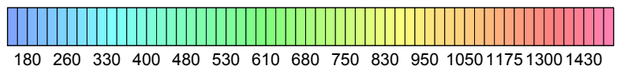
INTERPRETED MASW PROFILE
SL-102-03

FRONTIER GEOSCIENCES INC.

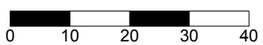
DATE: OCT. 2015	SCALE 1:1,000	FIG. 51

SL-102-04 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

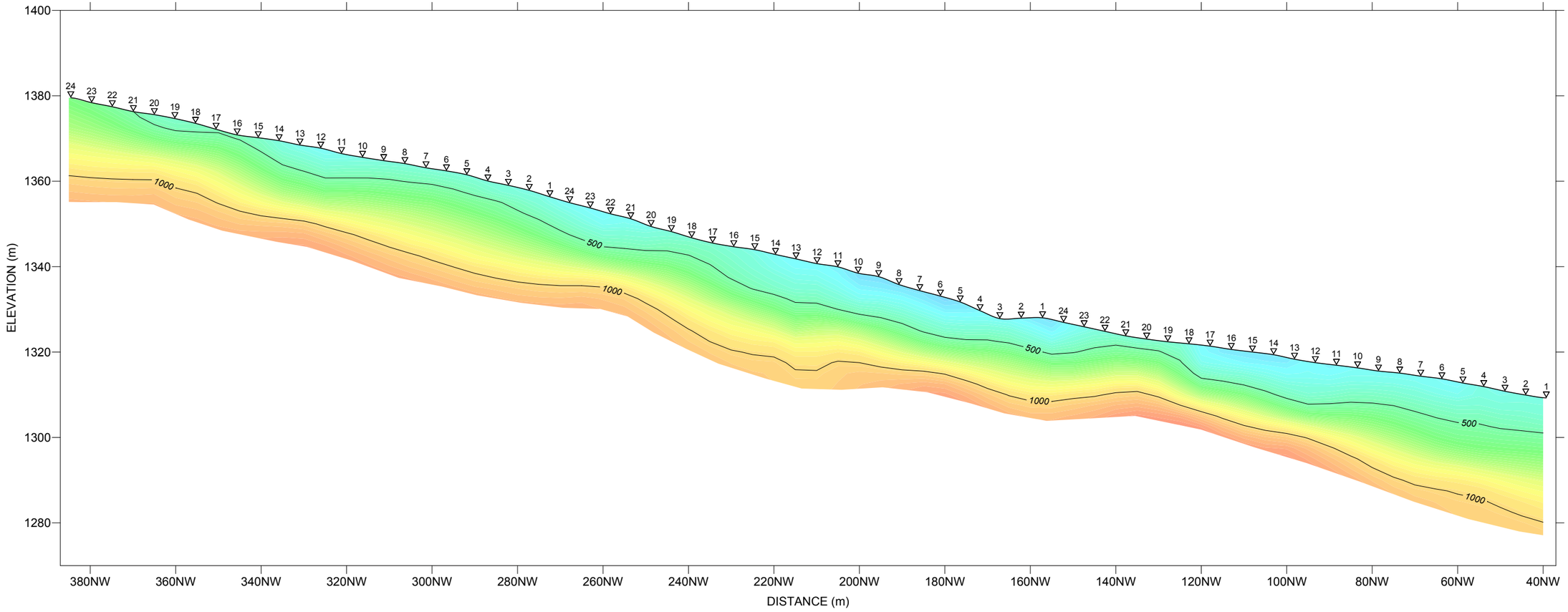
MASW SURVEY

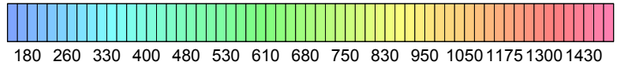
INTERPRETED MASW PROFILE
SL-102-04

FRONTIER GEOSCIENCES INC.

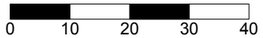
DATE: OCT. 2015	SCALE 1:1,000	FIG. 52

SL-102-05 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

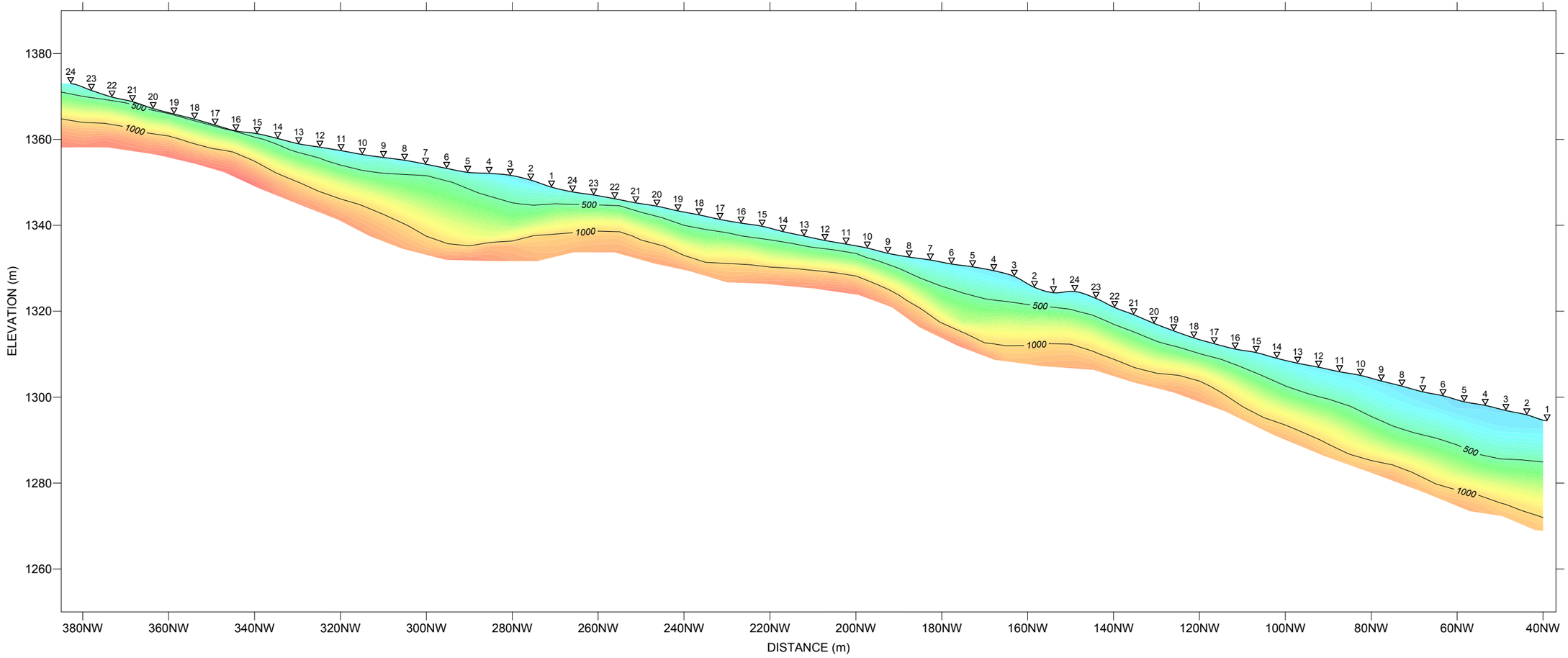
MASW SURVEY

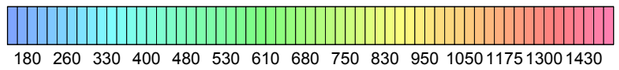
INTERPRETED MASW PROFILE
SL-102-05

FRONTIER GEOSCIENCES INC.

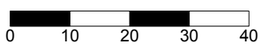
DATE: OCT. 2015	SCALE 1:1,000	FIG. 53

SL-102-06 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

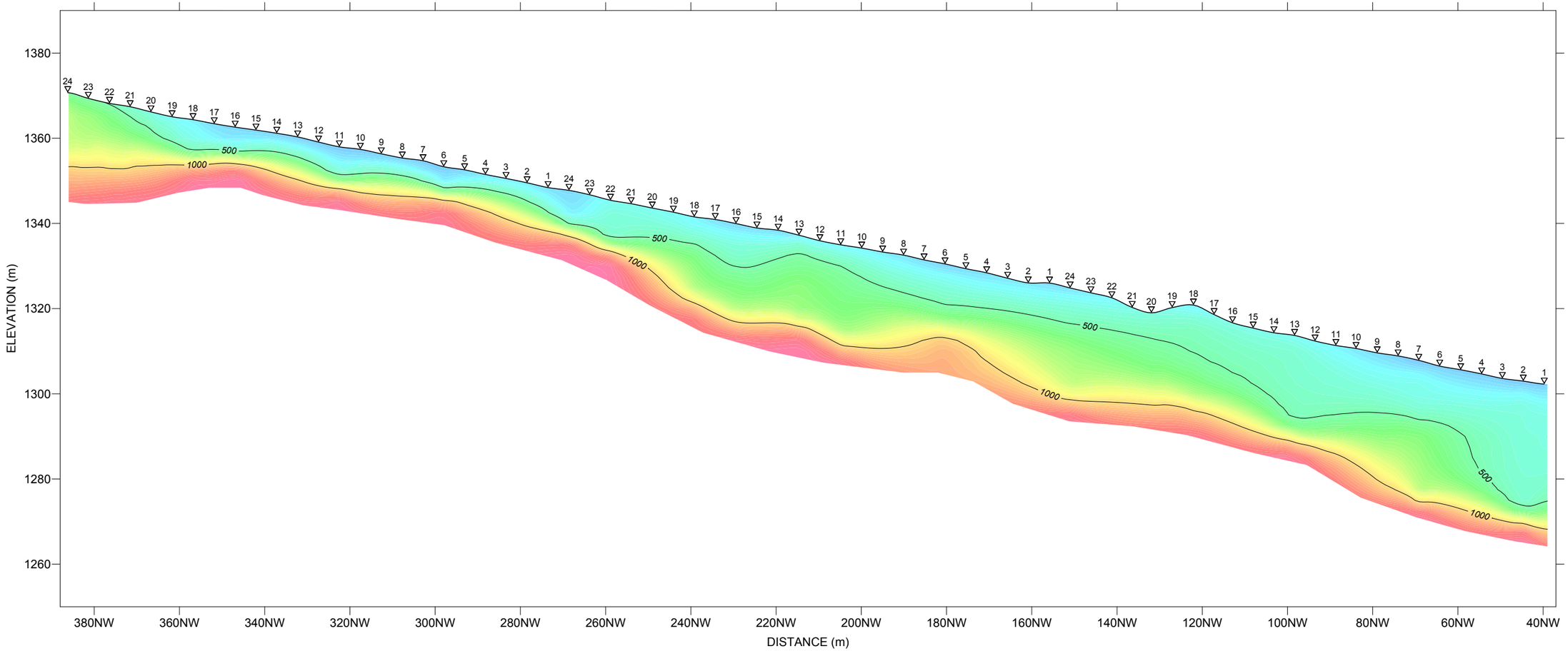
MASW SURVEY

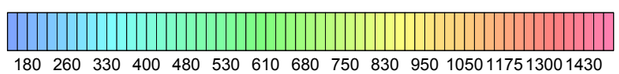
INTERPRETED MASW PROFILE
SL-102-06

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 54

SL-102-07 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

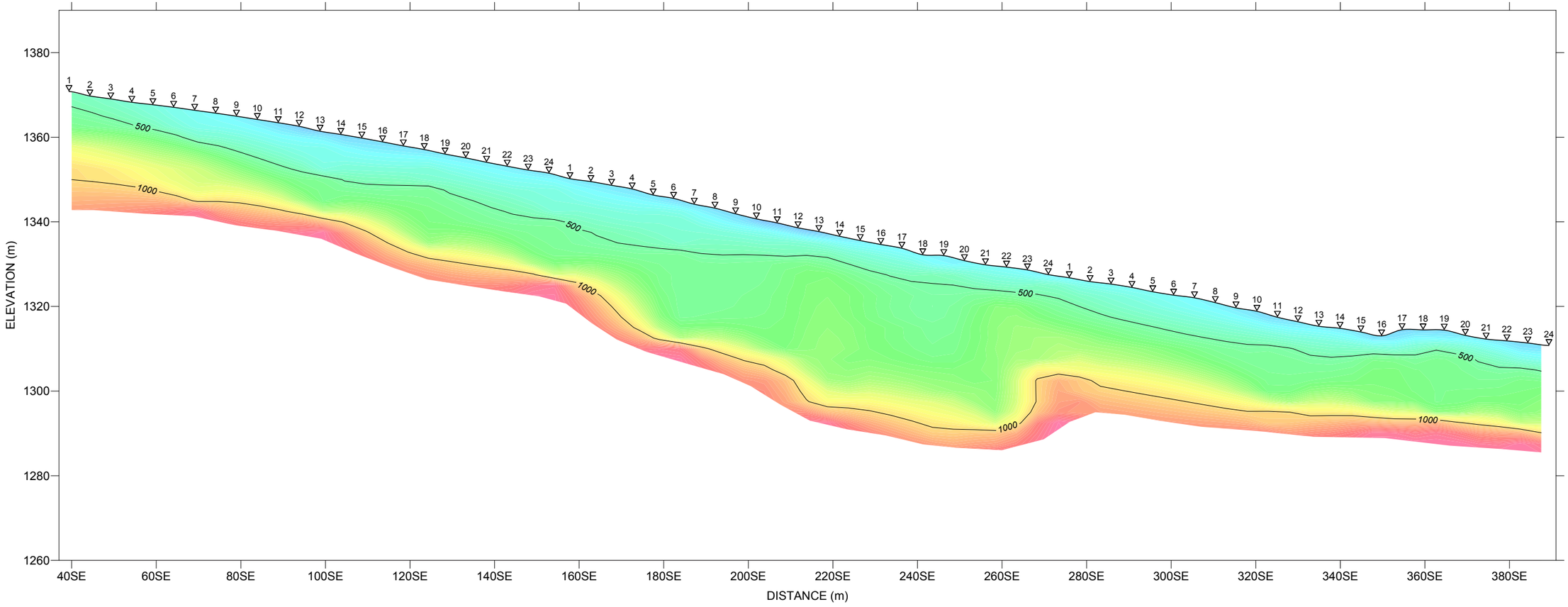
MASW SURVEY

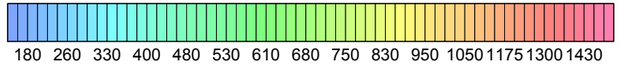
INTERPRETED MASW PROFILE
SL-102-07

FRONTIER GEOSCIENCES INC.

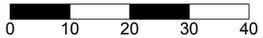
DATE: OCT. 2015	SCALE 1:1,000	FIG. 55

SL-102-08 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

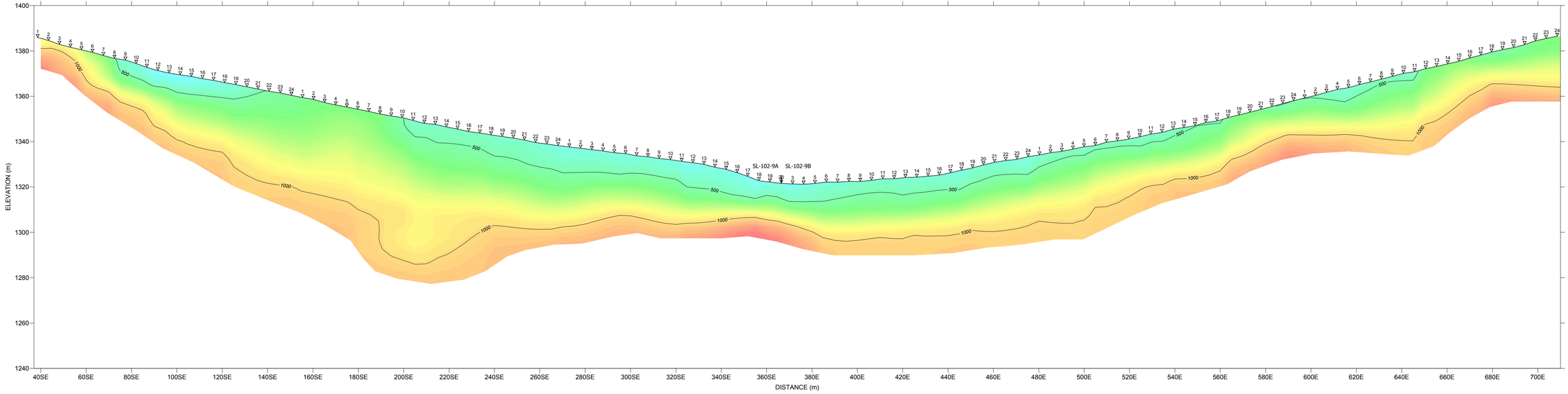
MASW SURVEY

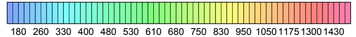
INTERPRETED MASW PROFILE
SL-102-08

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 56

SL-102-09A & SL-102-09B MASW PROFILE



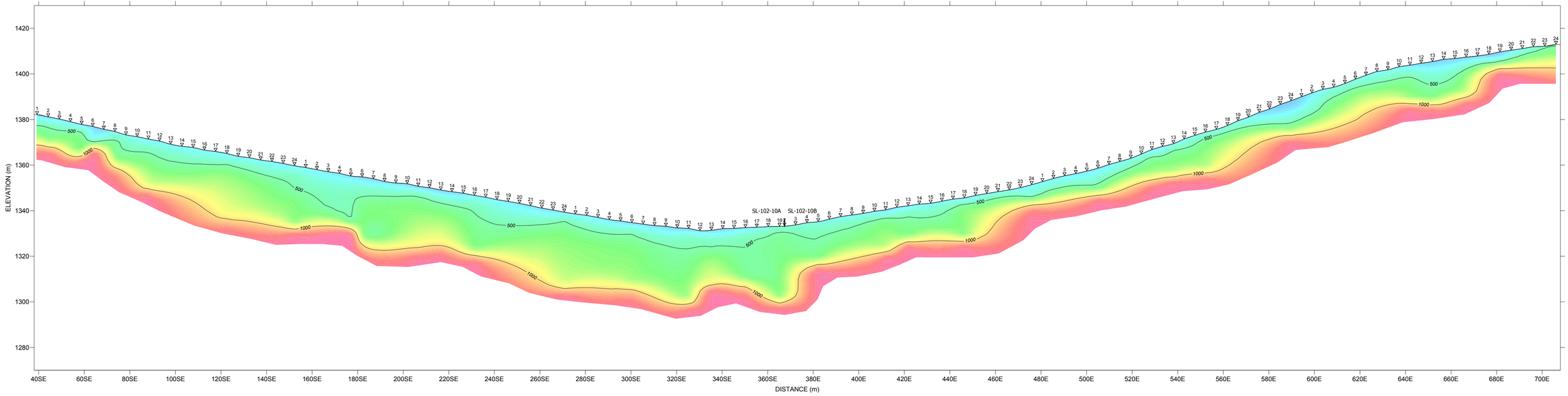


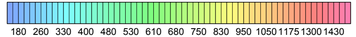


NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL FCD AREA, FARO MINE REMEDIATION PROJECT		
MASW SURVEY		
INTERPRETED MASW PROFILE SL-102-09A & SL-102-09B		
FRONTIER GEOSCIENCES INC.		
DATE: OCT. 2015	SCALE 1:1,000	FIG. 57

SL-102-10A & SL-102-10B MASW PROFILE



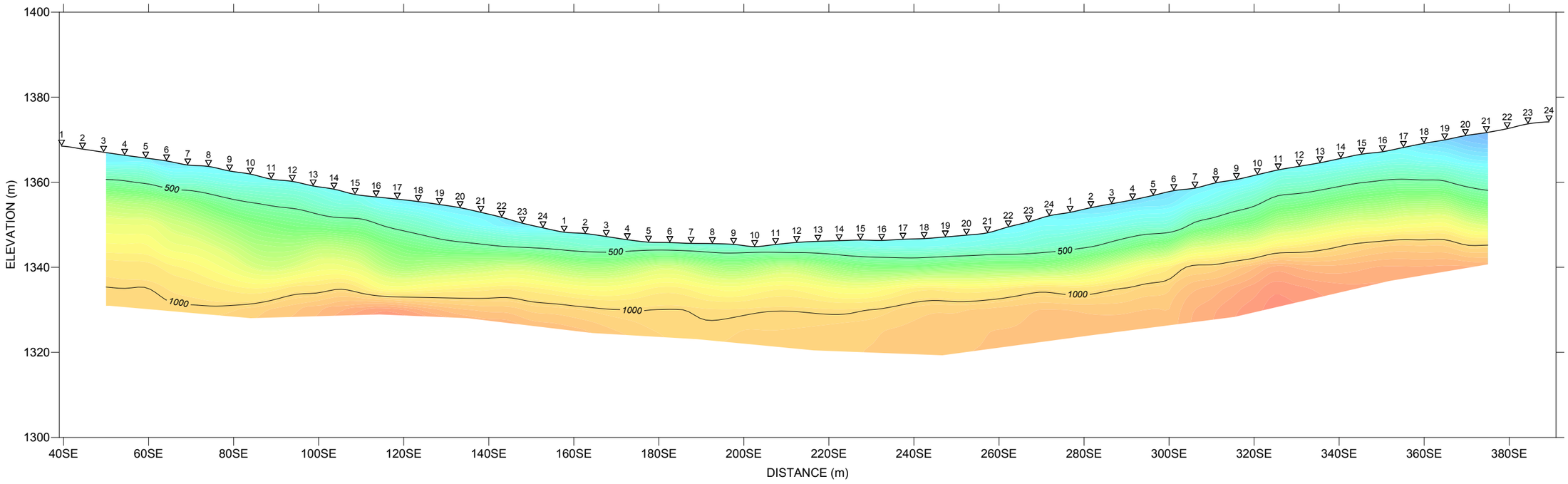


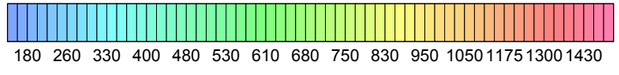


NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

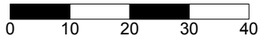
CH2MHILL FCD AREA, FARO MINE REMEDIATION PROJECT		
MASW SURVEY		
INTERPRETED MASW PROFILE SL-102-10A & SL-102-10B		
FRONTIER GEOSCIENCES INC.		
DATE: OCT. 2015	SCALE 1:1,000	FIG. 35

SL-102-11 MASW PROFILE





S-WAVE VELOCITY (m/s)

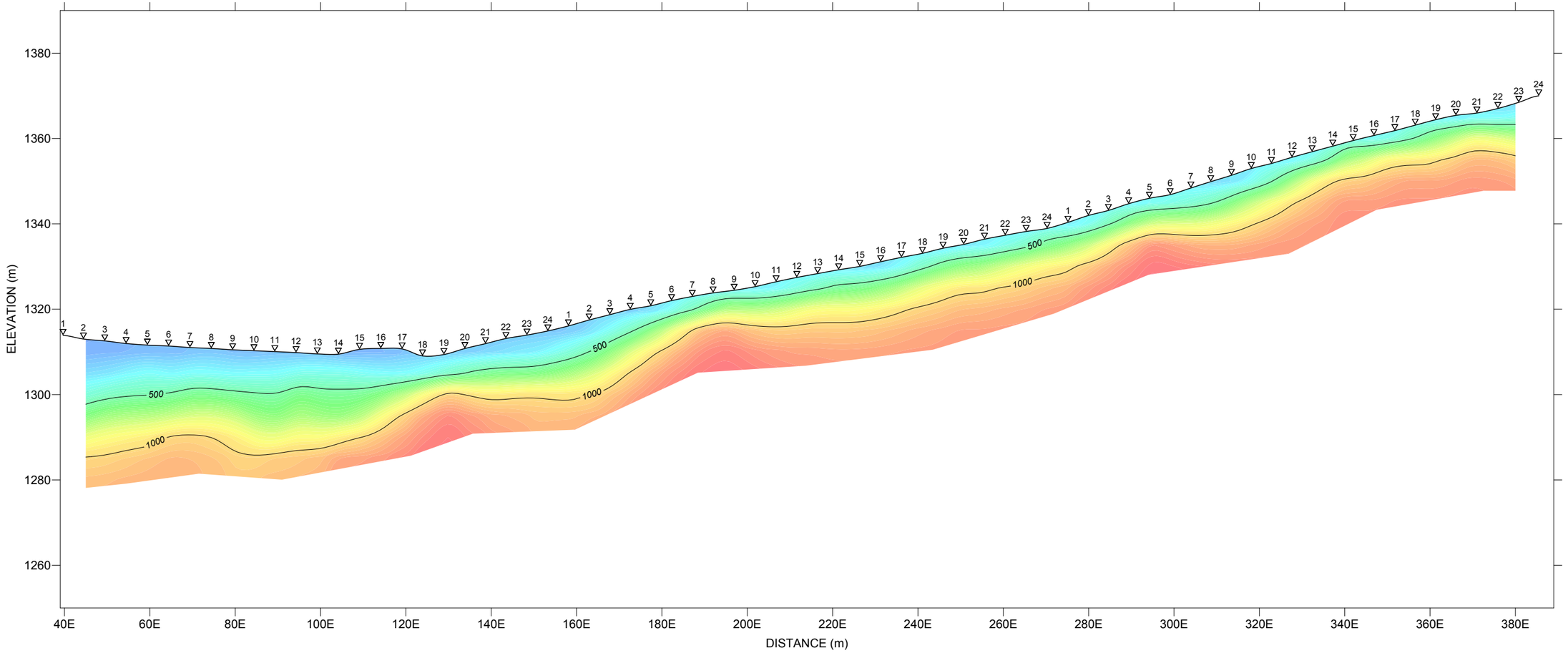


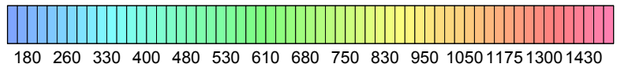
METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL		
FCD AREA, FARO MINE REMEDIATION PROJECT		
MASW SURVEY		
INTERPRETED MASW PROFILE SL-102-11		
FRONTIER GEOSCIENCES INC.		
DATE: OCT. 2015	SCALE 1:1,000	FIG. 59

SL-102-12 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

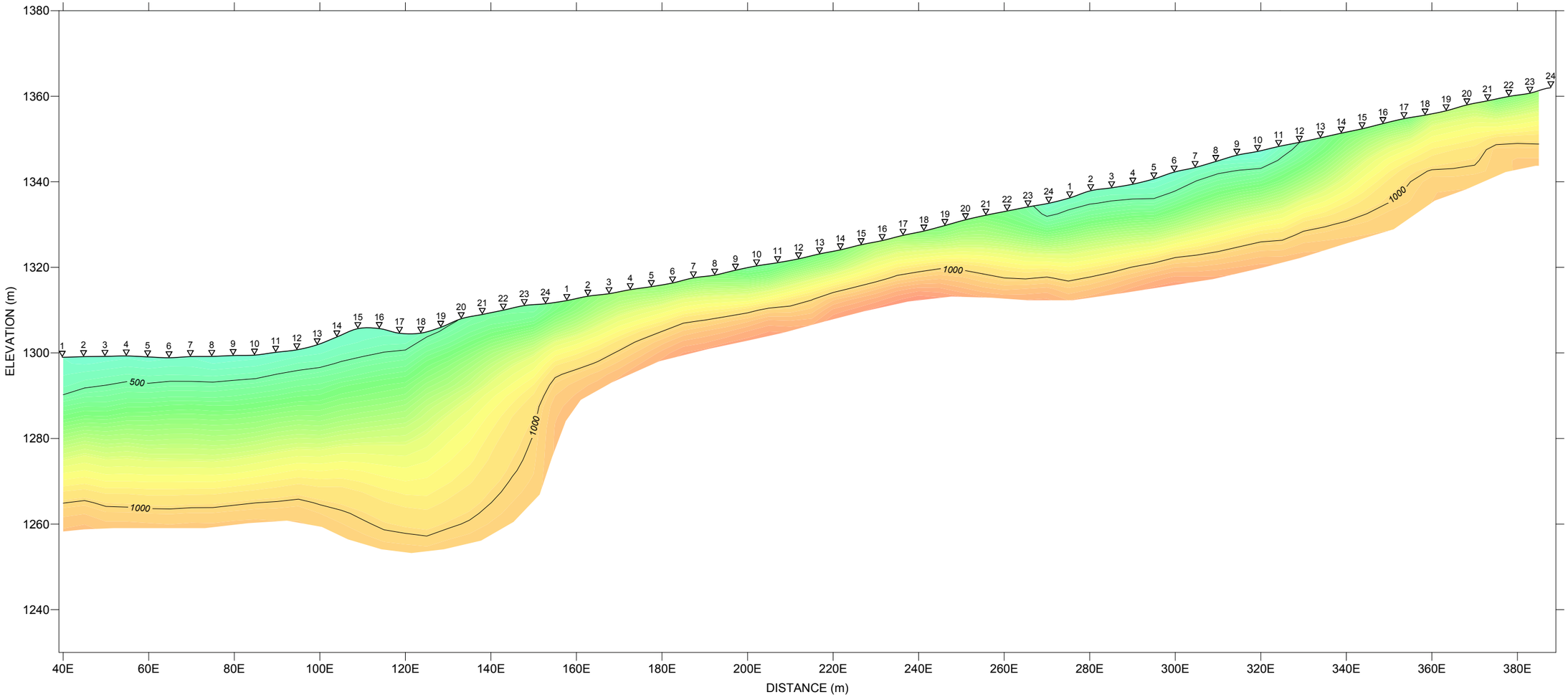
MASW SURVEY

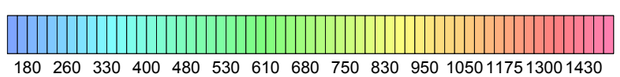
INTERPRETED MASW PROFILE
SL-102-12

FRONTIER GEOSCIENCES INC.

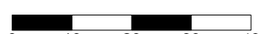
DATE: OCT. 2015	SCALE 1:1,000	FIG. 60

SL-102-13 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

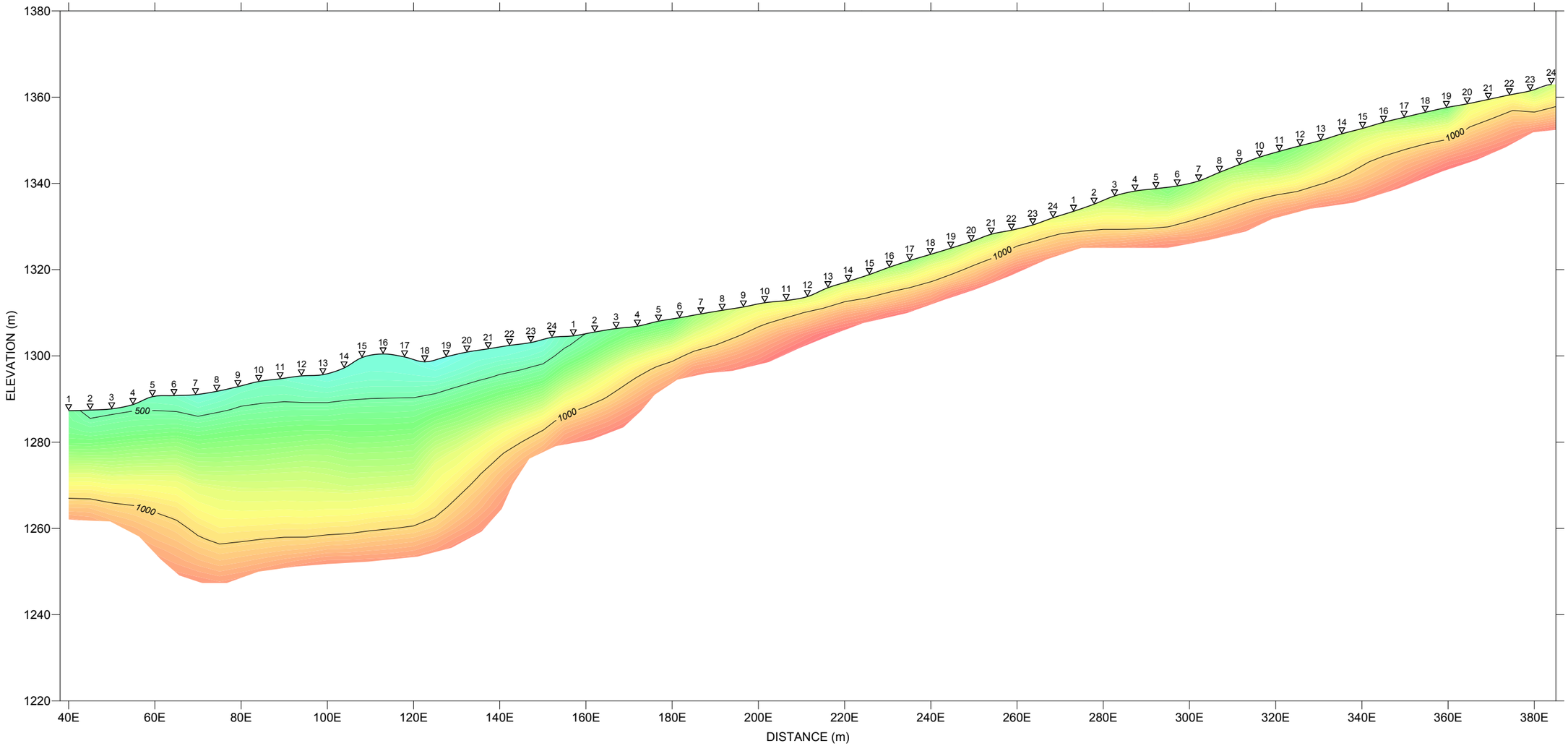
MASW SURVEY

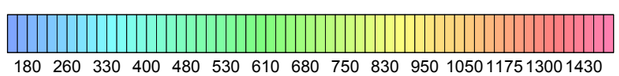
INTERPRETED MASW PROFILE
SL-102-13

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 61

SL-102-14 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

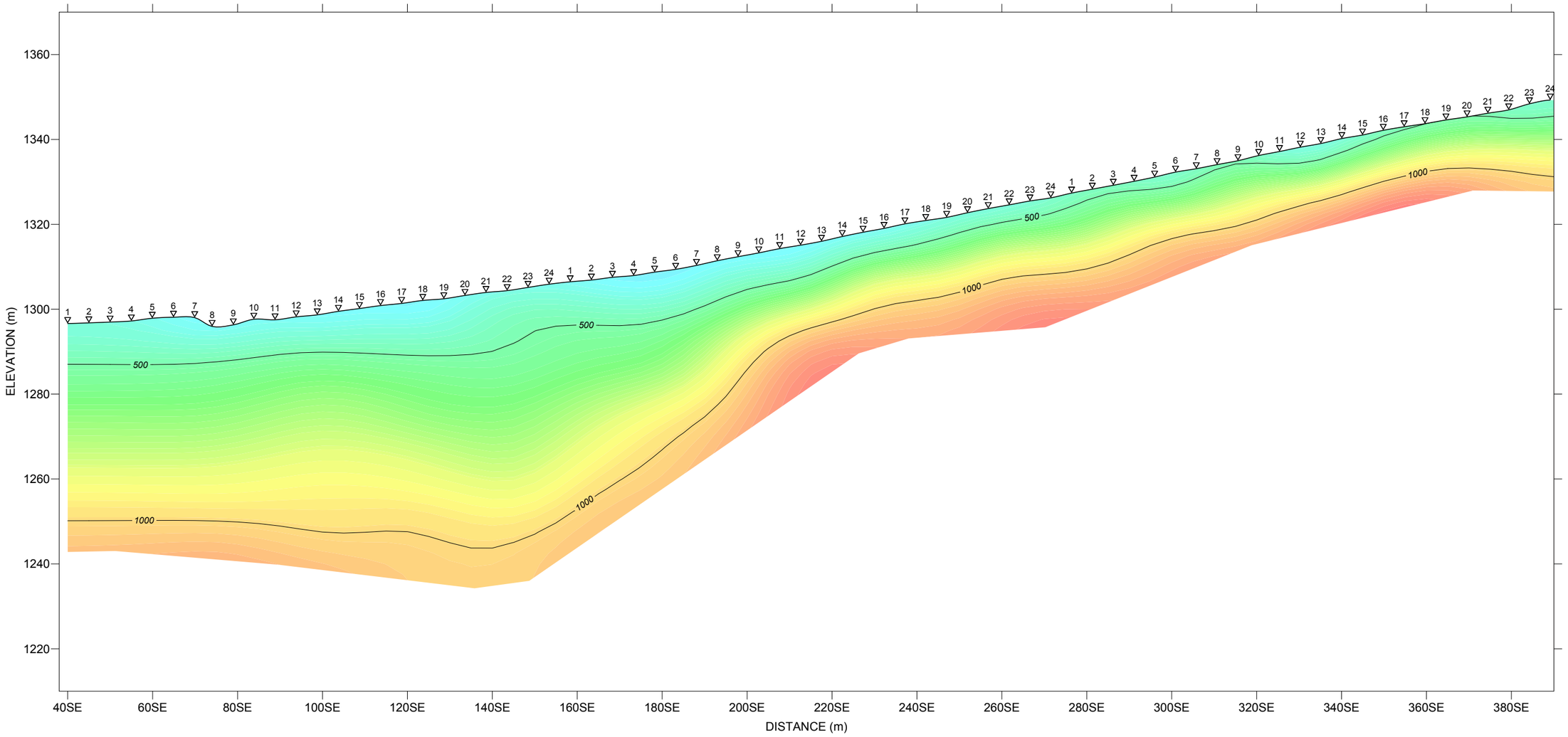
MASW SURVEY

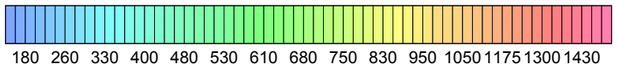
INTERPRETED MASW PROFILE
SL-102-14

FRONTIER GEOSCIENCES INC.

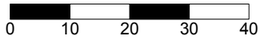
DATE: OCT. 2015	SCALE 1:1,000	FIG. 62

SL-102-15 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

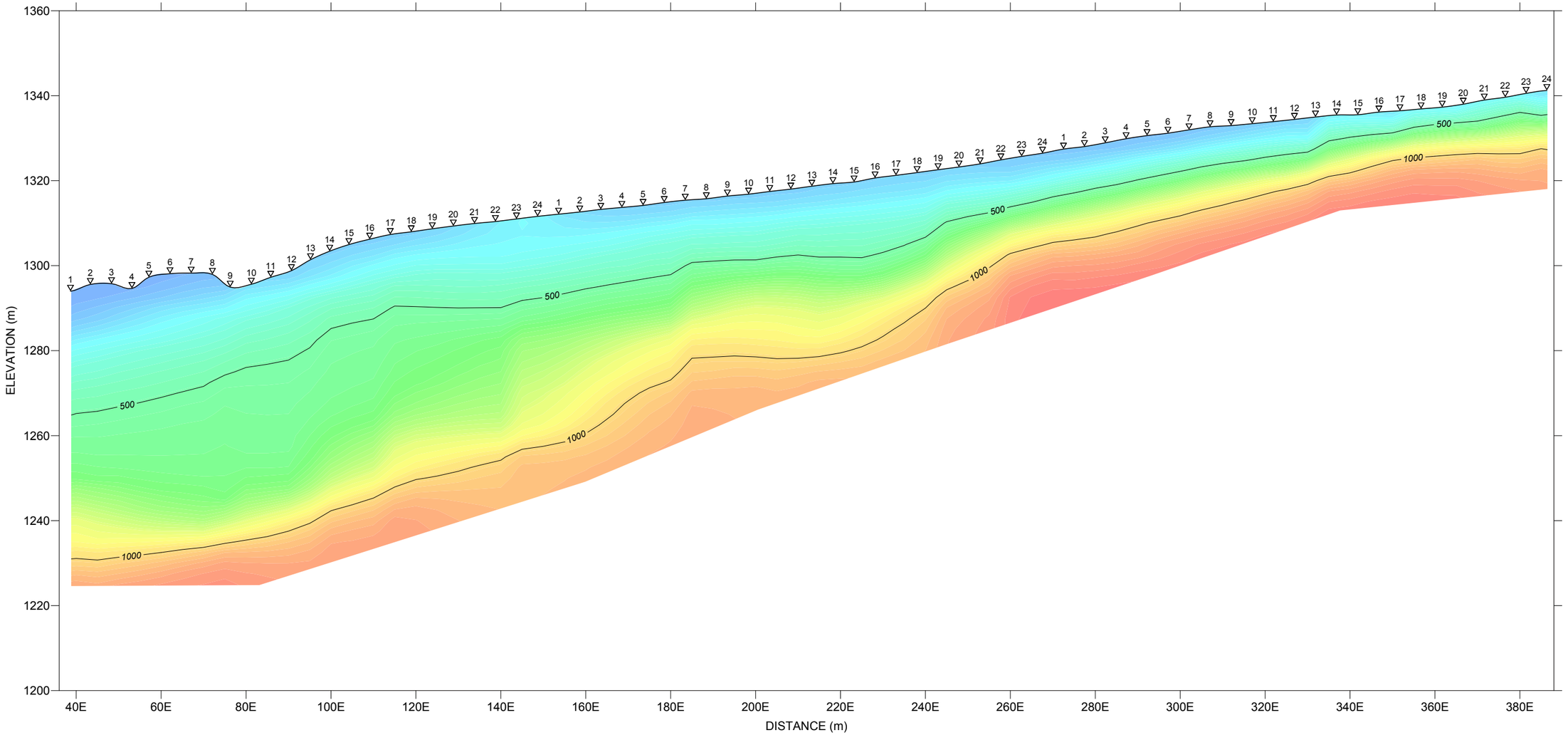
MASW SURVEY

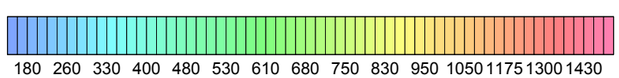
INTERPRETED MASW PROFILE
SL-102-15

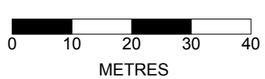
FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 63

SL-102-16 MASW PROFILE







NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

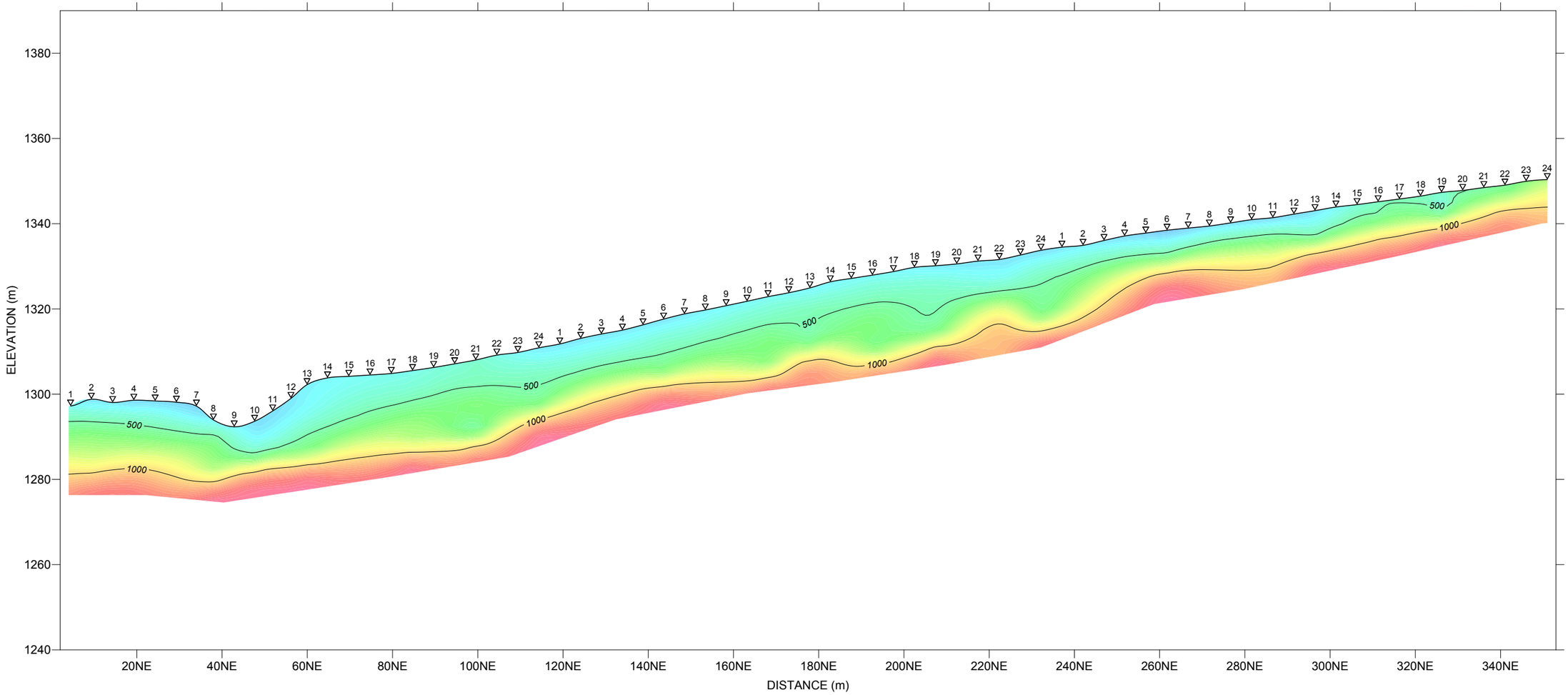
MASW SURVEY

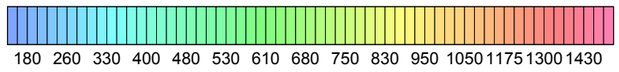
INTERPRETED MASW PROFILE
SL-102-16

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 64

SL-102-17 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

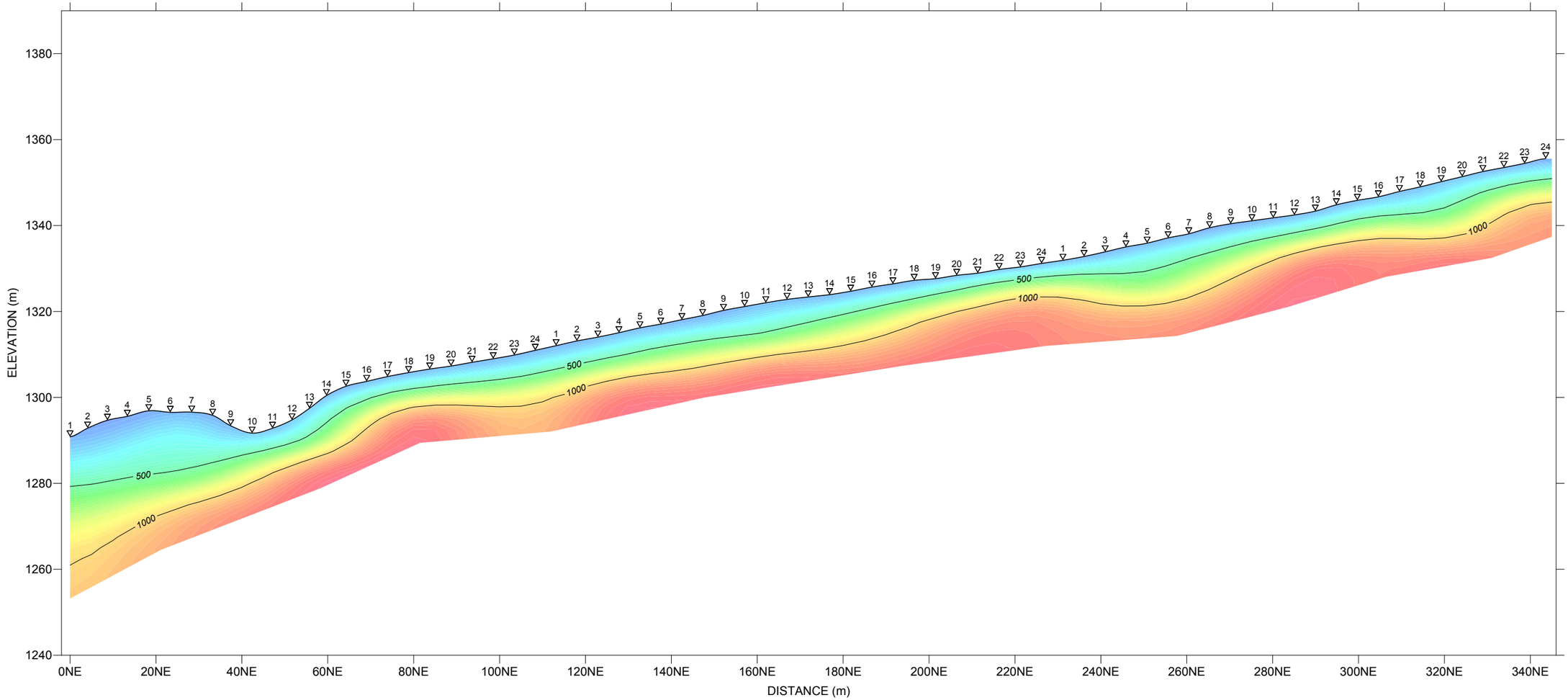
MASW SURVEY

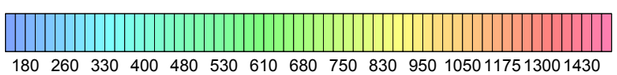
INTERPRETED MASW PROFILE
SL-102-17

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 65

SL-102-18 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

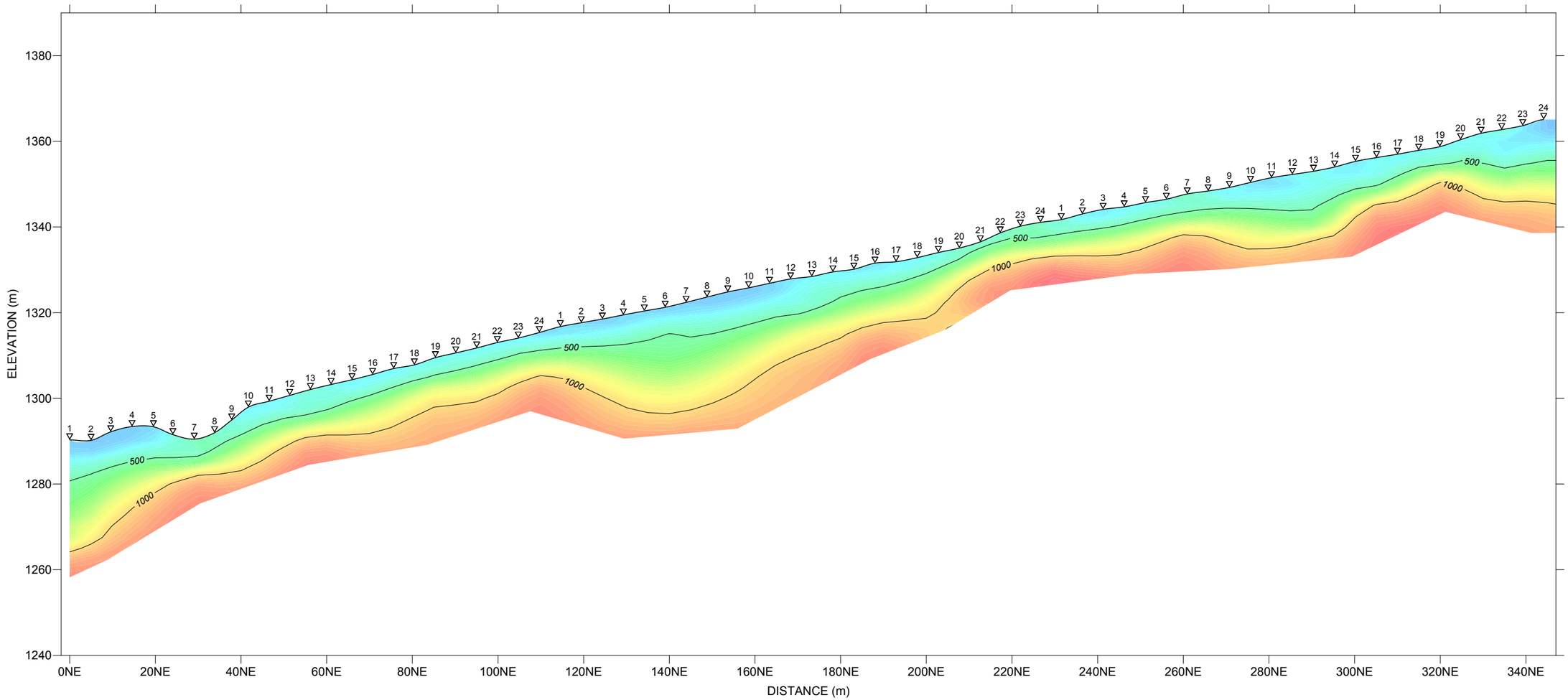
MASW SURVEY

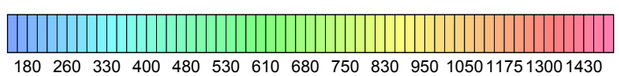
INTERPRETED MASW PROFILE
SL-102-18

FRONTIER GEOSCIENCES INC.

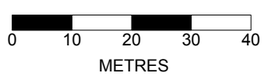
DATE: OCT. 2015	SCALE 1:1,000	FIG. 66

SL-102-19 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

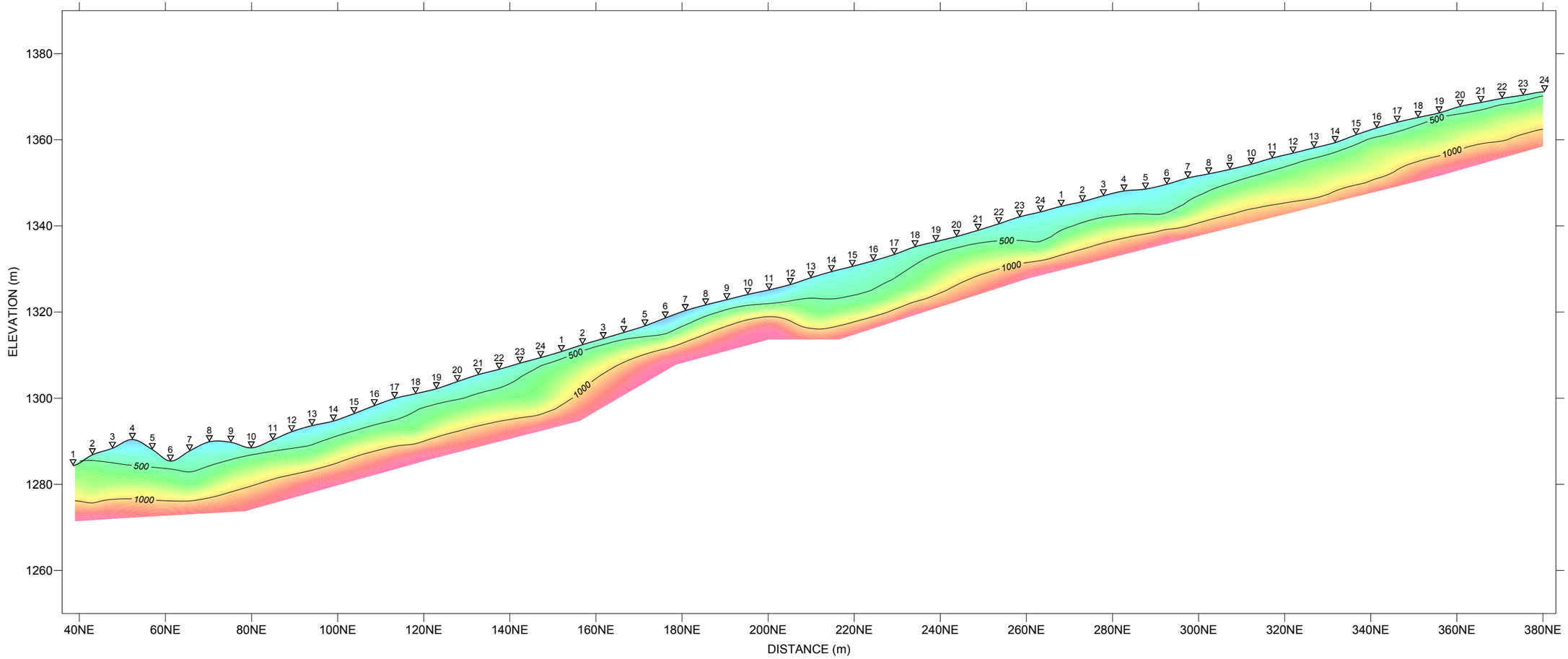
MASW SURVEY

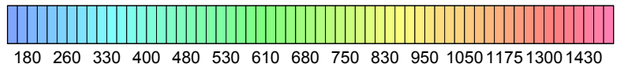
INTERPRETED MASW PROFILE
SL-102-19

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 67

SL-102-20 MASW PROFILE







NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL
FCD AREA, FARO MINE REMEDIATION PROJECT

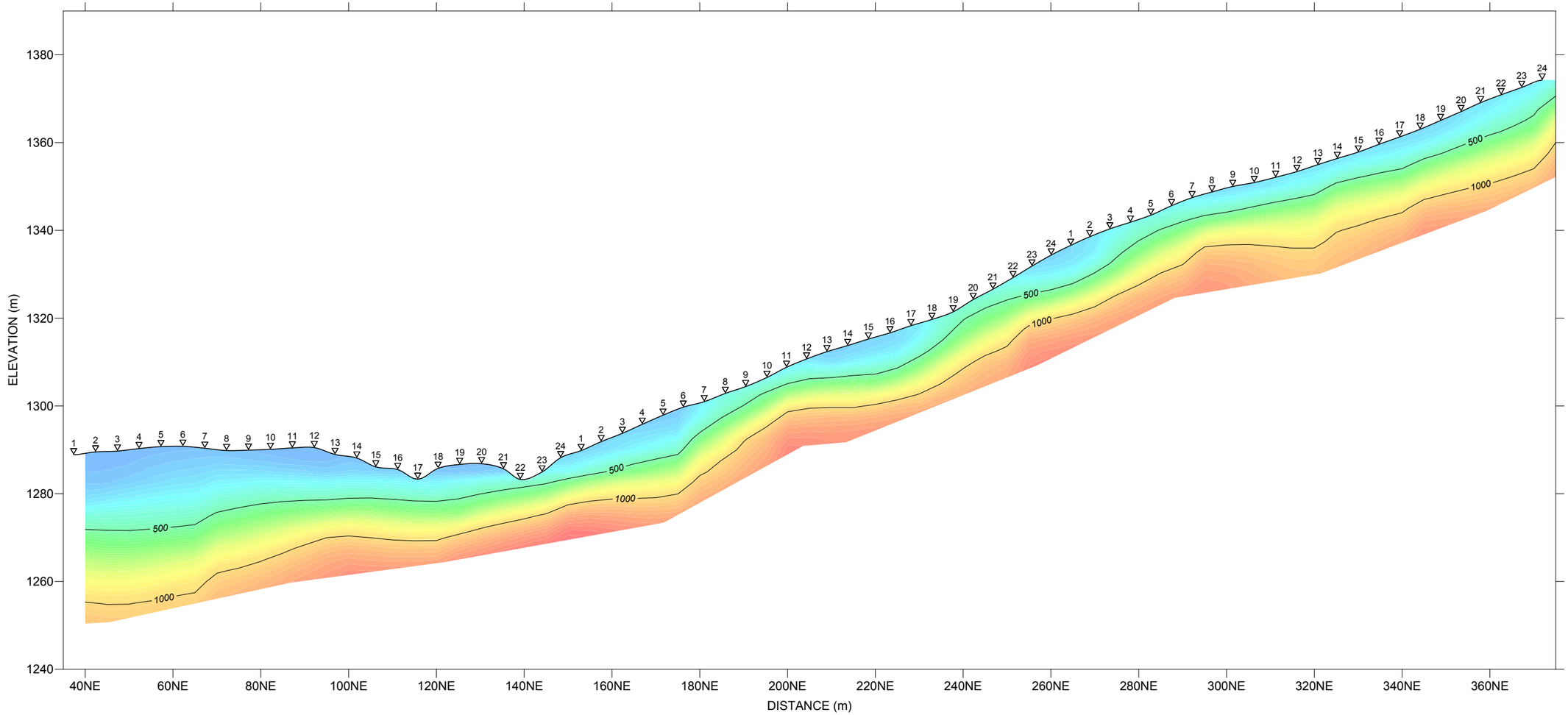
MASW SURVEY

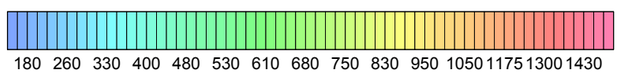
INTERPRETED MASW PROFILE
SL-102-20

FRONTIER GEOSCIENCES INC.

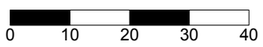
DATE: OCT. 2015	SCALE 1:1,000	FIG. 68

SL-102-21 MASW PROFILE





S-WAVE VELOCITY (m/s)



METRES

NOTE: THIS DRAWING MUST BE READ WITH REFERENCE TO PROJECT REPORT FGI-1415-FC

CH2MHILL

FCD AREA, FARO MINE REMEDIATION PROJECT

MASW SURVEY

INTERPRETED MASW PROFILE
SL-102-21

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2015	SCALE 1:1,000	FIG. 69

Attachment 4
Geochemical Analytical Laboratory Reports

CH2M HILL, INC
ATTN: Mark Cichy
2525 Airpark Drive
Redding CA 96001

Date Received: 09-MAR-16
Report Date: 30-MAR-16 13:53 (MT)
Version: FINAL

Client Phone: 530-229-3203

Certificate of Analysis

Lab Work Order #: L1742756

Project P.O. #:	660403.07.01.01.01.05.FW "PO=10201-7-100939"
Job Reference:	FARO CREEK DIV NEW ALIGNMENT DRILLING 102
C of C Numbers:	ALS08031601
Legal Site Desc:	

Amber Springer, B.Sc
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1742756-1 CH16-102-MW006_SOE							
Sampled By: CLIENT on 03-MAR-16 @ 15:45							
Matrix: Soil							
Miscellaneous Parameters							
Moisture	5.95		0.25	%		11-MAR-16	R3417849
Atterberg limits							
Liquid Limit (LL)	20		1	%	21-MAR-16	21-MAR-16	R3423013
Plasticity Index (PI)	5		1	%	21-MAR-16	21-MAR-16	R3423013
Grain Size by Hydrometer							
Grain Size Curve	SEE ATTACHED				17-MAR-16	17-MAR-16	R3422915
Gravel (4.75mm - 3in.)	36.4		1.0	%	17-MAR-16	17-MAR-16	R3422915
Coarse Sand (2.0mm - 4.75mm)	12.0		1.0	%	17-MAR-16	17-MAR-16	R3422915
Medium Sand (0.425mm - 2.0mm)	27.8		1.0	%	17-MAR-16	17-MAR-16	R3422915
Fine Sand (0.075mm - 0.425mm)	9.4		1.0	%	17-MAR-16	17-MAR-16	R3422915
Silt (0.005mm - 0.075mm)	7.7		1.0	%	17-MAR-16	17-MAR-16	R3422915
Clay (<0.005mm)	6.8		1.0	%	17-MAR-16	17-MAR-16	R3422915
L1742756-2 CH16-102-MW006_SOI							
Sampled By: CLIENT on 03-MAR-16 @ 17:30							
Matrix: Soil							
Miscellaneous Parameters							
Moisture	6.65		0.25	%		11-MAR-16	R3417849
Atterberg limits							
Liquid Limit (LL)	22		1	%	21-MAR-16	21-MAR-16	R3423013
Plasticity Index (PI)	4		1	%	21-MAR-16	21-MAR-16	R3423013
Grain Size by Hydrometer							
Grain Size Curve	SEE ATTACHED				17-MAR-16	17-MAR-16	R3422915
Gravel (4.75mm - 3in.)	25.6		1.0	%	17-MAR-16	17-MAR-16	R3422915
Coarse Sand (2.0mm - 4.75mm)	9.2		1.0	%	17-MAR-16	17-MAR-16	R3422915
Medium Sand (0.425mm - 2.0mm)	20.1		1.0	%	17-MAR-16	17-MAR-16	R3422915
Fine Sand (0.075mm - 0.425mm)	17.0		1.0	%	17-MAR-16	17-MAR-16	R3422915
Silt (0.005mm - 0.075mm)	18.3		1.0	%	17-MAR-16	17-MAR-16	R3422915
Clay (<0.005mm)	9.8		1.0	%	17-MAR-16	17-MAR-16	R3422915
L1742756-3 CH16-102-MW006_SOQ							
Sampled By: CLIENT on 04-MAR-16 @ 15:25							
Matrix: Soil							
Metals in Soil (CCME)							
Mercury in Soil by CVAFS							
Mercury (Hg)	0.0102		0.0050	mg/kg	11-MAR-16	17-MAR-16	R3421057
Metals in Soil by CRC ICPMS							
Aluminum (Al)	9070		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Antimony (Sb)	0.37		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Arsenic (As)	4.65		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Barium (Ba)	127		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Beryllium (Be)	0.58		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Bismuth (Bi)	0.47		0.20	mg/kg	11-MAR-16	17-MAR-16	R3421933
Boron (B)	<5.0		5.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Cadmium (Cd)	0.250		0.020	mg/kg	11-MAR-16	17-MAR-16	R3421933
Calcium (Ca)	2400		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Chromium (Cr)	16.7		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Cobalt (Co)	6.01		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Copper (Cu)	12.2		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Iron (Fe)	16200		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Lead (Pb)	10.3		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Lithium (Li)	21.6		2.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Magnesium (Mg)	3180		20	mg/kg	11-MAR-16	17-MAR-16	R3421933

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1742756-3 CH16-102-MW006_SOQ							
Sampled By: CLIENT on 04-MAR-16 @ 15:25							
Matrix: Soil							
Metals in Soil by CRC ICPMS							
Manganese (Mn)	241		1.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Molybdenum (Mo)	0.86		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Nickel (Ni)	13.8		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Phosphorus (P)	493		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Potassium (K)	1420		100	mg/kg	11-MAR-16	17-MAR-16	R3421933
Selenium (Se)	0.56		0.20	mg/kg	11-MAR-16	17-MAR-16	R3421933
Silver (Ag)	<0.10		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Sodium (Na)	118		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Strontium (Sr)	13.7		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Thallium (Tl)	0.170		0.050	mg/kg	11-MAR-16	17-MAR-16	R3421933
Tin (Sn)	<2.0		2.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Titanium (Ti)	486		1.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Uranium (U)	1.56		0.050	mg/kg	11-MAR-16	17-MAR-16	R3421933
Vanadium (V)	27.9		0.20	mg/kg	11-MAR-16	17-MAR-16	R3421933
Zinc (Zn)	56.8		2.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Zirconium (Zr)	5.8		1.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
pH in Soil (1:2 Soil:Water Extraction)							
pH (1:2 soil:water)	7.80		0.10	pH		14-MAR-16	R3419077
Miscellaneous Parameters							
Sulfur (S)-Total	1800		500	mg/kg	17-MAR-16	17-MAR-16	R3421095
Paste pH	7.35		0.10	pH		15-MAR-16	R3419804
L1742756-4 CH16-102-MW003_SOA							
Sampled By: CLIENT on 05-MAR-16 @ 10:30							
Matrix: Soil							
Miscellaneous Parameters							
Moisture	2.79		0.25	%		11-MAR-16	R3417849
Grain Size by Hydrometer							
Grain Size Curve	SEE ATTACHED				17-MAR-16	17-MAR-16	R3422915
Gravel (4.75mm - 3in.)	6.9		1.0	%	17-MAR-16	17-MAR-16	R3422915
Coarse Sand (2.0mm - 4.75mm)	2.7		1.0	%	17-MAR-16	17-MAR-16	R3422915
Medium Sand (0.425mm - 2.0mm)	43.4		1.0	%	17-MAR-16	17-MAR-16	R3422915
Fine Sand (0.075mm - 0.425mm)	22.1		1.0	%	17-MAR-16	17-MAR-16	R3422915
Silt (0.005mm - 0.075mm)	14.1		1.0	%	17-MAR-16	17-MAR-16	R3422915
Clay (<0.005mm)	10.9		1.0	%	17-MAR-16	17-MAR-16	R3422915
L1742756-5 CH16-102-MW003_SOB							
Sampled By: CLIENT on 05-MAR-16 @ 10:45							
Matrix: Soil							
Miscellaneous Parameters							
Moisture	6.69		0.25	%		11-MAR-16	R3417849
Atterberg limits							
Liquid Limit (LL)	28		1	%	21-MAR-16	21-MAR-16	R3423013
Plasticity Index (PI)	5		1	%	21-MAR-16	21-MAR-16	R3423013
Grain Size by Hydrometer							
Grain Size Curve	SEE ATTACHED				17-MAR-16	17-MAR-16	R3422915
Gravel (4.75mm - 3in.)	40.7		1.0	%	17-MAR-16	17-MAR-16	R3422915
Coarse Sand (2.0mm - 4.75mm)	17.5		1.0	%	17-MAR-16	17-MAR-16	R3422915
Medium Sand (0.425mm - 2.0mm)	16.4		1.0	%	17-MAR-16	17-MAR-16	R3422915
Fine Sand (0.075mm - 0.425mm)	11.0		1.0	%	17-MAR-16	17-MAR-16	R3422915
Silt (0.005mm - 0.075mm)	8.5		1.0	%	17-MAR-16	17-MAR-16	R3422915
Clay (<0.005mm)	5.9		1.0	%	17-MAR-16	17-MAR-16	R3422915

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1742756-6 CH16-102-MW003_SOC							
Sampled By: CLIENT on 05-MAR-16 @ 11:25							
Matrix: Soil							
Metals in Soil (CCME)							
Mercury in Soil by CVAFS							
Mercury (Hg)	0.0078		0.0050	mg/kg	11-MAR-16	17-MAR-16	R3421057
Metals in Soil by CRC ICPMS							
Aluminum (Al)	29600		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Antimony (Sb)	<0.10		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Arsenic (As)	2.67		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Barium (Ba)	244		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Beryllium (Be)	1.89		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Bismuth (Bi)	0.36		0.20	mg/kg	11-MAR-16	17-MAR-16	R3421933
Boron (B)	<5.0		5.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Cadmium (Cd)	0.033		0.020	mg/kg	11-MAR-16	17-MAR-16	R3421933
Calcium (Ca)	1810		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Chromium (Cr)	76.8		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Cobalt (Co)	27.1		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Copper (Cu)	38.3		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Iron (Fe)	59800		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Lead (Pb)	8.13		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Lithium (Li)	69.9		2.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Magnesium (Mg)	12800		20	mg/kg	11-MAR-16	17-MAR-16	R3421933
Manganese (Mn)	613		1.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Molybdenum (Mo)	1.14		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Nickel (Ni)	55.8		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Phosphorus (P)	525		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Potassium (K)	13000		100	mg/kg	11-MAR-16	17-MAR-16	R3421933
Selenium (Se)	<0.20		0.20	mg/kg	11-MAR-16	17-MAR-16	R3421933
Silver (Ag)	<0.10		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Sodium (Na)	243		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Strontium (Sr)	6.83		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Thallium (Tl)	0.526		0.050	mg/kg	11-MAR-16	17-MAR-16	R3421933
Tin (Sn)	<2.0		2.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Titanium (Ti)	2080		1.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Uranium (U)	1.56		0.050	mg/kg	11-MAR-16	17-MAR-16	R3421933
Vanadium (V)	79.0		0.20	mg/kg	11-MAR-16	17-MAR-16	R3421933
Zinc (Zn)	91.7		2.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Zirconium (Zr)	5.6		1.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
pH in Soil (1:2 Soil:Water Extraction)							
pH (1:2 soil:water)	7.50		0.10	pH		14-MAR-16	R3419077
Miscellaneous Parameters							
Sulfur (S)-Total	1100		500	mg/kg	17-MAR-16	17-MAR-16	R3421095
Paste pH	7.06		0.10	pH		15-MAR-16	R3419804
L1742756-7 CH16-102-MW903_SOC							
Sampled By: CLIENT on 05-MAR-16 @ 11:25							
Matrix: Soil							
Metals in Soil (CCME)							
Mercury in Soil by CVAFS							
Mercury (Hg)	<0.0050		0.0050	mg/kg	11-MAR-16	17-MAR-16	R3421057
Metals in Soil by CRC ICPMS							
Aluminum (Al)	28200		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Antimony (Sb)	<0.10		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Arsenic (As)	2.57		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Barium (Ba)	238		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1742756-7 CH16-102-MW903_SOC							
Sampled By: CLIENT on 05-MAR-16 @ 11:25							
Matrix: Soil							
Metals in Soil by CRC ICPMS							
Beryllium (Be)	1.76		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Bismuth (Bi)	0.32		0.20	mg/kg	11-MAR-16	17-MAR-16	R3421933
Boron (B)	<5.0		5.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Cadmium (Cd)	0.037		0.020	mg/kg	11-MAR-16	17-MAR-16	R3421933
Calcium (Ca)	1760		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Chromium (Cr)	74.8		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Cobalt (Co)	25.7		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Copper (Cu)	37.4		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Iron (Fe)	58100		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Lead (Pb)	7.86		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Lithium (Li)	65.5		2.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Magnesium (Mg)	12300		20	mg/kg	11-MAR-16	17-MAR-16	R3421933
Manganese (Mn)	613		1.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Molybdenum (Mo)	1.09		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Nickel (Ni)	52.9		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Phosphorus (P)	477		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Potassium (K)	12700		100	mg/kg	11-MAR-16	17-MAR-16	R3421933
Selenium (Se)	<0.20		0.20	mg/kg	11-MAR-16	17-MAR-16	R3421933
Silver (Ag)	<0.10		0.10	mg/kg	11-MAR-16	17-MAR-16	R3421933
Sodium (Na)	234		50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Strontium (Sr)	6.73		0.50	mg/kg	11-MAR-16	17-MAR-16	R3421933
Thallium (Tl)	0.505		0.050	mg/kg	11-MAR-16	17-MAR-16	R3421933
Tin (Sn)	<2.0		2.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Titanium (Ti)	1900		1.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Uranium (U)	1.45		0.050	mg/kg	11-MAR-16	17-MAR-16	R3421933
Vanadium (V)	76.1		0.20	mg/kg	11-MAR-16	17-MAR-16	R3421933
Zinc (Zn)	89.3		2.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
Zirconium (Zr)	5.5		1.0	mg/kg	11-MAR-16	17-MAR-16	R3421933
pH in Soil (1:2 Soil:Water Extraction)							
pH (1:2 soil:water)	7.50		0.10	pH		14-MAR-16	R3419077
Miscellaneous Parameters							
Sulfur (S)-Total	1100		500	mg/kg	17-MAR-16	17-MAR-16	R3421095
Paste pH	7.04		0.10	pH		15-MAR-16	R3419804

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ATTERBERG-SK	Soil	Atterberg limits	CARTER CSSS 58

The liquid limit (or upper plastic limit) is the point at which the soil becomes semifluid, like softened butter. In operational terms, the liquid limit is defined as the water content at which a trapezoidal groove cut in moist soil is closed after 25 taps on a hard rubber plate (ASTM D-18, 1958).

The plastic limit (or lower plastic limit) is defined as the water content at which soil begins to crumble on being rolled into a thread 1/8 inch (or 3 mm) in diameter. It represents the lowest water content at which soil can be deformed readily without cracking.

The plastic index (which is the difference between the liquid and plastic limits) gives an indication of the "clayeyness" or plasticity of a clay and is employed in engineering classification systems for soils.

References: McKeague, J.A. 1978. Atterberg Limits pp 50 - 55 In: Soil Sampling and Methods of Analysis. Can. Soc. Soil Sci. p. 50 - 55

GRAIN SIZE-HYD-SK	Soil	Grain Size by Hydrometer	ASTM D422-63

Particle size curve is generated from dry sieving (particles > 2 mm), wet sieving (particles 2 mm-75 um and hydrometer readings (particles < 75 um)

GRAIN SIZE-HYD-SR-SK	Soil	% Particle size passing	ASTM D422-63

Particle size curve is generated from dry sieving (particles > 2 mm), wet sieving (particles 2 mm-75 um and hydrometer readings (particles < 75 um)

HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAFS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MOISTURE-VA	Soil	Moisture content	ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PH-1:2-VA	Soil	pH in Soil (1:2 Soil:Water Extraction)	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL

This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.

PH-PASTE-VA	Soil	pH in Soil (Paste) by Meter	Carter-CSSS / APHA 4500 H

A soil extract produced by the saturated paste extraction procedure is analyzed by pH meter.

S-TOT-LECO-SK	Soil	Total Sulphur by combustion method	ISO 15178:2000

The sample is ignited in a combustion analyzer where sulfur in the reduced SO2 gas is determined using a thermal conductivity detector.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

ALS08031601

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
GRAIN SIZE-HYD-SK	**Soil**							
Batch R3422915								
WG2275884-1 DUP		**L1742756-2**						
Gravel (4.75mm - 3in.)		25.6	25.6		%	0.0	25	17-MAR-16
Coarse Sand (2.0mm - 4.75mm)		9.2	9.2		%	0.0	25	17-MAR-16
Medium Sand (0.425mm - 2.0mm)		20.1	21.0		%	4.5	25	17-MAR-16
Fine Sand (0.075mm - 0.425mm)		17.0	17.0		%	0.2	25	17-MAR-16
Silt (0.005mm - 0.075mm)		18.3	16.5		%	10	25	17-MAR-16
Clay (<0.005mm)		9.8	10.6		%	8.0	25	17-MAR-16
HG-200.2-CVAF-VA	**Soil**							
Batch R3421057								
WG2274196-4 CRM		**VA-NRC-STSD1**						
Mercury (Hg)			92.7		%		70-130	17-MAR-16
WG2274196-5 CRM		**VA-NRC-PACS3**						
Mercury (Hg)			93.7		%		70-130	17-MAR-16
WG2274196-2 DUP		**L1742756-6**						
Mercury (Hg)		0.0078	0.0057		mg/kg	30	40	17-MAR-16
WG2274196-3 LCS								
Mercury (Hg)			93.5		%		70-130	17-MAR-16
WG2274196-1 MB								
Mercury (Hg)			<0.0050		mg/kg		0.005	17-MAR-16
WG2274196-7 MS		**L1742756-3**						
Mercury (Hg)			99.0		%		70-130	17-MAR-16
MET-200.2-CCMS-VA	**Soil**							
Batch R3421933								
WG2274196-4 CRM		**VA-NRC-STSD1**						
Aluminum (Al)			104.2		%		70-130	17-MAR-16
Antimony (Sb)			102.4		%		70-130	17-MAR-16
Arsenic (As)			101.6		%		70-130	17-MAR-16
Barium (Ba)			95.0		%		70-130	17-MAR-16
Beryllium (Be)			105.9		%		70-130	17-MAR-16
Bismuth (Bi)			92.1		%		70-130	17-MAR-16
Boron (B)			104.5		%		70-130	17-MAR-16
Cadmium (Cd)			97.2		%		70-130	17-MAR-16
Calcium (Ca)			102.2		%		70-130	17-MAR-16
Chromium (Cr)			103.3		%		70-130	17-MAR-16
Cobalt (Co)			100.5		%		70-130	17-MAR-16
Copper (Cu)			99.7		%		70-130	17-MAR-16

Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-VA	**Soil**							
Batch R3421933								
WG2274196-4 CRM		**VA-NRC-STSD1**						
Iron (Fe)			100.7		%		70-130	17-MAR-16
Lead (Pb)			99.1		%		70-130	17-MAR-16
Lithium (Li)			109.1		%		70-130	17-MAR-16
Magnesium (Mg)			102.4		%		70-130	17-MAR-16
Manganese (Mn)			98.6		%		70-130	17-MAR-16
Molybdenum (Mo)			101.3		%		70-130	17-MAR-16
Nickel (Ni)			100.0		%		70-130	17-MAR-16
Phosphorus (P)			102.3		%		70-130	17-MAR-16
Potassium (K)			110.3		%		70-130	17-MAR-16
Selenium (Se)			101.6		%		70-130	17-MAR-16
Silver (Ag)			98.8		%		70-130	17-MAR-16
Sodium (Na)			113.0		%		70-130	17-MAR-16
Strontium (Sr)			104.5		%		70-130	17-MAR-16
Thallium (Tl)			99.8		%		70-130	17-MAR-16
Tin (Sn)			95.4		%		70-130	17-MAR-16
Titanium (Ti)			116.8		%		70-130	17-MAR-16
Vanadium (V)			107.6		%		70-130	17-MAR-16
Zinc (Zn)			102.3		%		70-130	17-MAR-16
WG2274196-5 CRM		**VA-NRC-PACS3**						
Aluminum (Al)			102.2		%		70-130	17-MAR-16
Antimony (Sb)			97.0		%		70-130	17-MAR-16
Arsenic (As)			90.5		%		70-130	17-MAR-16
Barium (Ba)			99.1		%		70-130	17-MAR-16
Beryllium (Be)			98.0		%		70-130	17-MAR-16
Boron (B)			100.2		%		70-130	17-MAR-16
Cadmium (Cd)			92.5		%		70-130	17-MAR-16
Calcium (Ca)			100.2		%		70-130	17-MAR-16
Chromium (Cr)			97.3		%		70-130	17-MAR-16
Cobalt (Co)			96.6		%		70-130	17-MAR-16
Copper (Cu)			99.4		%		70-130	17-MAR-16
Iron (Fe)			97.9		%		70-130	17-MAR-16
Lead (Pb)			101.5		%		70-130	17-MAR-16
Lithium (Li)			96.6		%		70-130	17-MAR-16
Magnesium (Mg)			104.2		%		70-130	17-MAR-16

Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-VA	**Soil**							
Batch R3421933								
WG2274196-5 CRM		**VA-NRC-PACS3**						
Manganese (Mn)			94.4		%		70-130	17-MAR-16
Molybdenum (Mo)			90.3		%		70-130	17-MAR-16
Nickel (Ni)			96.8		%		70-130	17-MAR-16
Phosphorus (P)			95.0		%		70-130	17-MAR-16
Potassium (K)			100.5		%		70-130	17-MAR-16
Selenium (Se)			99.9		%		70-130	17-MAR-16
Silver (Ag)			107.9		%		70-130	17-MAR-16
Sodium (Na)			96.1		%		70-130	17-MAR-16
Strontium (Sr)			99.7		%		70-130	17-MAR-16
Thallium (Tl)			98.5		%		70-130	17-MAR-16
Tin (Sn)			86.3		%		70-130	17-MAR-16
Titanium (Ti)			100.6		%		70-130	17-MAR-16
Uranium (U)			98.7		%		70-130	17-MAR-16
Vanadium (V)			100.2		%		70-130	17-MAR-16
Zinc (Zn)			100.6		%		70-130	17-MAR-16
Zirconium (Zr)			95.3		%		70-130	17-MAR-16
WG2274196-2 DUP		**L1742756-6**						
Aluminum (Al)		29600	29000		mg/kg	2.2	40	17-MAR-16
Antimony (Sb)		<0.10	<0.10	RPD-NA	mg/kg	N/A	30	17-MAR-16
Arsenic (As)		2.67	2.60		mg/kg	2.7	30	17-MAR-16
Barium (Ba)		244	246		mg/kg	0.9	40	17-MAR-16
Beryllium (Be)		1.89	1.86		mg/kg	1.3	30	17-MAR-16
Bismuth (Bi)		0.36	0.34		mg/kg	4.0	30	17-MAR-16
Boron (B)		<5.0	<5.0	RPD-NA	mg/kg	N/A	30	17-MAR-16
Cadmium (Cd)		0.033	0.034		mg/kg	3.3	30	17-MAR-16
Calcium (Ca)		1810	1820		mg/kg	0.5	30	17-MAR-16
Chromium (Cr)		76.8	76.4		mg/kg	0.6	30	17-MAR-16
Cobalt (Co)		27.1	26.8		mg/kg	1.3	30	17-MAR-16
Copper (Cu)		38.3	39.5		mg/kg	3.0	30	17-MAR-16
Iron (Fe)		59800	59300		mg/kg	0.9	30	17-MAR-16
Lead (Pb)		8.13	8.00		mg/kg	1.6	40	17-MAR-16
Lithium (Li)		69.9	69.2		mg/kg	1.0	30	17-MAR-16
Magnesium (Mg)		12800	12400		mg/kg	2.8	30	17-MAR-16

Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-VA	**Soil**							
Batch R3421933								
WG2274196-2 DUP		**L1742756-6**						
Manganese (Mn)		613	609		mg/kg	0.7	30	17-MAR-16
Molybdenum (Mo)		1.14	1.16		mg/kg	1.9	40	17-MAR-16
Nickel (Ni)		55.8	55.0		mg/kg	1.5	30	17-MAR-16
Phosphorus (P)		525	511		mg/kg	2.8	30	17-MAR-16
Potassium (K)		13000	12900		mg/kg	0.9	40	17-MAR-16
Selenium (Se)		<0.20	<0.20	RPD-NA	mg/kg	N/A	30	17-MAR-16
Silver (Ag)		<0.10	<0.10	RPD-NA	mg/kg	N/A	40	17-MAR-16
Sodium (Na)		243	232		mg/kg	4.6	40	17-MAR-16
Strontium (Sr)		6.83	6.77		mg/kg	0.9	40	17-MAR-16
Thallium (Tl)		0.526	0.522		mg/kg	0.8	30	17-MAR-16
Tin (Sn)		<2.0	<2.0	RPD-NA	mg/kg	N/A	40	17-MAR-16
Titanium (Ti)		2080	2050		mg/kg	1.1	40	17-MAR-16
Uranium (U)		1.56	1.48		mg/kg	5.5	30	17-MAR-16
Vanadium (V)		79.0	77.6		mg/kg	1.8	30	17-MAR-16
Zinc (Zn)		91.7	91.3		mg/kg	0.4	30	17-MAR-16
Zirconium (Zr)		5.6	5.7		mg/kg	2.1	30	17-MAR-16
WG2274196-3 LCS								
Aluminum (Al)			100.2		%		70-130	17-MAR-16
Antimony (Sb)			95.4		%		70-130	17-MAR-16
Arsenic (As)			99.1		%		70-130	17-MAR-16
Barium (Ba)			98.5		%		70-130	17-MAR-16
Beryllium (Be)			95.3		%		70-130	17-MAR-16
Bismuth (Bi)			94.3		%		70-130	17-MAR-16
Boron (B)			93.6		%		70-130	17-MAR-16
Cadmium (Cd)			94.5		%		70-130	17-MAR-16
Calcium (Ca)			96.9		%		70-130	17-MAR-16
Chromium (Cr)			97.7		%		70-130	17-MAR-16
Cobalt (Co)			97.0		%		70-130	17-MAR-16
Copper (Cu)			95.7		%		70-130	17-MAR-16
Iron (Fe)			96.4		%		70-130	17-MAR-16
Lead (Pb)			95.5		%		70-130	17-MAR-16
Lithium (Li)			94.8		%		70-130	17-MAR-16
Magnesium (Mg)			96.8		%		70-130	17-MAR-16

Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-VA	**Soil**							
Batch R3421933								
WG2274196-3 LCS								
Manganese (Mn)			96.8		%		70-130	17-MAR-16
Molybdenum (Mo)			96.4		%		70-130	17-MAR-16
Nickel (Ni)			95.7		%		70-130	17-MAR-16
Phosphorus (P)			104.3		%		70-130	17-MAR-16
Potassium (K)			98.8		%		70-130	17-MAR-16
Selenium (Se)			96.6		%		70-130	17-MAR-16
Silver (Ag)			92.7		%		70-130	17-MAR-16
Sodium (Na)			98.7		%		70-130	17-MAR-16
Strontium (Sr)			95.3		%		70-130	17-MAR-16
Thallium (Tl)			95.8		%		70-130	17-MAR-16
Tin (Sn)			94.4		%		70-130	17-MAR-16
Titanium (Ti)			97.0		%		70-130	17-MAR-16
Uranium (U)			91.4		%		70-130	17-MAR-16
Vanadium (V)			100.9		%		70-130	17-MAR-16
Zinc (Zn)			91.3		%		70-130	17-MAR-16
Zirconium (Zr)			91.7		%		70-130	17-MAR-16
WG2274196-1 MB								
Aluminum (Al)			<50		mg/kg		50	18-MAR-16
Antimony (Sb)			<0.10		mg/kg		0.1	18-MAR-16
Arsenic (As)			<0.10		mg/kg		0.1	18-MAR-16
Barium (Ba)			<0.50		mg/kg		0.5	18-MAR-16
Beryllium (Be)			<0.10		mg/kg		0.1	18-MAR-16
Bismuth (Bi)			<0.20		mg/kg		0.2	18-MAR-16
Boron (B)			<5.0		mg/kg		5	18-MAR-16
Cadmium (Cd)			<0.020		mg/kg		0.02	18-MAR-16
Calcium (Ca)			<50		mg/kg		50	18-MAR-16
Chromium (Cr)			<0.50		mg/kg		0.5	18-MAR-16
Cobalt (Co)			<0.10		mg/kg		0.1	18-MAR-16
Copper (Cu)			<0.50		mg/kg		0.5	18-MAR-16
Iron (Fe)			<50		mg/kg		50	18-MAR-16
Lead (Pb)			<0.50		mg/kg		0.5	18-MAR-16
Lithium (Li)			<2.0		mg/kg		2	18-MAR-16
Magnesium (Mg)			<20		mg/kg		20	18-MAR-16
Manganese (Mn)			<1.0		mg/kg		1	18-MAR-16

Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-VA	**Soil**							
Batch R3421933								
WG2274196-1 MB								
Molybdenum (Mo)			<0.10		mg/kg		0.1	18-MAR-16
Nickel (Ni)			<0.50		mg/kg		0.5	18-MAR-16
Phosphorus (P)			<50		mg/kg		50	18-MAR-16
Potassium (K)			<100		mg/kg		100	18-MAR-16
Selenium (Se)			<0.20		mg/kg		0.2	18-MAR-16
Silver (Ag)			<0.10		mg/kg		0.1	18-MAR-16
Sodium (Na)			<50		mg/kg		50	18-MAR-16
Strontium (Sr)			<0.50		mg/kg		0.5	18-MAR-16
Thallium (Tl)			<0.050		mg/kg		0.05	18-MAR-16
Tin (Sn)			<2.0		mg/kg		2	18-MAR-16
Titanium (Ti)			<1.0		mg/kg		1	18-MAR-16
Uranium (U)			<0.050		mg/kg		0.05	18-MAR-16
Vanadium (V)			<0.20		mg/kg		0.2	18-MAR-16
Zinc (Zn)			<2.0		mg/kg		2	18-MAR-16
Zirconium (Zr)			<1.0		mg/kg		1	18-MAR-16
WG2274196-7 MS		**L1742756-3**						
Aluminum (Al)			N/A	MS-B	%		-	17-MAR-16
Antimony (Sb)			97.1		%		70-130	17-MAR-16
Arsenic (As)			97.1		%		70-130	17-MAR-16
Barium (Ba)			97.9		%		70-130	17-MAR-16
Beryllium (Be)			88.4		%		70-130	17-MAR-16
Bismuth (Bi)			95.2		%		70-130	17-MAR-16
Boron (B)			84.9		%		70-130	17-MAR-16
Cadmium (Cd)			97.0		%		70-130	17-MAR-16
Calcium (Ca)			N/A	MS-B	%		-	17-MAR-16
Chromium (Cr)			96.8		%		70-130	17-MAR-16
Cobalt (Co)			96.6		%		70-130	17-MAR-16
Copper (Cu)			93.5		%		70-130	17-MAR-16
Iron (Fe)			N/A	MS-B	%		-	17-MAR-16
Lead (Pb)			97.2		%		70-130	17-MAR-16
Lithium (Li)			86.2		%		70-130	17-MAR-16
Magnesium (Mg)			N/A	MS-B	%		-	17-MAR-16
Manganese (Mn)			N/A	MS-B	%		-	17-MAR-16
Molybdenum (Mo)			89.4		%		70-130	17-MAR-16

Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-VA	**Soil**							
Batch R3421933								
WG2274196-7 MS		**L1742756-3**						
Nickel (Ni)			92.9		%		70-130	17-MAR-16
Phosphorus (P)			103.9		%		70-130	17-MAR-16
Potassium (K)			98.6		%		70-130	17-MAR-16
Selenium (Se)			88.1		%		70-130	17-MAR-16
Silver (Ag)			80.4		%		70-130	17-MAR-16
Sodium (Na)			95.1		%		70-130	17-MAR-16
Strontium (Sr)			90.6		%		70-130	17-MAR-16
Thallium (Tl)			97.2		%		70-130	17-MAR-16
Tin (Sn)			95.3		%		70-130	17-MAR-16
Titanium (Ti)			N/A	MS-B	%		-	17-MAR-16
Uranium (U)			97.4		%		70-130	17-MAR-16
Vanadium (V)			99.5		%		70-130	17-MAR-16
Zinc (Zn)			94.2		%		70-130	17-MAR-16
MOISTURE-VA	**Soil**							
Batch R3417849								
WG2274366-3 DUP		**L1742756-2**						
Moisture		6.65	6.46		%	3.0	20	11-MAR-16
WG2274366-2 LCS								
Moisture			100.2		%		90-110	11-MAR-16
WG2274366-1 MB								
Moisture			<0.25		%		0.25	11-MAR-16
PH-1:2-VA	**Soil**							
Batch R3419077								
WG2274196-2 DUP		**L1742756-6**						
pH (1:2 soil:water)		7.50	7.45	J	pH	0.05	0.3	14-MAR-16
WG2274196-6 IRM		**VA-ALP-SRS1507**						
pH (1:2 soil:water)			7.81		pH		7.52-8.12	14-MAR-16
PH-PASTE-VA	**Soil**							
Batch R3419804								
WG2274149-4 DUP		**L1742756-7**						
Paste pH		7.04	7.01	J	pH	0.03	0.3	15-MAR-16
WG2274149-3 IRM		**VA-ALP-SRS1507**						
Paste pH			7.26		pH		7.02-7.62	15-MAR-16
WG2274149-2 LCS								
Paste pH			6.77		pH		6.44-7.64	15-MAR-16

Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
S-TOT-LECO-SK	**Soil**							
Batch R3421095								
WG2276191-1 DUP		**L1744376-2**						
Sulfur (S)-Total		9600	9800		mg/kg	1.2	30	17-MAR-16
WG2276191-4 IRM		**1646A_SOIL**						
Sulfur (S)-Total			2900		mg/kg		2500-4600	17-MAR-16
WG2276191-5 MB								
Sulfur (S)-Total			<500		mg/kg		500	17-MAR-16

Quality Control Report

Workorder: L1742756 Report Date: 30-MAR-16

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CH2MHILL **CHAIN OF CUSTODY RECORD** *3/8/2016 10:24:10 AM* Page 1 OF 1

Project Name Faro Mine
Location Faro Mine Complex - Faro YK
Project Number 660403.07.01.01.01.05.FW
Project Manager Chuck Shewen
Sample Manager Travis Gouveia
(530) 229-3268
Task Order 102
Project FARO CREEK DIV NEW ALIGNMENT DRILLING
Turnaround Time 10 Days
Shipping Date: 3/8/2016
COC Number: ALS08031601

L1742756-COFC

	DATE	TIME	Matrix	Container:	1 Gallon	1 Gallon	1 Gallon	1 Gallon	1 Gallon	1 Gallon		Number of Containers	COMMENTS
				Preservatives:	4°C	4°C	4°C	4°C	4°C	4°C			
				Filtered:	NA	NA	NA	NA	NA	NA			
				Holding Time:	30	NA	NA	NA	30	180/28			
					CSSS/APHA 4500H Paste pH	ASTM 2216 Moisture	ASTM D422-63 Gradation Hydrometer	ASTM D4318 Atterberg	ISO 15178-2000 Total Sulfur	SW6010B/6020A Total Metals			
CH16-102-MW006_SOe	3/3/2016	15:45	Soil			X	X	X				1	
CH16-102-MW006_SOl	3/3/2016	17:30	Soil			X	X	X				1	
CH16-102-MW006_SOq	3/4/2016	15:25	Soil		X				X	X		1	
CH16-102-MW003_SOa	3/5/2016	10:30	Soil			X	X					1	
CH16-102-MW003_SOb	3/5/2016	10:45	Soil			X	X	X				1	
CH16-102-MW003_SOc	3/5/2016	11:25	Soil		X				X	X		1	
CH16-102-MW903_SOc	3/5/2016	11:25	Soil		X				X	X		1	
											TOTAL NUMBER OF CONTAINERS	7	

Signatures	Date/Time
Approved by	Mar 8/16
Sampled by	
Relinquished by	
Received by	4-Mar 16 9:50 3.4.4.2
Relinquished by	
Received by	Jann 5,5,5,6,4 14:00 Mar 10

Shipping Details
Method of Shipment: ~~FedEx~~ A-1
On Ice: (yes) / no
Airbill No:
Lab Name: ALS Vancouver
Lab Phone: (604) 253-4188

ATTN:
Sample Custody
and
Amber Springer

Special Instructions:

Report Copy to
Mark Cichy
(530) 229-3274

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1745580-1 E_102_16_001							
Sampled By: CBCP on 12-MAR-16 @ 12:46							
Matrix: Water							
Faro Mine Project Dissolved Metals							
Diss. Mercury in Water by CVAAS or CVAFS							
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	18-MAR-16	20-MAR-16	R3422662
Dissolved Mercury Filtration Location	FIELD					18-MAR-16	R3422228
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					18-MAR-16	R3422230
Aluminum (Al)-Dissolved	0.0051		0.0010	mg/L	18-MAR-16	29-MAR-16	R3426592
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	18-MAR-16	29-MAR-16	R3426592
Arsenic (As)-Dissolved	<0.00010		0.00010	mg/L	18-MAR-16	29-MAR-16	R3426592
Barium (Ba)-Dissolved	0.0130		0.000050	mg/L	18-MAR-16	29-MAR-16	R3426592
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	18-MAR-16	29-MAR-16	R3426592
Boron (B)-Dissolved	0.017		0.010	mg/L	18-MAR-16	29-MAR-16	R3426592
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L	18-MAR-16	29-MAR-16	R3426592
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L	18-MAR-16	29-MAR-16	R3426592
Cobalt (Co)-Dissolved	<0.00010		0.00010	mg/L	18-MAR-16	29-MAR-16	R3426592
Copper (Cu)-Dissolved	0.00103		0.00020	mg/L	18-MAR-16	29-MAR-16	R3426592
Lead (Pb)-Dissolved	0.000079		0.000050	mg/L	18-MAR-16	29-MAR-16	R3426592
Lithium (Li)-Dissolved	0.0129		0.0010	mg/L	18-MAR-16	29-MAR-16	R3426592
Manganese (Mn)-Dissolved	0.00200		0.00010	mg/L	18-MAR-16	29-MAR-16	R3426592
Molybdenum (Mo)-Dissolved	0.000597		0.000050	mg/L	18-MAR-16	29-MAR-16	R3426592
Nickel (Ni)-Dissolved	0.00099		0.00050	mg/L	18-MAR-16	29-MAR-16	R3426592
Potassium (K)-Dissolved	0.685		0.050	mg/L	18-MAR-16	29-MAR-16	R3426592
Selenium (Se)-Dissolved	0.000193		0.000050	mg/L	18-MAR-16	29-MAR-16	R3426592
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	18-MAR-16	29-MAR-16	R3426592
Sodium (Na)-Dissolved	16.4		0.050	mg/L	18-MAR-16	29-MAR-16	R3426592
Strontium (Sr)-Dissolved	0.733		0.00020	mg/L	18-MAR-16	29-MAR-16	R3426592
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	18-MAR-16	29-MAR-16	R3426592
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	18-MAR-16	29-MAR-16	R3426592
Uranium (U)-Dissolved	0.000634		0.000010	mg/L	18-MAR-16	29-MAR-16	R3426592
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	18-MAR-16	29-MAR-16	R3426592
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L	18-MAR-16	29-MAR-16	R3426592
Dissolved Metals in Water by ICPOES							
Dissolved Metals Filtration Location	FIELD					18-MAR-16	R3422230
Calcium (Ca)-Dissolved	55.0		0.050	mg/L	18-MAR-16	27-MAR-16	R3425493
Iron (Fe)-Dissolved	<0.030		0.030	mg/L	18-MAR-16	27-MAR-16	R3425493
Magnesium (Mg)-Dissolved	24.1		0.10	mg/L	18-MAR-16	27-MAR-16	R3425493
Phosphorus (P)-Dissolved	<0.30		0.30	mg/L	18-MAR-16	27-MAR-16	R3425493
Silicon (Si)-Dissolved	8.73		0.050	mg/L	18-MAR-16	27-MAR-16	R3425493
Dissolved Silicon (reported as Silica)							
Silicon (as SiO2)-Dissolved	18.7		0.20	mg/L		28-MAR-16	
Dissolved Sulfur in Water by ICPOES							
Dissolved Metals Filtration Location	FIELD					18-MAR-16	R3422230
Sulfur (S)-Dissolved	13.0		0.50	mg/L	18-MAR-16	27-MAR-16	R3425493
Faro Mine Project Total Metals							
Hardness							
Hardness (as CaCO3)	237		0.50	mg/L		29-MAR-16	
Total Mercury in Water by CVAAS or CVAFS							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		20-MAR-16	R3422580
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0339		0.0030	mg/L		29-MAR-16	R3426592
Antimony (Sb)-Total	<0.00010		0.00010	mg/L		29-MAR-16	R3426592
Arsenic (As)-Total	0.00011		0.00010	mg/L		29-MAR-16	R3426592
Barium (Ba)-Total	0.0132		0.000050	mg/L		29-MAR-16	R3426592

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1745580-1 E_102_16_001							
Sampled By: CBCP on 12-MAR-16 @ 12:46							
Matrix: Water							
Total Metals in Water by CRC ICPMS							
Beryllium (Be)-Total	<0.00010		0.00010	mg/L		29-MAR-16	R3426592
Boron (B)-Total	0.018		0.010	mg/L		29-MAR-16	R3426592
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		29-MAR-16	R3426592
Chromium (Cr)-Total	0.00023		0.00010	mg/L		29-MAR-16	R3426592
Cobalt (Co)-Total	<0.00010		0.00010	mg/L		29-MAR-16	R3426592
Copper (Cu)-Total	0.00133		0.00050	mg/L		29-MAR-16	R3426592
Lead (Pb)-Total	0.000174		0.000050	mg/L		29-MAR-16	R3426592
Lithium (Li)-Total	0.0131		0.0010	mg/L		29-MAR-16	R3426592
Manganese (Mn)-Total	0.00415		0.00010	mg/L		29-MAR-16	R3426592
Molybdenum (Mo)-Total	0.000650		0.000050	mg/L		29-MAR-16	R3426592
Nickel (Ni)-Total	0.00118		0.00050	mg/L		29-MAR-16	R3426592
Potassium (K)-Total	0.699		0.050	mg/L		29-MAR-16	R3426592
Selenium (Se)-Total	0.000197		0.000050	mg/L		29-MAR-16	R3426592
Silver (Ag)-Total	<0.000010		0.000010	mg/L		29-MAR-16	R3426592
Sodium (Na)-Total	16.7		0.050	mg/L		29-MAR-16	R3426592
Strontium (Sr)-Total	0.757		0.00020	mg/L		29-MAR-16	R3426592
Thallium (Tl)-Total	<0.000010		0.000010	mg/L		29-MAR-16	R3426592
Titanium (Ti)-Total	0.00149		0.00030	mg/L		29-MAR-16	R3426592
Uranium (U)-Total	0.000675		0.000010	mg/L		29-MAR-16	R3426592
Vanadium (V)-Total	<0.00050		0.00050	mg/L		29-MAR-16	R3426592
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		29-MAR-16	R3426592
Total Metals in Water by ICPOES							
Calcium (Ca)-Total	55.2		0.050	mg/L		27-MAR-16	R3425493
Iron (Fe)-Total	0.104		0.030	mg/L		27-MAR-16	R3425493
Magnesium (Mg)-Total	24.6		0.10	mg/L		27-MAR-16	R3425493
Phosphorus (P)-Total	<0.30		0.30	mg/L		27-MAR-16	R3425493
Silicon (Si)-Total	8.91		0.050	mg/L		27-MAR-16	R3425493
Total Silicon (reported as Silica)							
Silicon (as SiO2)-Total	19.1		0.20	mg/L		28-MAR-16	
Total Sulfur in Water by ICPOES							
Sulfur (S)-Total	13.2		0.50	mg/L		27-MAR-16	R3425493
Miscellaneous Parameters							
Sulfate (SO4)	40.0		0.30	mg/L		18-MAR-16	R3422006

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA	Water	Diss. Mercury in Water by CVAAS or CVAFS	APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-CVAA-VA	Water	Total Mercury in Water by CVAAS or CVAFS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

MET-D-CCMS-VA	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-DIS-ICP-VA	Water	Dissolved Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

S-DIS-ICP-VA	Water	Dissolved Sulfur in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S-TOT-ICP-VA	Water	Total Sulfur in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

SIO2-D-CALC-VA	Water	Dissolved Silicon (reported as Silica)	CALCULATION

Dissolved Silicon (as SiO2) is a calculated parameter. Dissolved Silicon (as SiO2 mg/L) = 2.139 x Dissolved Silicon (mg/L).

SIO2-T-CALC-VA	Water	Total Silicon (reported as Silica)	CALCULATION

Total Silicon (as SiO2) is a calculated parameter. Total Silicon (as SiO2 mg/L) = 2.139 x Total Silicon (mg/L).

SO4-IC-N-WR	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

ALS03151601

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L1745580 Report Date: 30-MAR-16

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-D-CVAA-VA	**Water**							
Batch R3422602								
WG2278216-2 LCS								
Mercury (Hg)-Dissolved			95.3		%		80-120	20-MAR-16
Batch R3422662								
WG2278216-3 DUP		**L1745580-1**						
Mercury (Hg)-Dissolved		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	20-MAR-16
WG2278216-4 MS		**L1745598-1**						
Mercury (Hg)-Dissolved			102.0		%		70-130	20-MAR-16
Batch R3423115								
WG2278216-1 MB								
Mercury (Hg)-Dissolved			<0.000005(		mg/L		0.000005	21-MAR-16
HG-T-CVAA-VA	**Water**							
Batch R3422580								
WG2278597-3 DUP		**L1745580-1**						
Mercury (Hg)-Total		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	20-MAR-16
WG2278597-2 LCS								
Mercury (Hg)-Total			94.2		%		80-120	20-MAR-16
WG2278597-1 MB								
Mercury (Hg)-Total			<0.000005(		mg/L		0.000005	20-MAR-16
WG2278597-4 MS		**L1745598-1**						
Mercury (Hg)-Total			102.8		%		70-130	20-MAR-16
MET-D-CCMS-VA	**Water**							
Batch R3423075								
WG2278218-2 LCS								
Aluminum (Al)-Dissolved			96.8		%		80-120	19-MAR-16
Antimony (Sb)-Dissolved			96.4		%		80-120	19-MAR-16
Arsenic (As)-Dissolved			97.1		%		80-120	19-MAR-16
Barium (Ba)-Dissolved			99.5		%		80-120	19-MAR-16
Beryllium (Be)-Dissolved			98.4		%		80-120	19-MAR-16
Boron (B)-Dissolved			90.3		%		80-120	19-MAR-16
Cadmium (Cd)-Dissolved			96.1		%		80-120	19-MAR-16
Chromium (Cr)-Dissolved			98.7		%		80-120	19-MAR-16
Cobalt (Co)-Dissolved			99.1		%		80-120	19-MAR-16
Copper (Cu)-Dissolved			95.9		%		80-120	19-MAR-16
Lead (Pb)-Dissolved			99.6		%		80-120	19-MAR-16



Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-VA	**Water**							
Batch R3423075								
WG2278218-2 LCS								
Lithium (Li)-Dissolved			101.7		%		80-120	19-MAR-16
Manganese (Mn)-Dissolved			102.4		%		80-120	19-MAR-16
Molybdenum (Mo)-Dissolved			99.8		%		80-120	19-MAR-16
Nickel (Ni)-Dissolved			97.4		%		80-120	19-MAR-16
Potassium (K)-Dissolved			98.2		%		80-120	19-MAR-16
Selenium (Se)-Dissolved			97.1		%		80-120	19-MAR-16
Silver (Ag)-Dissolved			96.9		%		80-120	19-MAR-16
Sodium (Na)-Dissolved			99.96		%		80-120	19-MAR-16
Strontium (Sr)-Dissolved			96.6		%		80-120	19-MAR-16
Thallium (Tl)-Dissolved			100.1		%		80-120	19-MAR-16
Titanium (Ti)-Dissolved			93.5		%		80-120	19-MAR-16
Uranium (U)-Dissolved			98.0		%		80-120	19-MAR-16
Vanadium (V)-Dissolved			96.4		%		80-120	19-MAR-16
Zinc (Zn)-Dissolved			91.1		%		80-120	19-MAR-16
WG2278218-1 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	19-MAR-16
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	19-MAR-16
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	19-MAR-16
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	19-MAR-16
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	19-MAR-16
Boron (B)-Dissolved			<0.010		mg/L		0.01	19-MAR-16
Cadmium (Cd)-Dissolved			<0.000005(		mg/L		0.000005	19-MAR-16
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	19-MAR-16
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	19-MAR-16
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	19-MAR-16
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	19-MAR-16
Lithium (Li)-Dissolved			<0.0010		mg/L		0.001	19-MAR-16
Manganese (Mn)-Dissolved			<0.00010		mg/L		0.0001	19-MAR-16
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	19-MAR-16
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	19-MAR-16
Potassium (K)-Dissolved			<0.050		mg/L		0.05	19-MAR-16
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	19-MAR-16
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	19-MAR-16
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	19-MAR-16



Quality Control Report

Workorder: L1745580 Report Date: 30-MAR-16

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-VA	**Water**							
Batch R3423075								
WG2278218-1 MB								
Strontium (Sr)-Dissolved			<0.00020		mg/L		0.0002	19-MAR-16
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	19-MAR-16
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	19-MAR-16
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	19-MAR-16
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	19-MAR-16
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	19-MAR-16
Batch R3426592								
WG2278218-4 MS		**L1745580-1**						
Aluminum (Al)-Dissolved			106.2		%		70-130	29-MAR-16
Antimony (Sb)-Dissolved			113.4		%		70-130	29-MAR-16
Arsenic (As)-Dissolved			112.9		%		70-130	29-MAR-16
Barium (Ba)-Dissolved			109.3		%		70-130	29-MAR-16
Beryllium (Be)-Dissolved			109.2		%		70-130	29-MAR-16
Boron (B)-Dissolved			99.99		%		70-130	29-MAR-16
Cadmium (Cd)-Dissolved			109.4		%		70-130	29-MAR-16
Chromium (Cr)-Dissolved			105.3		%		70-130	29-MAR-16
Cobalt (Co)-Dissolved			102.2		%		70-130	29-MAR-16
Copper (Cu)-Dissolved			98.9		%		70-130	29-MAR-16
Lead (Pb)-Dissolved			105.3		%		70-130	29-MAR-16
Lithium (Li)-Dissolved			110.5		%		70-130	29-MAR-16
Manganese (Mn)-Dissolved			107.0		%		70-130	29-MAR-16
Molybdenum (Mo)-Dissolved			104.3		%		70-130	29-MAR-16
Nickel (Ni)-Dissolved			102.3		%		70-130	29-MAR-16
Potassium (K)-Dissolved			107.3		%		70-130	29-MAR-16
Selenium (Se)-Dissolved			126.3		%		70-130	29-MAR-16
Silver (Ag)-Dissolved			111.0		%		70-130	29-MAR-16
Sodium (Na)-Dissolved			N/A	MS-B	%		-	29-MAR-16
Strontium (Sr)-Dissolved			N/A	MS-B	%		-	29-MAR-16
Thallium (Tl)-Dissolved			104.1		%		70-130	29-MAR-16
Titanium (Ti)-Dissolved			110.3		%		70-130	29-MAR-16
Uranium (U)-Dissolved			106.4		%		70-130	29-MAR-16
Vanadium (V)-Dissolved			110.2		%		70-130	29-MAR-16
Zinc (Zn)-Dissolved			97.1		%		70-130	29-MAR-16



Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-VA	**Water**							
Batch R3427127								
WG2278218-3 DUP		**L1745598-1**						
Aluminum (Al)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	29-MAR-16
Antimony (Sb)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-MAR-16
Arsenic (As)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-MAR-16
Barium (Ba)-Dissolved		0.000498	0.000510		mg/L	2.4	20	29-MAR-16
Beryllium (Be)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-MAR-16
Boron (B)-Dissolved		<0.010	<0.010	RPD-NA	mg/L	N/A	20	29-MAR-16
Cadmium (Cd)-Dissolved		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	29-MAR-16
Chromium (Cr)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-MAR-16
Cobalt (Co)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-MAR-16
Copper (Cu)-Dissolved		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	29-MAR-16
Lead (Pb)-Dissolved		0.000052	<0.000050	RPD-NA	mg/L	N/A	20	29-MAR-16
Lithium (Li)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	29-MAR-16
Manganese (Mn)-Dissolved		0.0226	0.0233		mg/L	3.3	20	29-MAR-16
Molybdenum (Mo)-Dissolved		0.000089	0.000084		mg/L	6.7	20	29-MAR-16
Nickel (Ni)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	29-MAR-16
Potassium (K)-Dissolved		0.060	<0.050	RPD-NA	mg/L	N/A	20	29-MAR-16
Selenium (Se)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	29-MAR-16
Silver (Ag)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	29-MAR-16
Sodium (Na)-Dissolved		<0.050	<0.050	RPD-NA	mg/L	N/A	20	29-MAR-16
Strontium (Sr)-Dissolved		0.00088	0.00088		mg/L	1.0	20	29-MAR-16
Thallium (Tl)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	29-MAR-16
Titanium (Ti)-Dissolved		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	29-MAR-16
Uranium (U)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	29-MAR-16
Vanadium (V)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	29-MAR-16
Zinc (Zn)-Dissolved		0.0011	<0.0010	RPD-NA	mg/L	N/A	20	29-MAR-16
MET-DIS-ICP-VA	**Water**							
Batch R3425493								
WG2278218-3 DUP		**L1745598-1**						
Calcium (Ca)-Dissolved		0.329	0.329		mg/L	0.3	20	27-MAR-16
Iron (Fe)-Dissolved		<0.030	<0.030	RPD-NA	mg/L	N/A	20	27-MAR-16
Magnesium (Mg)-Dissolved		<0.10	<0.10	RPD-NA	mg/L	N/A	20	27-MAR-16
Phosphorus (P)-Dissolved		<0.30	<0.30	RPD-NA	mg/L	N/A	20	27-MAR-16
Silicon (Si)-Dissolved		<0.050	<0.050	RPD-NA	mg/L	N/A	20	27-MAR-16



Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-ICP-VA	**Water**							
Batch R3425493								
WG2278218-2 LCS								
Calcium (Ca)-Dissolved			104.8		%		80-120	27-MAR-16
Iron (Fe)-Dissolved			98.0		%		80-120	27-MAR-16
Magnesium (Mg)-Dissolved			98.2		%		80-120	27-MAR-16
Phosphorus (P)-Dissolved			101.4		%		80-120	27-MAR-16
Silicon (Si)-Dissolved			107.3		%		80-120	27-MAR-16
WG2278218-1 MB								
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	27-MAR-16
Iron (Fe)-Dissolved			<0.030		mg/L		0.03	27-MAR-16
Magnesium (Mg)-Dissolved			<0.10		mg/L		0.1	27-MAR-16
Phosphorus (P)-Dissolved			<0.30		mg/L		0.3	27-MAR-16
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	27-MAR-16
WG2278218-4 MS		**L1745580-1**						
Calcium (Ca)-Dissolved			N/A	MS-B	%		-	27-MAR-16
Iron (Fe)-Dissolved			94.5		%		70-130	27-MAR-16
Magnesium (Mg)-Dissolved			94.6		%		70-130	27-MAR-16
Phosphorus (P)-Dissolved			99.8		%		70-130	27-MAR-16
Silicon (Si)-Dissolved			N/A	MS-B	%		-	27-MAR-16
MET-T-CCMS-VA	**Water**							
Batch R3426562								
WG2280612-2 LCS								
Aluminum (Al)-Total			101.1		%		80-120	24-MAR-16
Antimony (Sb)-Total			99.0		%		80-120	24-MAR-16
Arsenic (As)-Total			97.0		%		80-120	24-MAR-16
Barium (Ba)-Total			98.3		%		80-120	24-MAR-16
Beryllium (Be)-Total			101.7		%		80-120	24-MAR-16
Boron (B)-Total			89.3		%		80-120	24-MAR-16
Cadmium (Cd)-Total			97.8		%		80-120	24-MAR-16
Chromium (Cr)-Total			99.9		%		80-120	24-MAR-16
Cobalt (Co)-Total			98.4		%		80-120	24-MAR-16
Copper (Cu)-Total			97.5		%		80-120	24-MAR-16
Lead (Pb)-Total			101.2		%		80-120	24-MAR-16
Lithium (Li)-Total			99.2		%		80-120	24-MAR-16
Manganese (Mn)-Total			101.3		%		80-120	24-MAR-16
Molybdenum (Mo)-Total			96.8		%		80-120	24-MAR-16



Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-VA	**Water**							
Batch R3426562								
WG2280612-2 LCS								
Nickel (Ni)-Total			98.1		%		80-120	24-MAR-16
Potassium (K)-Total			99.5		%		80-120	24-MAR-16
Selenium (Se)-Total			97.5		%		80-120	24-MAR-16
Silver (Ag)-Total			96.9		%		80-120	24-MAR-16
Sodium (Na)-Total			102.1		%		80-120	24-MAR-16
Strontium (Sr)-Total			96.2		%		80-120	24-MAR-16
Thallium (Tl)-Total			101.9		%		80-120	24-MAR-16
Titanium (Ti)-Total			99.7		%		80-120	24-MAR-16
Uranium (U)-Total			99.5		%		80-120	24-MAR-16
Vanadium (V)-Total			101.6		%		80-120	24-MAR-16
Zinc (Zn)-Total			91.7		%		80-120	24-MAR-16
WG2280612-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	24-MAR-16
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	24-MAR-16
Arsenic (As)-Total			<0.00010		mg/L		0.0001	24-MAR-16
Barium (Ba)-Total			<0.000050		mg/L		0.00005	24-MAR-16
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	24-MAR-16
Boron (B)-Total			<0.010		mg/L		0.01	24-MAR-16
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	24-MAR-16
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	24-MAR-16
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	24-MAR-16
Copper (Cu)-Total			<0.00050		mg/L		0.0005	24-MAR-16
Lead (Pb)-Total			<0.000050		mg/L		0.00005	24-MAR-16
Lithium (Li)-Total			<0.0010		mg/L		0.001	24-MAR-16
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	24-MAR-16
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	24-MAR-16
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	24-MAR-16
Potassium (K)-Total			<0.050		mg/L		0.05	24-MAR-16
Selenium (Se)-Total			<0.000050		mg/L		0.00005	24-MAR-16
Silver (Ag)-Total			<0.000010		mg/L		0.00001	24-MAR-16
Sodium (Na)-Total			<0.050		mg/L		0.05	24-MAR-16
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	24-MAR-16
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	24-MAR-16
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	24-MAR-16



Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-VA	**Water**							
Batch R3426562								
WG2280612-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	24-MAR-16
Vanadium (V)-Total			<0.00050		mg/L		0.0005	24-MAR-16
Zinc (Zn)-Total			<0.0030		mg/L		0.003	24-MAR-16
Batch R3426592								
WG2280612-4 MS		**L1745580-1**						
Aluminum (Al)-Total			95.3		%		70-130	29-MAR-16
Antimony (Sb)-Total			88.5		%		70-130	29-MAR-16
Arsenic (As)-Total			96.9		%		70-130	29-MAR-16
Barium (Ba)-Total			94.3		%		70-130	29-MAR-16
Beryllium (Be)-Total			85.8		%		70-130	29-MAR-16
Boron (B)-Total			77.5		%		70-130	29-MAR-16
Cadmium (Cd)-Total			93.8		%		70-130	29-MAR-16
Chromium (Cr)-Total			93.2		%		70-130	29-MAR-16
Cobalt (Co)-Total			91.0		%		70-130	29-MAR-16
Copper (Cu)-Total			87.1		%		70-130	29-MAR-16
Lead (Pb)-Total			81.5		%		70-130	29-MAR-16
Lithium (Li)-Total			85.2		%		70-130	29-MAR-16
Manganese (Mn)-Total			94.3		%		70-130	29-MAR-16
Molybdenum (Mo)-Total			83.6		%		70-130	29-MAR-16
Nickel (Ni)-Total			91.3		%		70-130	29-MAR-16
Potassium (K)-Total			94.7		%		70-130	29-MAR-16
Selenium (Se)-Total			92.5		%		70-130	29-MAR-16
Silver (Ag)-Total			87.5		%		70-130	29-MAR-16
Sodium (Na)-Total			N/A	MS-B	%		-	29-MAR-16
Strontium (Sr)-Total			N/A	MS-B	%		-	29-MAR-16
Thallium (Tl)-Total			80.9		%		70-130	29-MAR-16
Titanium (Ti)-Total			97.1		%		70-130	29-MAR-16
Uranium (U)-Total			81.1		%		70-130	29-MAR-16
Vanadium (V)-Total			96.5		%		70-130	29-MAR-16
Zinc (Zn)-Total			83.4		%		70-130	29-MAR-16
Batch R3427127								
WG2280612-3 DUP		**L1745598-1**						
Aluminum (Al)-Total		0.214	0.231		mg/L	7.8	20	29-MAR-16
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-MAR-16



Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-VA	**Water**							
Batch R3427127								
WG2280612-3 DUP		**L1745598-1**						
Arsenic (As)-Total		0.00028	0.00033		mg/L	14	20	29-MAR-16
Barium (Ba)-Total		0.00483	0.00497		mg/L	2.9	20	29-MAR-16
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-MAR-16
Boron (B)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	29-MAR-16
Cadmium (Cd)-Total		0.0000070	0.0000117	J	mg/L	0.0000048	0.00001	29-MAR-16
Chromium (Cr)-Total		0.00304	0.00314		mg/L	3.1	20	29-MAR-16
Cobalt (Co)-Total		0.00022	0.00022		mg/L	3.3	20	29-MAR-16
Copper (Cu)-Total		0.00651	0.00681		mg/L	4.4	20	29-MAR-16
Lead (Pb)-Total		0.00102	0.00103		mg/L	0.9	20	29-MAR-16
Lithium (Li)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	29-MAR-16
Manganese (Mn)-Total		0.0300	0.0304		mg/L	1.6	20	29-MAR-16
Molybdenum (Mo)-Total		0.000233	0.000221		mg/L	5.2	20	29-MAR-16
Nickel (Ni)-Total		0.00101	0.00098		mg/L	3.3	20	29-MAR-16
Potassium (K)-Total		0.075	0.070		mg/L	6.2	20	29-MAR-16
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	29-MAR-16
Silver (Ag)-Total		<0.000010	0.000011	RPD-NA	mg/L	N/A	20	29-MAR-16
Sodium (Na)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	29-MAR-16
Strontium (Sr)-Total		0.00143	0.00141		mg/L	1.8	20	29-MAR-16
Thallium (Tl)-Total		<0.000010	0.000012	RPD-NA	mg/L	N/A	20	29-MAR-16
Titanium (Ti)-Total		0.00530	0.00613		mg/L	14	20	29-MAR-16
Uranium (U)-Total		0.000021	0.000029	J	mg/L	0.000008	0.00002	29-MAR-16
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	29-MAR-16
Zinc (Zn)-Total		0.0037	0.0036		mg/L	1.4	20	29-MAR-16
MET-TOT-ICP-VA	**Water**							
Batch R3425493								
WG2280612-3 DUP		**L1745598-1**						
Calcium (Ca)-Total		0.419	0.425		mg/L	1.5	20	27-MAR-16
Iron (Fe)-Total		0.301	0.308		mg/L	2.4	20	27-MAR-16
Magnesium (Mg)-Total		0.13	0.14		mg/L	2.4	20	27-MAR-16
Phosphorus (P)-Total		<0.30	<0.30	RPD-NA	mg/L	N/A	20	27-MAR-16
Silicon (Si)-Total		0.279	0.304		mg/L	8.7	20	27-MAR-16
WG2280612-2 LCS								
Calcium (Ca)-Total			103.8		%		80-120	27-MAR-16



Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-TOT-ICP-VA	**Water**							
Batch R3425493								
WG2280612-2 LCS								
Iron (Fe)-Total			97.9		%		80-120	27-MAR-16
Magnesium (Mg)-Total			101.2		%		80-120	27-MAR-16
Phosphorus (P)-Total			102.0		%		80-120	27-MAR-16
Silicon (Si)-Total			106.3		%		80-120	27-MAR-16
WG2280612-1 MB								
Calcium (Ca)-Total			<0.050		mg/L		0.05	27-MAR-16
Iron (Fe)-Total			<0.030		mg/L		0.03	27-MAR-16
Magnesium (Mg)-Total			<0.10		mg/L		0.1	27-MAR-16
Phosphorus (P)-Total			<0.30		mg/L		0.3	27-MAR-16
Silicon (Si)-Total			<0.050		mg/L		0.05	27-MAR-16
WG2280612-4 MS		**L1745580-1**						
Calcium (Ca)-Total			N/A	MS-B	%		-	27-MAR-16
Iron (Fe)-Total			93.6		%		70-130	27-MAR-16
Magnesium (Mg)-Total			96.1		%		70-130	27-MAR-16
Phosphorus (P)-Total			99.5		%		70-130	27-MAR-16
Silicon (Si)-Total			N/A	MS-B	%		-	27-MAR-16
S-DIS-ICP-VA	**Water**							
Batch R3425493								
WG2278218-3 DUP		**L1745598-1**						
Sulfur (S)-Dissolved		<0.50	<0.50	RPD-NA	mg/L	N/A	20	27-MAR-16
WG2278218-2 LCS								
Sulfur (S)-Dissolved			99.0		%		80-120	27-MAR-16
WG2278218-1 MB								
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	27-MAR-16
WG2278218-4 MS		**L1745580-1**						
Sulfur (S)-Dissolved			N/A	MS-B	%		-	27-MAR-16
S-TOT-ICP-VA	**Water**							
Batch R3425493								
WG2280612-3 DUP		**L1745598-1**						
Sulfur (S)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	27-MAR-16
WG2280612-2 LCS								
Sulfur (S)-Total			99.3		%		80-120	27-MAR-16
WG2280612-1 MB								
Sulfur (S)-Total			<0.50		mg/L		0.5	27-MAR-16
WG2280612-4 MS		**L1745580-1**						



Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
S-TOT-ICP-VA	**Water**							
Batch R3425493								
WG2280612-4 MS		**L1745580-1**						
Sulfur (S)-Total			N/A	MS-B	%		-	27-MAR-16
SO4-IC-N-WR	**Water**							
Batch R3422006								
WG2277454-3 DUP		**L1745598-1**						
Sulfate (SO4)		2.30	2.31		mg/L	0.3	20	18-MAR-16
WG2277454-2 LCS								
Sulfate (SO4)			102.4		%		90-110	18-MAR-16
WG2277454-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	18-MAR-16
WG2277454-4 MS		**L1745580-1**						
Sulfate (SO4)			90.9		%		75-125	18-MAR-16

Quality Control Report

Workorder: L1745580 Report Date: 30-MAR-16

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CH2MHILL **CHAIN OF CUSTODY RECORD** *3/15/2016 12:28:40 PM* Page 1 OF 1

Project Name Faro Mine
Location Faro Mine Complex - Faro YK
Project Number 660403.07.01.01.01.05.FW
Project Manager Chuck Shewen
Sample Manager Travis Gouveia
(530) 229-3268
Task Order 102
Project FCD NEW ALIGNMENT DRILLING 2016
Turnaround Time 10 Days
Shipping Date: 3/15/2016
COC Number: ALS03151601

				Container:	40ml vial	125ml Poly	125ml Poly	40ml vial	500ml Poly			
				Preservatives:	HCl, 4°C	HNO3, 4°C	HNO3, 4°C	HCl, 4°C	4°C			
				Filtered:	Field	NA	Field	NA	NA			
				Holding Time:	28	180	180	28	3			
	DATE	TIME	Matrix		(E245.7-Diss) Field Filtered Diss Hg	(SW6010B/SW6020A) Total Metals Table 1	(SW6010B/SW6020A) Field Filtered Diss Metals Table 1	E245.7 Total Hg	SM4110B Sulfate		Number of Containers	COMMENTS
E_102_16_001	3/12/2016	12:46	Water		x	x	x	x	x		5	
										TOTAL NUMBER OF CONTAINERS	5	

L1745580-COFC

Signatures	Date/Time
Approved by	
Sampled by	3/18/16
Relinquished by	
Received by	16-Mar-16 9:50 5.0
Relinquished by	
Received by	

Shipping Details
Method of Shipment: ~~FedEx~~ A-1
On Ice: (yes) / no
Airbill No:
Lab Name: ALS Vancouver
Lab Phone: (604) 253-4188

ATTN:
Sample Custody
and
Amber Springer

Special Instructions:

Report Copy to
Mark Clchy
(530) 229-3274

CH2M HILL, INC
ATTN: Mark Cichy
2525 Airpark Drive
Redding CA 96001

Date Received: 19-MAR-16
Report Date: 04-APR-16 13:55 (MT)
Version: FINAL

Client Phone: 530-229-3203

Certificate of Analysis

Lab Work Order #: L1746856

Project P.O. #:	660403.07.01.01.01.05.FW PO=10201-7-100939
Job Reference:	FCD NEW ALIGNMENT DRILLING 2016 102
C of C Numbers:	ALS999
Legal Site Desc:	

Amber Springer, B.Sc
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1746856-1 CH16-102-MW005_SOA							
Sampled By: CLIENT on 11-MAR-16 @ 17:15							
Matrix: Soil							
Miscellaneous Parameters							
PSA % < 75UM	28.2		0.10	%	29-MAR-16	30-MAR-16	R3427456
Moisture	8.57		0.25	%		24-MAR-16	R3425123
L1746856-2 CH16-102-MW005_SOB							
Sampled By: CLIENT on 11-MAR-16 @ 17:35							
Matrix: Soil							
Atterberg limits							
Liquid Limit (LL)	22		1	%	31-MAR-16	31-MAR-16	R3428288
Plasticity Index (PI)	4		1	%	31-MAR-16	31-MAR-16	R3428288
Grain Size by Hydrometer							
Grain Size Curve	SEE ATTACHED				29-MAR-16	29-MAR-16	R3428268
Gravel (4.75mm - 3in.)	9.9		1.0	%	29-MAR-16	29-MAR-16	R3428268
Coarse Sand (2.0mm - 4.75mm)	14.4		1.0	%	29-MAR-16	29-MAR-16	R3428268
Medium Sand (0.425mm - 2.0mm)	29.0		1.0	%	29-MAR-16	29-MAR-16	R3428268
Fine Sand (0.075mm - 0.425mm)	18.8		1.0	%	29-MAR-16	29-MAR-16	R3428268
Silt (0.005mm - 0.075mm)	14.2		1.0	%	29-MAR-16	29-MAR-16	R3428268
Clay (<0.005mm)	13.8		1.0	%	29-MAR-16	29-MAR-16	R3428268
L1746856-3 CH16-102-MW005_SOD							
Sampled By: CLIENT on 11-MAR-16 @ 18:00							
Matrix: Soil							
Atterberg limits							
Liquid Limit (LL)	23		1	%	31-MAR-16	31-MAR-16	R3428288
Plasticity Index (PI)	4		1	%	31-MAR-16	31-MAR-16	R3428288
Grain Size by Hydrometer							
Grain Size Curve	SEE ATTACHED				29-MAR-16	29-MAR-16	R3428268
Gravel (4.75mm - 3in.)	24.7		1.0	%	29-MAR-16	29-MAR-16	R3428268
Coarse Sand (2.0mm - 4.75mm)	21.4		1.0	%	29-MAR-16	29-MAR-16	R3428268
Medium Sand (0.425mm - 2.0mm)	22.4		1.0	%	29-MAR-16	29-MAR-16	R3428268
Fine Sand (0.075mm - 0.425mm)	12.9		1.0	%	29-MAR-16	29-MAR-16	R3428268
Silt (0.005mm - 0.075mm)	10.1		1.0	%	29-MAR-16	29-MAR-16	R3428268
Clay (<0.005mm)	8.5		1.0	%	29-MAR-16	29-MAR-16	R3428268
L1746856-4 CH16-102-MW004_SOB							
Sampled By: CLIENT on 06-MAR-16 @ 16:05							
Matrix: Soil							
Miscellaneous Parameters							
Moisture	4.96		0.25	%		29-MAR-16	R3427376
L1746856-5 CH16-102-MW004_SOC							
Sampled By: CLIENT on 06-MAR-16 @ 16:25							
Matrix: Soil							
Metals in Soil (CCME) with Extra Metals							
Mercury in Soil by CVAFS							
Mercury (Hg)	0.0112		0.0050	mg/kg	29-MAR-16	30-MAR-16	R3427698
Metals in Soil by CRC ICPMS							
Aluminum (Al)	32300		50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Antimony (Sb)	0.28		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Arsenic (As)	5.47		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Barium (Ba)	117		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Beryllium (Be)	0.82		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Bismuth (Bi)	0.94		0.20	mg/kg	29-MAR-16	30-MAR-16	R3427827

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1746856-5 CH16-102-MW004_SOC							
Sampled By: CLIENT on 06-MAR-16 @ 16:25							
Matrix: Soil							
Metals in Soil by CRC ICPMS							
Boron (B)	<5.0		5.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Cadmium (Cd)	2.63		0.020	mg/kg	29-MAR-16	30-MAR-16	R3427827
Calcium (Ca)	5020		50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Chromium (Cr)	290		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Cobalt (Co)	43.6		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Copper (Cu)	105		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Iron (Fe)	44900		50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Lead (Pb)	7.05		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Lithium (Li)	42.7		2.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Magnesium (Mg)	18800		20	mg/kg	29-MAR-16	30-MAR-16	R3427827
Manganese (Mn)	304		1.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Molybdenum (Mo)	9.29		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Nickel (Ni)	381		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Phosphorus (P)	910		50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Potassium (K)	2130		100	mg/kg	29-MAR-16	30-MAR-16	R3427827
Selenium (Se)	2.38		0.20	mg/kg	29-MAR-16	30-MAR-16	R3427827
Silver (Ag)	0.40		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Sodium (Na)	202		50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Strontium (Sr)	21.1		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Thallium (Tl)	0.303		0.050	mg/kg	29-MAR-16	30-MAR-16	R3427827
Tin (Sn)	<2.0		2.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Titanium (Ti)	598		1.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Uranium (U)	7.55		0.050	mg/kg	29-MAR-16	30-MAR-16	R3427827
Vanadium (V)	80.3		0.20	mg/kg	29-MAR-16	30-MAR-16	R3427827
Zinc (Zn)	189		2.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Zirconium (Zr)	4.6		1.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
pH in Soil (1:2 Soil:Water Extraction)							
pH (1:2 soil:water)	7.50		0.10	pH		30-MAR-16	R3427803
Miscellaneous Parameters							
Moisture	9.30		0.25	%		29-MAR-16	R3427376
Sulfur (S)-Total	900		500	mg/kg	28-MAR-16	28-MAR-16	R3426563
Paste pH	7.06		0.10	pH		04-APR-16	R3429614
Atterberg limits							
Liquid Limit (LL)	26		1	%	31-MAR-16	31-MAR-16	R3428288
Plasticity Index (PI)	5		1	%	31-MAR-16	31-MAR-16	R3428288
Grain Size by Hydrometer							
Grain Size Curve	SEE ATTACHED				29-MAR-16	29-MAR-16	R3428268
Gravel (4.75mm - 3in.)	33.2		1.0	%	29-MAR-16	29-MAR-16	R3428268
Coarse Sand (2.0mm - 4.75mm)	15.8		1.0	%	29-MAR-16	29-MAR-16	R3428268
Medium Sand (0.425mm - 2.0mm)	16.2		1.0	%	29-MAR-16	29-MAR-16	R3428268
Fine Sand (0.075mm - 0.425mm)	13.8		1.0	%	29-MAR-16	29-MAR-16	R3428268
Silt (0.005mm - 0.075mm)	12.7		1.0	%	29-MAR-16	29-MAR-16	R3428268
Clay (<0.005mm)	8.4		1.0	%	29-MAR-16	29-MAR-16	R3428268
L1746856-6 CH16-102-MW005_SOJ							
Sampled By: CLIENT on 12-MAR-16 @ 11:00							
Matrix: Soil							
Metals in Soil (CCME) with Extra Metals							
Mercury in Soil by CVAFS							
Mercury (Hg)	0.0095		0.0050	mg/kg	29-MAR-16	30-MAR-16	R3427698
Metals in Soil by CRC ICPMS							
Aluminum (Al)	10500		50	mg/kg	29-MAR-16	30-MAR-16	R3427827

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1746856-6 CH16-102-MW005_SOJ							
Sampled By: CLIENT on 12-MAR-16 @ 11:00							
Matrix: Soil							
Metals in Soil by CRC ICPMS							
Antimony (Sb)	0.34		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Arsenic (As)	6.44		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Barium (Ba)	86.0		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Beryllium (Be)	0.96		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Bismuth (Bi)	0.81		0.20	mg/kg	29-MAR-16	30-MAR-16	R3427827
Boron (B)	<5.0		5.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Cadmium (Cd)	0.280		0.020	mg/kg	29-MAR-16	30-MAR-16	R3427827
Calcium (Ca)	2430		50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Chromium (Cr)	26.6		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Cobalt (Co)	8.14		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Copper (Cu)	20.2		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Iron (Fe)	19700		50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Lead (Pb)	16.0		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Lithium (Li)	23.3		2.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Magnesium (Mg)	4090		20	mg/kg	29-MAR-16	30-MAR-16	R3427827
Manganese (Mn)	248		1.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Molybdenum (Mo)	1.21		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Nickel (Ni)	25.5		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Phosphorus (P)	468		50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Potassium (K)	2640		100	mg/kg	29-MAR-16	30-MAR-16	R3427827
Selenium (Se)	<0.20		0.20	mg/kg	29-MAR-16	30-MAR-16	R3427827
Silver (Ag)	0.11		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Sodium (Na)	145		50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Strontium (Sr)	12.6		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Thallium (Tl)	0.232		0.050	mg/kg	29-MAR-16	30-MAR-16	R3427827
Tin (Sn)	<2.0		2.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Titanium (Ti)	466		1.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Uranium (U)	2.35		0.050	mg/kg	29-MAR-16	30-MAR-16	R3427827
Vanadium (V)	25.9		0.20	mg/kg	29-MAR-16	30-MAR-16	R3427827
Zinc (Zn)	67.5		2.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Zirconium (Zr)	5.8		1.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
pH in Soil (1:2 Soil:Water Extraction)							
pH (1:2 soil:water)	7.57		0.10	pH		30-MAR-16	R3427803
Miscellaneous Parameters							
Sulfur (S)-Total	600		500	mg/kg	28-MAR-16	28-MAR-16	R3426563
Paste pH	7.12		0.10	pH		04-APR-16	R3429614
L1746856-7 CH16-102-MW007_SOA							
Sampled By: CLIENT on 17-MAR-16 @ 13:10							
Matrix: Soil							
Miscellaneous Parameters							
Moisture	33.9		0.25	%		29-MAR-16	R3427376
Atterberg limits							
Liquid Limit (LL)	87		1	%	31-MAR-16	31-MAR-16	R3428288
Plasticity Index (PI)	22		1	%	31-MAR-16	31-MAR-16	R3428288
Grain Size by Hydrometer							
Grain Size Curve	SEE ATTACHED				29-MAR-16	29-MAR-16	R3428268
Gravel (4.75mm - 3in.)	10.7		1.0	%	29-MAR-16	29-MAR-16	R3428268
Coarse Sand (2.0mm - 4.75mm)	3.5		1.0	%	29-MAR-16	29-MAR-16	R3428268
Medium Sand (0.425mm - 2.0mm)	10.7		1.0	%	29-MAR-16	29-MAR-16	R3428268
Fine Sand (0.075mm - 0.425mm)	15.6		1.0	%	29-MAR-16	29-MAR-16	R3428268
Silt (0.005mm - 0.075mm)	41.5		1.0	%	29-MAR-16	29-MAR-16	R3428268

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1746856-7 CH16-102-MW007_SOA							
Sampled By: CLIENT on 17-MAR-16 @ 13:10							
Matrix: Soil							
Grain Size by Hydrometer							
Clay (<0.005mm)	18.1		1.0	%	29-MAR-16	29-MAR-16	R3428268
L1746856-8 CH16-102-MW007_SOB							
Sampled By: CLIENT on 17-MAR-16 @ 13:30							
Matrix: Soil							
Metals in Soil (CCME) with Extra Metals							
Mercury in Soil by CVAFS							
Mercury (Hg)	0.0123		0.0050	mg/kg	29-MAR-16	30-MAR-16	R3427698
Metals in Soil by CRC ICPMS							
Aluminum (Al)	26100		50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Antimony (Sb)	0.22		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Arsenic (As)	5.45		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Barium (Ba)	138		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Beryllium (Be)	1.18		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Bismuth (Bi)	0.52		0.20	mg/kg	29-MAR-16	30-MAR-16	R3427827
Boron (B)	<5.0		5.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Cadmium (Cd)	0.446		0.020	mg/kg	29-MAR-16	30-MAR-16	R3427827
Calcium (Ca)	5240		50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Chromium (Cr)	60.5		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Cobalt (Co)	17.6		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Copper (Cu)	33.7		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Iron (Fe)	45700		50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Lead (Pb)	23.8		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Lithium (Li)	63.5		2.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Magnesium (Mg)	13200		20	mg/kg	29-MAR-16	30-MAR-16	R3427827
Manganese (Mn)	462		1.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Molybdenum (Mo)	0.86		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Nickel (Ni)	61.8		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Phosphorus (P)	1270		50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Potassium (K)	6470		100	mg/kg	29-MAR-16	30-MAR-16	R3427827
Selenium (Se)	<0.20		0.20	mg/kg	29-MAR-16	30-MAR-16	R3427827
Silver (Ag)	0.18		0.10	mg/kg	29-MAR-16	30-MAR-16	R3427827
Sodium (Na)	141		50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Strontium (Sr)	17.8		0.50	mg/kg	29-MAR-16	30-MAR-16	R3427827
Thallium (Tl)	0.496		0.050	mg/kg	29-MAR-16	30-MAR-16	R3427827
Tin (Sn)	<2.0		2.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Titanium (Ti)	923		1.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Uranium (U)	1.08		0.050	mg/kg	29-MAR-16	30-MAR-16	R3427827
Vanadium (V)	54.2		0.20	mg/kg	29-MAR-16	30-MAR-16	R3427827
Zinc (Zn)	97.6		2.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
Zirconium (Zr)	4.5		1.0	mg/kg	29-MAR-16	30-MAR-16	R3427827
pH in Soil (1:2 Soil:Water Extraction)							
pH (1:2 soil:water)	7.61		0.10	pH		30-MAR-16	R3427803
Miscellaneous Parameters							
Sulfur (S)-Total	700		500	mg/kg	28-MAR-16	28-MAR-16	R3426563
Paste pH	7.22		0.10	pH		04-APR-16	R3429614
L1746856-9 CH16-102-MW007_SOC							
Sampled By: CLIENT on 17-MAR-16 @ 13:45							
Matrix: Soil							
Atterberg limits							
Liquid Limit (LL)	59		1	%	31-MAR-16	31-MAR-16	R3428288

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1746856-9 CH16-102-MW007_SOC							
Sampled By: CLIENT on 17-MAR-16 @ 13:45							
Matrix: Soil							
Atterberg limits							
Plasticity Index (PI)	19		1	%	31-MAR-16	31-MAR-16	R3428288
Grain Size by Hydrometer							
Grain Size Curve	SEE ATTACHED				29-MAR-16	29-MAR-16	R3428268
Gravel (4.75mm - 3in.)	7.3		1.0	%	29-MAR-16	29-MAR-16	R3428268
Coarse Sand (2.0mm - 4.75mm)	8.6		1.0	%	29-MAR-16	29-MAR-16	R3428268
Medium Sand (0.425mm - 2.0mm)	15.6		1.0	%	29-MAR-16	29-MAR-16	R3428268
Fine Sand (0.075mm - 0.425mm)	18.3		1.0	%	29-MAR-16	29-MAR-16	R3428268
Silt (0.005mm - 0.075mm)	32.7		1.0	%	29-MAR-16	29-MAR-16	R3428268
Clay (<0.005mm)	17.6		1.0	%	29-MAR-16	29-MAR-16	R3428268

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ATTERBERG-SK	Soil	Atterberg limits	CARTER CSSS 58

The liquid limit (or upper plastic limit) is the point at which the soil becomes semifluid, like softened butter. In operational terms, the liquid limit is defined as the water content at which a trapezoidal groove cut in moist soil is closed after 25 taps on a hard rubber plate (ASTM D-18, 1958).

The plastic limit (or lower plastic limit) is defined as the water content at which soil begins to crumble on being rolled into a thread 1/8 inch (or 3 mm) in diameter. It represents the lowest water content at which soil can be deformed readily without cracking.

The plastic index (which is the difference between the liquid and plastic limits) gives an indication of the "clayeyness" or plasticity of a clay and is employed in engineering classification systems for soils.

References: McKeague, J.A. 1978. Atterberg Limits pp 50 - 55 In: Soil Sampling and Methods of Analysis. Can. Soc. Soil Sci. p. 50 - 55

GRAIN SIZE-HYD-SK	Soil	Grain Size by Hydrometer	ASTM D422-63

Particle size curve is generated from dry sieving (particles > 2 mm), wet sieving (particles 2 mm-75 um and hydrometer readings (particles < 75 um)

GRAIN SIZE-HYD-SR-SK	Soil	% Particle size passing	ASTM D422-63

Particle size curve is generated from dry sieving (particles > 2 mm), wet sieving (particles 2 mm-75 um and hydrometer readings (particles < 75 um)

HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAFS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MOISTURE-VA	Soil	Moisture content	ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PH-1:2-VA	Soil	pH in Soil (1:2 Soil:Water Extraction)	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL

This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.

PH-PASTE-VA	Soil	pH in Soil (Paste) by Meter	Carter-CSSS / APHA 4500 H

A soil extract produced by the saturated paste extraction procedure is analyzed by pH meter.

PSA-D1140-SK	Soil	% Particles < 75um (Fine)	ASTM D1140-15

An oven-dried sample is mixed with a dispersing agent. The sample is washed through a 200 mesh (75 um) sieve. The retained mass of sample is used to determine % passing 75 um.

S-TOT-LECO-SK	Soil	Total Sulphur by combustion method	ISO 15178:2000

The sample is ignited in a combustion analyzer where sulfur in the reduced SO2 gas is determined using a thermal conductivity detector.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

ALS999

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L1746856 Report Date: 04-APR-16

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
GRAIN SIZE-HYD-SK	**Soil**							
Batch R3428268								
WG2281064-1 DUP		**L1746856-5**						
Gravel (4.75mm - 3in.)		33.2	33.2		%	0.0	25	29-MAR-16
Coarse Sand (2.0mm - 4.75mm)		15.8	15.7		%	0.1	25	29-MAR-16
Medium Sand (0.425mm - 2.0mm)		16.2	16.7		%	3.2	25	29-MAR-16
Fine Sand (0.075mm - 0.425mm)		13.8	13.8		%	0.1	25	29-MAR-16
Silt (0.005mm - 0.075mm)		12.7	12.0		%	5.3	25	29-MAR-16
Clay (<0.005mm)		8.4	8.6		%	1.4	25	29-MAR-16
HG-200.2-CVAF-VA	**Soil**							
Batch R3427698								
WG2282761-4 CRM		**VA-NRC-STSD1**						
Mercury (Hg)			87.1		%		70-130	30-MAR-16
WG2282761-5 CRM		**VA-NRC-PACS3**						
Mercury (Hg)			85.8		%		70-130	30-MAR-16
WG2282761-2 DUP		**L1746856-5**						
Mercury (Hg)		0.0112	0.0129		mg/kg	14	40	30-MAR-16
WG2282761-3 LCS								
Mercury (Hg)			87.8		%		70-130	30-MAR-16
WG2282761-1 MB								
Mercury (Hg)			<0.0050		mg/kg		0.005	30-MAR-16
WG2282761-7 MS		**L1746856-6**						
Mercury (Hg)			93.8		%		70-130	30-MAR-16
MET-200.2-CCMS-VA	**Soil**							
Batch R3427827								
WG2282761-4 CRM		**VA-NRC-STSD1**						
Aluminum (Al)			106.2		%		70-130	30-MAR-16
Antimony (Sb)			108.2		%		70-130	30-MAR-16
Arsenic (As)			103.2		%		70-130	30-MAR-16
Barium (Ba)			100.2		%		70-130	30-MAR-16
Beryllium (Be)			100.8		%		70-130	30-MAR-16
Bismuth (Bi)			95.7		%		70-130	30-MAR-16
Boron (B)			91.3		%		70-130	30-MAR-16
Cadmium (Cd)			104.6		%		70-130	30-MAR-16
Calcium (Ca)			99.5		%		70-130	30-MAR-16
Chromium (Cr)			103.9		%		70-130	30-MAR-16
Cobalt (Co)			101.8		%		70-130	30-MAR-16
Copper (Cu)			99.6		%		70-130	30-MAR-16

Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-VA	**Soil**							
Batch R3427827								
WG2282761-4 CRM		**VA-NRC-STSD1**						
Iron (Fe)			103.2		%		70-130	30-MAR-16
Lead (Pb)			96.6		%		70-130	30-MAR-16
Lithium (Li)			95.6		%		70-130	30-MAR-16
Magnesium (Mg)			100.5		%		70-130	30-MAR-16
Manganese (Mn)			99.4		%		70-130	30-MAR-16
Molybdenum (Mo)			101.0		%		70-130	30-MAR-16
Nickel (Ni)			101.7		%		70-130	30-MAR-16
Phosphorus (P)			102.5		%		70-130	30-MAR-16
Potassium (K)			110.3		%		70-130	30-MAR-16
Selenium (Se)			102.2		%		70-130	30-MAR-16
Silver (Ag)			101.5		%		70-130	30-MAR-16
Sodium (Na)			107.3		%		70-130	30-MAR-16
Strontium (Sr)			102.6		%		70-130	30-MAR-16
Thallium (Tl)			100.2		%		70-130	30-MAR-16
Tin (Sn)			108.4		%		70-130	30-MAR-16
Titanium (Ti)			114.2		%		70-130	30-MAR-16
Vanadium (V)			105.8		%		70-130	30-MAR-16
Zinc (Zn)			97.9		%		70-130	30-MAR-16
WG2282761-5 CRM		**VA-NRC-PACS3**						
Aluminum (Al)			102.1		%		70-130	30-MAR-16
Antimony (Sb)			101.1		%		70-130	30-MAR-16
Arsenic (As)			90.7		%		70-130	30-MAR-16
Barium (Ba)			93.7		%		70-130	30-MAR-16
Beryllium (Be)			95.7		%		70-130	30-MAR-16
Boron (B)			90.0		%		70-130	30-MAR-16
Cadmium (Cd)			93.7		%		70-130	30-MAR-16
Calcium (Ca)			95.5		%		70-130	30-MAR-16
Chromium (Cr)			95.5		%		70-130	30-MAR-16
Cobalt (Co)			97.0		%		70-130	30-MAR-16
Copper (Cu)			97.1		%		70-130	30-MAR-16
Iron (Fe)			99.5		%		70-130	30-MAR-16
Lead (Pb)			91.3		%		70-130	30-MAR-16
Lithium (Li)			90.7		%		70-130	30-MAR-16
Magnesium (Mg)			104.1		%		70-130	30-MAR-16

Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-VA	**Soil**							
Batch R3427827								
WG2282761-5 CRM		**VA-NRC-PACS3**						
Manganese (Mn)			96.2		%		70-130	30-MAR-16
Molybdenum (Mo)			88.4		%		70-130	30-MAR-16
Nickel (Ni)			100.2		%		70-130	30-MAR-16
Phosphorus (P)			90.6		%		70-130	30-MAR-16
Potassium (K)			97.5		%		70-130	30-MAR-16
Selenium (Se)			92.9		%		70-130	30-MAR-16
Silver (Ag)			99.7		%		70-130	30-MAR-16
Sodium (Na)			92.7		%		70-130	30-MAR-16
Strontium (Sr)			94.2		%		70-130	30-MAR-16
Thallium (Tl)			89.7		%		70-130	30-MAR-16
Tin (Sn)			91.7		%		70-130	30-MAR-16
Titanium (Ti)			97.7		%		70-130	30-MAR-16
Uranium (U)			94.2		%		70-130	30-MAR-16
Vanadium (V)			96.9		%		70-130	30-MAR-16
Zinc (Zn)			96.2		%		70-130	30-MAR-16
Zirconium (Zr)			94.2		%		70-130	30-MAR-16
WG2282761-2 DUP		**L1746856-5**						
Aluminum (Al)		32300	30500		mg/kg	5.8	40	30-MAR-16
Antimony (Sb)		0.28	0.30		mg/kg	5.5	30	30-MAR-16
Arsenic (As)		5.47	5.84		mg/kg	6.4	30	30-MAR-16
Barium (Ba)		117	125		mg/kg	6.2	40	30-MAR-16
Beryllium (Be)		0.82	0.96		mg/kg	16	30	30-MAR-16
Bismuth (Bi)		0.94	0.99		mg/kg	5.6	30	30-MAR-16
Boron (B)		<5.0	<5.0	RPD-NA	mg/kg	N/A	30	30-MAR-16
Cadmium (Cd)		2.63	2.71		mg/kg	3.0	30	30-MAR-16
Calcium (Ca)		5020	5530		mg/kg	9.7	30	30-MAR-16
Chromium (Cr)		290	283		mg/kg	2.6	30	30-MAR-16
Cobalt (Co)		43.6	44.9		mg/kg	2.9	30	30-MAR-16
Copper (Cu)		105	112		mg/kg	6.1	30	30-MAR-16
Iron (Fe)		44900	47500		mg/kg	5.4	30	30-MAR-16
Lead (Pb)		7.05	8.84		mg/kg	23	40	30-MAR-16
Lithium (Li)		42.7	47.8		mg/kg	11	30	30-MAR-16
Magnesium (Mg)		18800	17600		mg/kg	7.0	30	30-MAR-16

Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-VA	**Soil**							
Batch R3427827								
WG2282761-2 DUP		**L1746856-5**						
Manganese (Mn)		304	309		mg/kg	1.7	30	30-MAR-16
Molybdenum (Mo)		9.29	10.1		mg/kg	8.4	40	30-MAR-16
Nickel (Ni)		381	400		mg/kg	4.9	30	30-MAR-16
Phosphorus (P)		910	1010		mg/kg	10	30	30-MAR-16
Potassium (K)		2130	2060		mg/kg	3.4	40	30-MAR-16
Selenium (Se)		2.38	2.65		mg/kg	11	30	30-MAR-16
Silver (Ag)		0.40	0.42		mg/kg	5.2	40	30-MAR-16
Sodium (Na)		202	198		mg/kg	2.0	40	30-MAR-16
Strontium (Sr)		21.1	23.1		mg/kg	8.7	40	30-MAR-16
Thallium (Tl)		0.303	0.319		mg/kg	5.1	30	30-MAR-16
Tin (Sn)		<2.0	<2.0	RPD-NA	mg/kg	N/A	40	30-MAR-16
Titanium (Ti)		598	521		mg/kg	14	40	30-MAR-16
Uranium (U)		7.55	8.20		mg/kg	8.3	30	30-MAR-16
Vanadium (V)		80.3	74.7		mg/kg	7.3	30	30-MAR-16
Zinc (Zn)		189	189		mg/kg	0.1	30	30-MAR-16
Zirconium (Zr)		4.6	5.0		mg/kg	9.2	30	30-MAR-16
WG2282761-3 LCS								
Aluminum (Al)			103.5		%		70-130	30-MAR-16
Antimony (Sb)			102.4		%		70-130	30-MAR-16
Arsenic (As)			100.9		%		70-130	30-MAR-16
Barium (Ba)			102.9		%		70-130	30-MAR-16
Beryllium (Be)			92.0		%		70-130	30-MAR-16
Bismuth (Bi)			88.9		%		70-130	30-MAR-16
Boron (B)			83.7		%		70-130	30-MAR-16
Cadmium (Cd)			103.0		%		70-130	30-MAR-16
Calcium (Ca)			93.4		%		70-130	30-MAR-16
Chromium (Cr)			99.4		%		70-130	30-MAR-16
Cobalt (Co)			100.3		%		70-130	30-MAR-16
Copper (Cu)			95.7		%		70-130	30-MAR-16
Iron (Fe)			104.5		%		70-130	30-MAR-16
Lead (Pb)			92.5		%		70-130	30-MAR-16
Lithium (Li)			94.3		%		70-130	30-MAR-16
Magnesium (Mg)			98.8		%		70-130	30-MAR-16

Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-VA	**Soil**							
Batch R3427827								
WG2282761-3 LCS								
Manganese (Mn)			101.4		%		70-130	30-MAR-16
Molybdenum (Mo)			95.2		%		70-130	30-MAR-16
Nickel (Ni)			102.2		%		70-130	30-MAR-16
Phosphorus (P)			106.2		%		70-130	30-MAR-16
Potassium (K)			100.5		%		70-130	30-MAR-16
Selenium (Se)			98.6		%		70-130	30-MAR-16
Silver (Ag)			97.6		%		70-130	30-MAR-16
Sodium (Na)			96.8		%		70-130	30-MAR-16
Strontium (Sr)			90.5		%		70-130	30-MAR-16
Thallium (Tl)			93.0		%		70-130	30-MAR-16
Tin (Sn)			98.7		%		70-130	30-MAR-16
Titanium (Ti)			96.0		%		70-130	30-MAR-16
Uranium (U)			93.6		%		70-130	30-MAR-16
Vanadium (V)			102.3		%		70-130	30-MAR-16
Zinc (Zn)			92.0		%		70-130	30-MAR-16
Zirconium (Zr)			90.3		%		70-130	30-MAR-16
WG2282761-1 MB								
Aluminum (Al)			<50		mg/kg		50	30-MAR-16
Antimony (Sb)			<0.10		mg/kg		0.1	30-MAR-16
Arsenic (As)			<0.10		mg/kg		0.1	30-MAR-16
Barium (Ba)			<0.50		mg/kg		0.5	30-MAR-16
Beryllium (Be)			<0.10		mg/kg		0.1	30-MAR-16
Bismuth (Bi)			<0.20		mg/kg		0.2	30-MAR-16
Boron (B)			<5.0		mg/kg		5	30-MAR-16
Cadmium (Cd)			<0.020		mg/kg		0.02	30-MAR-16
Calcium (Ca)			<50		mg/kg		50	30-MAR-16
Chromium (Cr)			<0.50		mg/kg		0.5	30-MAR-16
Cobalt (Co)			<0.10		mg/kg		0.1	30-MAR-16
Copper (Cu)			<0.50		mg/kg		0.5	30-MAR-16
Iron (Fe)			<50		mg/kg		50	30-MAR-16
Lead (Pb)			<0.50		mg/kg		0.5	30-MAR-16
Lithium (Li)			<2.0		mg/kg		2	30-MAR-16
Magnesium (Mg)			<20		mg/kg		20	30-MAR-16
Manganese (Mn)			<1.0		mg/kg		1	30-MAR-16

Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-VA	**Soil**							
Batch R3427827								
WG2282761-1 MB								
Molybdenum (Mo)			<0.10		mg/kg		0.1	30-MAR-16
Nickel (Ni)			<0.50		mg/kg		0.5	30-MAR-16
Phosphorus (P)			<50		mg/kg		50	30-MAR-16
Potassium (K)			<100		mg/kg		100	30-MAR-16
Selenium (Se)			<0.20		mg/kg		0.2	30-MAR-16
Silver (Ag)			<0.10		mg/kg		0.1	30-MAR-16
Sodium (Na)			<50		mg/kg		50	30-MAR-16
Strontium (Sr)			<0.50		mg/kg		0.5	30-MAR-16
Thallium (Tl)			<0.050		mg/kg		0.05	30-MAR-16
Tin (Sn)			<2.0		mg/kg		2	30-MAR-16
Titanium (Ti)			<1.0		mg/kg		1	30-MAR-16
Uranium (U)			<0.050		mg/kg		0.05	30-MAR-16
Vanadium (V)			<0.20		mg/kg		0.2	30-MAR-16
Zinc (Zn)			<2.0		mg/kg		2	30-MAR-16
Zirconium (Zr)			<1.0		mg/kg		1	30-MAR-16
WG2282761-7 MS		**L1746856-6**						
Aluminum (Al)			N/A	MS-B	%		-	01-APR-16
Antimony (Sb)			94.0		%		70-130	01-APR-16
Arsenic (As)			89.4		%		70-130	01-APR-16
Barium (Ba)			84.0		%		70-130	01-APR-16
Beryllium (Be)			85.7		%		70-130	01-APR-16
Bismuth (Bi)			92.7		%		70-130	01-APR-16
Boron (B)			77.9		%		70-130	01-APR-16
Cadmium (Cd)			89.5		%		70-130	01-APR-16
Calcium (Ca)			N/A	MS-B	%		-	01-APR-16
Chromium (Cr)			87.6		%		70-130	01-APR-16
Cobalt (Co)			90.9		%		70-130	01-APR-16
Copper (Cu)			87.6		%		70-130	01-APR-16
Iron (Fe)			N/A	MS-B	%		-	01-APR-16
Lead (Pb)			93.7		%		70-130	01-APR-16
Lithium (Li)			73.9		%		70-130	01-APR-16
Magnesium (Mg)			N/A	MS-B	%		-	01-APR-16
Manganese (Mn)			N/A	MS-B	%		-	01-APR-16
Molybdenum (Mo)			84.5		%		70-130	01-APR-16

Quality Control Report

Workorder: L1746856 Report Date: 04-APR-16

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-VA	**Soil**							
Batch R3427827								
WG2282761-7 MS		**L1746856-6**						
Nickel (Ni)			87.9		%		70-130	01-APR-16
Phosphorus (P)			86.3		%		70-130	01-APR-16
Potassium (K)			88.0		%		70-130	01-APR-16
Selenium (Se)			81.0		%		70-130	01-APR-16
Silver (Ag)			93.7		%		70-130	01-APR-16
Sodium (Na)			86.8		%		70-130	01-APR-16
Strontium (Sr)			84.6		%		70-130	01-APR-16
Thallium (Tl)			92.4		%		70-130	01-APR-16
Tin (Sn)			79.1		%		70-130	01-APR-16
Titanium (Ti)			N/A	MS-B	%		-	01-APR-16
Uranium (U)			99.8		%		70-130	01-APR-16
Vanadium (V)			94.5		%		70-130	01-APR-16
Zinc (Zn)			81.7		%		70-130	01-APR-16
MOISTURE-VA	**Soil**							
Batch R3425123								
WG2281058-3 DUP		**L1747895-9**						
Moisture		28.0	29.0		%	3.6	20	24-MAR-16
WG2281058-4 DUP		**L1748384-3**						
Moisture		25.9	25.7		%	0.7	20	24-MAR-16
WG2281058-2 LCS								
Moisture			100.3		%		90-110	24-MAR-16
WG2281058-1 MB								
Moisture			<0.25		%		0.25	24-MAR-16
Batch R3427376								
WG2282760-3 DUP		**L1746856-7**						
Moisture		33.9	35.5		%	4.6	20	29-MAR-16
WG2282760-2 LCS								
Moisture			100.0		%		90-110	29-MAR-16
WG2282760-1 MB								
Moisture			<0.25		%		0.25	29-MAR-16
PH-1:2-VA	**Soil**							
Batch R3427803								
WG2282761-2 DUP		**L1746856-5**						
pH (1:2 soil:water)		7.50	7.46	J	pH	0.04	0.3	30-MAR-16
WG2282761-6 IRM		**VA-ALP-SRS1507**						

Quality Control Report

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH-1:2-VA	**Soil**							
Batch R3427803								
WG2282761-6 IRM		**VA-ALP-SRS1507**						
pH (1:2 soil:water)			7.82		pH		7.52-8.12	30-MAR-16
PH-PASTE-VA	**Soil**							
Batch R3429614								
WG2283470-4 DUP		**L1746856-5**						
Paste pH		7.06	7.01	J	pH	0.05	0.3	04-APR-16
WG2283470-3 IRM		**VA-ALP-SRS1507**						
Paste pH			7.30		pH		7.02-7.62	04-APR-16
WG2283470-2 LCS								
Paste pH			6.83		pH		6.44-7.64	04-APR-16
PSA-D1140-SK	**Soil**							
Batch R3427456								
WG2281071-1 DUP		**L1746856-1**						
PSA % < 75UM		28.2	29.8	J	%	1.63	5	30-MAR-16
S-TOT-LECO-SK	**Soil**							
Batch R3426563								
WG2281132-1 DUP		**L1746856-6**						
Sulfur (S)-Total		600	600		mg/kg	2.8	30	28-MAR-16
WG2281132-2 IRM		**1646A_SOIL**						
Sulfur (S)-Total			2600		mg/kg		2500-4600	28-MAR-16
WG2281132-3 MB								
Sulfur (S)-Total			<500		mg/kg		500	28-MAR-16

Quality Control Report

Workorder: L1746856 Report Date: 04-APR-16

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L1746856 Report Date: 04-APR-16

Client: CH2M HILL, INC
2525 Airpark Drive
Redding CA 96001
Contact: Mark Cichy

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Moisture content							
	4	06-MAR-16 16:05	29-MAR-16 21:22	14	23	days	EHTL
	5	06-MAR-16 16:25	29-MAR-16 21:22	14	23	days	EHTL

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1746856 were received on 19-MAR-16 20:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CH2MHILL

CHAIN OF CUSTODY RECORD

3/19/2016 2:24:21 PM

Project Name Faro Mine
Location Faro Mine Complex - Faro YK
Project Number 660403.07.01.01.01.05.FW
Project Manager Chuck Shewen
Sample Manager Travis Gouveia
(530) 229-3268
Task Order 102
Project FCD NEW ALIGNMENT DRILLING 2016
Turnaround Time 10 Days
Shipping Date: 3/18/2016
COC Number: ALS999

L1746856-COFC

	DATE	TIME	Matrix	CSSS/APHA 4500H Paste pH	P200	ASTM 2216 Moisture	ASTM D422-63 gradation	ASTM D422-63 Gradation Hydrometer	ASTM D4318 Atterberg	ISO 15178-2000 Total Sulfur	SW6010B/6020A Total Metals	Number of Containers	COMMENTS
Container:				1 Gallon Ziploc	1 Gallon Ziploc	1 Gallon Ziploc	1 Gallon Ziploc	1 Gallon Ziploc	1 Gallon Ziploc	1 Gallon Ziploc	1 Gallon Ziploc		
Preservatives:				4°C	4°C	4°C	4°C	4°C	4°C	4°C	4°C		
Filtered:				NA	NA	NA	NA	NA	NA	NA	NA		
Holding Time:				30	NA	NA	NA	NA	NA	30	180/28		
CH16-102-MW005_SOa	3/11/2016	17:15	Soil		x	x						1	
CH16-102-MW005_SOb	3/11/2016	17:35	Soil				x		x			1	
CH16-102-MW005_SOd	3/11/2016	18:00	Soil				x		x			1	
CH16-102-MW004_SOb	3/6/2016	16:05	Soil			x						1	
CH16-102-MW004_SOc	3/6/2016	16:25	Soil	x		x		x	x	x	x	3	
CH16-102-MW005_SOj	3/12/2016	11:00	Soil	x						x	x	2	
CH16-102-MW007_SOa	3/17/2016	13:10	Soil			x		x	x			1	
CH16-102-MW007_SOb	3/17/2016	13:30	Soil	x						x	x	2	
CH16-102-MW007_SOc	3/17/2016	13:45	Soil					x	x			1	
											TOTAL NUMBER OF CONTAINERS	13	

Signatures	Date/Time
Approved by	
Sampled by	
Relinquished by	3/19/16
Received by	19-Mar 16 1.0,0.5,1.0
Relinquished by	8pm
Received by	Lady Mar 22 2:30PM

7/5/8/8/6 C

Shipping Details
Method of Shipment: ~~FedEX~~
On Ice: yes / no
Airbill No:
Lab Name: ALS Vancouver
Lab Phone: (604) 253-4188

ATTN:
Sample Custody
and
Amber Springer

Special Instructions:

Report Copy to
Mark Cichy
(530) 229-3274

Attachment 5
Geotechnical Laboratory Test Results for Soil and Rock

Soil Test Reports

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ATTERBERG-SK	Soil	Atterberg limits	CARTER CSSS 58

The liquid limit (or upper plastic limit) is the point at which the soil becomes semifluid, like softened butter. In operational terms, the liquid limit is defined as the water content at which a trapezoidal groove cut in moist soil is closed after 25 taps on a hard rubber plate (ASTM D-18, 1958).

The plastic limit (or lower plastic limit) is defined as the water content at which soil begins to crumble on being rolled into a thread 1/8 inch (or 3 mm) in diameter. It represents the lowest water content at which soil can be deformed readily without cracking.

The plastic index (which is the difference between the liquid and plastic limits) gives an indication of the "clayeyness" or plasticity of a clay and is employed in engineering classification systems for soils.

References: McKeague, J.A. 1978. Atterberg Limits pp 50 - 55 In: Soil Sampling and Methods of Analysis. Can. Soc. Soil Sci. p. 50 - 55

GRAIN SIZE-HYD-SK	Soil	Grain Size by Hydrometer	ASTM D422-63

Particle size curve is generated from dry sieving (particles > 2 mm), wet sieving (particles 2 mm-75 um and hydrometer readings (particles < 75 um)

GRAIN SIZE-HYD-SR-SK	Soil	% Particle size passing	ASTM D422-63

Particle size curve is generated from dry sieving (particles > 2 mm), wet sieving (particles 2 mm-75 um and hydrometer readings (particles < 75 um)

HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAFS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MOISTURE-VA	Soil	Moisture content	ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PH-1:2-VA	Soil	pH in Soil (1:2 Soil:Water Extraction)	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL

This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.

PH-PASTE-VA	Soil	pH in Soil (Paste) by Meter	Carter-CSSS / APHA 4500 H

A soil extract produced by the saturated paste extraction procedure is analyzed by pH meter.

PSA-D1140-SK	Soil	% Particles < 75um (Fine)	ASTM D1140-15

An oven-dried sample is mixed with a dispersing agent. The sample is washed through a 200 mesh (75 um) sieve. The retained mass of sample is used to determine % passing 75 um.

S-TOT-LECO-SK	Soil	Total Sulphur by combustion method	ISO 15178:2000

The sample is ignited in a combustion analyzer where sulfur in the reduced SO2 gas is determined using a thermal conductivity detector.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

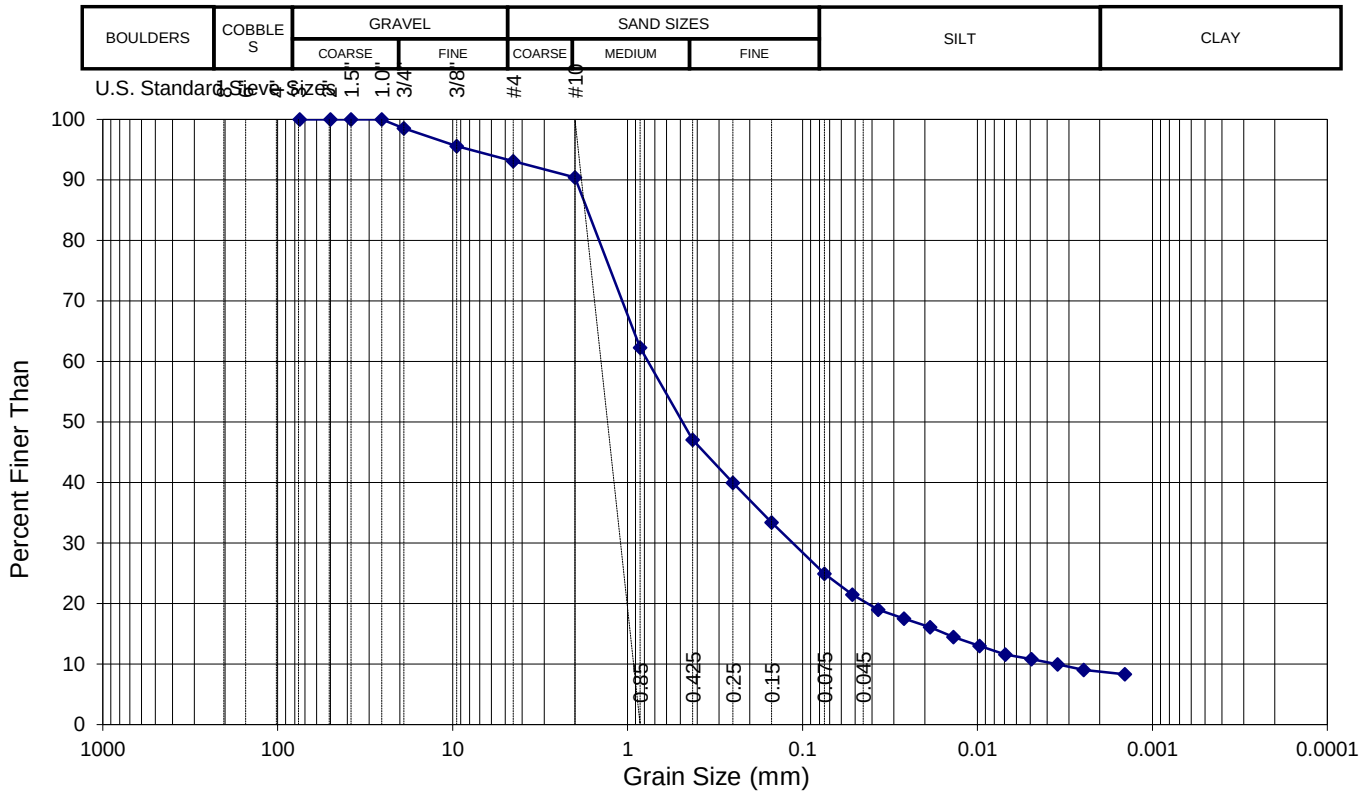
ALS999

ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	CH2M HILL, INC
Project Number:	CHM400-CHM200-VA
Client Sample ID	CH16-102-MW003_SOA
Lab Sample ID	L1742756-4
Date Sample Received	09-Mar-16
Test Completion Date:	18-Mar-16
Analyst:	SHC



PARTICLE SIZE DISTRIBUTION

Particle Size range (mm)	Weight %	Passing %	Method
> 300 mm	0	100	Sieve
75 mm	0	100	Sieve
50 mm	0	100	Sieve
37.5 mm	0	100	Sieve
25 mm	0	99.908214	Sieve
19 mm	1	98.531426	Sieve
9.5 mm	3	95.594277	Sieve
4.75 mm	2	93.22419	Sieve
2 mm	3	90.391778	Sieve
0.85 mm	28	62.278965	Sieve
0.425 mm	15	47.038749	Sieve
0.25 mm	7	39.944919	Sieve
0.106 mm	12	28.434377	Sieve
0.075 mm	4	24.92674	Hydrometer
0.045 mm	5	20.332355	Hydrometer
0.033 mm	2	18.433797	Hydrometer
0.023 mm	2	16.904214	Hydrometer
0.017 mm	1	15.533907	Hydrometer
0.012 mm	2	13.831119	Hydrometer
0.009 mm	1	12.624943	Hydrometer
0.006 mm	1	11.22844	Hydrometer
0.005 mm	0	10.871336	Hydrometer
0.0046 mm	0	10.642728	Hydrometer
0.003 mm	1	9.5070246	Hydrometer
0.002 mm	1	8.6169505	Hydrometer
0.0015 mm	0	8.1719135	Hydrometer
0.001 mm	0	7.7268765	Hydrometer

METHOD DESCRIPTION

Method Reference: ASTM D 422 - 63 (2002)

Dispersion method: Mechanical

Dispesion period: 1 minute cm/s

Soil classification system used: Unified Soil Classification

DESCRIPTION OF SAND AND GRAVEL PARTICLES

Shape: Angular

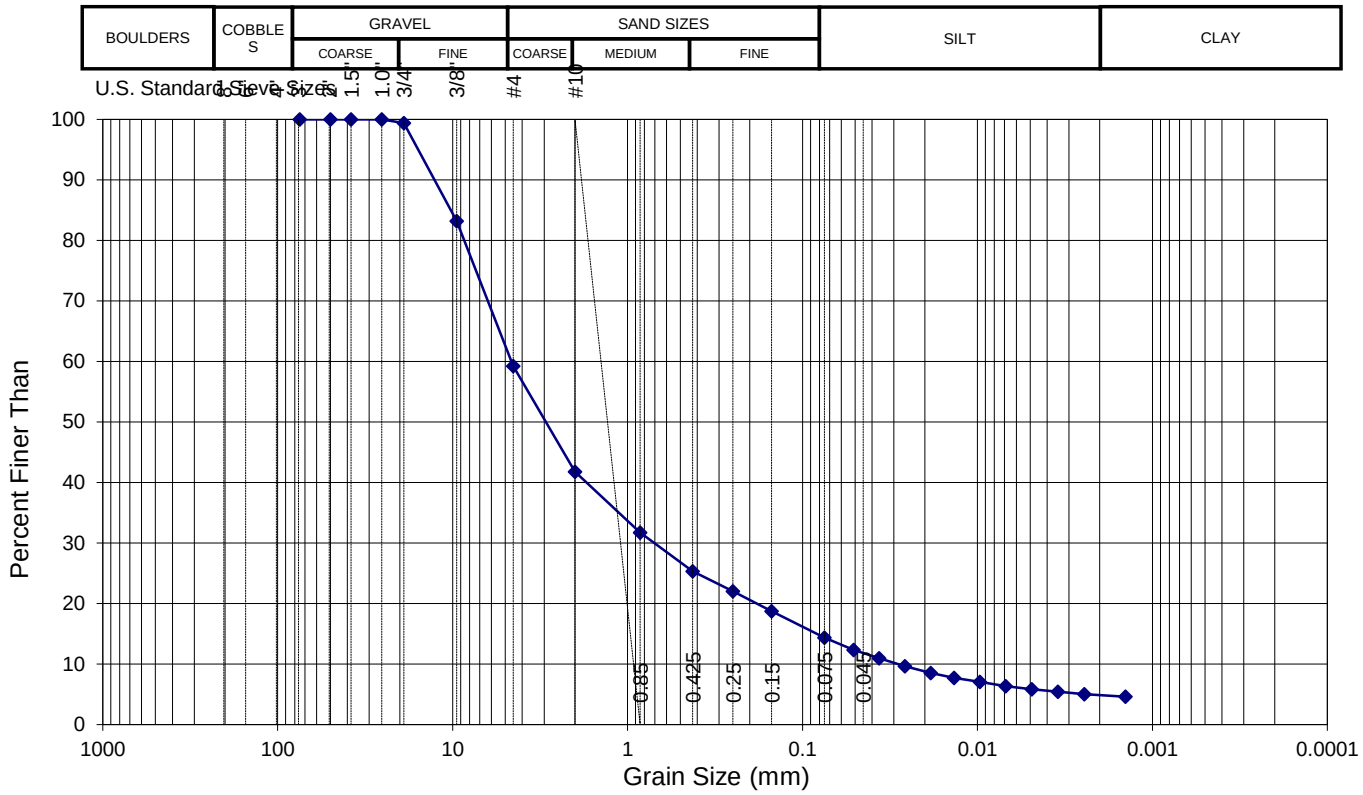
Hardness: Hard

ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	CH2M HILL, INC
Project Number:	CHM400-CHM200-VA
Client Sample ID	CH16-102-MW003_SOB
Lab Sample ID	L1742756-5
Date Sample Received	09-Mar-16
Test Completion Date:	18-Mar-16
Analyst:	SHC



METHOD DESCRIPTION

Method Reference: ASTM D 422 - 63 (2002)

Dispersion method: Mechanical

Dispesion period: 1 minute cm/s

Soil classification system used: Unified Soil Classification

DESCRIPTION OF SAND AND GRAVEL PARTICLES

Shape: Angular

Hardness: Hard

PARTICLE SIZE DISTRIBUTION

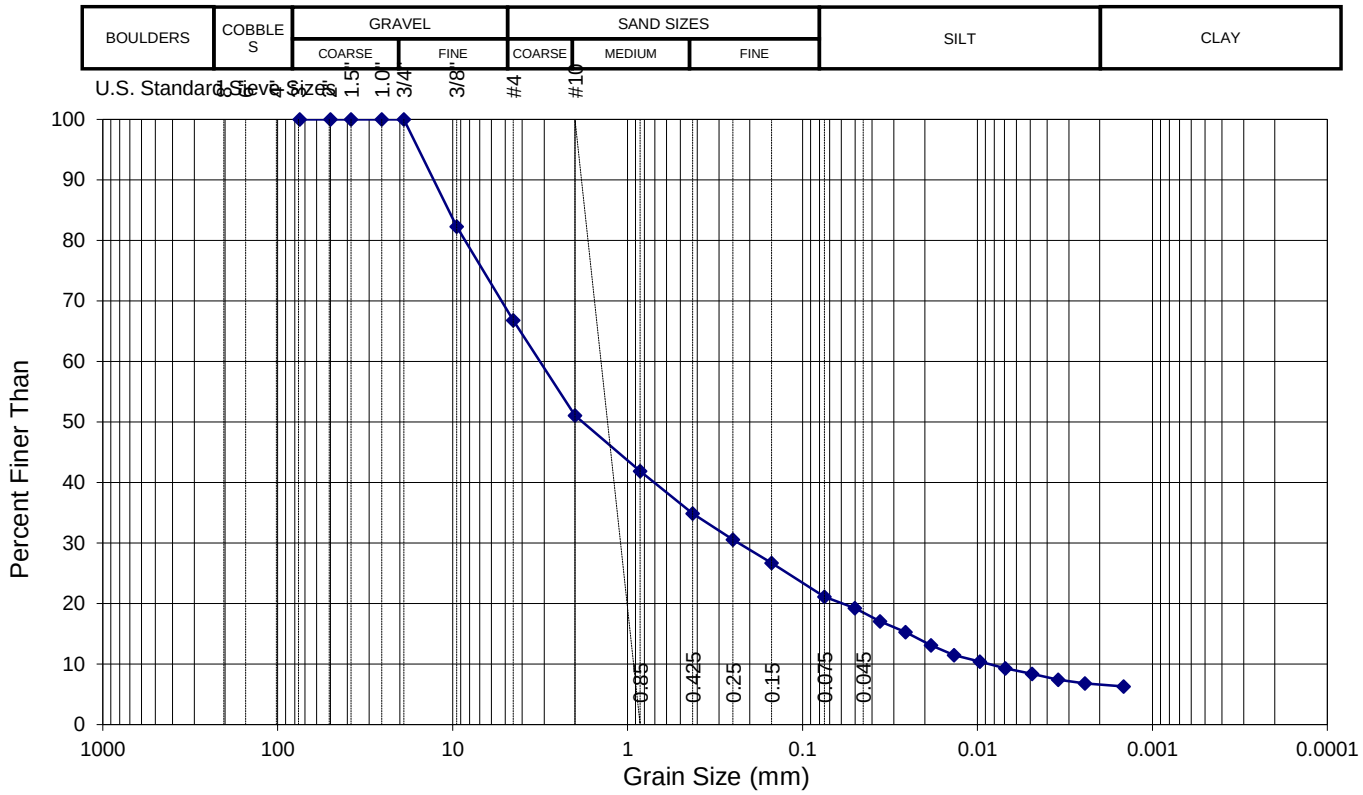
Particle Size range (mm)	Weight %	Passing %	Method
> 300 mm	0	100	Sieve
75 mm	0	100	Sieve
50 mm	0	100	Sieve
37.5 mm	0	100	Sieve
25 mm	0	99.963105	Sieve
19 mm	1	99.409686	Sieve
9.5 mm	16	83.180996	Sieve
4.75 mm	23	60.460413	Sieve
2 mm	19	41.790433	Sieve
0.85 mm	10	31.712425	Sieve
0.425 mm	6	25.357407	Sieve
0.25 mm	3	22.042365	Sieve
0.106 mm	6	16.155943	Sieve
0.075 mm	2	14.349719	Hydrometer
0.045 mm	3	11.762411	Hydrometer
0.033 mm	1	10.535299	Hydrometer
0.023 mm	1	9.1982731	Hydrometer
0.017 mm	1	8.2854975	Hydrometer
0.012 mm	1	7.4331464	Hydrometer
0.009 mm	1	6.8744402	Hydrometer
0.006 mm	1	6.1443305	Hydrometer
0.005 mm	0	5.8936202	Hydrometer
0.0046 mm	0	5.7807759	Hydrometer
0.003 mm	1	5.2534481	Hydrometer
0.002 mm	0	4.8384239	Hydrometer
0.0015 mm	0	4.6309118	Hydrometer
0.001 mm	0	4.4233997	Hydrometer

ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	CH2M HILL, INC
Project Number:	CHM400-CHM200-VA
Client Sample ID	CH16-102-MW004_SOC
Lab Sample ID	L1746856-5
Date Sample Received	19-Mar-16
Test Completion Date:	31-Mar-16
Analyst:	HSL



PARTICLE SIZE DISTRIBUTION

Particle Size range (mm)	Weight %	Passing %	Method
> 300 mm	0	100	Sieve
75 mm	0	100	Sieve
50 mm	0	100	Sieve
37.5 mm	0	100	Sieve
25 mm	0	100	Sieve
19 mm	0	100	Sieve
9.5 mm	18	82.312001	Sieve
4.75 mm	15	67.603828	Sieve
2 mm	17	51.08454	Sieve
0.85 mm	9	41.895733	Sieve
0.425 mm	7	34.872584	Sieve
0.25 mm	4	30.561313	Sieve
0.106 mm	7	23.417529	Sieve
0.075 mm	2	21.105493	Hydrometer
0.045 mm	3	18.413876	Hydrometer
0.033 mm	2	16.53309	Hydrometer
0.023 mm	2	14.479186	Hydrometer
0.017 mm	2	12.629757	Hydrometer
0.012 mm	2	11.044922	Hydrometer
0.009 mm	1	10.149719	Hydrometer
0.006 mm	1	8.8798101	Hydrometer
0.005 mm	0	8.4285359	Hydrometer
0.0046 mm	0	8.1916689	Hydrometer
0.003 mm	1	7.1635821	Hydrometer
0.002 mm	1	6.5636508	Hydrometer
0.0015 mm	0	6.2636851	Hydrometer
0.001 mm	0	5.9637194	Hydrometer

METHOD DESCRIPTION

Method Reference: ASTM D 422 - 63 (2002)

Dispersion method: Mechanical

Dispesion period: 1 minute cm/s

Soil classification system used: Unified Soil Classification

DESCRIPTION OF SAND AND GRAVEL PARTICLES

Shape: Angular

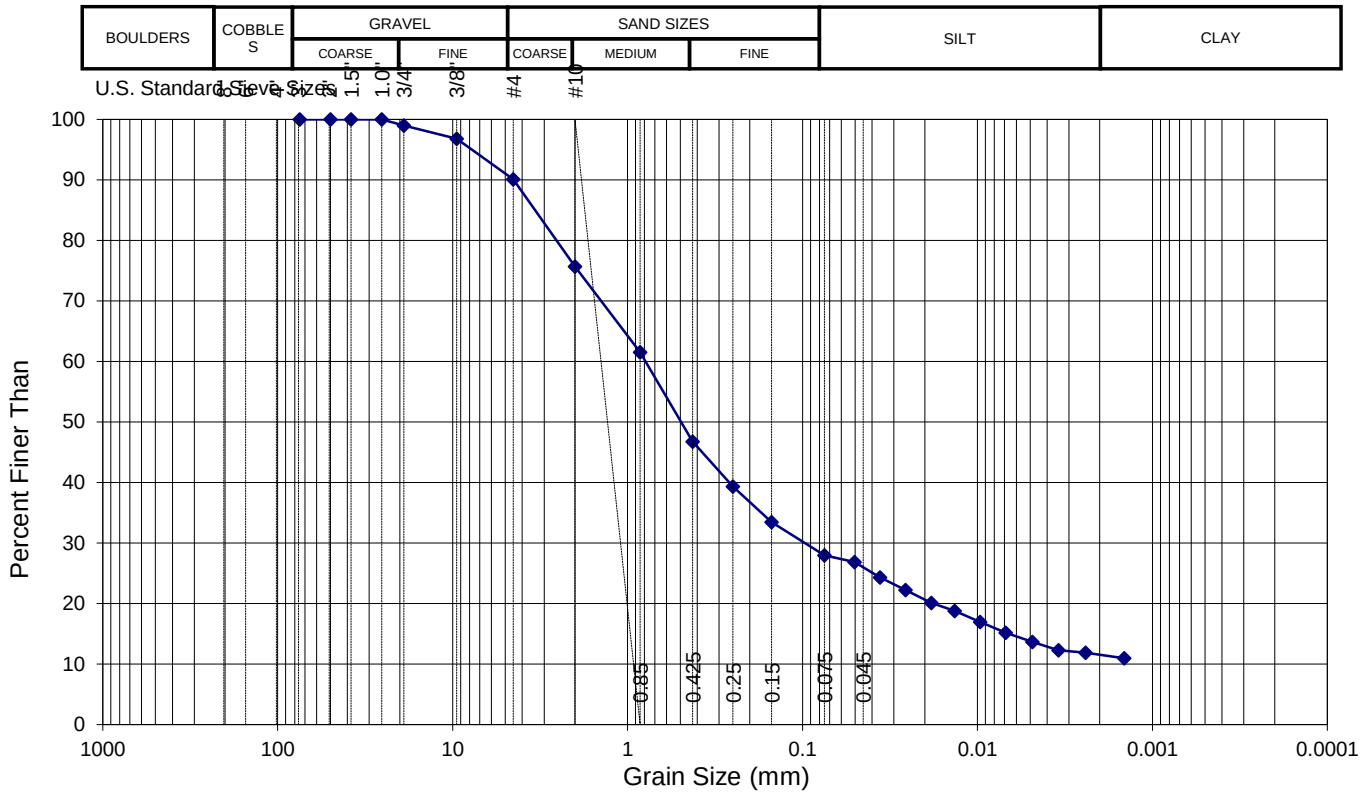
Hardness: Hard

ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	CH2M HILL, INC
Project Number:	CHM400-CHM200-VA
Client Sample ID	CH16-102-MW005_SOB
Lab Sample ID	L1746856-2
Date Sample Received	19-Mar-16
Test Completion Date:	31-Mar-16
Analyst:	HSL



METHOD DESCRIPTION

Method Reference: ASTM D 422 - 63 (2002)

Dispersion method: Mechanical

Dispesion period: 1 minute cm/s

Soil classification system used: Unified Soil Classification

DESCRIPTION OF SAND AND GRAVEL PARTICLES

Shape: Angular

Hardness: Hard

PARTICLE SIZE DISTRIBUTION

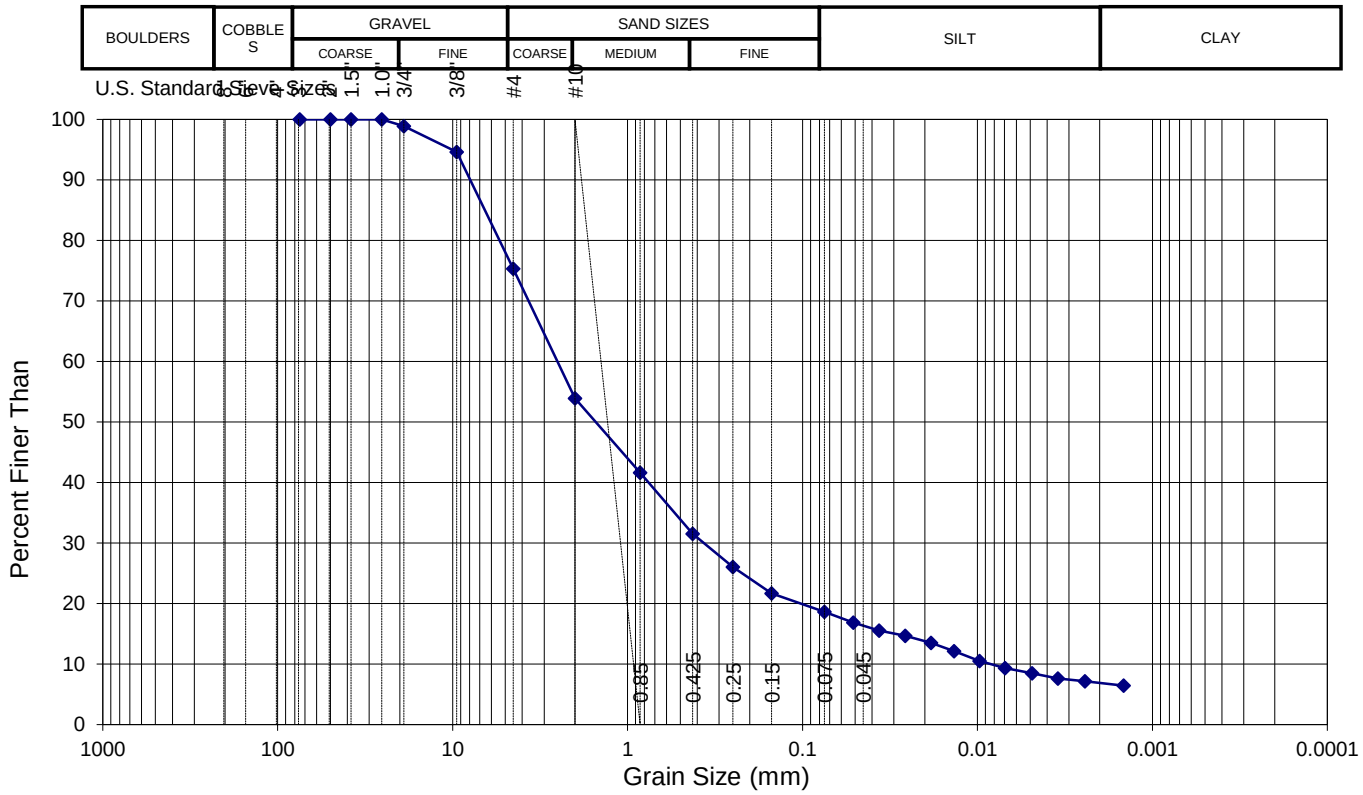
Particle Size range (mm)	Weight %	Passing %	Method
> 300 mm	0	100	Sieve
75 mm	0	100	Sieve
50 mm	0	100	Sieve
37.5 mm	0	100	Sieve
25 mm	0	99.935509	Sieve
19 mm	1	98.96814	Sieve
9.5 mm	2	96.81459	Sieve
4.75 mm	6	90.419753	Sieve
2 mm	15	75.700549	Sieve
0.85 mm	14	61.533921	Sieve
0.425 mm	15	46.751543	Sieve
0.25 mm	7	39.364933	Sieve
0.106 mm	9	30.229996	Sieve
0.075 mm	2	27.963854	Hydrometer
0.045 mm	2	25.899566	Hydrometer
0.033 mm	2	23.695881	Hydrometer
0.023 mm	2	21.441033	Hydrometer
0.017 mm	2	19.739735	Hydrometer
0.012 mm	2	18.069401	Hydrometer
0.009 mm	2	16.550833	Hydrometer
0.006 mm	2	14.512323	Hydrometer
0.005 mm	1	13.778208	Hydrometer
0.0046 mm	0	13.42855	Hydrometer
0.003 mm	1	12.119075	Hydrometer
0.002 mm	0	11.682473	Hydrometer
0.0015 mm	0	11.464172	Hydrometer
0.001 mm	0	11.24587	Hydrometer

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819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	CH2M HILL, INC
Project Number:	CHM400-CHM200-VA
Client Sample ID	CH16-102-MW005_SOD
Lab Sample ID	L1746856-3
Date Sample Received	19-Mar-16
Test Completion Date:	31-Mar-16
Analyst:	HSL



METHOD DESCRIPTION

Method Reference: ASTM D 422 - 63 (2002)

Dispersion method: Mechanical

Dispesion period: 1 minute cm/s

Soil classification system used: Unified Soil Classification

DESCRIPTION OF SAND AND GRAVEL PARTICLES

Shape: Angular

Hardness: Hard

PARTICLE SIZE DISTRIBUTION

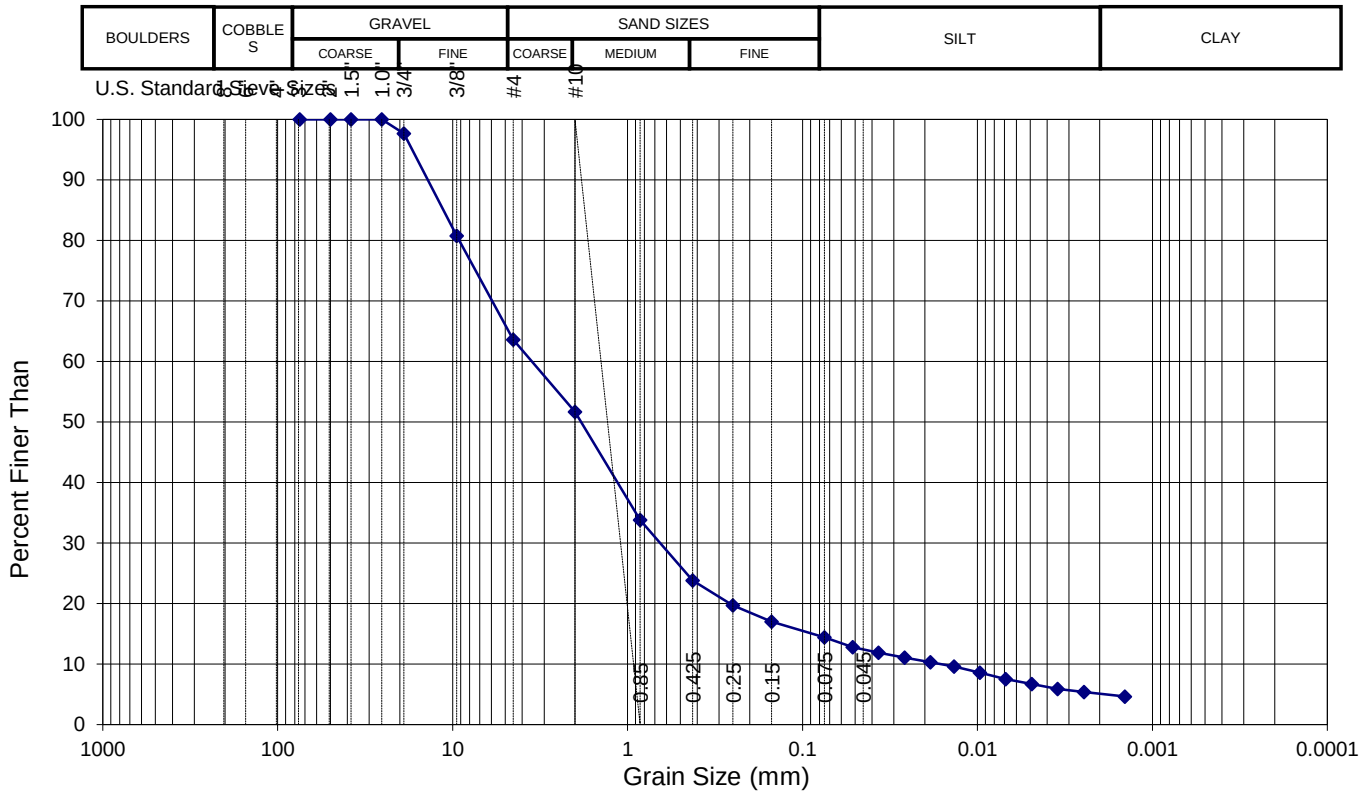
Particle Size range (mm)	Weight %	Passing %	Method
> 300 mm	0	100	Sieve
75 mm	0	100	Sieve
50 mm	0	100	Sieve
37.5 mm	0	100	Sieve
25 mm	0	99.928909	Sieve
19 mm	1	98.862546	Sieve
9.5 mm	4	94.624869	Sieve
4.75 mm	18	76.300355	Sieve
2 mm	22	53.904674	Sieve
0.85 mm	12	41.620706	Sieve
0.425 mm	10	31.50617	Sieve
0.25 mm	5	26.040001	Sieve
0.106 mm	6	19.894865	Sieve
0.075 mm	1	18.632694	Hydrometer
0.045 mm	2	16.301682	Hydrometer
0.033 mm	1	15.274389	Hydrometer
0.023 mm	1	14.237574	Hydrometer
0.017 mm	1	13.100211	Hydrometer
0.012 mm	2	11.461749	Hydrometer
0.009 mm	1	10.209196	Hydrometer
0.006 mm	1	8.9420438	Hydrometer
0.005 mm	0	8.5268287	Hydrometer
0.0046 mm	0	8.3077757	Hydrometer
0.003 mm	1	7.4254294	Hydrometer
0.002 mm	0	7.0114721	Hydrometer
0.0015 mm	0	6.8044935	Hydrometer
0.001 mm	0	6.5975149	Hydrometer

ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	CH2M HILL, INC
Project Number:	CHM400-CHM200-VA
Client Sample ID	CH16-102-MW006_SOE
Lab Sample ID	L1742756-1
Date Sample Received	09-Mar-16
Test Completion Date:	18-Mar-16
Analyst:	SHC



PARTICLE SIZE DISTRIBUTION

Particle Size range (mm)	Weight %	Passing %	Method
> 300 mm	0	100	Sieve
75 mm	0	100	Sieve
50 mm	0	100	Sieve
37.5 mm	0	100	Sieve
25 mm	0	99.855253	Sieve
19 mm	2	97.684056	Sieve
9.5 mm	17	80.748143	Sieve
4.75 mm	16	64.473981	Sieve
2 mm	13	51.658041	Sieve
0.85 mm	18	33.795536	Sieve
0.425 mm	10	23.821036	Sieve
0.25 mm	4	19.691943	Sieve
0.106 mm	4	15.495568	Sieve
0.075 mm	1	14.435786	Hydrometer
0.045 mm	2	12.38966	Hydrometer
0.033 mm	1	11.5859	Hydrometer
0.023 mm	1	10.754038	Hydrometer
0.017 mm	1	10.102055	Hydrometer
0.012 mm	1	9.1823709	Hydrometer
0.009 mm	1	8.3183263	Hydrometer
0.006 mm	1	7.1678342	Hydrometer
0.005 mm	0	6.7553461	Hydrometer
0.0046 mm	0	6.5397133	Hydrometer
0.003 mm	1	5.6433779	Hydrometer
0.002 mm	1	5.1339714	Hydrometer
0.0015 mm	0	4.8792682	Hydrometer
0.001 mm	0	4.6245649	Hydrometer

METHOD DESCRIPTION

Method Reference: ASTM D 422 - 63 (2002)

Dispersion method: Mechanical

Dispesion period: 1 minute cm/s

Soil classification system used: Unified Soil Classification

DESCRIPTION OF SAND AND GRAVEL PARTICLES

Shape: Angular

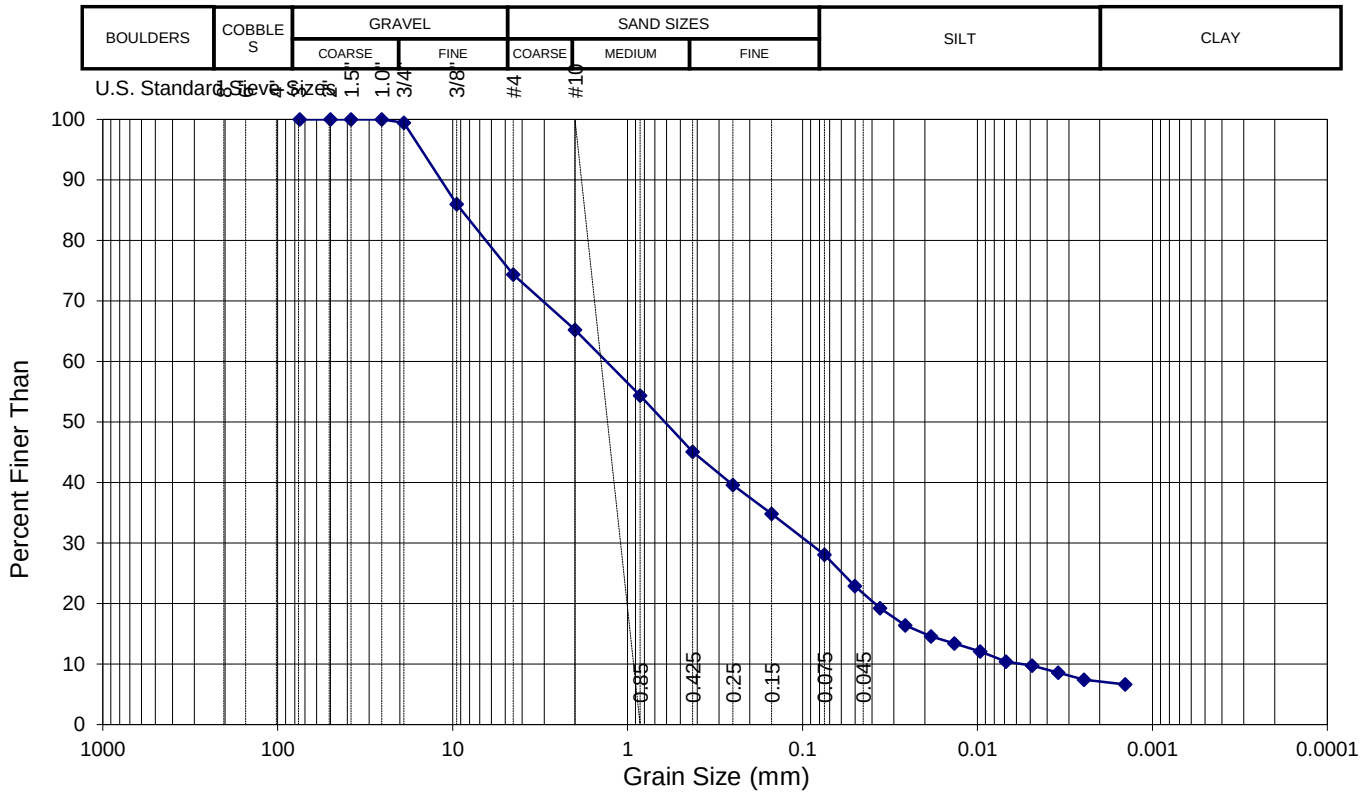
Hardness: Hard

ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	CH2M HILL, INC
Project Number:	CHM400-CHM200-VA
Client Sample ID	CH16-102-MW006_SOI
Lab Sample ID	L1742756-2
Date Sample Received	09-Mar-16
Test Completion Date:	18-Mar-16
Analyst:	SHC



PARTICLE SIZE DISTRIBUTION

Particle Size range (mm)	Weight %	Passing %	Method
> 300 mm	0	100	Sieve
75 mm	0	100	Sieve
50 mm	0	100	Sieve
37.5 mm	0	100	Sieve
25 mm	0	99.96578	Sieve
19 mm	1	99.452475	Sieve
9.5 mm	13	85.992877	Sieve
4.75 mm	11	74.945661	Sieve
2 mm	10	65.207934	Sieve
0.85 mm	11	54.346502	Sieve
0.425 mm	9	45.097884	Sieve
0.25 mm	5	39.608852	Sieve
0.106 mm	9	30.87174	Sieve
0.075 mm	3	28.09826	Hydrometer
0.045 mm	7	21.576155	Hydrometer
0.033 mm	3	18.406887	Hydrometer
0.023 mm	3	15.704625	Hydrometer
0.017 mm	1	14.238126	Hydrometer
0.012 mm	1	12.89632	Hydrometer
0.009 mm	1	11.717589	Hydrometer
0.006 mm	2	10.129117	Hydrometer
0.005 mm	0	9.8042352	Hydrometer
0.0046 mm	0	9.5364745	Hydrometer
0.003 mm	1	8.0517525	Hydrometer
0.002 mm	1	6.8844141	Hydrometer
0.0015 mm	1	6.3007449	Hydrometer
0.001 mm	1	5.7170757	Hydrometer

METHOD DESCRIPTION

Method Reference: ASTM D 422 - 63 (2002)

Dispersion method: Mechanical

Dispesion period: 1 minute cm/s

Soil classification system used: Unified Soil Classification

DESCRIPTION OF SAND AND GRAVEL PARTICLES

Shape: Angular

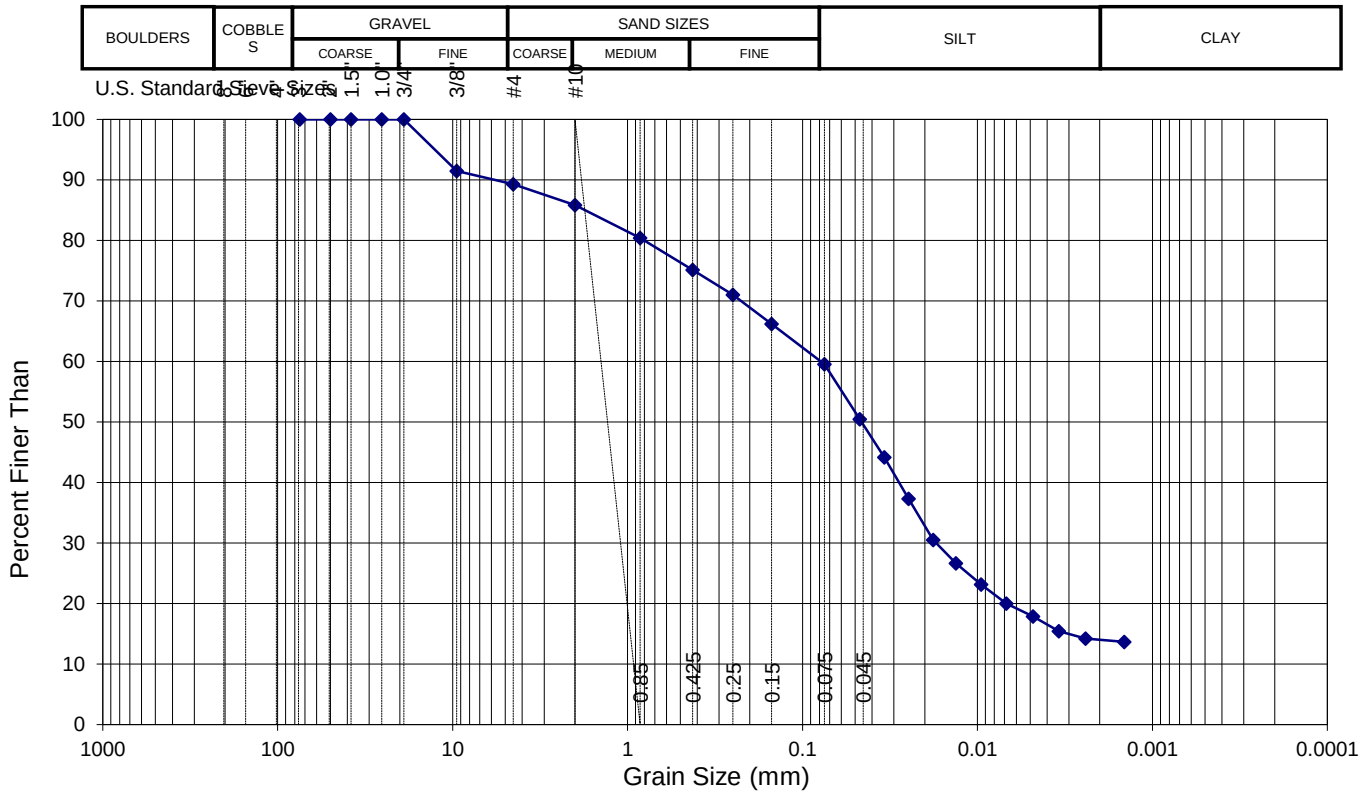
Hardness: Hard

ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	CH2M HILL, INC
Project Number:	CHM400-CHM200-VA
Client Sample ID	CH16-102-MW007_SOA
Lab Sample ID	L1746856-7
Date Sample Received	19-Mar-16
Test Completion Date:	31-Mar-16
Analyst:	HSL



PARTICLE SIZE DISTRIBUTION

Particle Size range (mm)	Weight %	Passing %	Method
> 300 mm	0	100	Sieve
75 mm	0	100	Sieve
50 mm	0	100	Sieve
37.5 mm	0	100	Sieve
25 mm	0	100	Sieve
19 mm	0	100	Sieve
9.5 mm	9	91.481957	Sieve
4.75 mm	2	89.387227	Sieve
2 mm	4	85.818574	Sieve
0.85 mm	5	80.42997	Sieve
0.425 mm	5	75.130064	Sieve
0.25 mm	4	71.03896	Sieve
0.106 mm	9	62.308884	Sieve
0.075 mm	3	59.552177	Hydrometer
0.045 mm	10	49.498396	Hydrometer
0.033 mm	6	43.380438	Hydrometer
0.023 mm	8	35.597986	Hydrometer
0.017 mm	6	29.723575	Hydrometer
0.012 mm	4	25.442676	Hydrometer
0.009 mm	3	22.518194	Hydrometer
0.006 mm	3	19.111954	Hydrometer
0.005 mm	1	18.072956	Hydrometer
0.0046 mm	1	17.500121	Hydrometer
0.003 mm	3	14.909101	Hydrometer
0.002 mm	1	13.709639	Hydrometer
0.0015 mm	1	13.109908	Hydrometer
0.001 mm	1	12.510176	Hydrometer

METHOD DESCRIPTION

Method Reference: ASTM D 422 - 63 (2002)

Dispersion method: Mechanical

Dispesion period: 1 minute cm/s

Soil classification system used: Unified Soil Classification

DESCRIPTION OF SAND AND GRAVEL PARTICLES

Shape: Angular

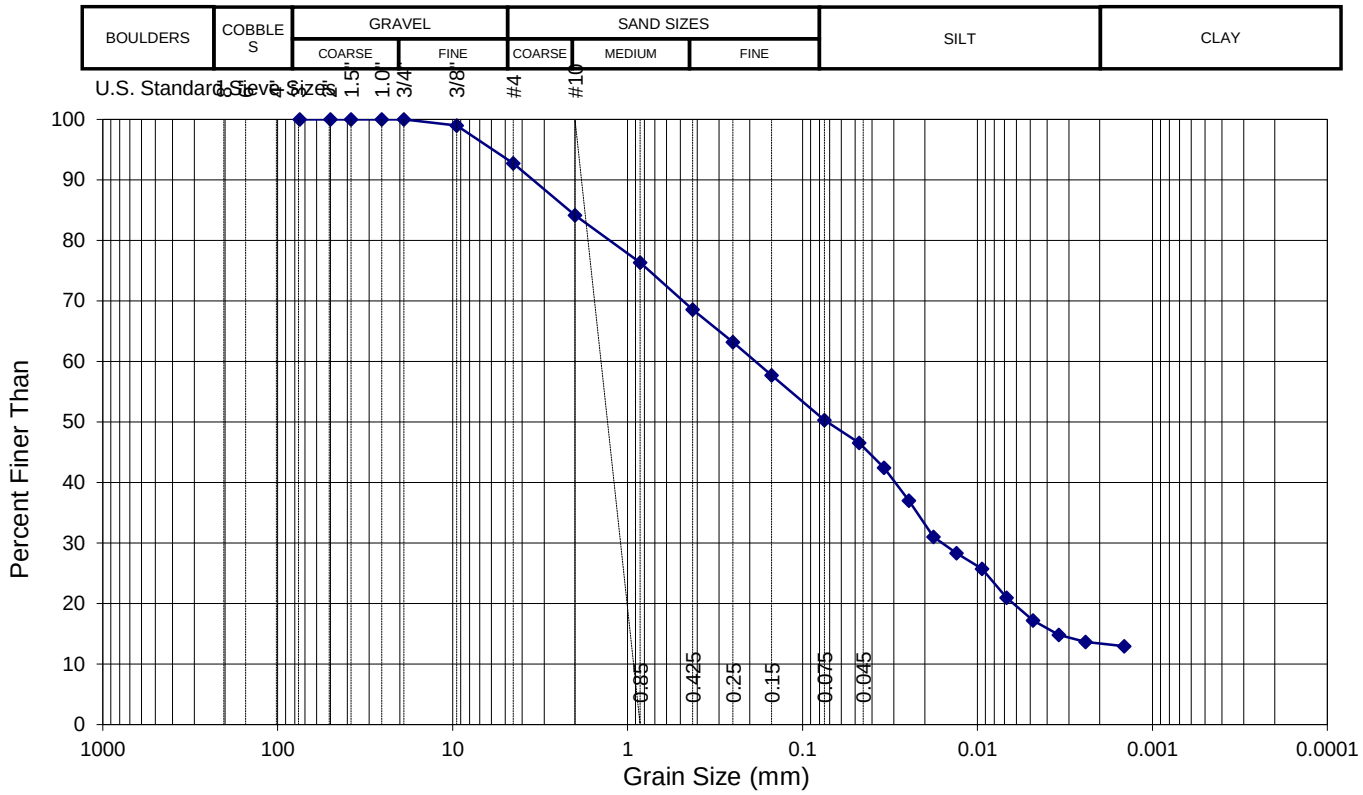
Hardness: Hard

ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	CH2M HILL, INC
Project Number:	CHM400-CHM200-VA
Client Sample ID	CH16-102-MW007_SOC
Lab Sample ID	L1746856-9
Date Sample Received	19-Mar-16
Test Completion Date:	31-Mar-16
Analyst:	HSL



METHOD DESCRIPTION

Method Reference: ASTM D 422 - 63 (2002)

Dispersion method: Mechanical

Dispesion period: 1 minute cm/s

Soil classification system used: Unified Soil Classification

DESCRIPTION OF SAND AND GRAVEL PARTICLES

Shape: Angular

Hardness: Hard

PARTICLE SIZE DISTRIBUTION

Particle Size range (mm)	Weight %	Passing %	Method
> 300 mm	0	100	Sieve
75 mm	0	100	Sieve
50 mm	0	100	Sieve
37.5 mm	0	100	Sieve
25 mm	0	100	Sieve
19 mm	0	100	Sieve
9.5 mm	1	98.996928	Sieve
4.75 mm	6	93.065934	Sieve
2 mm	9	84.162176	Sieve
0.85 mm	8	76.371277	Sieve
0.425 mm	8	68.576457	Sieve
0.25 mm	5	63.190287	Sieve
0.106 mm	10	53.362852	Sieve
0.075 mm	3	50.304302	Hydrometer
0.045 mm	5	45.782316	Hydrometer
0.033 mm	4	41.796917	Hydrometer
0.023 mm	6	35.546558	Hydrometer
0.017 mm	5	30.539641	Hydrometer
0.012 mm	3	27.504731	Hydrometer
0.009 mm	3	24.977919	Hydrometer
0.006 mm	6	19.457439	Hydrometer
0.005 mm	2	17.569182	Hydrometer
0.0046 mm	1	16.849297	Hydrometer
0.003 mm	3	14.331245	Hydrometer
0.002 mm	1	13.165053	Hydrometer
0.0015 mm	1	12.581957	Hydrometer
0.001 mm	1	11.998861	Hydrometer

Uniaxial Compressive Strength of Intact Rock Cores - Test Reports

Laboratory Determination of Uniaxial Compressive Strength of Intact Rock Core Specimens.

Summary of Test Results

ASTM D7012 Method C

Project No.: 1653443
Project: FCD New Alignment Drilling 2016
Location: Faro Mine
Client: CH2MHILL
Lab ID No: 112

Failure Modes
(1) Simple Extension
(2) Multiple Extension
(3) Multiple Fracturing
(4) Multiple Shear
(5) Single Shear
(6) Spalling
(7) Other

Note: (deg) measured from core axis

No.	Borehole #	Sample #	Depth (ft)	Dia (mm)	Ht (mm)	Area (cm^2)	Volume (cm^3)	Mass (g)	Wet Density (kg/m^3)	Moisture (%)	Dry Density (kg/m^3)	Maximum Load (kN)	Stress σ_u (MPa)	Rock Type	Failure Mode	
															Type	(deg)
1	CH16-102-MW003	RKc	32'9" - 33'6"	60.09	127.58	28.36	361.81	1038.50	2870	0.41	2859	89.90	31.7	Not Provided	5	43
2	CH16-102-MW004	RKg	50'9" - 51'7"	60.63	127.35	28.87	367.67	982.60	2672	0.37	2663	110.40	38.2	Not Provided	5	29
3	CH16-102-MW005	RKc	51'6" - 52'3"	61.02	129.27	29.24	378.04	976.90	2584	0.46	2572	333.00	113.9	Not Provided	2/6	N/A
4	CH16-102-MW007	RKd	35'11" - 36'4"	60.94	124.55	29.17	363.28	1005.30	2767	0.30	2759	160.60	55.1	Not Provided	3/5	33

The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

G. Patton	April 4, 2016	E. Kostyukov	April 5, 2016
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd.
300, 3811 North Fraser Way, Burnaby, British Columbia, Canada V5J 5J2
Tel: 604-412-6899 Fax: 604-412-6816 www.golder.com

Uniaxial Compressive Strength of Intact Rock Core Specimens (Method C)

ASTM D7012

Project No.:	1653443	**Borehole:**	CH16-102-MW003
Project:	FCD New Alignment Drilling 2016	**Sample Number:**	RKc
Location:	Faro Mine	**Depth (ft):**	32'9" - 33'6"
Client:	CH2MHILL	**Lab ID No:**	112

Testing Results

Max Load (kN)	**89.90**
Stress σ_u (MPa)	**31.7**
Pace Rate (kN/s)	1.25
Lithology	Not Provided

Sample Measurements

Diameter	(mm)	60.09
Height	(mm)	127.58
Area	(cm²)	28.36
Volume	(cm³)	361.81
Mass	(g)	1038.50
Moisture Content	(%)	0.41
Wet Density	(kg/m³)	2870
Dry Density	(kg/m³)	2859



BEFORE TEST

Failure Mode

Type: **5**

Degrees:* **43**

* Degrees measured with respect to core axis.

The impact of any pre-existing feature on the test results will be noted in the comments, if applicable.

Notes

- Water content as received

Mode:

(1) Simple Extension
(2) Multiple Extension
(3) Multiple Fracturing
(4) Multiple Shear
(5) Single Shear
(6) Spalling
(7) Other

Comments

Sample sheared along pre-existing discontinuity.



AFTER TEST

The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

G. Patton	April 4, 2016	E. Kostyukov	April 5, 2016
TESTED BY	DATE	CHECKED BY	DATE

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Uniaxial Compressive Strength of Intact Rock Core Specimens (Method C)

ASTM D7012

Project No.:	1653443	**Borehole:**	CH16-102-MW004
Project:	FCD New Alignment Drilling 2016	**Sample Number:**	RKg
Location:	Faro Mine	**Depth (ft):**	50'9" - 51'7"
Client:	CH2MHILL	**Lab ID No:**	112

Testing Results

Max Load (kN)	**110.40**
Stress σ_u (MPa)	**38.2**
Pace Rate (kN/s)	1.25
Lithology	Not Provided

Sample Measurements

Diameter	(mm)	60.63
Height	(mm)	127.35
Area	(cm^2)	28.87
Volume	(cm^3)	367.67
Mass	(g)	982.60
Moisture Content	(%)	0.37
Wet Density	(kg/m^3)	2672
Dry Density	(kg/m^3)	2663



BEFORE TEST

Failure Mode

Type: **5**

Degrees:* **29**

* Degrees measured with respect to core axis.

The impact of any pre-existing feature on the test results will be noted in the comments, if applicable.

Notes

- Water content as received

Mode:

(1) Simple Extension
(2) Multiple Extension
(3) Multiple Fracturing
(4) Multiple Shear
(5) Single Shear
(6) Spalling
(7) Other



AFTER TEST

Comments

The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

G. Patton	April 4, 2016	E. Kostyukov	April 5, 2016
TESTED BY	DATE	CHECKED BY	DATE

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Uniaxial Compressive Strength of Intact Rock Core Specimens (Method C)

ASTM D7012

Project No.:	1653443	**Borehole:**	CH16-102-MW005
Project:	FCD New Alignment Drilling 2016	**Sample Number:**	RKc
Location:	Faro Mine	**Depth (ft):**	51'6" - 52'3"
Client:	CH2MHILL	**Lab ID No:**	112

Testing Results

Max Load (kN)	**333.00**
Stress σ_u (MPa)	**113.9**
Pace Rate (kN/s)	1.25
Lithology	Not Provided

Sample Measurements

Diameter	(mm)	61.02
Height	(mm)	129.27
Area	(cm^2)	29.24
Volume	(cm^3)	378.04
Mass	(g)	976.90
Moisture Content	(%)	0.46
Wet Density	(kg/m^3)	2584
Dry Density	(kg/m^3)	2572



BEFORE TEST

Failure Mode

Type: **2/6**

Degrees:* **N/A**

* Degrees measured with respect to core axis.

The impact of any pre-existing feature on the test results will be noted in the comments, if applicable.

Notes

- Water content as received

Mode:

(1) Simple Extension
(2) Multiple Extension
(3) Multiple Fracturing
(4) Multiple Shear
(5) Single Shear
(6) Spalling
(7) Other



AFTER TEST

Comments

Sample failed along multiple pre-existing discontinuities.

The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

G. Patton	April 4, 2016	E. Kostyukov	April 5, 2016
TESTED BY	DATE	CHECKED BY	DATE

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Uniaxial Compressive Strength of Intact Rock Core Specimens (Method C)

ASTM D7012

Project No.:	1653443	**Borehole:**	CH16-102-MW007
Project:	FCD New Alignment Drilling 2016	**Sample Number:**	RKd
Location:	Faro Mine	**Depth (ft):**	35'11" - 36'4"
Client:	CH2MHILL	**Lab ID No:**	112

Testing Results

Max Load (kN)	**160.60**
Stress σ_u (MPa)	**55.1**
Pace Rate (kN/s)	1.25
Lithology	Not Provided

Sample Measurements

Diameter	(mm)	60.94
Height	(mm)	124.55
Area	(cm^2)	29.17
Volume	(cm^3)	363.28
Mass	(g)	1005.30
Moisture Content	(%)	0.30
Wet Density	(kg/m^3)	2767
Dry Density	(kg/m^3)	2759



BEFORE TEST

Failure Mode

Type: **3/5**

Degrees:* **33**

* Degrees measured with respect to core axis.

The impact of any pre-existing feature on the test results will be noted in the comments, if applicable.

Notes

- Water content as received

Mode:

(1) Simple Extension
(2) Multiple Extension
(3) Multiple Fracturing
(4) Multiple Shear
(5) Single Shear
(6) Spalling
(7) Other



AFTER TEST

Comments

Sample sheared along pre-existing discontinuity.

The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

G. Patton	April 4, 2016	E. Kostyukov	April 5, 2016
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd.
300, 3811 North Fraser Way, Burnaby, British Columbia, Canada V5J 5J2
Tel: 604-412-6899 Fax: 604-412-6816 www.golder.com

Rock Durability Test Reports

EVALUATION OF DURABILITY OF ROCK FOR EROSION CONTROL UNDER FREEZING AND THAWING CONDITIONS

ASTM D5312

CH2M Hill
1100 – 1st Street SE
Calgary, Alberta T2G 1B1

May 18, 2016
Project Number: 1653443

ATTENTION: Mr. Mark Cichy

PROJECT: Faro Creek Diversion

Sample:	**CH16 – 102 – MW003_RKc**
Source:	**Faro Mine Complex**

Objective and Method:

The objective of this testing program was to conduct a test of the durability of rock proposed for use as erosion control in an environment where it is understood that it would be exposed to freezing and thawing. The sample consisted of drilled rock core 61 mm in diameter, designated as "CH16 – 102 – MW003_RKc". The location and orientation of the drill hole was not provided and the depth range from which the rock core was sampled was not recorded. The sampling site was identified as "Faro Mine Complex". The cores were obtained by others.

The test program consisted solely of conducting the method described in ASTM D5312. This report constitutes the final results of the test; all previously issued draft results are hereby superseded. This report comprises a testing service only. Interpretation may be provided upon request.

Five test specimens were selected from a core box, and cut in half length-wise; the fresh cut surface was used in testing. Due to the size of the original core, the test specimens did not meet the size requirements of ASTM D5121 of no less than 125 mm on a side; the test specimens also did not meet the thickness requirement of 65 mm, as they were hemispherical with a maximum thickness of 30 mm. The five specimens selected were the largest available pieces in the core box. This deviation from the standard was discussed and approved by the client prior to commencement of testing.

The test was designed such that the samples would be subjected to 20 cycles of freezing and thawing, as instructed by the client. The freezing portion of each cycle consisted of storing the samples in a freezer at -18°C for a minimum of 16 hours. This was followed by a minimum of 8 hours of thawing in an oven at 32°C. The condition of each sample was evaluated every five cycles through macroscopic and microscopic examination using a binocular microscope with magnifications up to 50x, enabling observations of pre-existing cracks and newly developed deterioration. Inspections included photographs and descriptive logs.

Prior to and at the end of the test, each sample was weighed and the percent loss by mass calculated for the individual specimens.

A separate core was selected from the same core box and tested for Uniaxial Compressive Strength per ASTM D7012; results of this testing are provided under separate cover.

Quantitative Analysis:

Percent Loss

Sample ID	Specimen ID	Original Mass (g)	Final Mass (g)	Measured Loss (%)
CH16-102-MW003_RKc	**#1**	647.7	647.3	**0.06%**
	#2	652.3	651.6	**0.11%**
	#3	611.8	611.3	**0.08%**
	#4	732.4	731.6	**0.11%**
	#5	684.4	683.8	**0.09%**
			Final Average Loss (%)	**0.09%**

Qualitative Analysis:

Summary of Initial Condition

Petrographic examination was not undertaken on any of the specimens; thus, interpretations of mineralogy, texture, alteration and weathering are based solely on cursory, macroscopic inspection. Thin section examination and chemical analyses, such as whole-rock analysis by X-Ray Fluorescence, were not conducted. Generally, the specimens consisted of 'quartz mica schist'; however, each rock specimen was cut from a core with slight to significant variations in compositional, textural and structural qualities including those listed below.

Composition
- Mineral proportions (mafic/felsic, alteration, mica, metallic minerals)
- Amount and distribution (persistent vs. localized) of metallic minerals
- Distribution of oxidation products and nature of occurrence (light staining to concentrated coating on fracture surfaces and veins

Textural
- Schistosity ranging from moderately to well-developed, wavy/irregular to parallel-planar, and continuous to discontinuous
- Very fine to medium mineral grain size
- Presence of veins, blebs and alteration zones

Structure
- Presence/absence of fractures
- Fracture width
- Number of fractures and fracture spacing
- Orientation and pattern of fractures
- Presence of weathering and oxidation around fractures

Observations of Individual Specimens

Specimen ID	Observations		
	Initial @ 0 cycles	**Interim @ 10 cycles**	**Final @ 20 cycles**
#1	- The specimen was rectangular in shape with approximate dimensions of 61 mm wide by 186 mm long - The specimen consisted of quartz mica schist - Numerous biotite/pyrite-filled veins cut the specimen, in many cases stained by secondary iron-oxide deposits - Large horizontal veins were observed, with a large deposit of quartz (A), surrounded by tightly closed fractures - Small fracture (B) was visible with particles dislodging from fracture walls with minimal scraping effort - Tightly closed fractures and bands surrounding veins were slightly absorptive - Generally, small portions of the specimen were stained rusty orange by oxidation and were slightly weathered;	- No significant amount of material was dislodged from the specimen - The absorptive bands and fractures developed into more apparent fractures; evident by an increase in absorption from the beginning of the test. This potentially indicates that some widening occurred, particularly around deposit (A) - Dislodgement of small mica flakes and mineral fragments along pre-existing fractures exposed both fresh and weathered fracture walls - Overall, this specimen did not exhibit significant formation of fractures or loss of material	- Existing fractures continued to widen, increasing absorptive characteristics - A significant amount of material was not dislodged from the specimen at the conclusion of the test - Overall, this specimen exhibited a slight loss of material along pre-existing fractures which had poorly attached mineral grains prior to testing. Some fractures have widened very slightly.
#2	- The specimen was rectangular in shape with approximate dimensions of 61 mm wide by 170 mm long - The specimen consisted of quartz mica schist - Numerous biotite/pyrite-filled veins cut the specimen, in many cases stained by secondary iron-oxide deposits - Large, irregularly shaped veins were observed; a small particle was missing where the vein intersected the specimen edge, exposing a weathered vein surface - Small fracture (1) in centre of vein was observed to be slightly absorptive - Generally, the entire specimen was stained orange by oxidation and was slightly weathered	- Thin fragments from specimen bottom, not part of test surface, were dislodged into specimen container - Overall, this specimen did not exhibit significant formation of fractures or loss of material	- Fracture (1) was observed to have elongated by ~4 mm and become slightly more absorptive - Overall, this specimen did not exhibit significant formation of fractures or loss of material

#3	- The specimen was rectangular in shape with approximate dimensions of 61 mm wide by 166 mm long - The specimen consisted of quartz mica schist - Numerous biotite/pyrite-filled veins cut the specimen, in many cases stained by secondary iron-oxide deposits - Large, irregularly shaped veins were observed, moderately absorptive - Two large coarse-grained veins were observed on opposite ends of the specimen; the boundaries of the veins coincided with tightly closed fractures (A) and (B), (B) being slightly absorptive - A network of small, tightly closed fractures (C) were observed propagating through the vein and interconnecting with Fracture (B) - One fracture bisects the specimen; is roughly perpendicular to the schistose fabric and is associated with thin (~1.5 mm) veins infilled with a white mineral	- Particles were dislodged from fracture (B), exposing weathered fracture walls - Material dislodged along Fracture (C) exposing both fresh and weathered fracture walls; a particle ~3 mm in size was dislodged where Fracture (C) intersected the specimen edge - Overall, this specimen exhibited a slight loss of material along pre-existing fractures which were tightly closed prior to testing. Some fractures have widened slightly	- Significant material loss or propagation/formation of fractures was not observed
#4	- The specimen was rectangular in shape with approximate dimensions of 60 mm wide by 219 mm long - The specimen consisted of quartz mica schist - Numerous biotite/pyrite-filled veins cut the specimen, in many cases stained by secondary iron-oxide deposits - A large fracture (A) was observed bisecting the test surface, infilled with oxidation product and open ~0.5 mm for some short segment. Fracture (A) was moderately absorptive - Fracture (A) branches out into a network of smaller fractures (B) with similar properties to Fracture (A), also moderately absorptive - Two large fractures (C) and (D) were observed, bisecting the slab parallel to visible veins; both fractures were tightly closed and slightly absorptive - A small fracture (E), ~2 mm, long was observed	- Small fragments on sawn core edges around fractures (A) and (B) are dislodged - Existing fractures (A), (B), (C), (D), and (E) are observed to have widened, becoming more absorptive; particles along these fracture paths could be dislodged with minimal prying effort - Three new fractures (F), (G), and (H) have opened along existing veins and are moderately absorptive - Overall, this specimen exhibited a slight loss of material along pre-existing fractures which were tightly closed prior to testing. Some fractures have widened slightly and some new fractures formed or became more apparent	- All existing fractures continued to widen, with more particles dislodging and increased absorption observed

#5	- The specimen was rectangular in shape with approximate dimensions of 60 mm wide by 185 mm long - The specimen consisted of quartz mica schist. - Numerous biotitie/pyrite-filled veins cut the specimen, in many cases stained by secondary iron-oxide deposits - Fracture (A) was observed bisecting the specimen, mostly infilled with oxidized material, with some small openings - Fractures (B) and (C) were observed bisecting the specimen, infilled with oxidized material and tightly closed - Fractures (A), (B) and (C) were generally parallel to the orientation of schist banding.	- Overall, this specimen did not exhibit significant formation of fractures or loss of material	- Fracture (B) has slightly widened, with a small fragment dislodging from specimen edge, exposing weathered rock - Significant material loss or propagation/formation of fractures was not observed

Summary of Deterioration

The majority of specimens did not appear to have significant material loss. For those that exhibited loss of material, the loss consisted only of small flakes and fragments that were thin and weakly attached to pre-existing fractures. Some pre-existing fractures enlarged, specifically in specimens #1, #3 and #4 as a result of the freezing and thawing action. The following observations regarding sample conditions were made:

Loss of Material

- Dislodgement of thin portions of the specimen that were intersected by pre-existing fractures and were moderately to poorly adhered prior to testing
- Pitting and dislodgement of material occurred along pre-existing fracture paths where fractures were: i) braided and/or intersecting with other fractures, ii) open and with shallow angle relative to specimen surface, iii) significantly weathered and oxidized
- Specimens with abundant pre-existing fractures and significant weathering and oxidation experienced slightly higher amounts of material loss

Formation and/or propagation of fractures

- Several pre-existing fractures widened slightly. Typically, the pre-existing fractures that widened had the following properties prior to testing: i) width greater than ~0.5 mm, ii) fracture surfaces that were weathered and coated with iron oxidation product and other alteration minerals, and iii) were continuous across the specimen and often interconnected with other fractures.
- The strength of pre-existing fractures prior to testing was moderately strong, i.e. it would be expected to break from a firm hammer blow but may resist an impact of moderate force. Following completion of the test, the fractures that widened did not noticeably decrease in strength and would likely still resist moderate impact.

Overall Summary

The data given in this report pertain to the samples provided, and may not be applicable to material from other locations or trial periods.

The observations for material loss and fracture formation, as well as the visual and measured estimate of mass loss were comparable between the 10 cycle interim inspection and the 20 cycle final inspection. This indicates that the specimens did not undergo significant additional deterioration after 20 cycles, compared to 10 cycles.

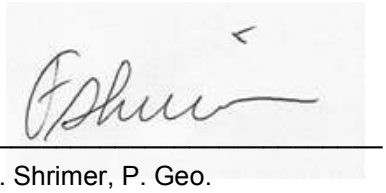
The specimens had an average measured loss of 0.09%. The samples were generally similar to each other with respect to their resistance to the stresses generated by freezing and thawing action. Material loss appeared to be caused by dislodging of material that was only moderately well adhered to pre-existing fracture surfaces prior to testing and generally consisted of the removal of small flakes, fragments and mineral grains. Specimens with more pre-existing fractures and more significant weathering and oxidation had an overall mineral bond strength that ranged from good to moderate and typically experienced higher loss.

Formation of new fractures, widening, and lengthening of pre-existing fractures was observed in minor amounts in the tested rock specimens and was typically associated with fractures which were open, weathered, oxidized and coated prior to testing. Some of the pre-existing fractures were interpreted to be of moderate strength and could be susceptible to fracturing if impacted with moderate force. All of the tested rock specimens had a schistose texture with weathering, alteration and oxidation along foliation planes; furthermore, the rock was veined and altered to varying degrees. Typically, rock with these characteristics will have wide variability in rock durability.

Prepared, tested and reported by:



I. Chung



F. Shrimer, P. Geo.

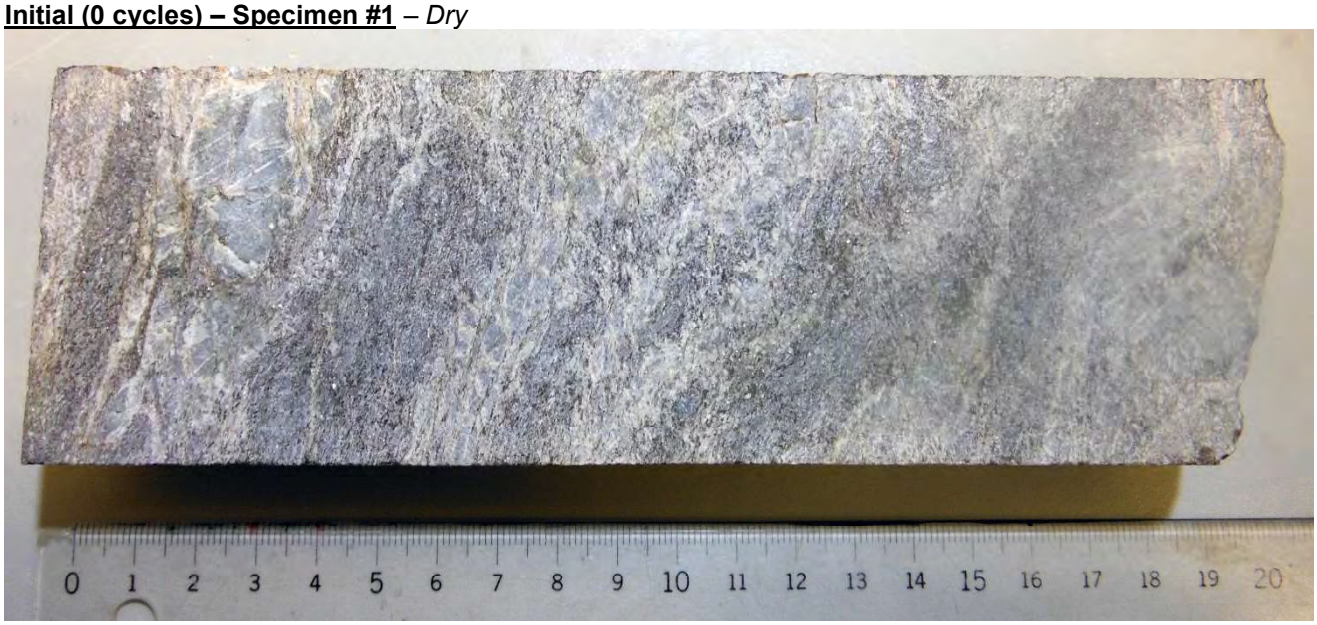
Reviewed by:



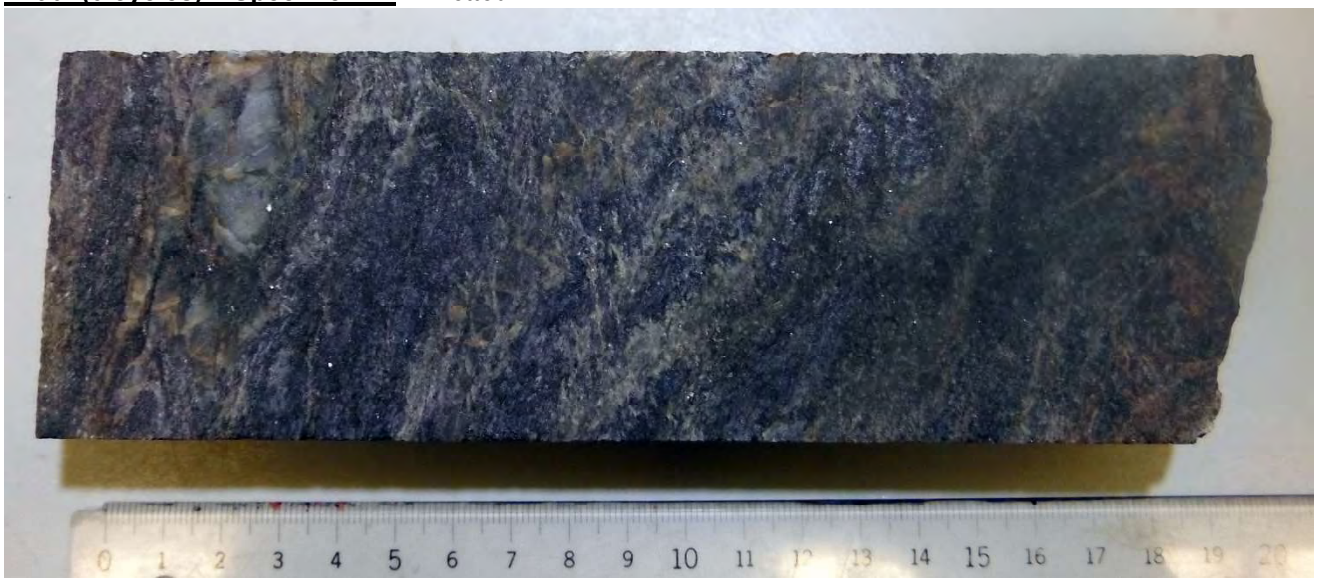
B. Hudson, P. Geo.

PHOTOGRAPHS

Initial (0 cycles) – Specimen #1 – *Dry*



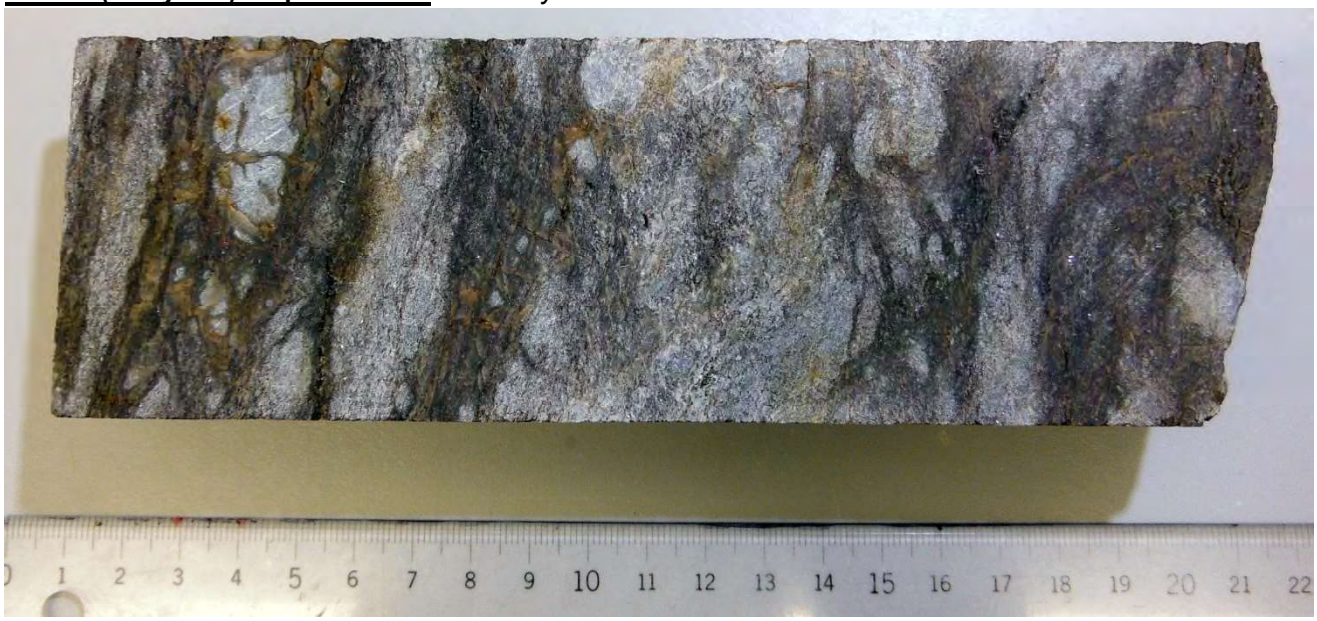
Initial (0 cycles) – Specimen #1 – *Wetted*



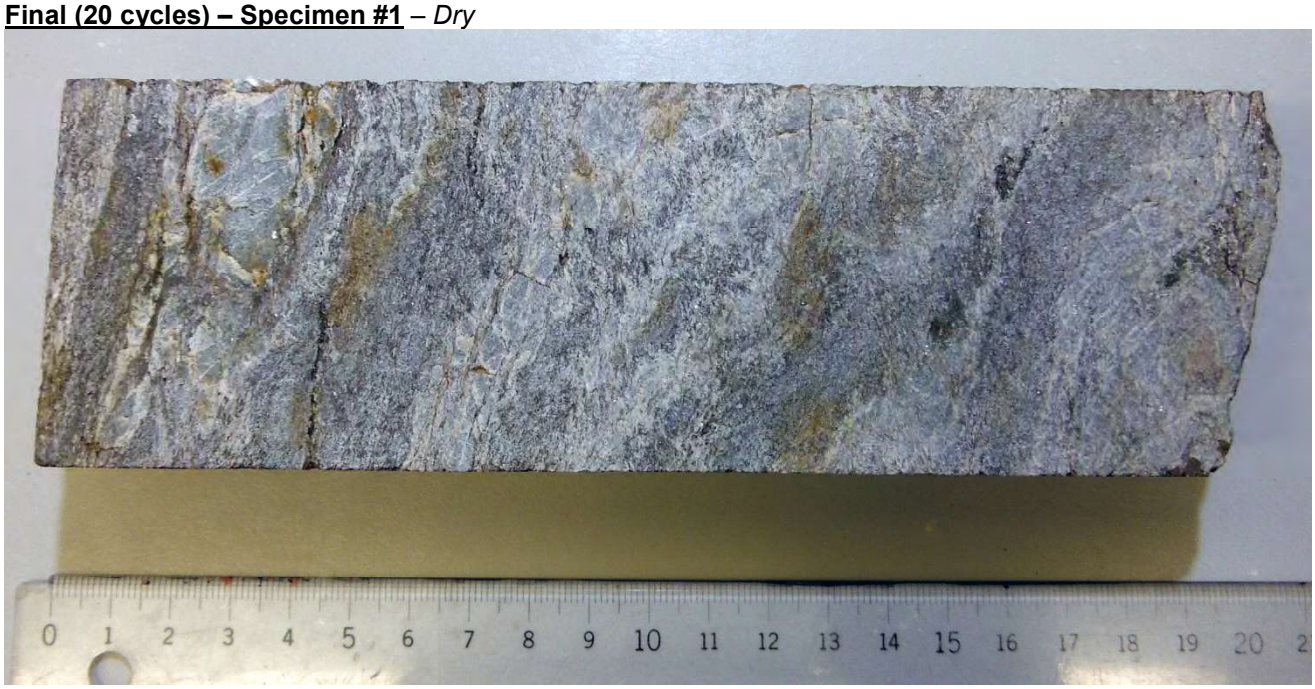
Initial (0 cycles) – Specimen #1 – *Partially dried back*



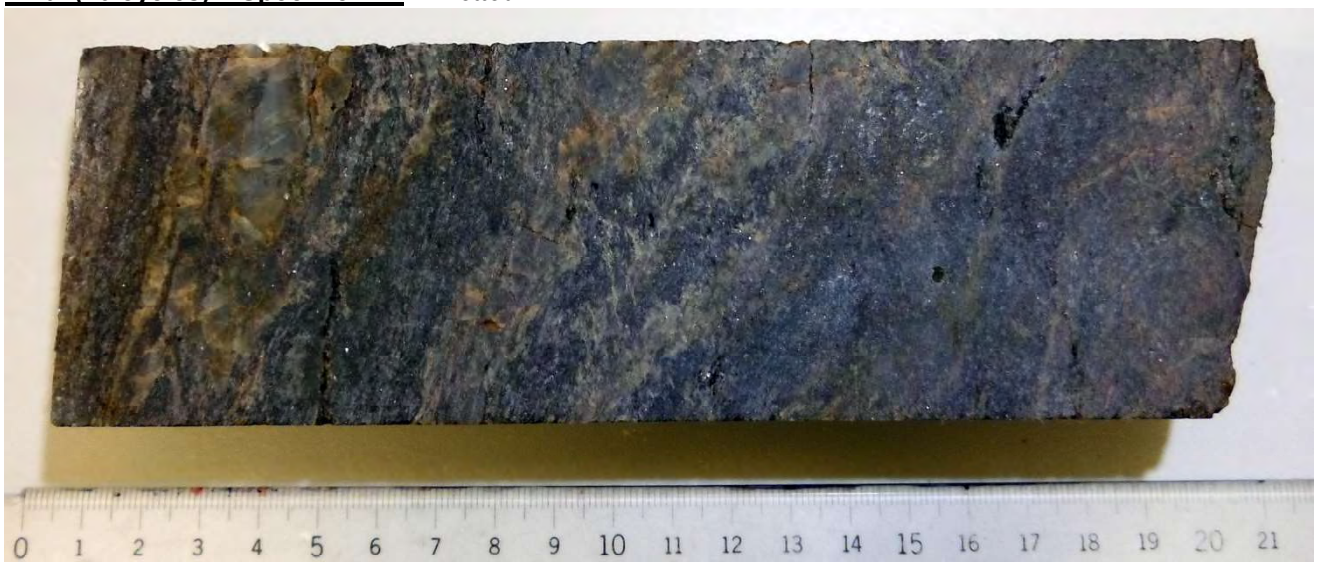
Interim (10 cycles) – Specimen #1 – *Partially dried back*



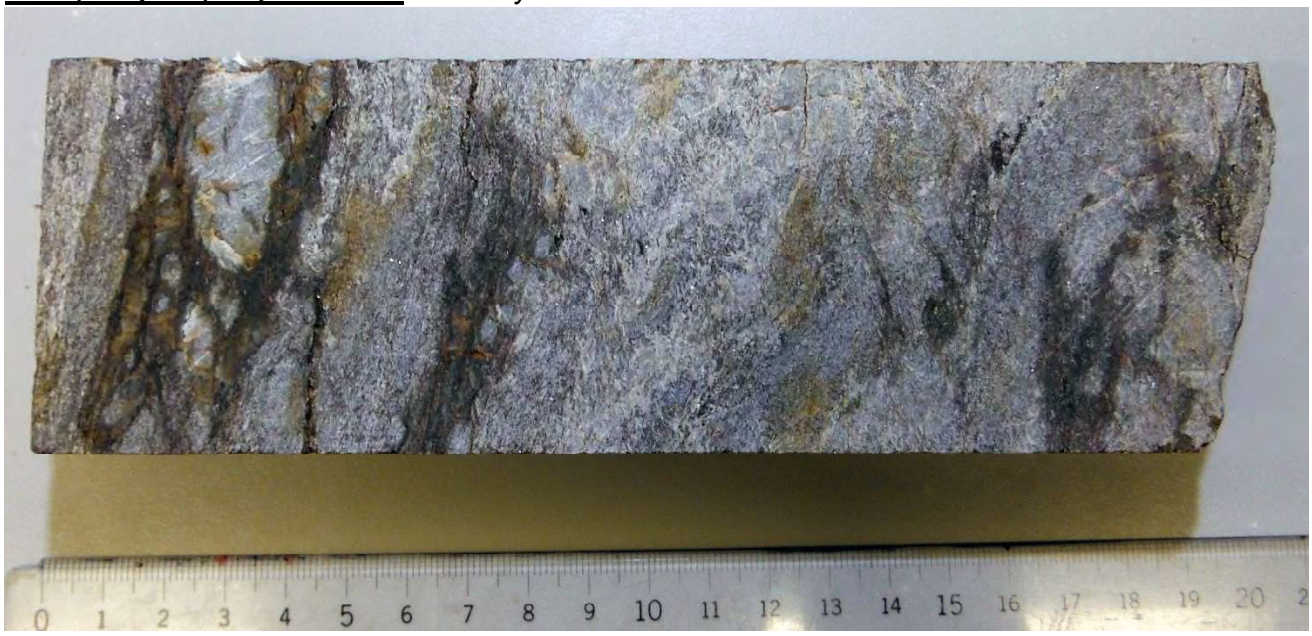
Final (20 cycles) – Specimen #1 – *Dry*



Final (20 cycles) – Specimen #1 – *Wetted*



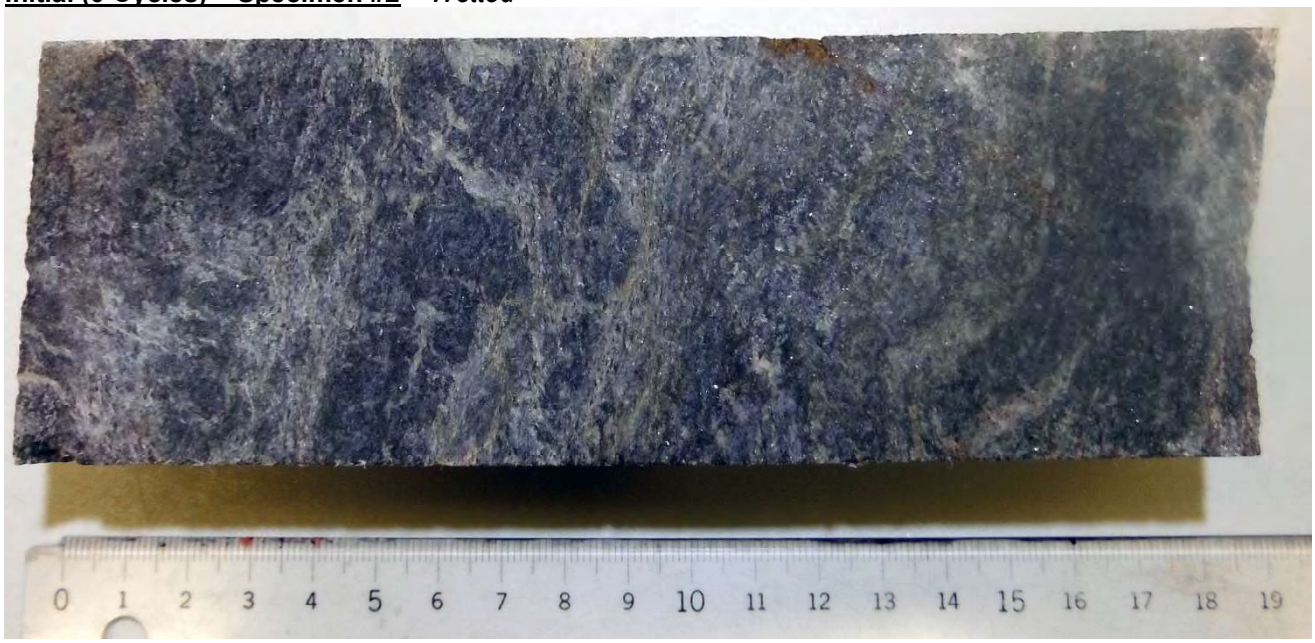
Final (20 cycles) – Specimen #1 – *Partially dried back*



Initial (0 Cycles) – Specimen #2 – *Dry*



Initial (0 Cycles) – Specimen #2 – *Wetted*



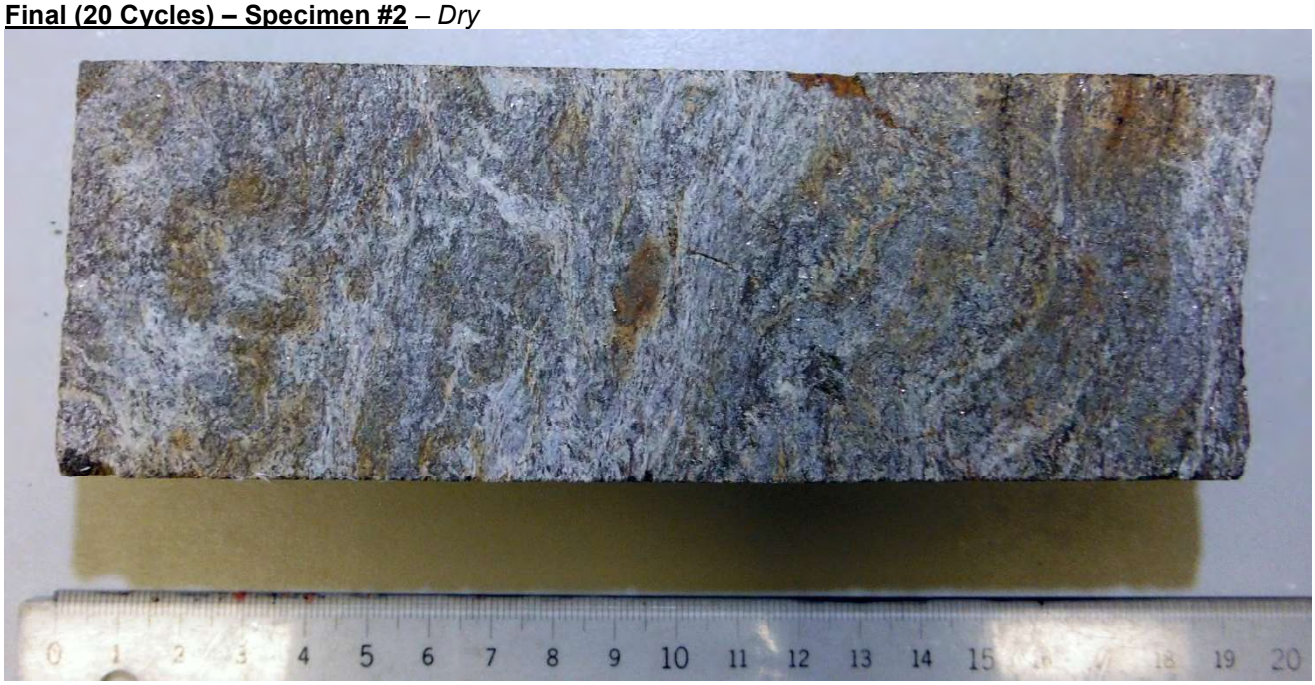
Initial (0 Cycles) – Specimen #2 – *Partially Dried Back*



Interim (10 Cycles) – Specimen #2 – *Partially Dried Back*



Final (20 Cycles) – Specimen #2 – *Dry*



Final (20 Cycles) – Specimen #2 – *Wetted*



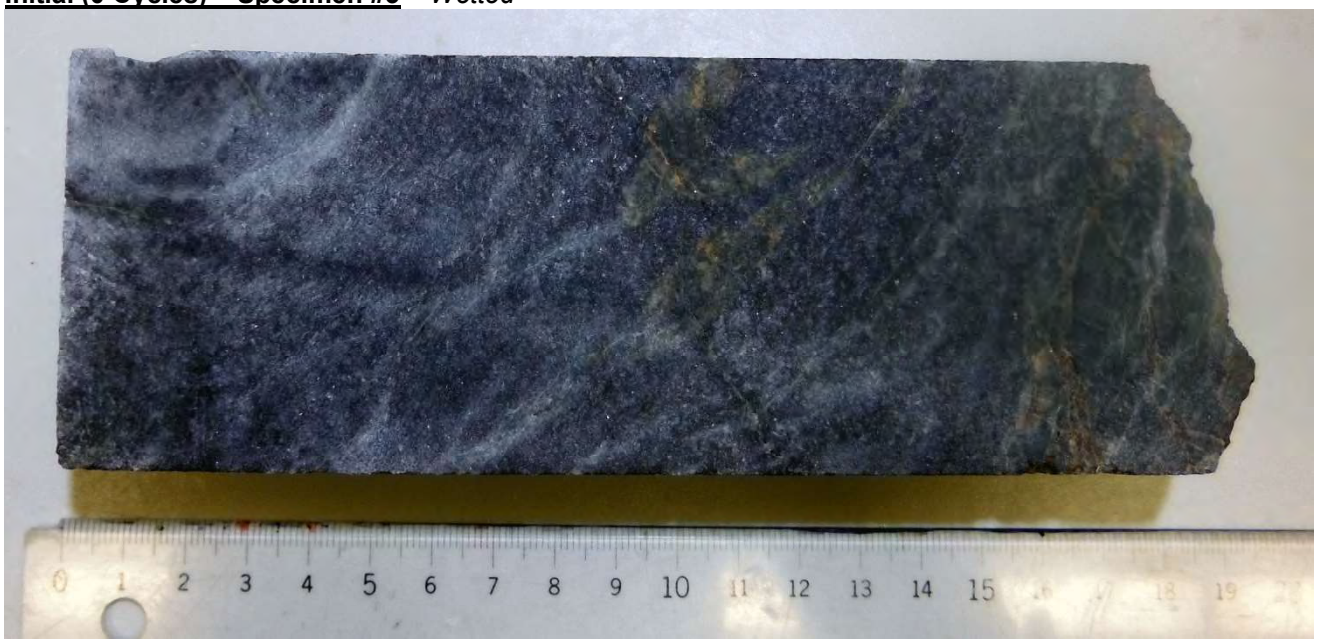
Final (20 Cycles) – Specimen #2 – *Partially Dried Back*



Initial (0 Cycles) – Specimen #3 – *Dry*



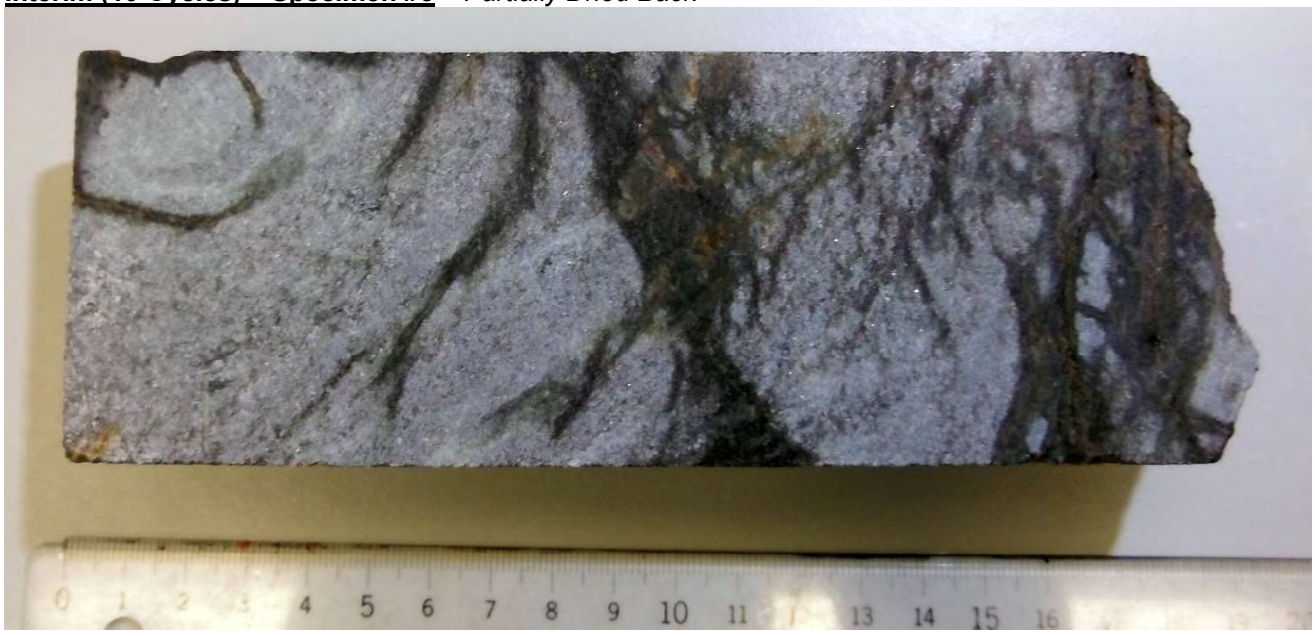
Initial (0 Cycles) – Specimen #3 – *Wetted*



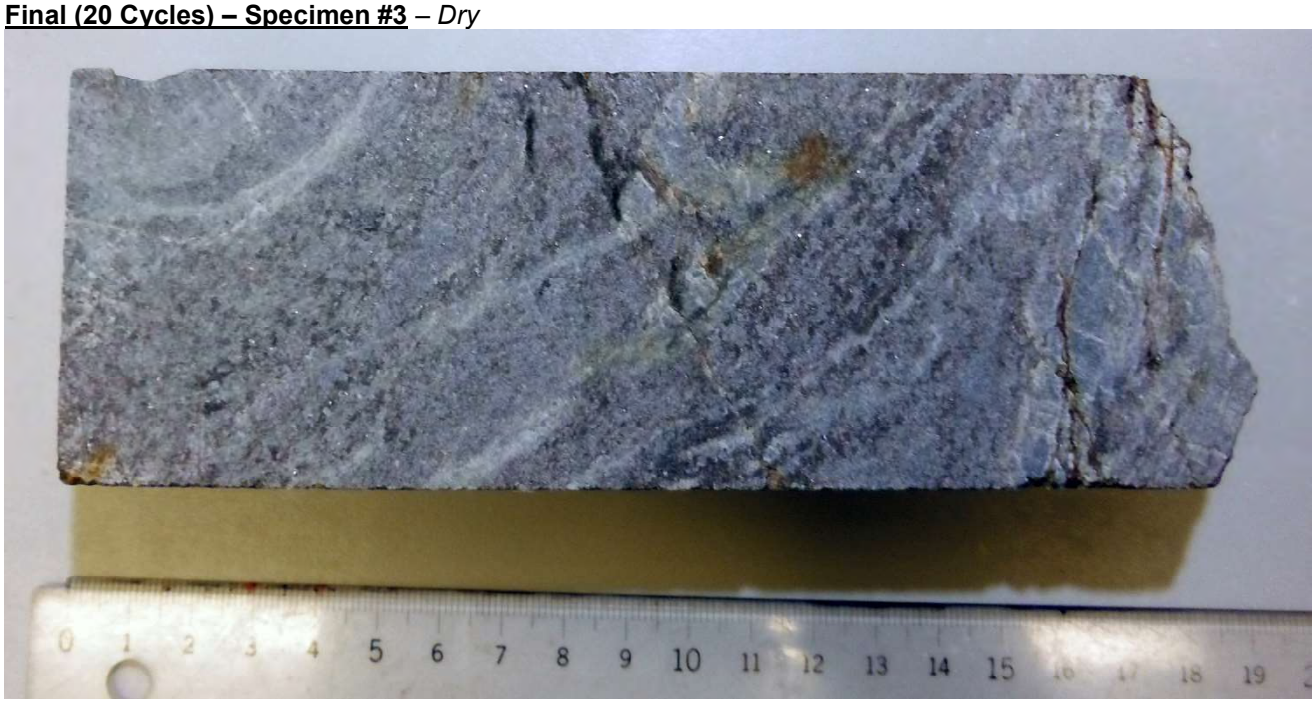
Initial (0 Cycles) – Specimen #3 – *Partially Dried Back*



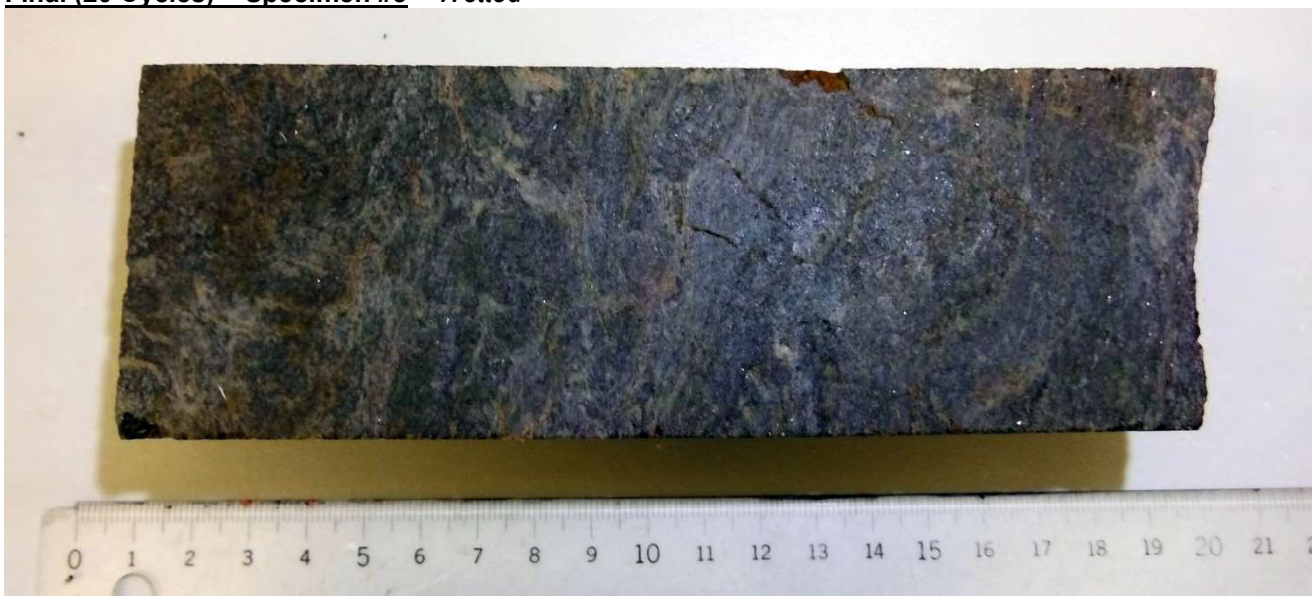
Interim (10 Cycles) – Specimen #3 – *Partially Dried Back*



Final (20 Cycles) – Specimen #3 – *Dry*



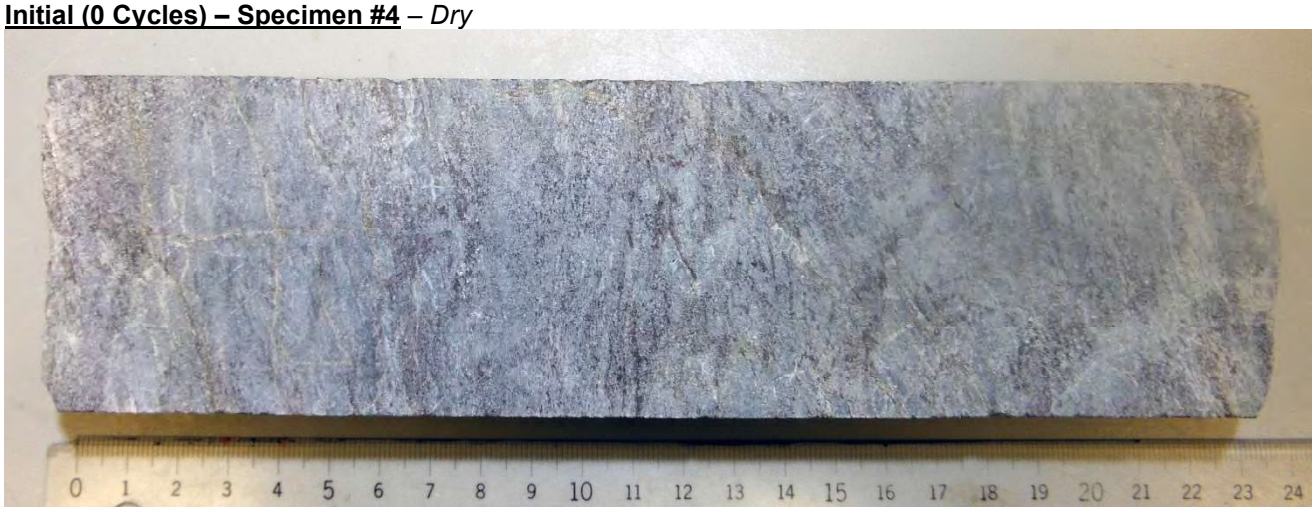
Final (20 Cycles) – Specimen #3 – *Wetted*



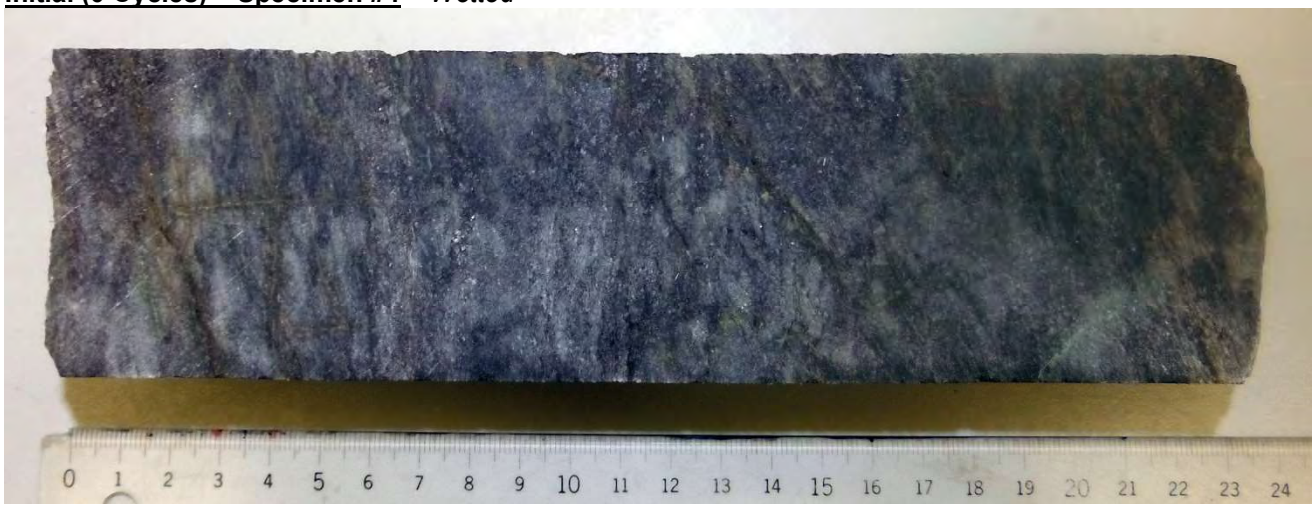
Final (20 Cycles) – Specimen #3 – *Partially Dried Back*



Initial (0 Cycles) – Specimen #4 – *Dry*



Initial (0 Cycles) – Specimen #4 – *Wetted*



Initial (0 Cycles) – Specimen #4 – *Partially Dried Back*



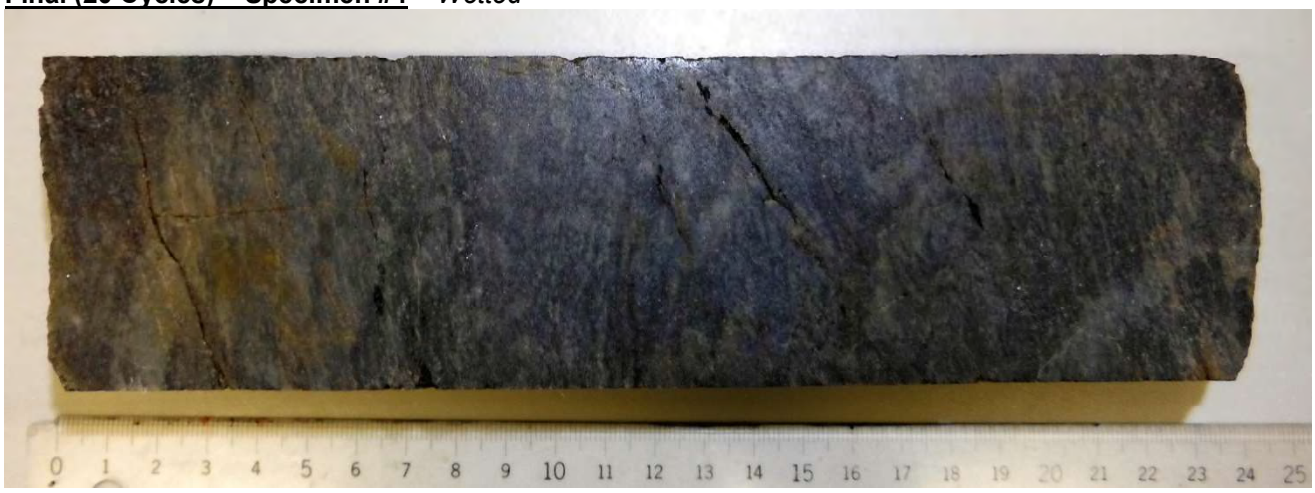
Interim (10 Cycles) – Specimen #4 – *Partially Dried Back*



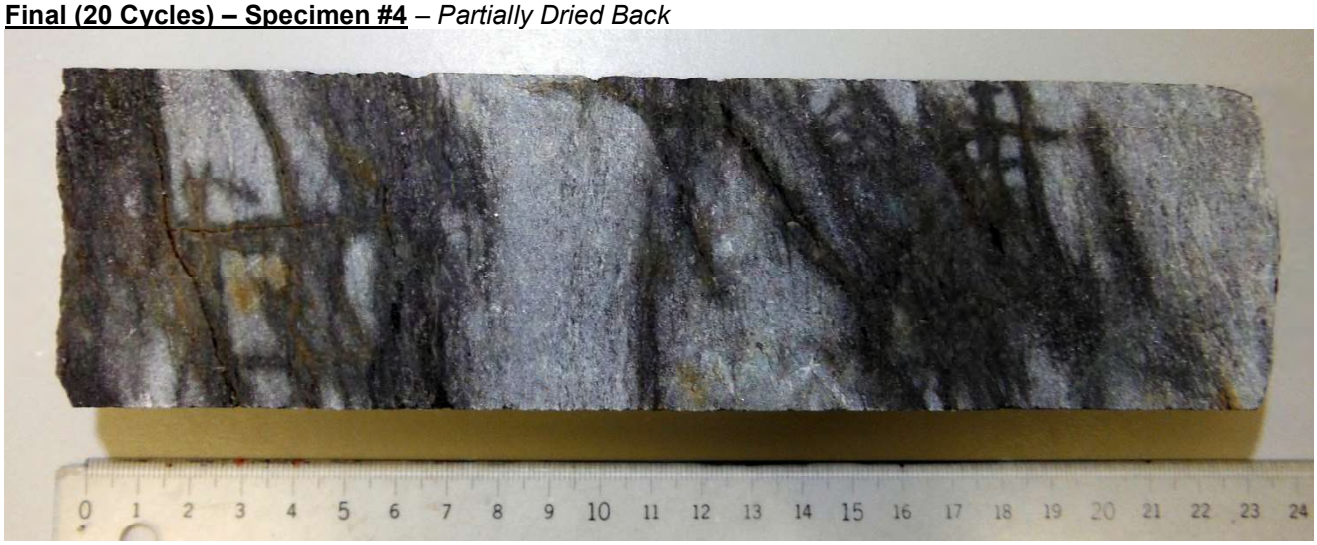
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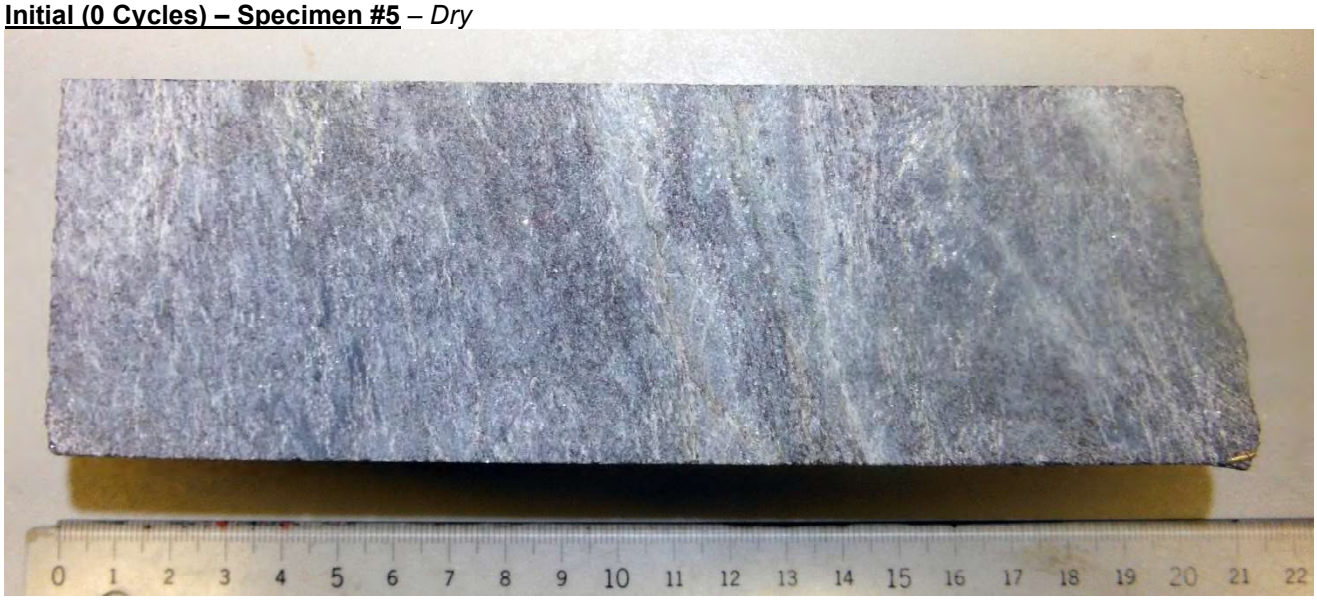
Final (20 Cycles) – Specimen #4 – *Wetted*



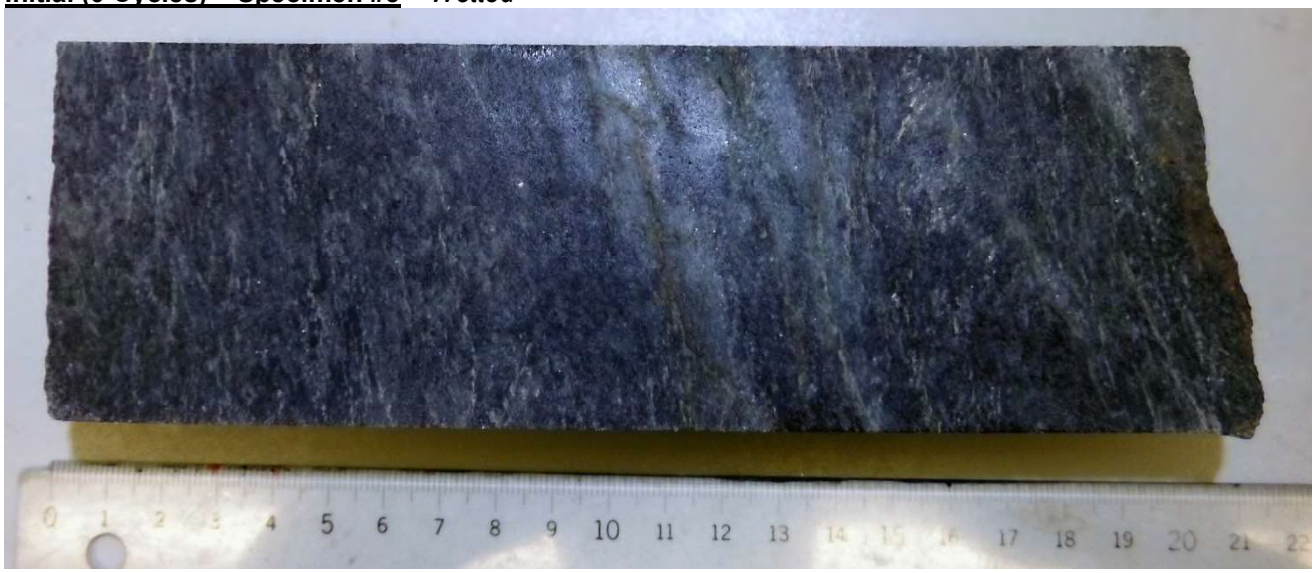
Final (20 Cycles) – Specimen #4 – *Partially Dried Back*



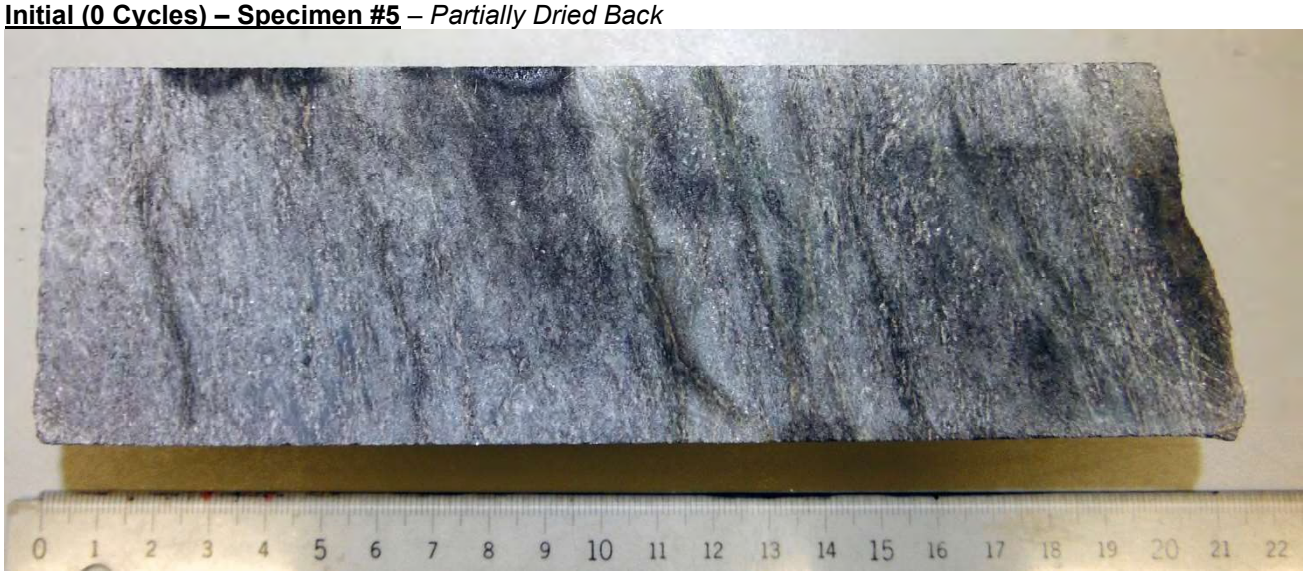
Initial (0 Cycles) – Specimen #5 – *Dry*



Initial (0 Cycles) – Specimen #5 – *Wetted*



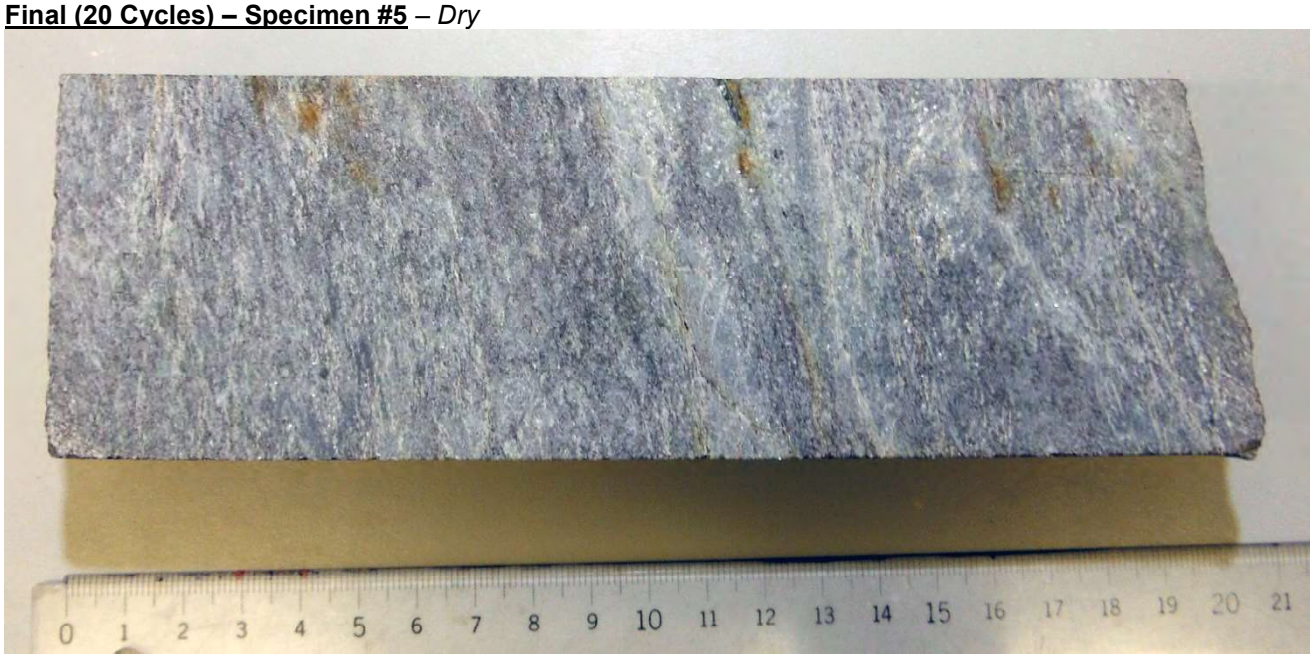
Initial (0 Cycles) – Specimen #5 – *Partially Dried Back*



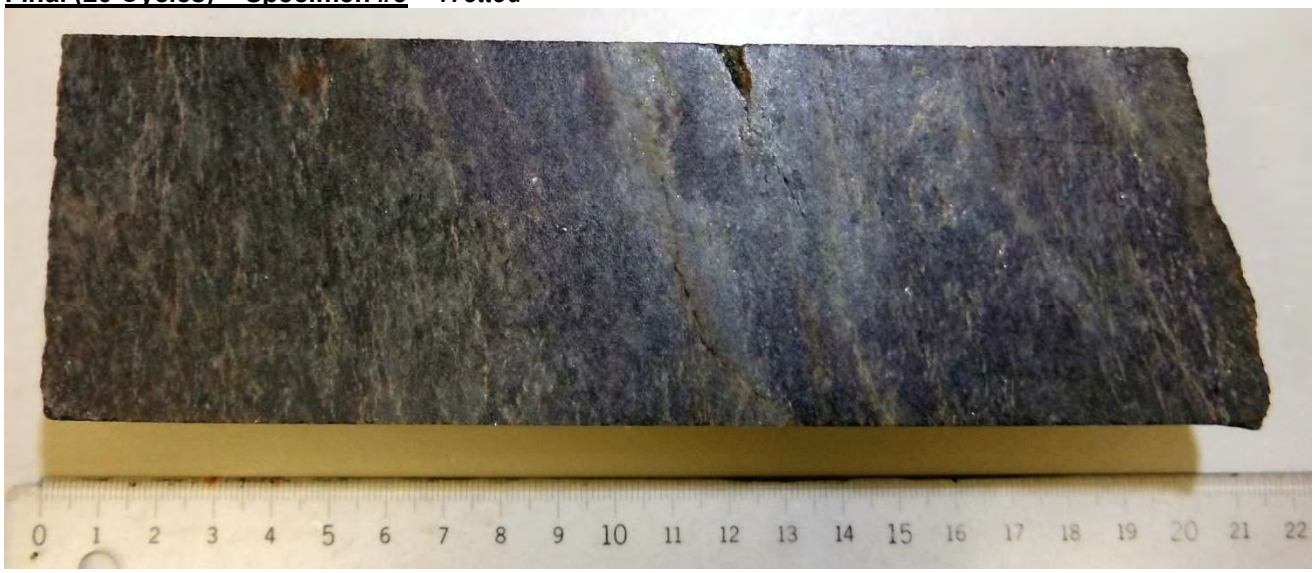
Interim (10 Cycles) – Specimen #5 – *Partially Dried Back*



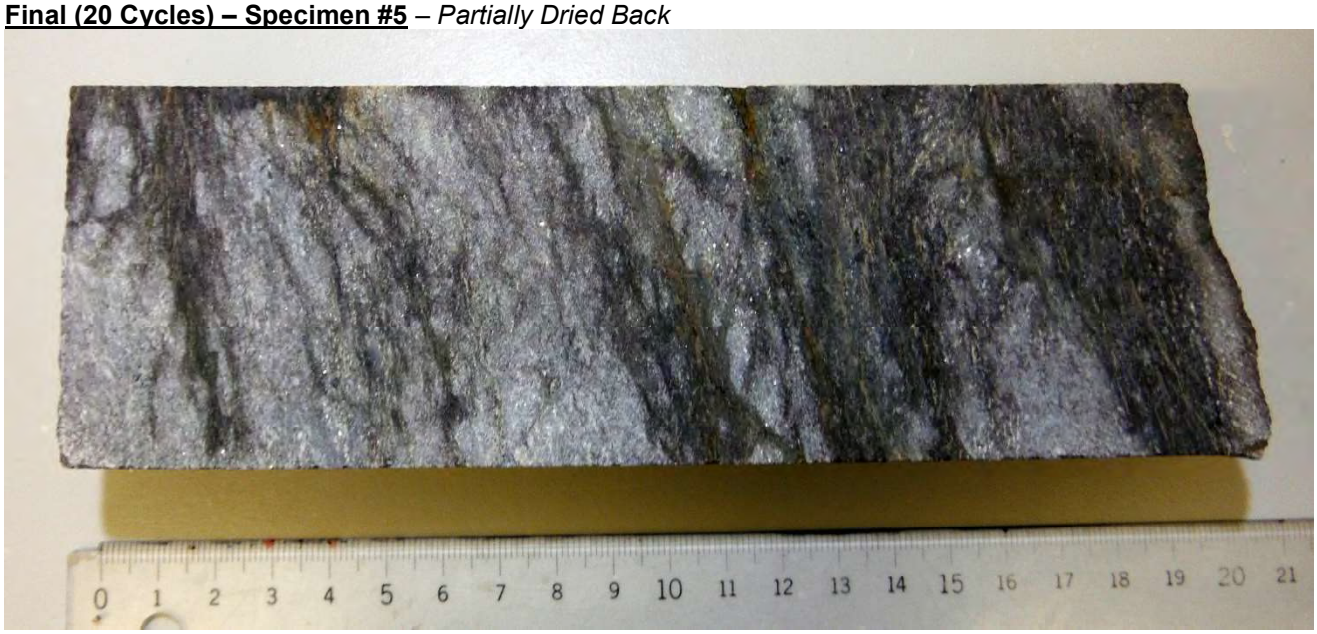
Final (20 Cycles) – Specimen #5 – *Dry*



Final (20 Cycles) – Specimen #5 – *Wetted*



Final (20 Cycles) – Specimen #5 – *Partially Dried Back*



-End of Photographs-

EVALUATION OF DURABILITY OF ROCK FOR EROSION CONTROL UNDER FREEZING AND THAWING CONDITIONS

ASTM D5312

CH2M Hill
1100 – 1st Street SE
Calgary, Alberta T2G 1B1

May 18, 2016
Project Number: 1653443

ATTENTION: Mr. Mark Cichy

PROJECT: Faro Creek Diversion

Sample:	**CH16 – 102 – MW004_RKg**
Source:	**Faro Mine Complex**

Objective and Method:

The objective of this testing program was to conduct a test of the durability of rock proposed for use as erosion control in an environment where it is understood that it would be exposed to freezing and thawing. The sample consisted of drilled rock core 61 mm in diameter, designated as "CH16 – 102 – MW004_RKg". The location and orientation of the drill hole was not provided and the depth range from which the rock core was sampled was not recorded. The sampling site was identified as "Faro Min Complex". The cores were obtained by others.

The test program consisted solely of conducting the method described in ASTM D5312. This report constitutes the final results of the test; all previously issued draft results are hereby superseded. This report comprises a testing service only. Interpretation may be provided upon request.

Five test specimens were selected from a core box, and cut in half length-wise; the fresh cut surface was used in testing. Due to the size of the original core, the test specimens did not meet the size requirements of ASTM D5121 of no less than 125 mm on a side; the test specimens also did not meet the thickness requirement of 65 mm, as they were hemispherical with a maximum thickness of 30 mm. The five specimens selected were the largest available sized pieces in the core box. This deviation from the standard was discussed and approved by the client prior to commencement of testing.

The test was designed such that the samples would be subjected to 20 cycles of freezing and thawing, as instructed by the client. The freezing portion of each cycle consisted of storing the samples in a freezer at -18°C for a minimum of 16 hours. This was followed by a minimum of 8 hours of thawing in an oven at 32°C. The condition of each sample was evaluated every five cycles through macroscopic and microscopic examination using a binocular microscope with magnifications up to 50x, enabling observations of pre-existing cracks and newly developed deterioration. Inspections included photographs and descriptive logs.

Prior to and at the end of the test, each sample was weighed and the percent loss by mass calculated for the individual specimens.

A separate core was selected from the same core box and tested for Uniaxial Compressive Strength per ASTM D7012; results of this testing is provided under separate cover.

Quantitative Analysis:

Percent Loss

Sample ID	Specimen ID	Original Mass (g)	Final Mass (g)	Measured Loss (%)
CH16-102-MW004_RKg	**#1**	488.2	487.7	**0.10%**
	#2	561.6	561.2	**0.07%**
	#3	547.8	547.4	**0.07%**
	#4	736.3	735.5	**0.11%**
	#5	803.5	802.9	**0.07%**
			Final Average Loss (%)	**0.09%**

Qualitative Analysis:

Summary of Initial Condition

Petrographic examination was not undertaken on any of the specimens; thus, interpretations of mineralogy, texture, alteration and weathering are based on cursory, macroscopic inspection. Thin section examination and chemical analyses, such as whole-rock analysis by X-Ray Fluorescence, were not conducted. Generally, the specimens consisted of 'quartz mica schist'; however, each rock specimen was cut from a core that exhibited slight to significant variations in compositional, textural and structural qualities including those listed below.

Composition
- Mineral proportions (mafic/felsic, alteration, mica, metallic minerals)
- Amount and distribution (persistent vs. localized) of metallic minerals
- Distribution of oxidation product and nature of occurrence (light staining to concentrated coating on fracture surfaces and veins

Textural
- Configuration of schistosity ranging from moderately to well-developed, wavy/irregular to parallel-planar, and continuous to discontinuous
- Very fine to medium mineral grain size
- Presence of veins, blebs and alteration zones

Structure
- Presence/absence of fractures
- Fracture width
- Number of fractures and fracture spacing
- Orientation and pattern of fractures
- Presence of weathering and oxidation around fractures

Observations of Individual Specimens

Specimen ID	Observations		
	Initial @ 0 cycles	**Interim @ 10 cycles**	**Final @ 20 cycles**
#1	- The specimen was rectangular in shape with approximate dimensions of 61 mm wide by 147 mm long - The specimen consisted of quartz mica schist with abundant irregular shaped veins infilled with pyrite and possible other metallic minerals. Frequent iron oxide staining in these veins was observed. - Smaller patches of dark grey rock were present that were highly absorptive - Fracture (A) bisected the specimen, cross-cutting the orientation of veins; it was visible when dry. Fracture (A) is also visible on back cored surface of the specimen - Tightly closed fractures (B), (C), and (D) are only visible when wetted; they are infilled with metallic minerals - Veins were generally absorbent and infilled with metallic minerals - Generally, small portions of the specimen were stained orange to rusty brown by oxidation and were slightly weathered	- No significant amount of material was dislodged from the specimen - Fractures (C) and (D) have widened slightly, with particles dislodging at the intersection of the fracture with the specimen edge - Overall, this specimen did not exhibit significant formation of fractures or loss of material	- A new fracture (E) was observed, propagating a short distance from the edge of specimen along a vein - Overall, this specimen did not exhibit significant formation of fractures or loss of material.

#2	- The specimen was rectangular in shape with approximate dimensions of 61 mm wide by 157 mm long - The specimen consisted of quartz mica schist with abundant irregular shaped veins infilled with pyrite and possible other metallic minerals. Frequent iron oxide staining in these veins was observed. - Smaller patches of dark grey rock were present that were highly absorptive - A continuous fracture (A) with localized straining and fracture surfaces coated in oxidation product cuts across foliation at an angle; it is moderately absorptive - Numerous features (B) parallel to foliation and appearing to be tightly closed fractures infilled with oxidized material were observed; all were moderately absorptive. Some appear to be associated with higher concentrations of muscovite.	- Foliation parallel features (B) have opened into fractures, revealing oxidized fracture walls - Iron oxide product has leached heavily into the carpet of specimen container - A new fracture (C) has opened along the boundary of a cluster of dark grey, medium-grained minerals - Overall, this specimen did not exhibit significant formation of fractures or loss of material; however small thin and short fractures became more apparent	- Foliation parallel features (B) have continued to open, become more absorptive - Small particle dislodged from fracture (C) - Overall, this specimen did not exhibit significant formation of fractures or loss of material
#3	- The specimen was rectangular in shape with approximate dimensions of 61 mm wide by 168 mm long - The specimen consisted of quartz mica schist with abundant irregular shaped veins infilled with pyrite and possible other metallic minerals. Frequent iron oxide staining in these veins was observed. - Numerous irregularly shaped veins were observed, infilled with metallic minerals, including pyrite, infrequently oxidized and forming orange-rusty iron oxide stains. - Smaller patches of dark grey, medium-grained minerals were present that were highly absorptive - Small fracture (A), 13 mm long and 0.18 mm wide observed, part of a larger tightly closed fracture - Small fracture (B), 4 mm long was observed, part of a larger tightly closed fracture - Fractures (A) and (B) follow the path of existing veins, and are highly absorptive - A small fragment dislodged from edge of specimen during handling, after initial mass recording	- Fracture (A) has elongated by 3 mm, and widened by 0.07 mm - New network of fractures (C) observed around dark grey area, with particles dislodging with minimal effort	- Fracture (A) has elongated by a further 5 mm, and widened by a further 0.05 mm - Overall, this specimen did not exhibit any significant loss of material; however, one fracture was observed to continuously elongate and widen as the test progressed.

#4	- The specimen was rectangular in shape with approximate dimensions of 61 mm wide by 215 mm long - The specimen consisted of quartz mica schist with abundant irregular shaped veins infilled with pyrite and possible other metallic minerals. Frequent iron oxide staining in these veins was observed. - Numerous irregularly shaped veins were observed, infilled with metallic minerals, including pyrite, with frequent iron oxide staining along veins. - Smaller patches of dark grey, medium-grained minerals were present, with cubic white mineral grains; veins associated with these patches were moderately absorptive - Two large fractures (A) and (B) were observed bisecting the test surface, they were mostly opened and 0.3 mm wide at its widest point near the specimen edge; some portions of the fractures were infilled with oxidation product. Fracture (A) was highly absorptive while Fracture (B) was moderately to slightly absorptive. - Large fracture (C) observed propagating from weathered edge of specimen, infilled with oxidized material and some white alteration minerals - Fracture (C) is visible from weathered edge of specimen, and propagates at 35 degrees from test surface plane	- Small fragments dislodged at the intersection of fractures (A) and (B) with the specimen edge - Existing fractures (A), (B), and (C) exhibited apparent widening, with particles dislodging along the fracture path with minimal prying effort and absorption increasing - Fracture (A) has widened by 0.3 mm at its widest point; however, the widening is near the specimen test surface and does not persist at this width into the fracture - Overall, this specimen exhibited a slight loss of material along pre-existing fractures, some of which were tightly closed prior to testing. Some fractures have widened slightly.	- All existing fractures have continued to widen, with more fragments dislodging and increased absorption observed; Fractures (A) and (B) are prominently visible from both the front and back of the specimen

#5	- The specimen was rectangular in shape with approximate dimensions of 60 mm wide by 235 mm long - The specimen consisted of quartz mica schist with abundant irregular shaped veins infilled with pyrite and possible other metallic minerals. Frequent iron oxide staining in these veins was observed. - Numerous irregularly shaped veins were observed, infilled with metallic minerals including pyrite. Iron oxide staining along vein faces in common - Smaller patches and bands of dark grey medium grained minerals were present; veins and associated fractures were moderately absorptive - Large fracture (A) was observed bisecting the specimen, at ~30 degrees from the specimen's long edge and infilled with oxidation products - A small fragment where fracture (A) intersects the specimen edge has dislodged, revealing an oxidized fracture surface - Fracture (B) was observed bisecting the specimen, at ~15 degrees from specimen long edge and infilled with oxidation; Fracture (B) is located beside and near Fracture (A) - Fractures (A) and (B) are prominently visible from the front and back face of the specimen - Fracture (B) is continuous (with some steps) until it branches off into network of fractures (C), where fractures are open (0.2 to 0.5 mm) and oxidation is observed on fracture walls - Fractures (A), (B), and (C) are highly absorptive	- Small fragments have been dislodged from the specimen edges where the dark grey mineral patch/band is present - Fractures (C) have opened slightly; the oxidation product coating the fracture walls is persistent - Overall, this specimen exhibited a slight loss of material along pre-existing fractures which were tightly closed prior to testing. Some fractures have widened slightly.	- Fractures (C) have further widened slightly - More fragments have been dislodged from the specimen edges where the dark grey mineral patch/band is present - Minimal material loss was observed, and pre-existing fractures continued to widen

Summary of Deterioration

The majority of specimens did not appear to have significant material loss. For those that did exhibit loss of material, the loss consisted only of small flakes and fragments that were thin and weakly attached to pre-existing fractures. Many pre-existing fractures were observed to have widened slightly and in some cases lengthened as a result of the freezing and thawing action; this was observed in specimens #2, #3, #4 and #5. The following observations regarding sample conditions were made:

Loss of Material

- Dislodgement of thin portions of the specimen that were intersected by pre-existing fractures and were moderately to poorly adhered prior to testing
- Pitting and dislodgement of material occurred along pre-existing fracture paths where fractures were: i) braided and/or intersecting with other fractures, ii) open and with shallow angle relative to specimen surface, iii) significantly weathered and oxidized
- Specimens with abundant pre-existing fractures and significant weathering and oxidation experienced slightly higher amounts of material loss

Formation and/or propagation of fractures

- Several pre-existing fractures widened slightly. Typically, these fractures had the following properties prior to testing: i) width greater than ~0.5 mm, ii) fracture surfaces that were weathered and coated with iron oxidation product and other alteration minerals, and iii) were continuous across the specimen and often interconnected with other fractures.
- The strength of pre-existing fractures prior to testing was moderately strong, i.e. it would be expected to break from a firm hammer blow but may resist an impact of moderate force. Following completion of the test, the fractures that widened and elongated did not noticeably decrease in strength and would likely still resist moderate impact.
- Specimen #5 had pre-existing fractures that may range from moderately strong to weak.

Overall Summary

The data given in this report pertain to the samples provided, and may not be applicable to material from other locations or trial periods.

The observations for material loss and fracture formation, as well as the visual and measured estimate of mass loss were comparable between the 10 cycle interim inspection and the 20 cycle final inspection. This indicates that the specimens did not undergo significant additional deterioration after 20 cycles, compared to 10 cycles.

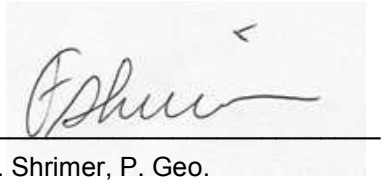
The specimens had an average measured loss of 0.09%. The samples were generally similar to each other with respect to their resistance to the stresses generated by freezing and thawing action. Material loss appeared to be caused by dislodging of material that was only moderately well adhered to pre-existing fracture surfaces prior to testing and generally consisted of the removal of small flakes, fragments and mineral grains. Specimens with more pre-existing fractures and more significant weathering and oxidation had an overall mineral bond strength that ranged from good to moderate and typically experienced higher loss.

Formation of new fractures, widening, and lengthening of pre-existing fractures was observed in minor amounts in the tested rock specimens and was typically associated with fractures which were open, weathered, oxidized and coated prior to testing. Some of the pre-existing fractures were interpreted to be of moderate strength and could be susceptible to fracturing if impacted with moderate force. All of the tested rock specimens had a schistose texture with weathering, alteration and oxidation along foliation planes; furthermore, the rock was veined and altered to varying degrees. Typically, rock with these characteristics will have wide variability in rock durability.

Prepared, tested and reported by:



I. Chung



F. Shrimer, P. Geo.

Reviewed by:



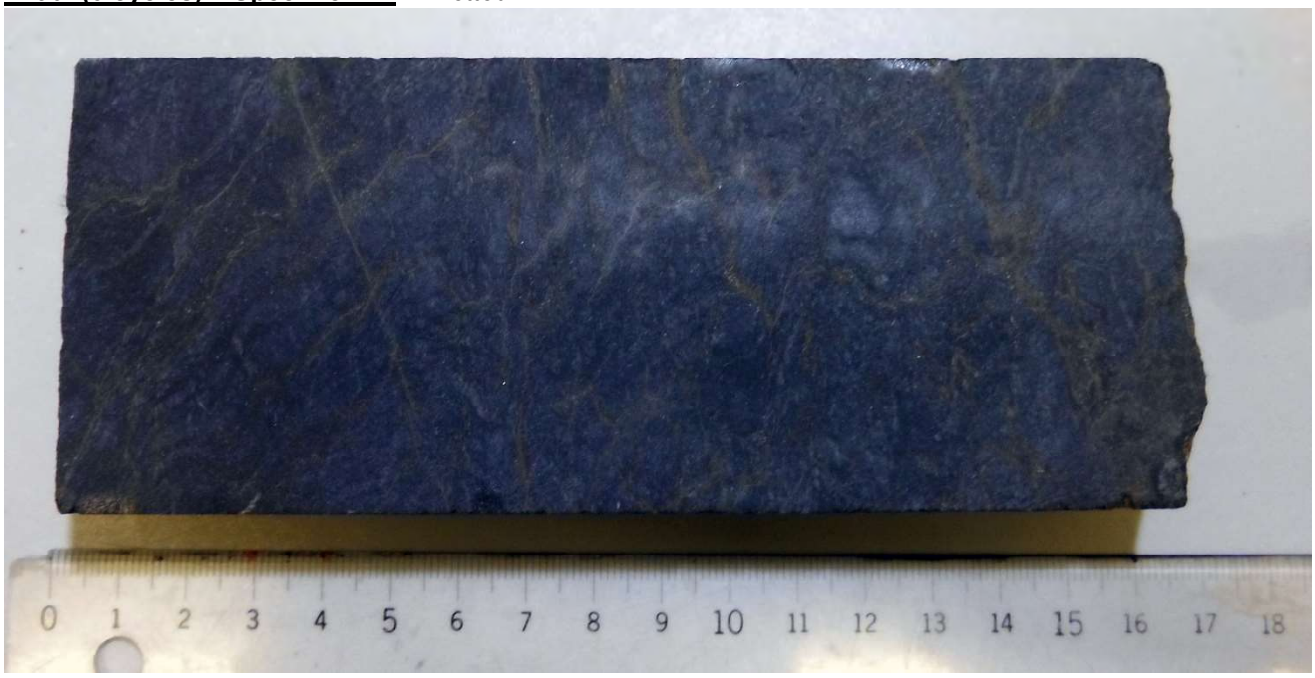
B. Hudson, P. Geo.

PHOTOGRAPHS

Initial (0 cycles) – Specimen #1 – *Dry*



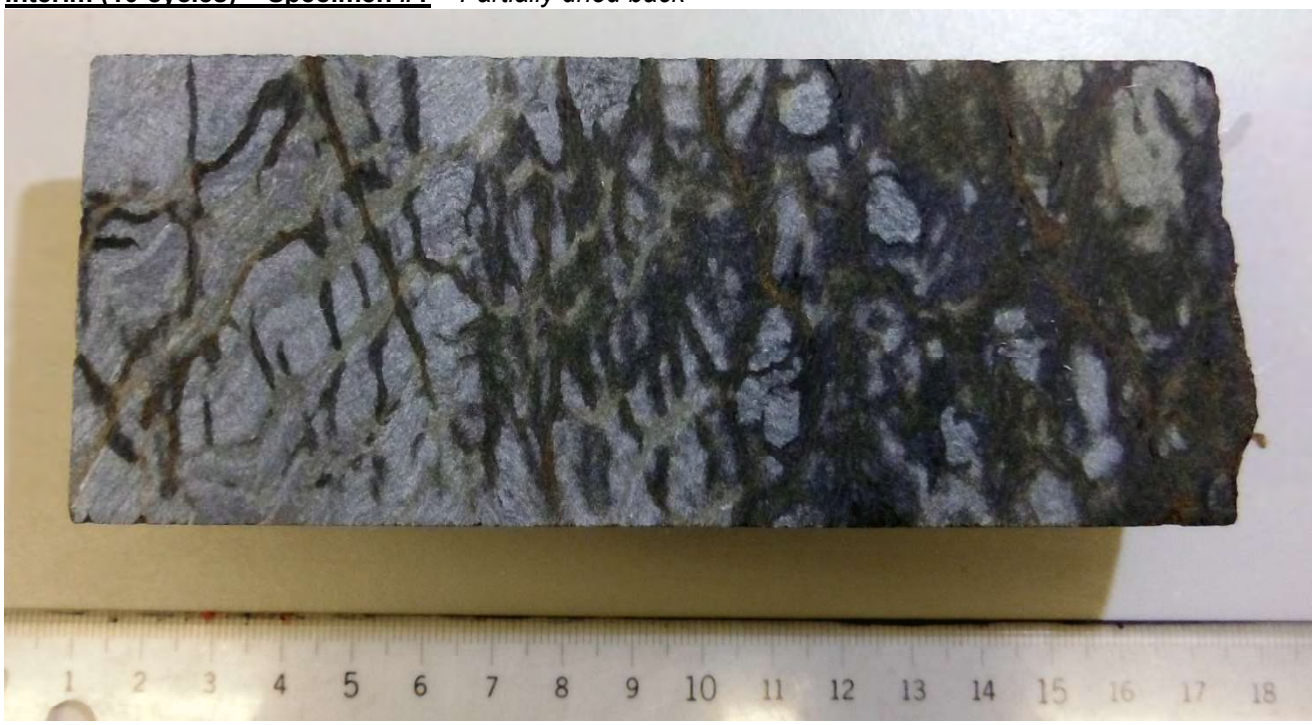
Initial (0 cycles) – Specimen #1 – *Wetted*



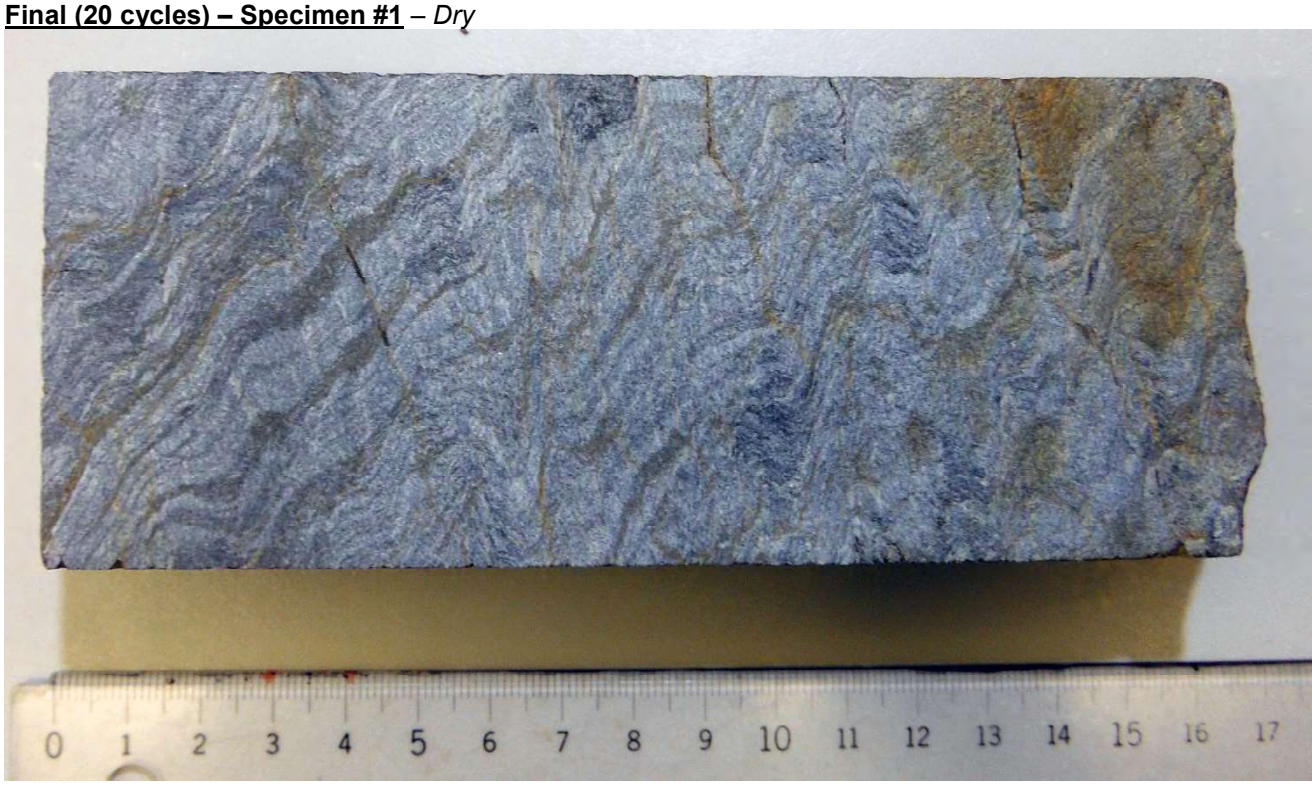
Initial (0 cycles) – Specimen #1 – *Partially dried back*



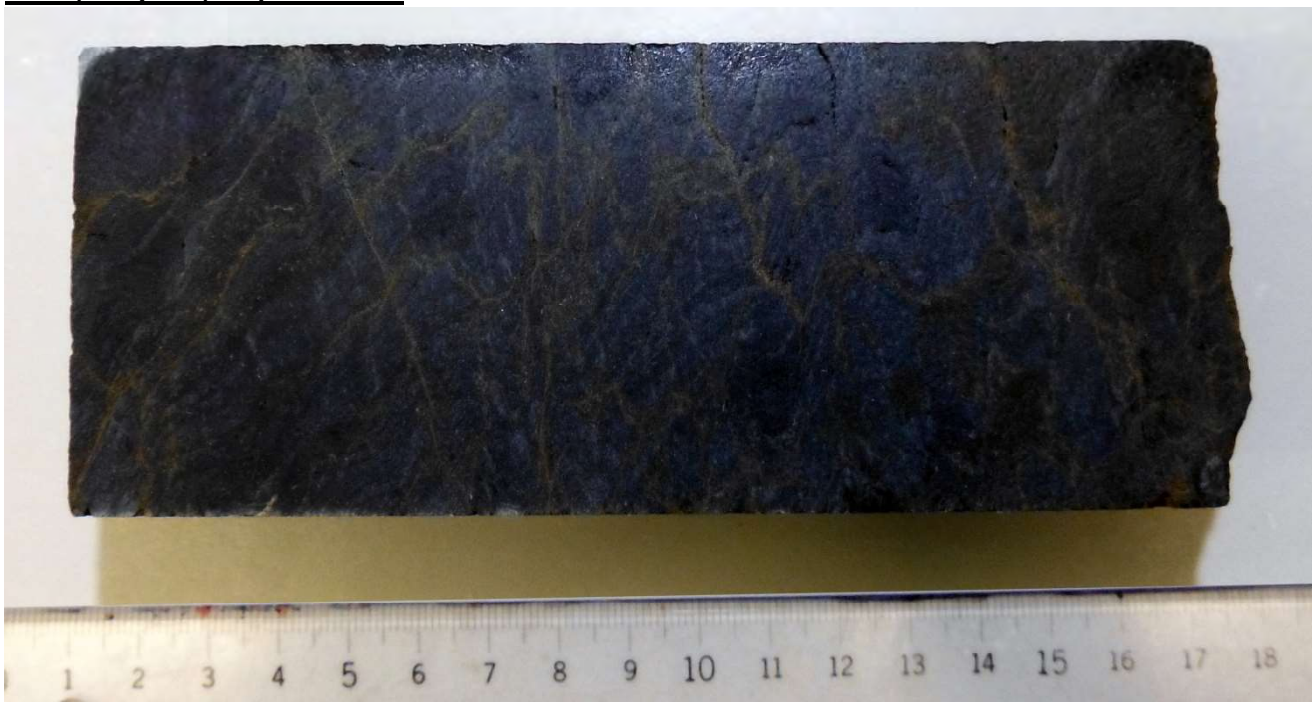
Interim (10 cycles) – Specimen #1 – *Partially dried back*



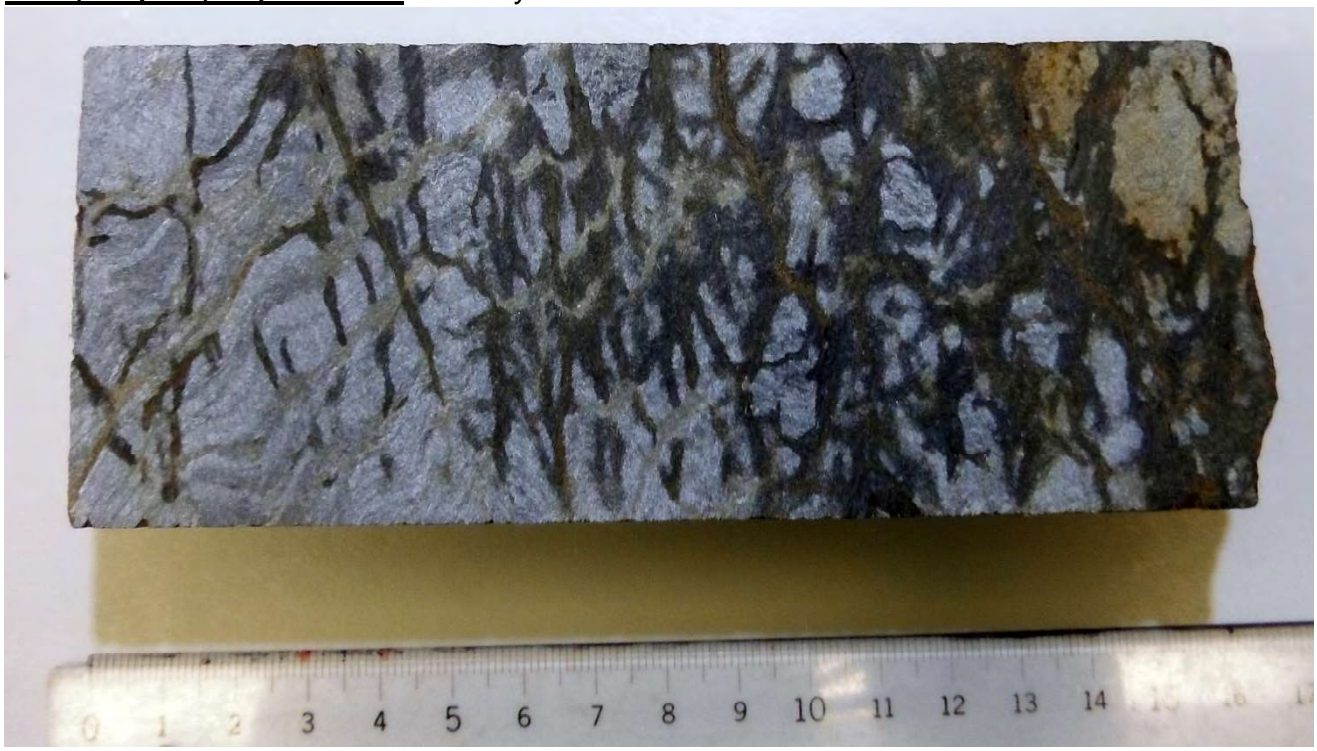
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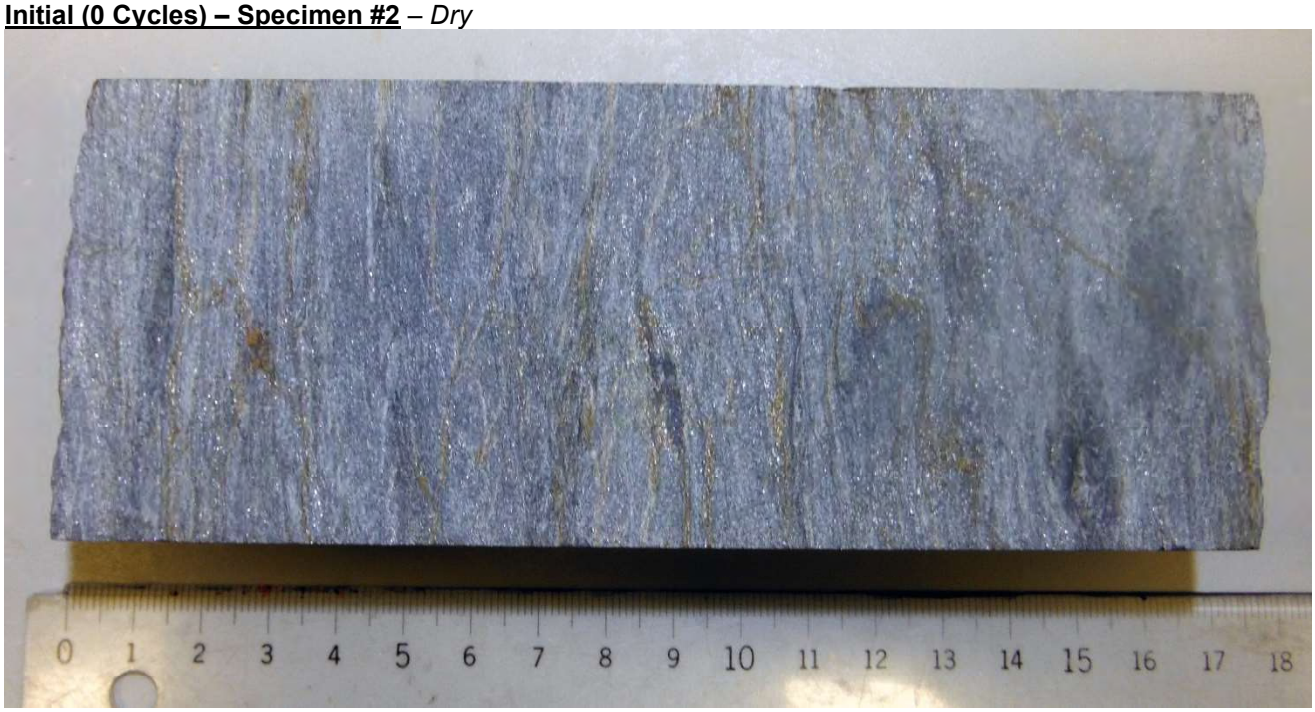
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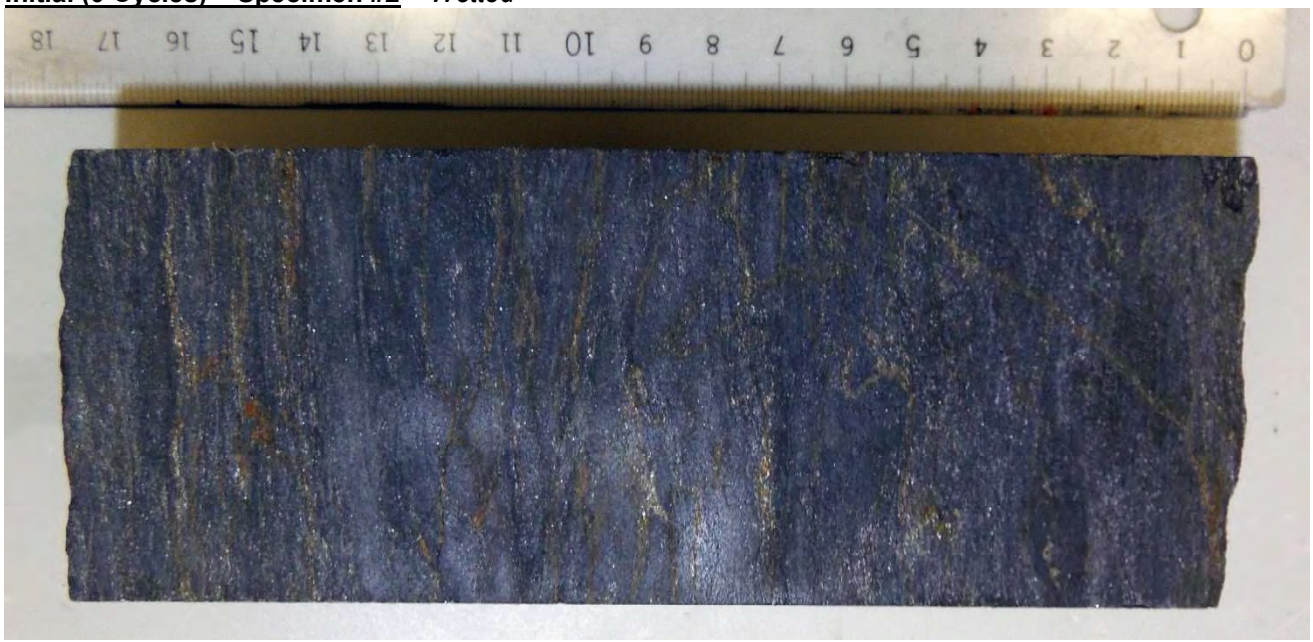
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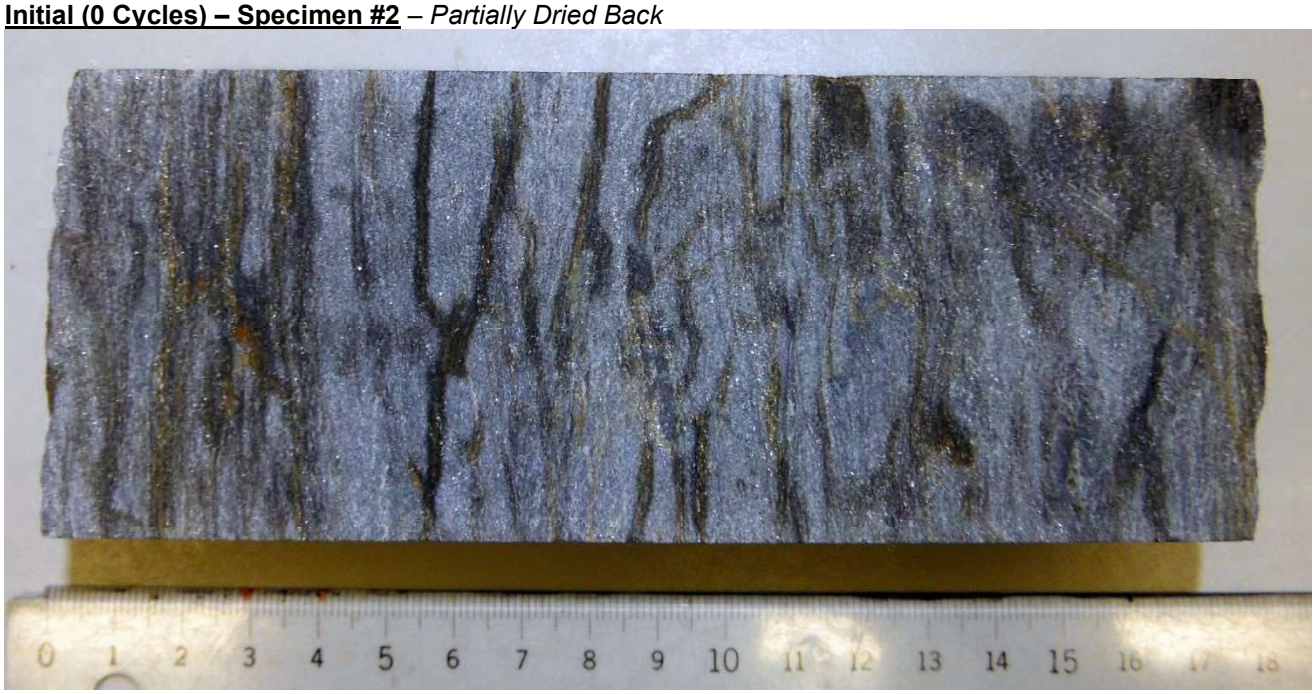
Initial (0 Cycles) – Specimen #2 – *Dry*



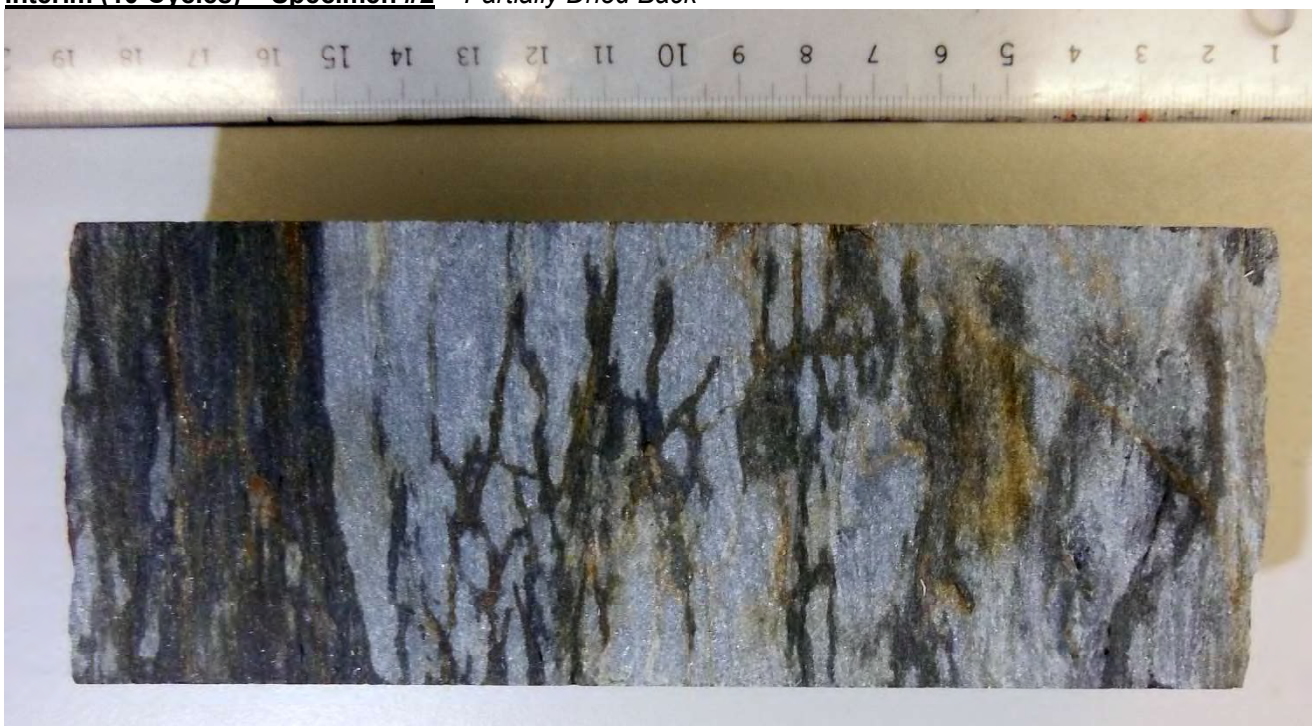
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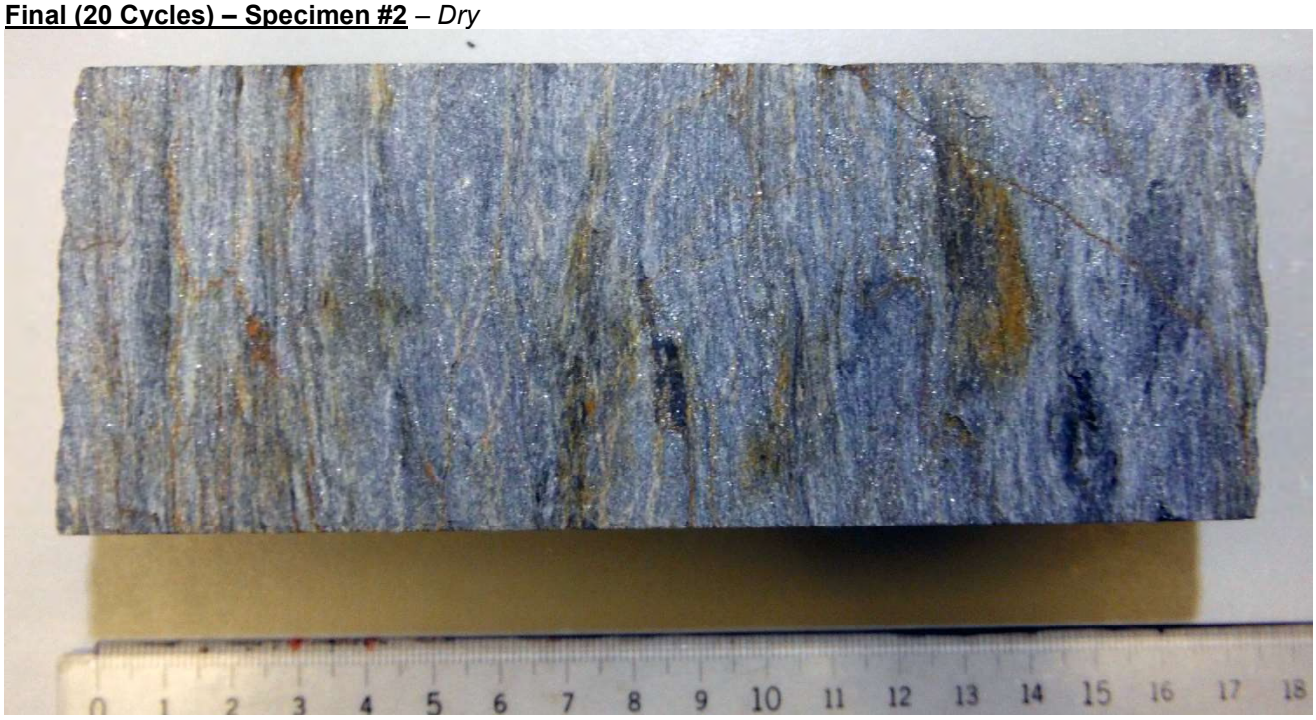
Initial (0 Cycles) – Specimen #2 – *Partially Dried Back*



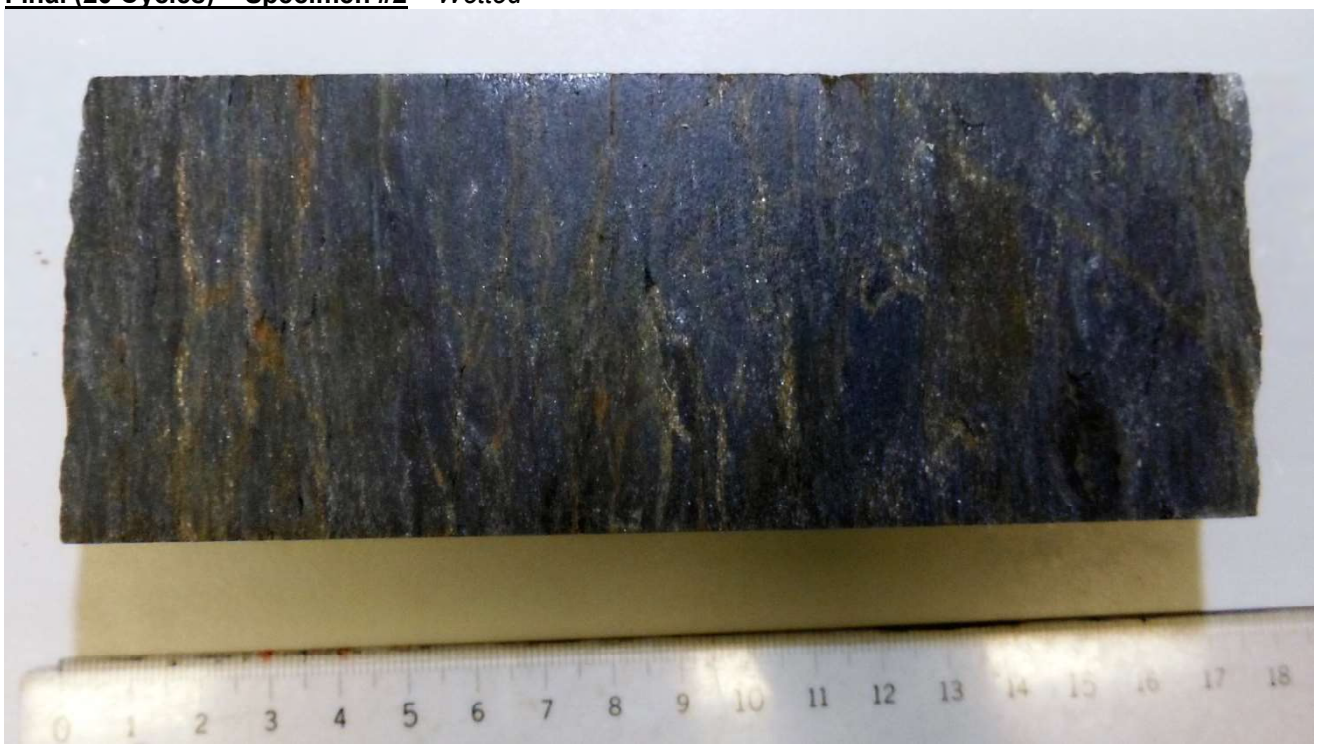
Interim (10 Cycles) – Specimen #2 – *Partially Dried Back*



Final (20 Cycles) – Specimen #2 – *Dry*



Final (20 Cycles) – Specimen #2 – *Wetted*



Final (20 Cycles) – Specimen #2 – *Partially Dried Back*



Initial (0 Cycles) – Specimen #3 – *Dry*



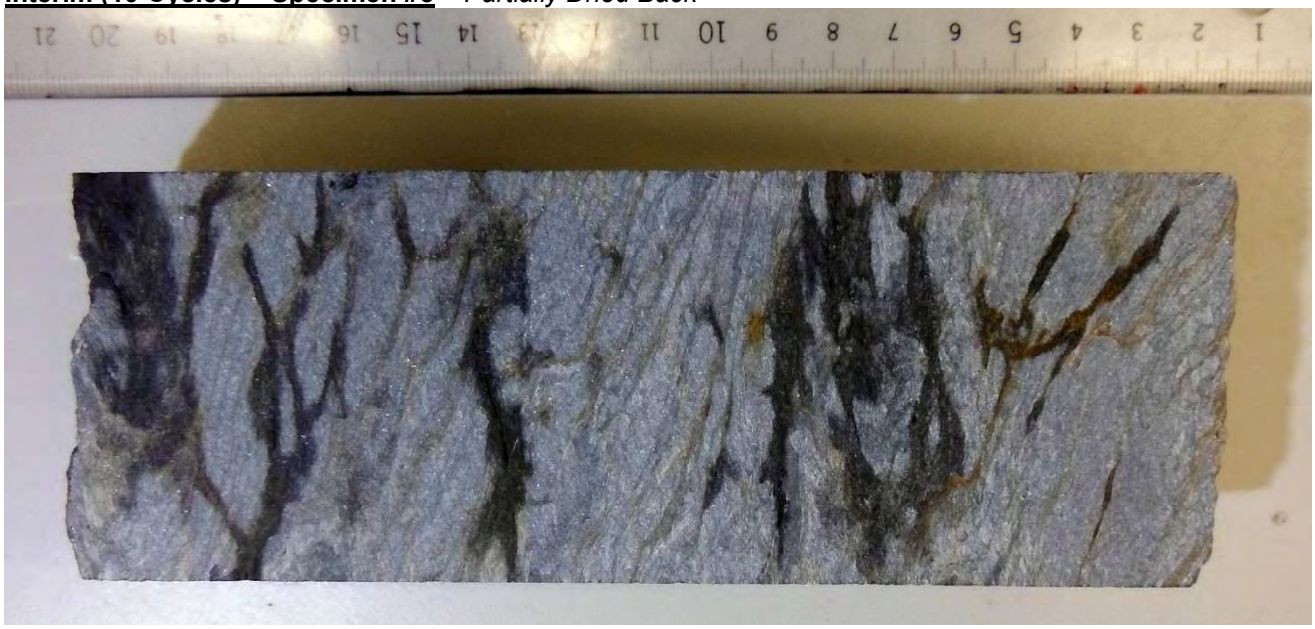
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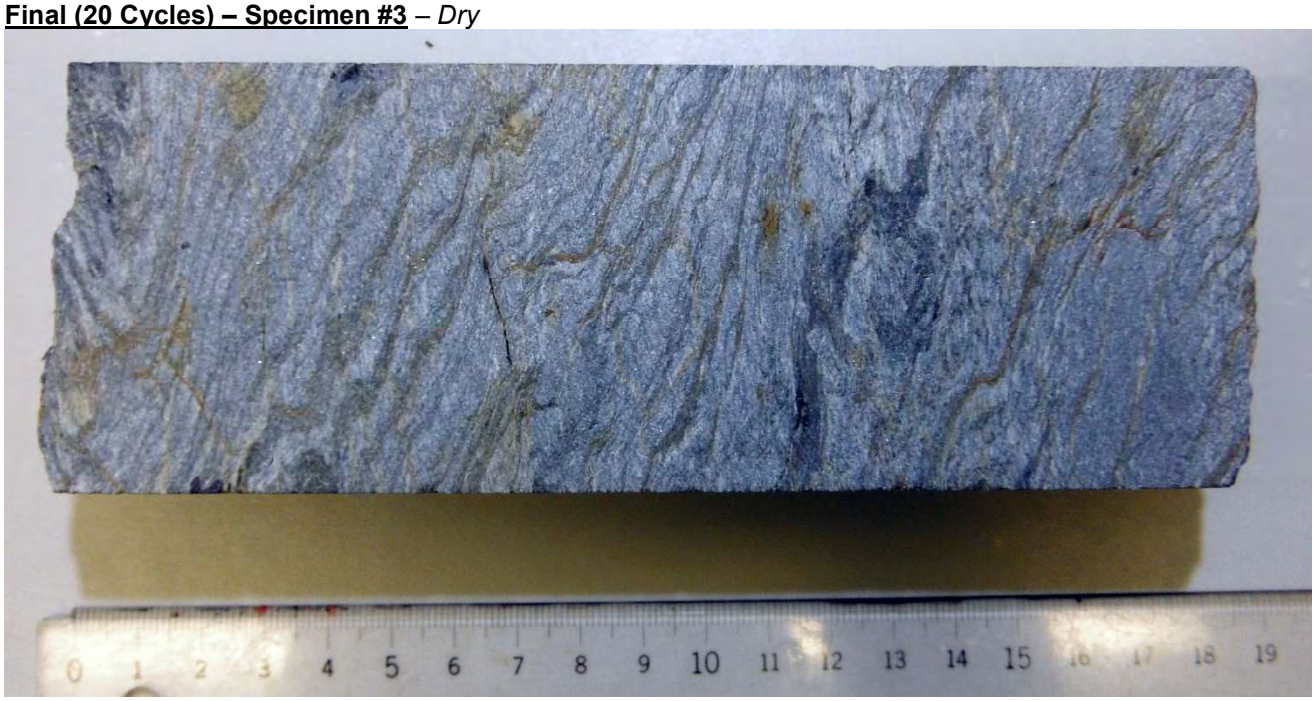
Initial (0 Cycles) – Specimen #3 – *Partially Dried Back*



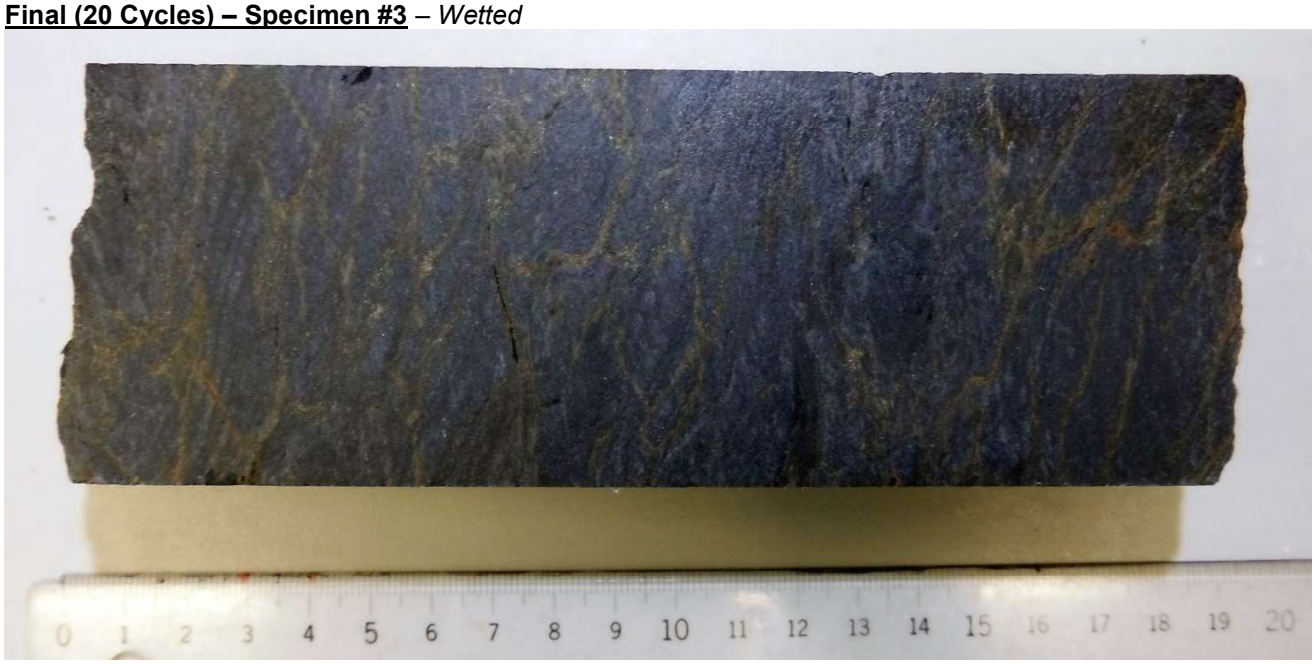
Interim (10 Cycles) – Specimen #3 – *Partially Dried Back*



Final (20 Cycles) – Specimen #3 – *Dry*



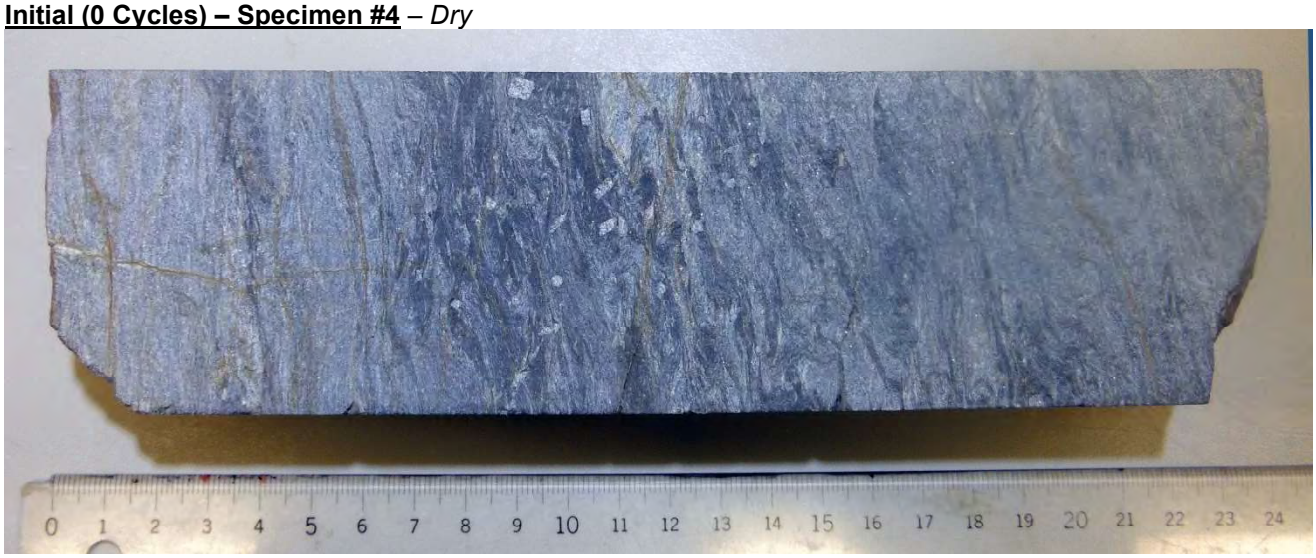
Final (20 Cycles) – Specimen #3 – *Wetted*



Final (20 Cycles) – Specimen #3 – *Partially Dried Back*



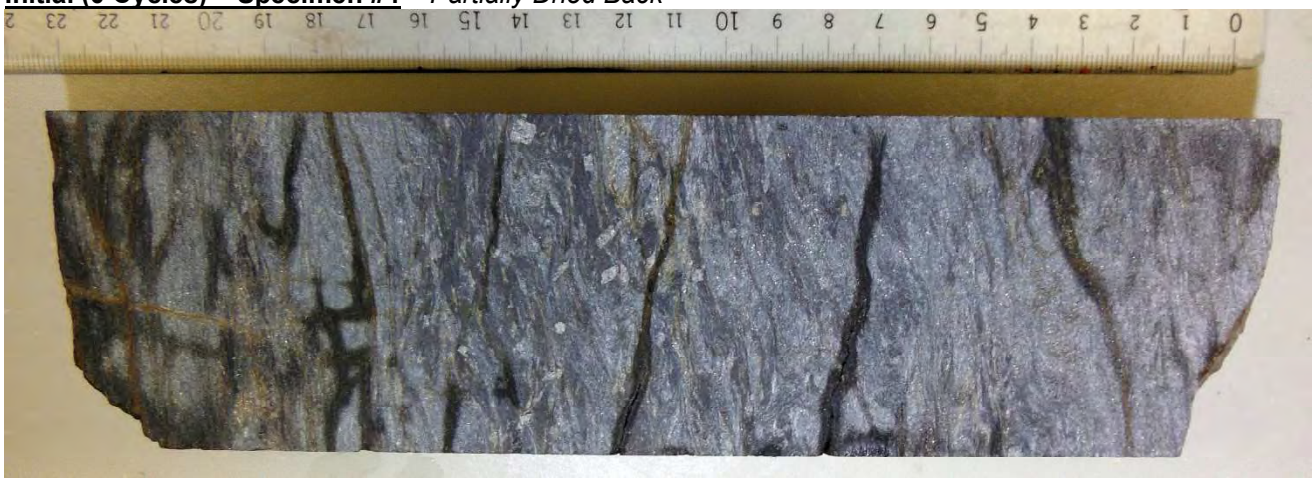
Initial (0 Cycles) – Specimen #4 – *Dry*



Initial (0 Cycles) – Specimen #4 – *Wetted*



Initial (0 Cycles) – Specimen #4 – *Partially Dried Back*



Interim (10 Cycles) – Specimen #4 – *Partially Dried Back*



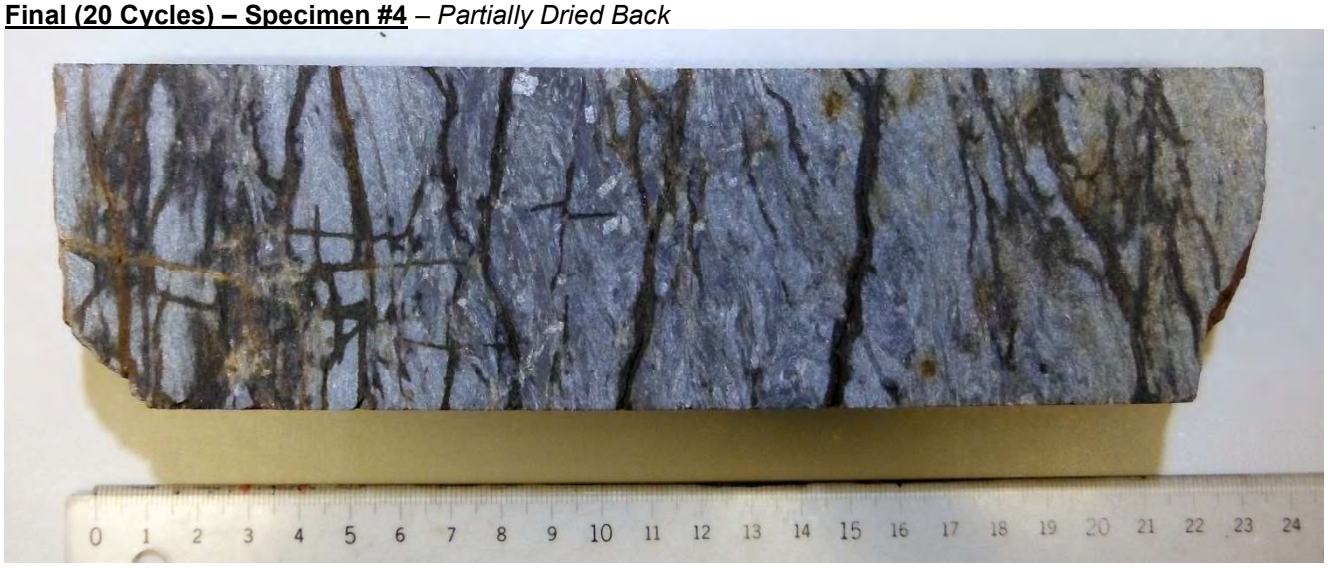
Final (20 Cycles) – Specimen #4 – *Dry*



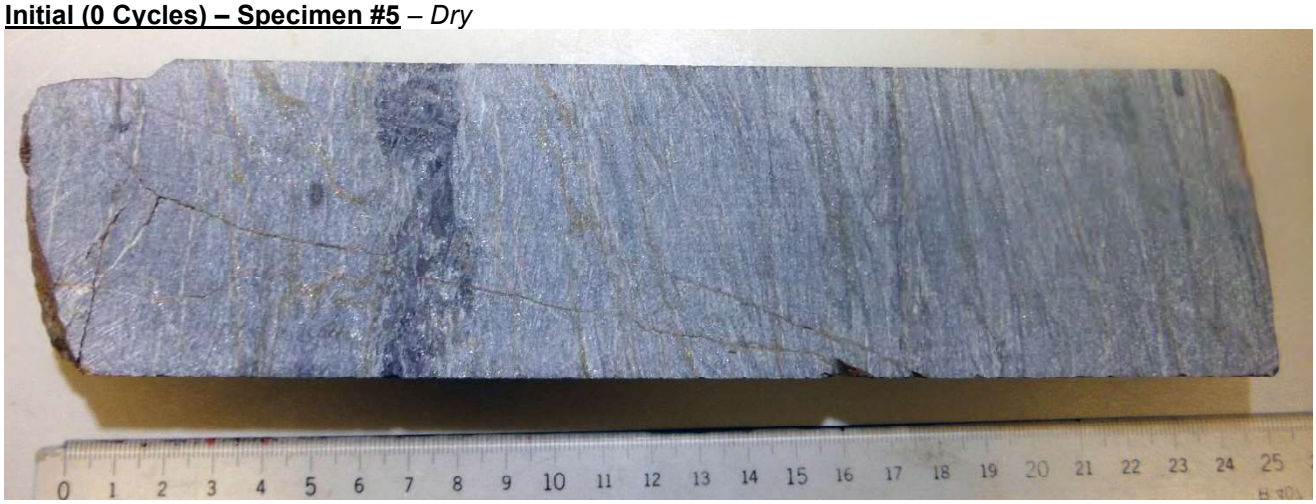
Final (20 Cycles) – Specimen #4 – *Wetted*



Final (20 Cycles) – Specimen #4 – *Partially Dried Back*



Initial (0 Cycles) – Specimen #5 – *Dry*



Initial (0 Cycles) – Specimen #5 – *Wetted*



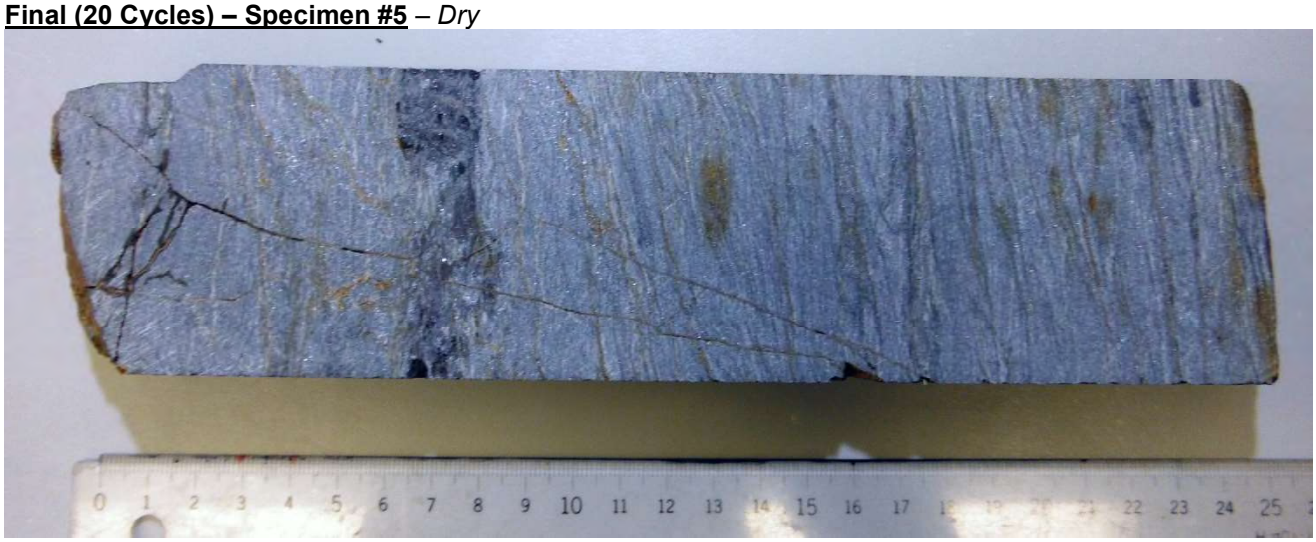
Initial (0 Cycles) – Specimen #5 – *Partially Dried Back*



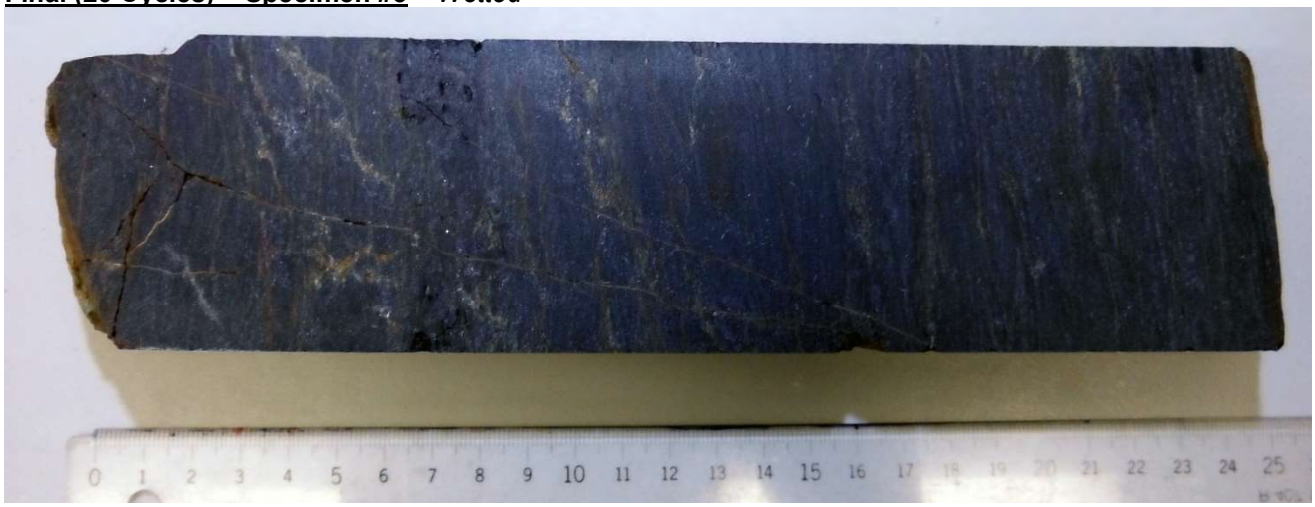
Interim (10 Cycles) – Specimen #5 – *Partially Dried Back*



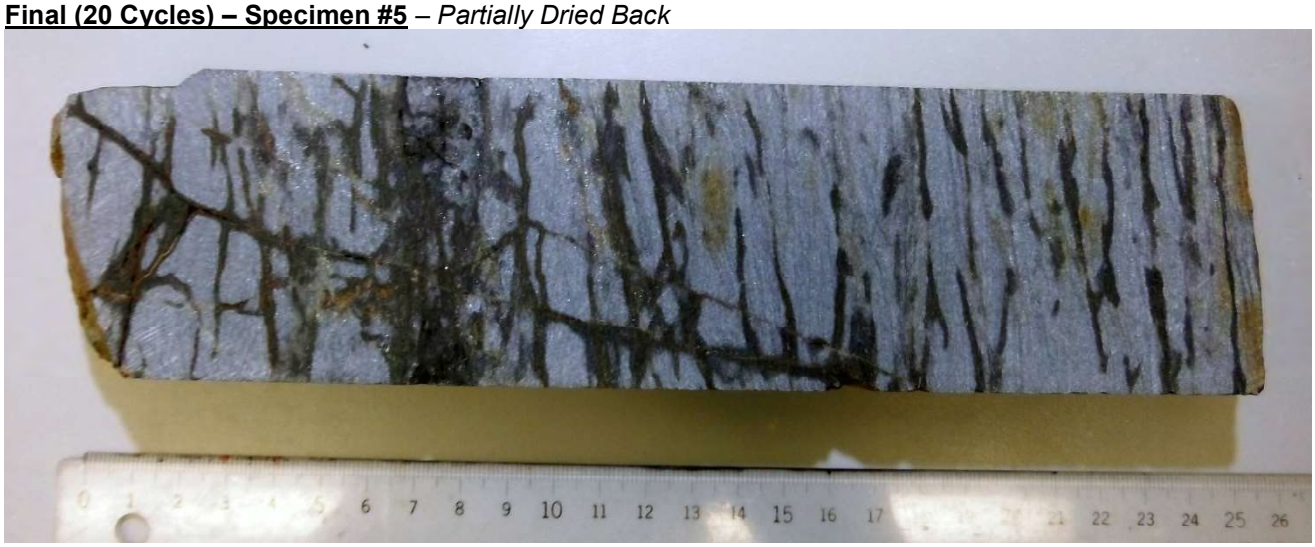
Final (20 Cycles) – Specimen #5 – *Dry*



Final (20 Cycles) – Specimen #5 – *Wetted*



Final (20 Cycles) – Specimen #5 – *Partially Dried Back*



-End of Photographs-

EVALUATION OF DURABILITY OF ROCK FOR EROSION CONTROL UNDER FREEZING AND THAWING CONDITIONS

ASTM D 5312

CH2M Hill
1100 – 1st Street SE
Calgary, Alberta T2G 1B1

May 18, 2016
Project Number: 1653443

ATTENTION: Mr. Mark Cichy

PROJECT: Faro Creek Diversion

Sample:	**CH16 – 102 – MW005_RKc**
Source:	**Faro Mine Complex**

Objective and Method:

The objective of this testing program was to conduct a test of the durability of rock proposed for use as erosion control in an environment where it is understood that it would be exposed to freezing and thawing. The sample consisted of drilled rock core 61 mm in diameter, designated as "CH16 – 102 – MW005_RKc". The location and orientation of the drillhole was not provided and the depth range from which the rock core was sampled was not recorded. The sampling site was identified as "Faro Mine Complex". The cores were obtained by others.

The test program consisted solely of conducting the method described in ASTM D5312. This report constitutes the final results of the test; all previously issued draft results are hereby superseded. This report comprises a testing service only. Interpretation may be provided upon request.

Five test specimens were selected from a core box, and cut in half length-wise; the fresh cut surface was used in testing. Due to the size of the original core, the test specimens did not meet the size requirements of ASTM D5121 of no less than 125 mm on a side; the test specimens also did not meet the thickness requirement of 65 mm, as they were hemispherical with a maximum thickness of 30 mm. The five specimens selected were the largest available sized pieces in the core box. This deviation from the standard was discussed and approved by the client prior to commencement of testing.

The test was designed such that the samples would be subjected to 20 cycles of freezing and thawing, as instructed by the client. The freezing portion of each cycle consisted of storing the samples in a freezer at -18°C for a minimum of 16 hours. This was followed by a minimum of 8 hours of thawing in an oven at 32°C. The condition of each sample was evaluated every five cycles through macroscopic and microscopic examination using a binocular microscope with magnifications up to 50x, enabling observations of pre-existing cracks and newly developed deterioration. Inspections included photographs and descriptive logs.

Prior to and at the end of the test, each sample was weighed and the percent loss by mass calculated for the individual specimens.

A separate core was selected from the same core box and tested for Uniaxial Compressive Strength per ASTM D7012; the results of this testing is provide under separate cover.

Quantitative Analysis:

Percent Loss

Sample ID	Specimen ID	Original Mass (g)	Final Mass (g)	Measured Loss (%)
CH16-102-MW005_RKg	**#1**	434.2	433.0	**0.28%**
	#2	519.9	519.2	**0.13%**
	#3	729.1	728.0	**0.15%**
	#4	766.4	764.9	**0.20%**
	#5	487.9	487.2	**0.14%**
			Final Average Loss (%)	**0.18%**

Qualitative Analysis:

Summary of Initial Condition

Petrographic examination was not undertaken on any of the specimens; thus, interpretations of mineralogy, texture, alteration and weathering are based on cursory, macroscopic inspection. Thin section examination and chemical analyses, such as whole-rock analysis by X-Ray Fluorescence, were not conducted. Generally, the specimens consisted of 'altered granite' with some specimens exhibiting gneissic texture; however, each rock specimen was cut from a core with slight to significant variations in compositional, textural and structural qualities including those listed below.

Composition
- Proportions of quartz, feldspar and mica minerals (biotite, muscovite)
- Distribution of mica minerals; localized, banded, patches
- Amount and distribution of metallic minerals
- Presence/absence of quartz veins
- Distribution of oxidation product and nature of occurrence (light/moderate/heavy staining to concentrated coating on fracture surfaces and veins
- Presence/absence of soft, absorptive alteration/weather product along some pre-existing fractures

Textural
- Degree of gneissic texture; well-developed bands to slight parallel alignment of mineral grains
- Fine to medium mineral grain size; distribution of fine-grained bands and medium-grained bands
- Presence of veins, blebs and alteration zones

Structure
- Presence/absence of fractures
- Fracture width
- Number of fractures and fracture spacing
- Orientation and pattern of fractures
- Presence of weathering and oxidation around fractures

Observations of Individual Specimens

Specimen ID	Observations		
	Initial @ 0 cycles	**Interim @ 10 cycles**	**Final @ 20 cycles**
#1	- The specimen was rectangular in shape with approximate dimensions of 61 mm wide by 125 mm long - The specimen consisted of altered granite with gneissic texture; mineral constituents included feldspar, quartz and biotite with other additional components - Medium orange oxidation stains are significant across the specimen, occurring in concentrated patches, zones and bands. - Fracture (A) was heavily oxidized, weathered and altered with an open crack up to 2 mm; fracture is very absorptive and material is easily dislodged by scraping and plucking - Fracture (B) cuts across the specimen at an angle of about 10 degrees from the long edge of the specimen; Fracture (B) is braided, irregularly shaped, moderately to heavily oxidized and moderately absorptive - Other small fractures throughout are typically associated with veins and/or orientation of gneissic texture.	- Fragments have dislodged in Fracture (A). Material along the fracture path is medium hard to soft and may include some clay alteration minerals (present prior to testing but only now apparent at this interim inspection) - Fractures (A) and (B) have widened slightly - Some of the banding parallel fractures have become more absorptive indicating potential widening.	- Mass was lost due to fragments dislodging along pre-existing fractures that were weathered, altered, oxidized and weak. - Several pre-existing fractures widened slightly.

#2	- The specimen was rectangular in shape with approximate dimensions of 61 mm wide by 158 mm long - The specimen consisted of altered granite with gneissic texture; mineral constituents included feldspar, quartz and biotite with other additional components - Medium orange oxidation stains are significant across the specimen, occurring in concentrated patches, zones and bands. - Fracture (A) is defined by a pronounced iron oxide stain. It can be seen on the test surface as well as the backside of the specimen. It is tightly closed and slightly to moderately absorptive; the fracture is undulating and braided. - Fracture (B) cuts a small corner of the test specimen and is coated in white alteration/weathering product with very slight iron oxidation. The fracture is tightly closed and planar. - Other small and very thin fractures throughout are typically associated with the orientation of gneissic texture and evident by iron oxide staining.	- Fracture (A), previously infilled with oxidation and alteration products, has widened slightly to a shallow depth into the test surface due to poorly adhered infill dislodging from the fracture - Fracture (B) is more apparent and has increased absorption; widening may have occurred - Overall, this specimen did not exhibit any significant formation of fractures or loss of material	- No significant material loss or propagation/formation of fractures was observed
#3	- The specimen was rectangular in shape with approximate dimensions of 61 mm wide by 170 mm long - The sample consisted of altered granite with gneissic texture; mineral constituents included feldspar, quartz and biotite with other additional components - Dark orange oxidation stains are significant across the specimen, occurring in concentrated patches, zones and bands. One portion of the specimen is completely free of oxidation - The test specimen is cross-cut by an irregular shaped fracture (A) that roughly follows an undulating gneissic texture; possible clay alteration along fracture path - A network of irregular shaped fractures associated with gneissic texture are absorptive; they are poorly interconnected and shallow - One major fracture exists underneath the test surface, diving at a shallow angle (~15 degrees). The fracture exhibits itself on the backside of the specimen but no on the test surface.	- Small fragments observed in specimen container, believed to have dislodged from a weathered edge of the specimen - Overall, this specimen did not exhibit any significant formation of fractures or loss of material	- No significant material loss or propagation/formation of fractures was observed

#4	- The specimen was rectangular in shape with approximate dimensions of 61 mm wide by 239 mm long - The sample consisted of altered granite with gneissic texture; mineral constituents included feldspar, quartz and biotite with other additional components - Medium to dark orange oxidation stains are significant across the specimen, occurring in concentrated patches, zones and bands. - A thin fracture (A) is parallel to the long-axis of the specimen and offset from the edge by ~17 mm. The fracture is thin and tightly closed; oxidation is not prevalent but some weathering and alteration of the fracture surface is observed. - Fracture (B) is a short fracture that is slightly absorptive and appears to be associated with gneissic texture and parallel alignment of mineral grains including biotite. - Fracture (C) is associated with a portion of a vein where some altered mineral has pitted and left a void.	- Small fragments observed in the specimen container, believed to have dislodged from a weathered edge of the specimen - Pre-existing fracture (C) has opened slightly, exhibiting increased absorption - Overall, this specimen did not exhibit any significant formation of fractures or loss of material	- No significant material loss or propagation/formation of fractures was observed
#5	- The specimen was rectangular in shape with approximate dimensions of 61 mm wide by 235 mm long - The sample consisted of altered granite with gneissic texture; mineral constituents included feldspar, quartz and biotite with other additional components - Medium orange oxidation stains are significant across the specimen, occurring in concentrated patches, zones and bands. - A thin fracture (A) is parallel to the long-axis of the specimen and roughly in the center; it is associated with a distinct vein that is infilled with quartz and other alteration minerals. The fracture is thin and tightly closed; oxidation is not prevalent but some weathering and alteration of the fracture surface is observed. The path of the fracture is somewhat braided and stepped. - Fracture (B) is associated with gneissic texture; it is slightly absorptive and discontinuous, extending roughly 13 mm from the specimen edge.	- Small fragments observed in the specimen container, believed to have dislodged from a weathered edge of the specimen - Overall, this specimen did not exhibit significant formation of fractures or loss of material	- No significant material loss or propagation/formation of fractures was observed

Summary of Deterioration

The majority of specimens did not undergo significant material loss. For those that exhibited any loss of material, the loss consisted only of small flakes and fragments that were thin and weakly attached to pre-existing fractures. Most pre-existing fractures did not undergo significant change from the start to the end of the test; slight widening and increased absorption was observed in a few cases. The exception was specimen #1 where a significantly weathered and altered pre-existing fracture that exhibited clay alteration was observed to have both material loss and widening of the fracture. The following observations regarding sample conditions were made:

Loss of Material

- Dislodgement of thin portions of the specimen that were intersected by pre-existing fractures and were moderately to poorly adhered prior to testing
- Pitting and dislodgement of material occurred along pre-existing fracture paths where fractures were: i) braided and/or intersecting with other fractures, ii) open and with shallow angle relative to specimen surface, iii) significantly weathered, altered and oxidized
- Specimens with well-developed pre-existing fractures and significant weathering and oxidation experienced slightly higher amounts of material loss

Formation and/or propagation of fractures

- Several pre-existing fractures widened slightly. Typically, the pre-existing fractures that widened had the following properties prior to testing: i) distinct and continuous fracture plane, and/or ii) fracture surfaces that were weathered and coated with iron oxidation product and other alteration minerals.
- The strength of pre-existing fractures prior to testing was moderately strong, i.e., it would be expected to break from a firm hammer blow but may resist an impact of moderate force. Following completion of the test, the fractures that widened and elongated did not noticeably decrease in strength and would likely still resist moderate impact.

Overall Summary

The data given in this report pertain to the samples provided, and may not be applicable to material from other locations or trial periods.

The observations for material loss and fracture formation, as well as the visual and measured estimate of mass loss were comparable between the 10 cycle interim inspection and the 20 cycle final inspection. This indicates that the specimens did not undergo significant additional deterioration after 20 cycles, compared to 10 cycles.

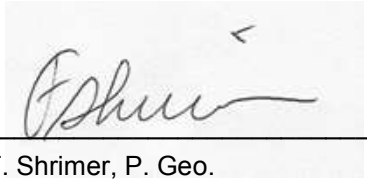
The specimens had an average measured loss of 0.18%. The samples were generally similar to each other with regard to their resistance to the stresses generated by freezing and thawing action; Specimen #1 contained one exception: a weathered and altered fracture that was not observed in the other specimens. Material loss appeared to be caused by dislodging of material that was only moderately well adhered to pre-existing fracture surfaces prior to testing and generally consisted of the removal of small flakes, fragments and mineral grains. Specimens with well-developed pre-existing fractures and more significant weathering, alteration and oxidation typically experienced higher loss.

Formation of new fractures, widening, and lengthening of pre-existing fractures was observed in very minor amounts in the tested rock specimens and was typically associated with fractures which were open, weathered, altered, oxidized and coated. Some of the pre-existing fractures were interpreted to be of moderate strength and could be susceptible to fracturing if impacted with moderate force.

Prepared, tested and reported by:



I. Chung



F. Shrimer, P. Geo.

Reviewed by:



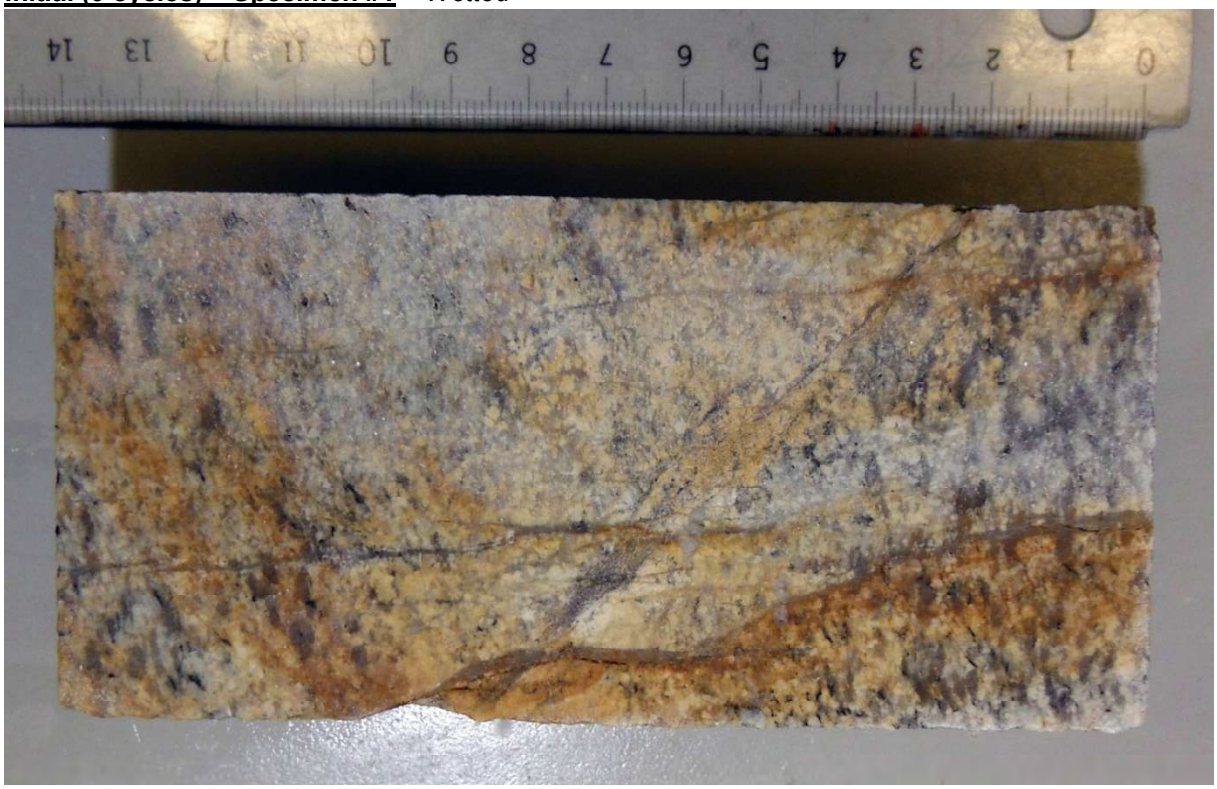
B. Hudson, P. Geo.

PHOTOGRAPHS

Initial (0 cycles) – Specimen #1 – *Dry*



Initial (0 cycles) – Specimen #1 – *Wetted*



Initial (0 cycles) – Specimen #1 – *Partially dried back*



Interim (10 cycles) – Specimen #1 – *Partially dried back*



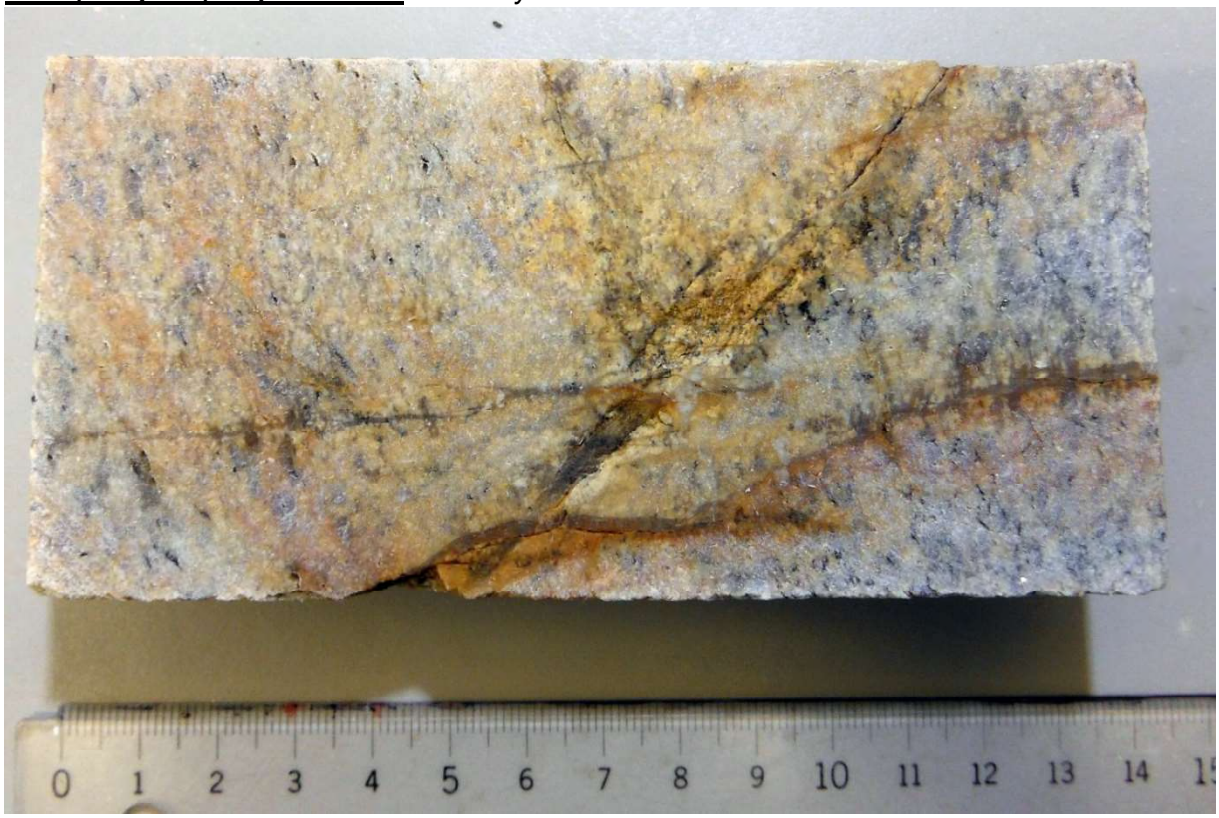
Final (20 cycles) – Specimen #1 – *Dry*



Final (20 cycles) – Specimen #1 – *Wetted*



Final (20 cycles) – Specimen #1 – *Partially dried back*



Initial (0 Cycles) – Specimen #2 – *Dry*



Initial (0 Cycles) – Specimen #2 – *Wetted*



Initial (0 Cycles) – Specimen #2 – *Partially Dried Back*



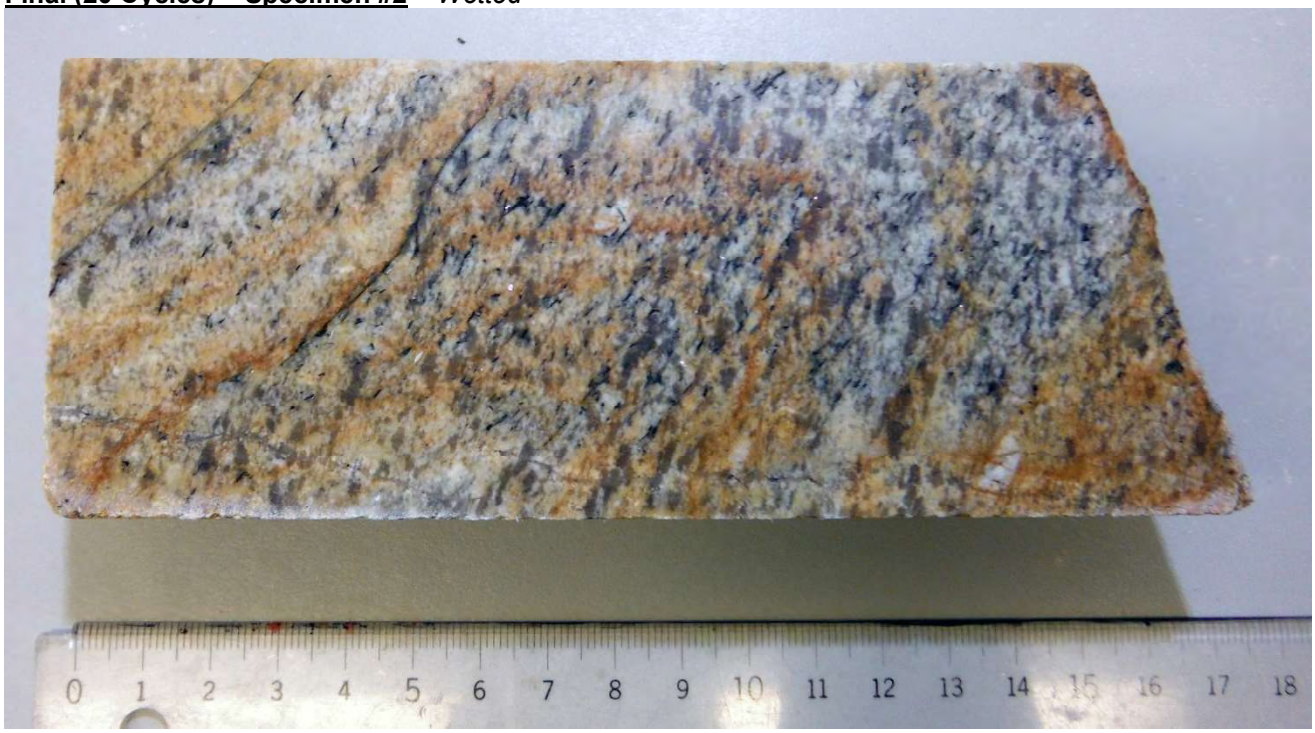
Interim (10 Cycles) – Specimen #2 – *Partially Dried Back*



Final (20 Cycles) – Specimen #2 – *Dry*



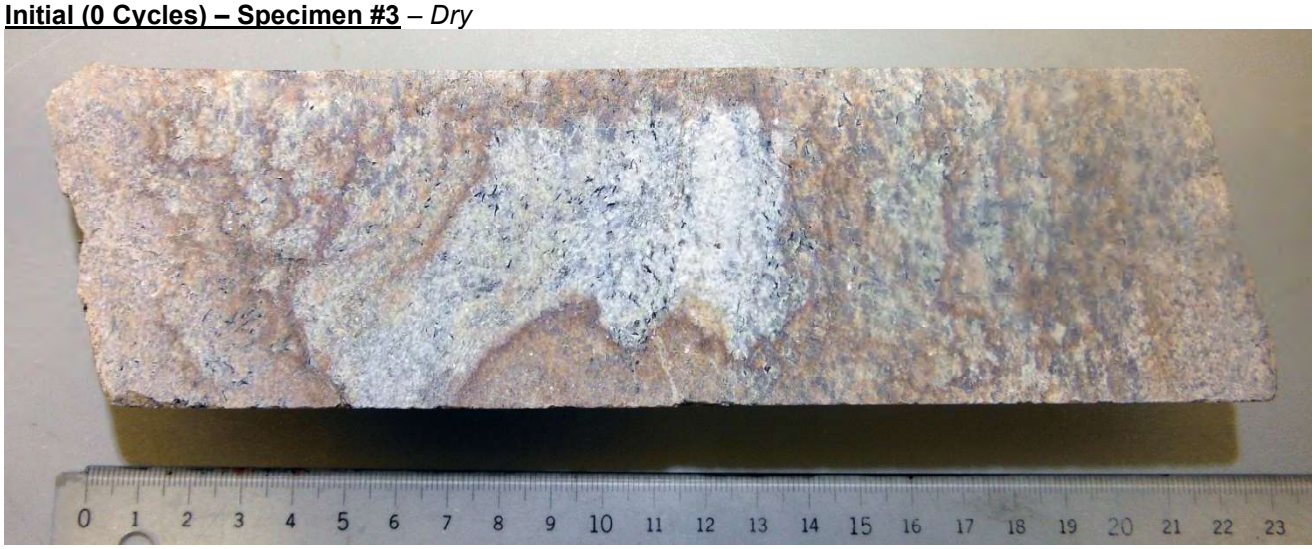
Final (20 Cycles) – Specimen #2 – *Wetted*



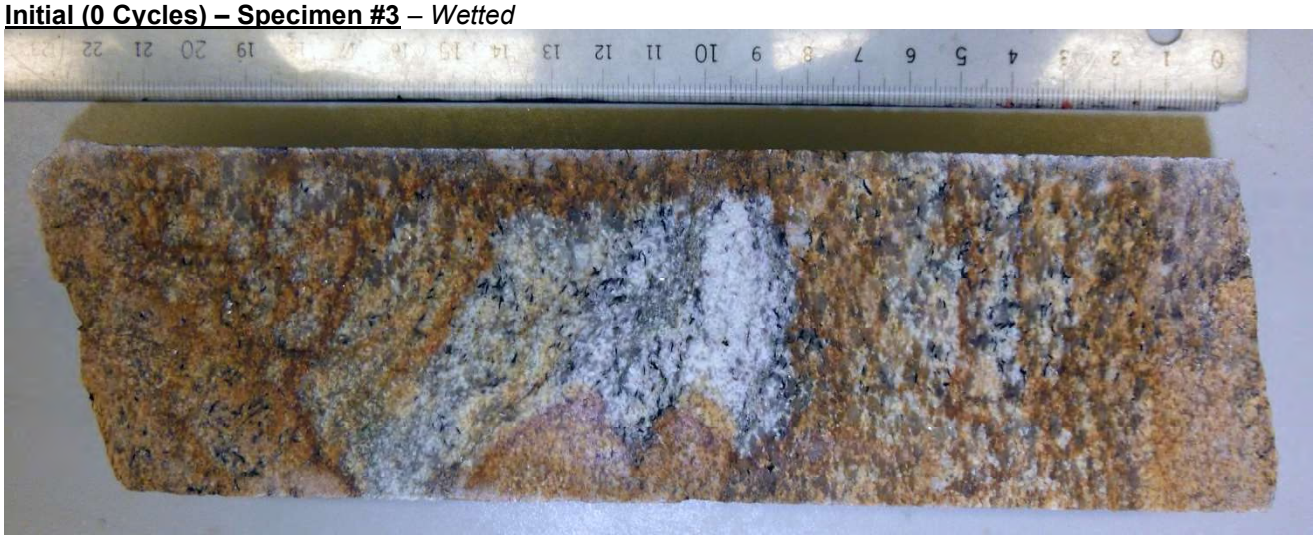
Final (20 Cycles) – Specimen #2 – *Partially Dried Back*



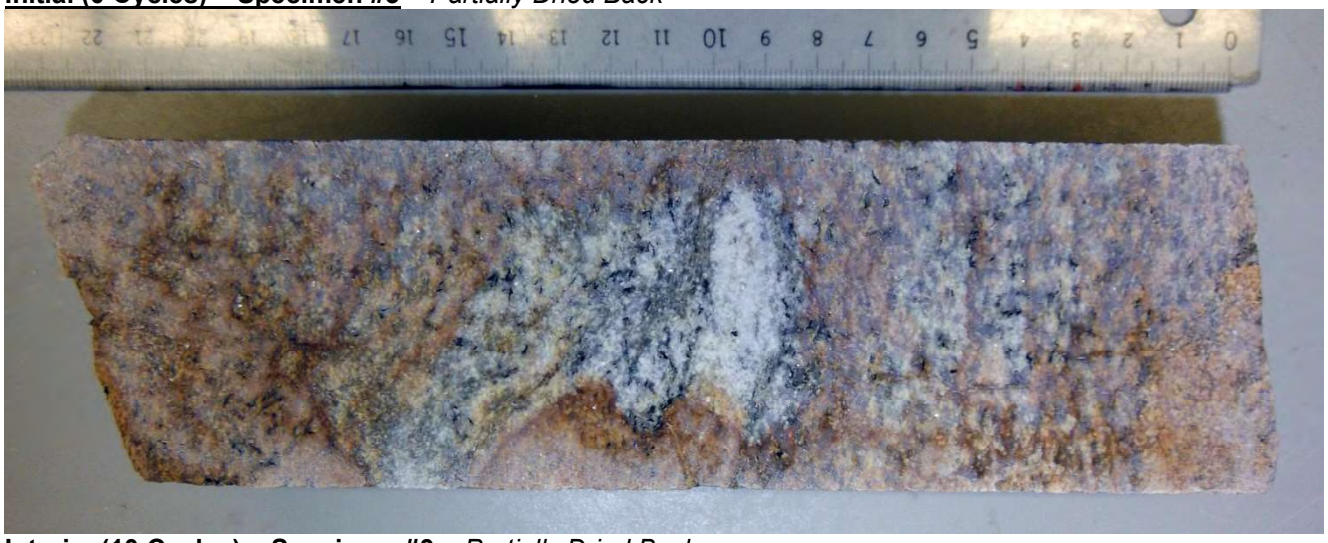
Initial (0 Cycles) – Specimen #3 – *Dry*



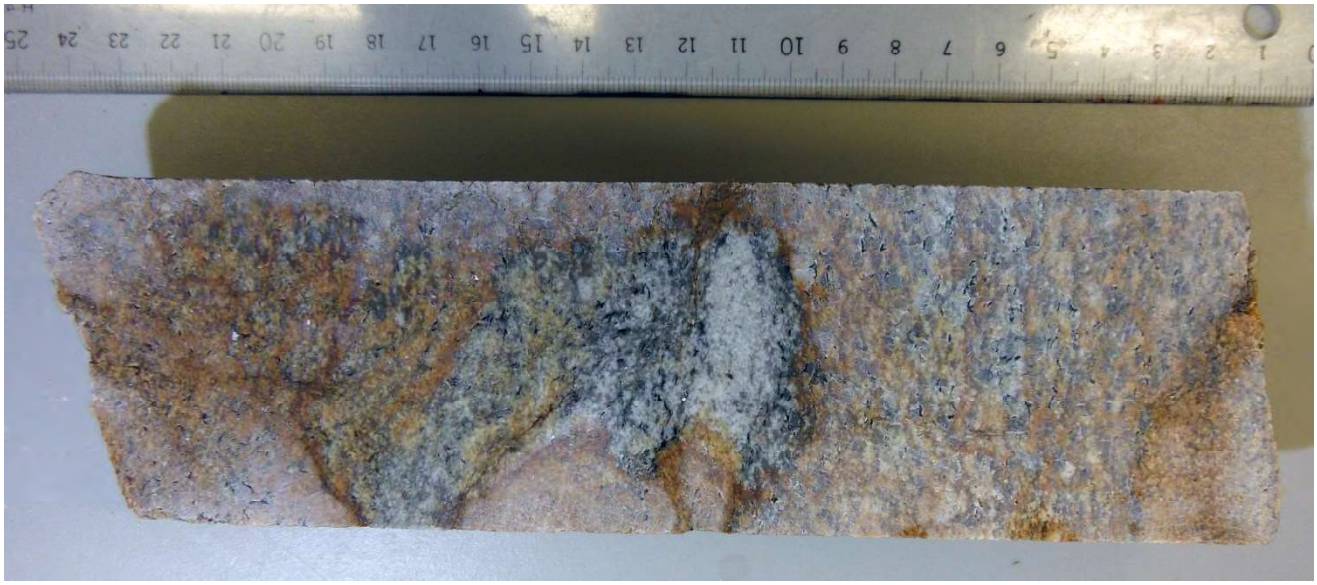
Initial (0 Cycles) – Specimen #3 – *Wetted*



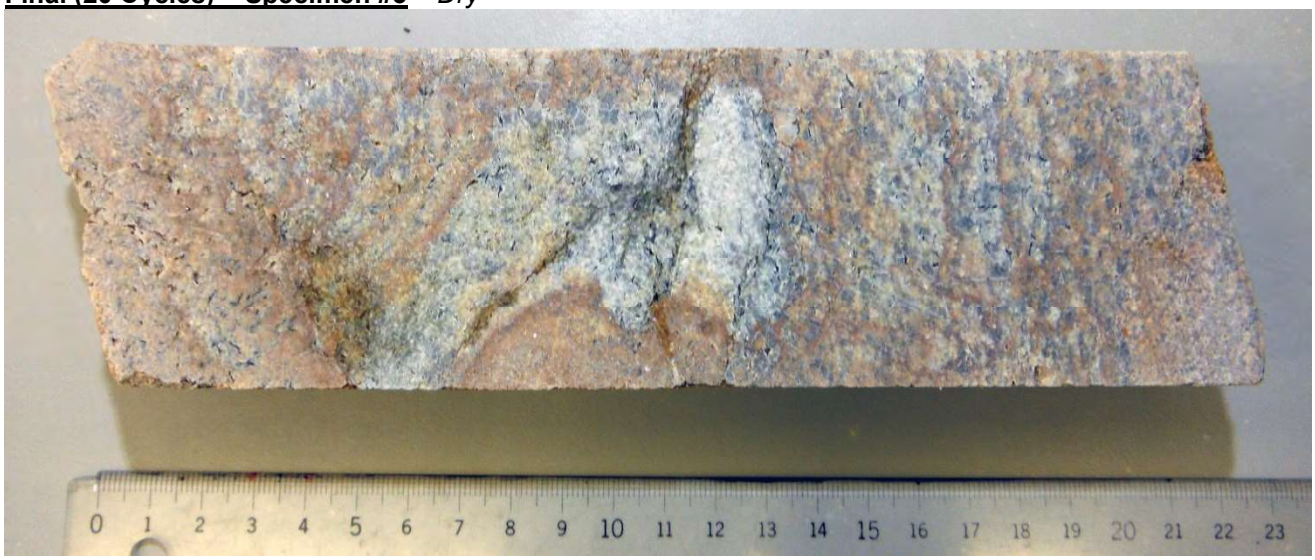
Initial (0 Cycles) – Specimen #3 – *Partially Dried Back*



Interim (10 Cycles) – Specimen #3 – *Partially Dried Back*



Final (20 Cycles) – Specimen #3 – *Dry*



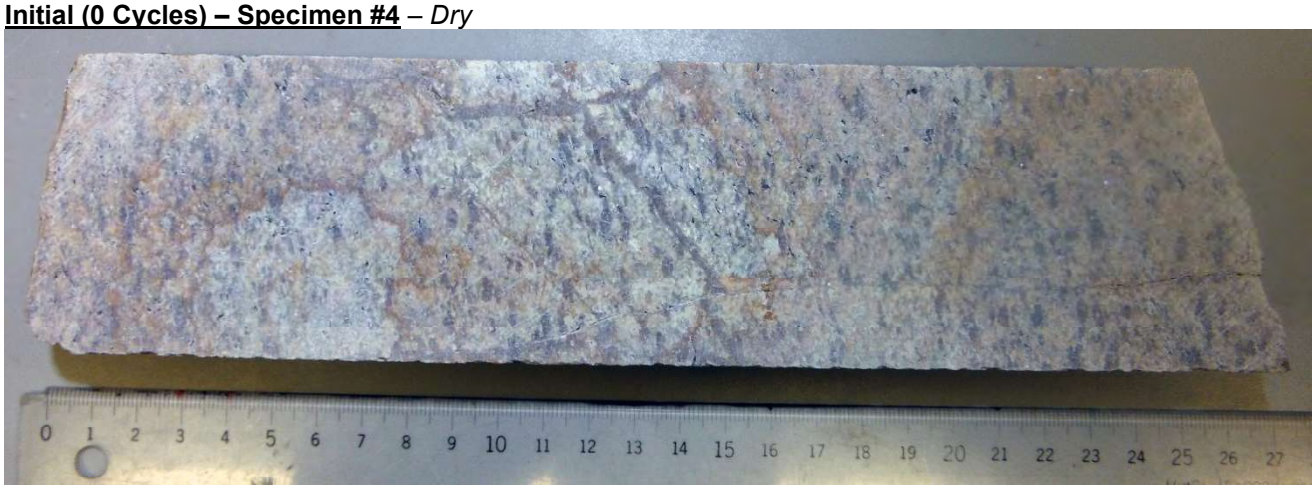
Final (20 Cycles) – Specimen #3 – *Wetted*



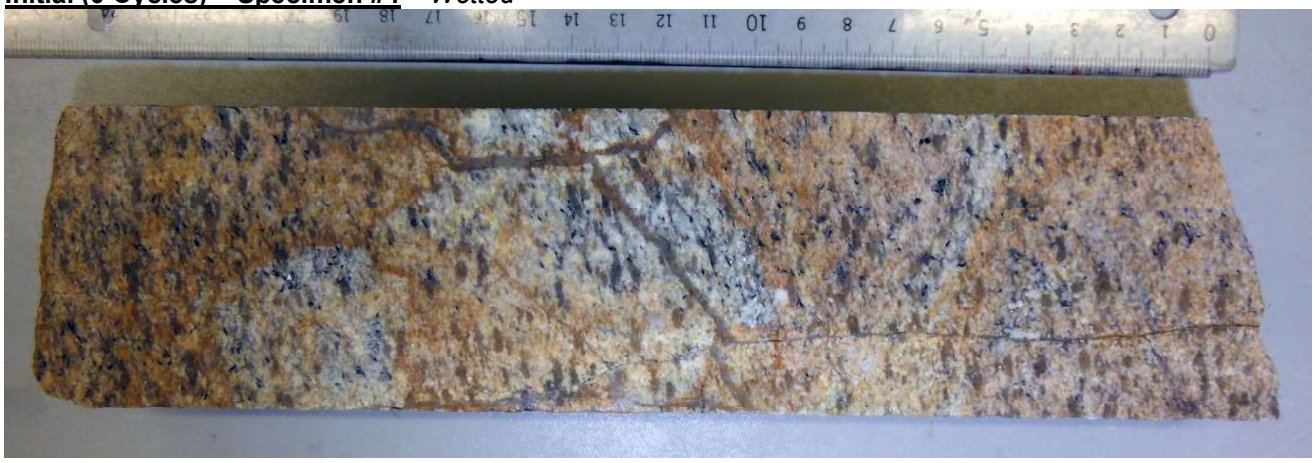
Final (20 Cycles) – Specimen #3 – *Partially Dried Back*



Initial (0 Cycles) – Specimen #4 – *Dry*



Initial (0 Cycles) – Specimen #4 – *Wetted*



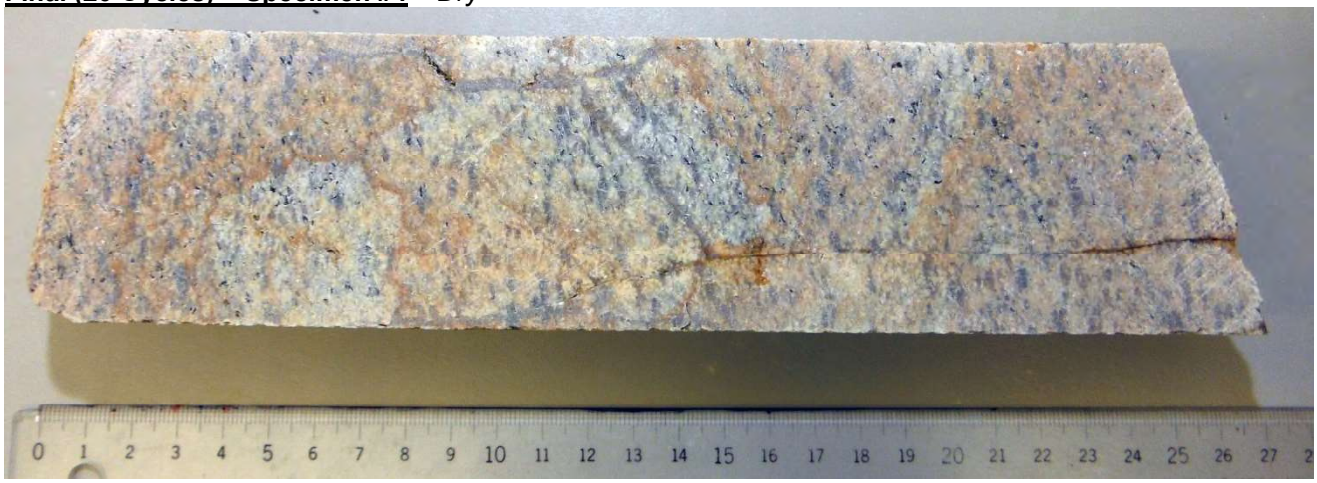
Initial (0 Cycles) – Specimen #4 – *Partially Dried Back*



Interim (10 Cycles) – Specimen #4 – *Partially Dried Back*



Final (20 Cycles) – Specimen #4 – *Dry*



Final (20 Cycles) – Specimen #4 – *Wetted*



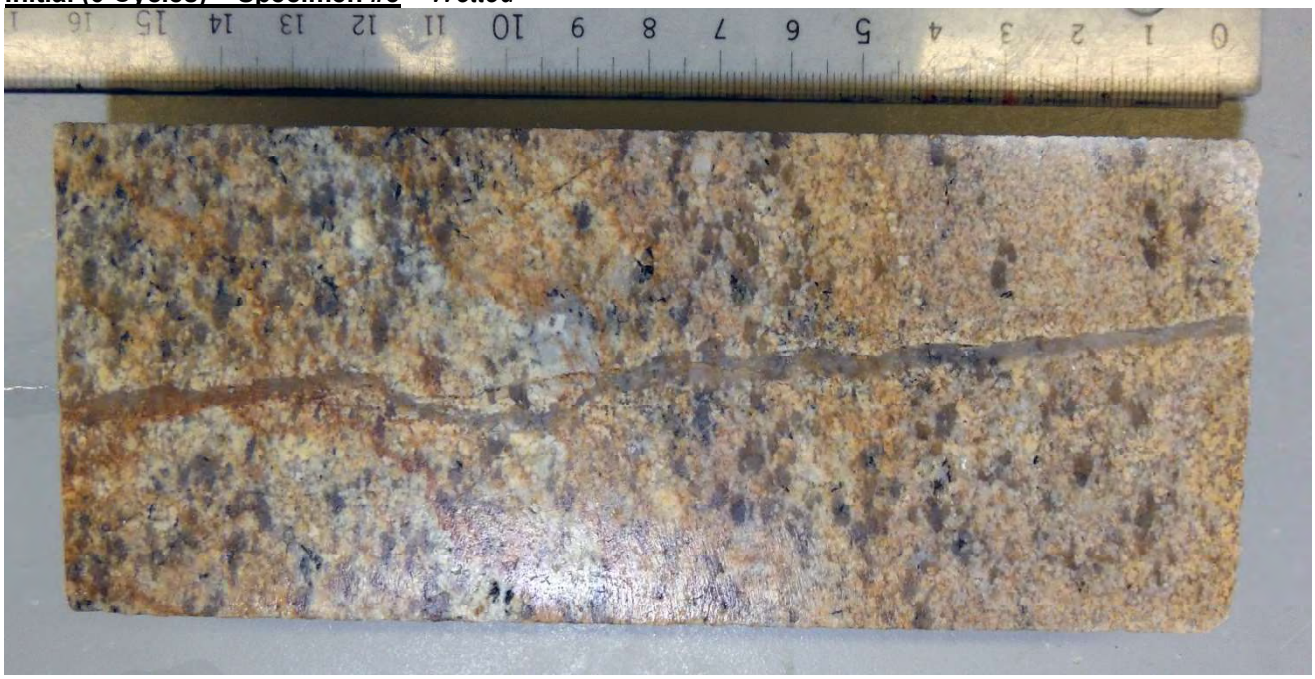
Final (20 Cycles) – Specimen #4 – *Partially Dried Back*



Initial (0 Cycles) – Specimen #5 – *Dry*



Initial (0 Cycles) – Specimen #5 – *Wetted*



Initial (0 Cycles) – Specimen #5 – *Partially Dried Back*



Interim (10 Cycles) – Specimen #5 – *Partially Dried Back*



Final (20 Cycles) – Specimen #5 – *Dry*



Final (20 Cycles) – Specimen #5 – *Wetted*



Final (20 Cycles) – Specimen #5 – *Partially Dried Back*



-End of Photographs-

Attachment 6
Data Quality Evaluation Report

ATTACHMENT 6

2016 Faro Creek Diversion Realignment Investigation Data Quality Evaluation Report

Aggregate and soil samples were collected and analyzed during the 2016 Faro Creek Diversion Realignment Investigation in support of the Faro Mine Remediation Project (FMRP). All analytical data were evaluated as described in the *Quality Assurance Project Plan, Faro Mine Remediation Project* (QAPP) (CH2M, September 2015). This data quality evaluation (DQE) report summarizes the results of the quality assurance and quality control activities prescribed in the QAPP and provides a data usability assessment. The QAPP identifies the method-specific quality control (QC) requirements for each analytical parameter and matrix and defines a plan to test that the correct sampling, analytical, and data reduction procedures are followed by using audits and data validation.

This report is a general data quality assessment designed to summarize data issues.

Analytical Data

Between March 3 and 17, 2016, one native environmental aggregate sample, fourteen native environmental soil samples and one soil field duplicate (FD) were collected. Samples were analyzed by ALS Canada, Ltd. (ALS), in Burnaby, British Columbia. The laboratory placed the samples into three sample delivery groups (SDG). Summaries of the samples collected are presented in Tables 1 and 2. A total of eight methods were used to analyze the environmental samples. The samples were collected and couriered to ALS in Whitehorse and shipped by overnight carrier to ALS in Burnaby for analysis. Selected samples were analyzed for one or more of the following analytes/methods:

- Moisture by Method ASTM 2216
- Material finer than 75-micron metres (µm) by Method ASTM D1140
- Particle size with hydrometer by Method ASTM D422-63
- Atterberg Limits by Method ASTM D4318
- Paste pH and pH(1:2 soil: water) by Method CSSS/APHA 4500H
- Mercury by Method E1631E
- Sulfur by Method ISO 15178:2000
- Metals by Method SW6010B

The SDGs were evaluated by CH2M HILL Canada Limited (CH2M) chemists for data quality. Analytical performance was initially assessed on an SDG basis or an analytical batch basis. The association of laboratory QC samples and environmental samples from the same analytical batch is determined by the laboratory lot control number. Data were assessed using Level II validation as follows:

- Review data set narrative to identify issues that the laboratory reported in the data deliverable.
- Check sample integrity (e.g., sample collection, preservation, and holding times).
- Evaluate basic QC measurements used to assess the accuracy, precision, and representativeness of data, including QC blanks, laboratory control samples, matrix spike samples, surrogate recovery (when applicable), and field or laboratory duplicate results.
- Review sample results, target compound lists, and detection limits to verify that project analytical requirements are met.

- Initiate corrective actions, as necessary, based on the data review findings.
- Verify that hardcopy results match electronic deliverable results.
- Qualify data by using appropriate qualifier flags, as necessary, to indicate data usability limitations.

Field samples were also reviewed to ascertain field compliance and data quality issues. This included a review of the FDs and equipment blanks (EBs).

Data flags were assigned in accordance with the QC acceptance limits defined in the QAPP. The data validation flags for the SDG are summarized in each data quality validation report. The flags, and the reason for each flag, are recorded in the electronic validation database. Multiple flags can be applied to specific sample method/matrix/analyte combinations, but there is only one final flag. The final flag is applied on the basis of the flags entered into the database and is the most conservative of the applied validation flags. The final flag also includes matrix and blank sample impacts.

Data flags can be separated into two categories as follows, to be used in estimating both contractor and analytical completeness:

1. Flags applied because of laboratory deviations from requirements in the QAPP
2. Flags applied because of the nature of the sample matrix or method limitations

The database tracks the type of protocol violation and the contractual and analytical completeness during data validation.

The data flags are defined in the QAPP as follows:

J	=	Analyte was present but the reported value may not be accurate or precise.
UJ	=	Analyte was not detected above the detection limit objective. However, the reported detection limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	=	Result has been rejected for use.
U	=	Analyte was analyzed for but not detected at the specified detection limit.
None	=	A database flag with no QC implications. A flag is not applied. This is a placeholder for calculating QC criteria issues that do not require flagging.
Exclude	=	A database flag with no QC implications. When multiple data points have been reported, such as dilutions or re-extractions, the data that best match QAPP QC requirements are presented to the data users and the remainders are marked with this flag.
=	=	A database flag with no QC implications. A place holder for the DQE reporting purposes noting that the reported result is a detected concentration greater than the RL.

Findings

The overall summaries of the data validation findings are contained in Tables 1 through 9 and summarized in the method sections that follow:

- **Table 1**: Sample Summary by Chain of Custody – Data Summary. Presents the sample identifiers, sampling dates, and SDG sorted by chain-of-custody (COC) number.
- **Table 2**: Sample Chronology – Data Summary. Presents the sample identifiers, methods, sampling dates, received dates, extraction dates, and analysis dates sorted by SDG number.

- **Table 3**: Overall Flagging Summary. Presents the number of occurrences for each data validation reason by method.
- **Table 4:** Holding Time Exceedances – Qualified Data. Presents the data qualified because of holding time criteria exceedances.
- **Table 5:** Blank Contamination – Qualified Data. Presents the data qualified because of blank contamination.
- **Table 6:** Laboratory Duplicate Precision – Qualified Data. Presents the results that are qualified because of laboratory duplicate precision exceedances.
- **Table 7**: Site Completeness by Analyte – Qualified Data. Presents the percent completeness by method, analyte, and matrix.

Overall Flagging Summary

The frequency of field and laboratory QC samples and the associated control criteria are specified in the QAPP. The control criteria were used to evaluate laboratory data. In the following method-specific discussions, only the criteria exceedances that affect data qualification are discussed.

Method ASTM 2216 (Moisture)

Holding Time

Table 4 lists the specific field samples and their associated holding time criteria exceedances. The 14-day holding time for soil samples was exceeded by 9 days for 2 sample results. The associated detected concentrations were flagged "J."

Method ASTM D1140 (Material finer than 75-µm)

Laboratory Duplicate

Table 6 lists the specific field sample and the associated laboratory duplicate relative percent difference (RPD) criteria exceedance. There was a criteria exceedance in one sample. The associated detected concentration was flagged "J."

Method SW6010B (Metals)

Equipment Blanks

Table 5 lists the specific field samples and their associated EB criteria exceedances. Calcium, magnesium, sodium, and strontium were detected in EBs greater than the reporting limits. Twenty associated soil sample results were less than 5 times the blank concentration and were flagged "U" as non-detects.

Overall Assessment

Completeness is calculated and reported for each method, matrix, and analyte combination as outlined in the QAPP. The number of valid (i.e., not qualified with an "R" flag) results divided by the number of possible individual analyte results, expressed as a percentage, determines the completeness of the data set. A summary of the completeness percentages is provided in Table 7.

The QAPP completeness goal is 90 percent, and the overall data completeness is 100 percent.

Of 295 normal and FD data points, three detected results (1.0 percent) were qualified as estimated concentrations because of QC exceedances. Blank contamination resulted in 20 detected results being flagged as non-detects (approximately 6.8 percent).

Evaluation of 100 percent of the chemical data was performed by using QAPP guidelines for this DQE.

Data Management

FMRP sampling activity logs and laboratory analytical data are maintained in a project database or in project files, where appropriate. Data were collected and stored in a manner consistent with the requirements of the QAPP.

All raw data will be maintained on file in the laboratory and will be available upon request. Complete documentation of sample preparation and analysis and associated QC information will be maintained in a manner that allows easy retrieval if that information is needed. The following minimum documentation was kept for this project:

- Original work order, COC forms, and other pertinent documents received with the samples
- Records of communications between the laboratory, field personnel, and the client
- Laboratory data reports
- Laboratory logbooks and all raw sample preparation and analytical data
- Electronic data and all pertinent standard operating procedures

The minimum field records retained for this project included correspondence, COC forms, field notes, field equipment performance records, maintenance logs, field procedures, corrective action reports, field personnel files, and project-related reports.

The receipt of electronic and portable document format (PDF) laboratory data were logged into the sample tracking program to determine completeness and contractor turnaround time compliance.

CH2M chemists uploaded electronic data into the validation program. All data validation was performed by a semi-automated data validation program that uses laboratory PDF report and electronic data simultaneously. All validation flags and discoveries were entered into the validation database and linked directly to each individual data point.

All DQE reports were generated from the validation database. Final validation flags and data points were uploaded to the FMRP EQuIS site.

The data management system is designed to maintain the usability and integrity of the data through a series of procedures and QC checks that began at the field site and carried through to the generation of data for the user. These data include chemical data and field operation information. Both the chemical data and the field operations information were handled in accordance with the guidelines established in the QAPP and the *Faro Mine Data Management Plan* (CH2M, December 2015g).

The laboratory PDF reports are stored in the project files and project local area network hard drive areas in the CH2M office in Redding, California. The original field data forms are stored on the FMRP SharePoint site. Laboratories are required to archive the analytical data as outlined in the QAPP.

Works Cited

CH2M HILL Canada Limited (CH2M). September 2015. *Quality Assurance Project Plan.* Prepared for Government of Yukon. and Government of Canada as represented by Aboriginal Affairs and Northern Development Canada. September 10.

CH2M HILL Canada Limited (CH2M). December 2015g. *Faro Mine Complex Data Management Plan.* Prepared for Government of Yukon and Government of Canada as represented by Aboriginal Affairs and Northern Development Canada. December 1.

Tables

TABLE 1

Sample Summary by Chain of Custody – Data Summary

CoC Number	Sample Date	Matrix	Sample ID / QAQC Type	SDG	Laboratory
ALS08031601					
	05-Mar-16	SOIL	CH16-102-MW003_SOA / N	L1742756	ALS
			CH16-102-MW003_SOB / N	L1742756	ALS
			CH16-102-MW003_SOC / N	L1742756	ALS
	03-Mar-16		CH16-102-MW006_SOE / N	L1742756	ALS
			CH16-102-MW006_SOI / N	L1742756	ALS
	04-Mar-16		CH16-102-MW006_SOQ / N	L1742756	ALS
			CH16-102-MW006_SOQMS / MS	L1742756	ALS
	05-Mar-16		CH16-102-MW903_SOC / FD	L1742756	ALS
ALS15031601					
	12-Mar-16	WATER	E_102_16_001 / EB	L1745580	ALS
			E_102_16_001MS / MS	L1745580	ALS
ALS999					
	06-Mar-16	SOIL	CH16-102-MW004_SOB / N	L1746856	ALS
			CH16-102-MW004_SOC / N	L1746856	ALS
	11-Mar-16		CH16-102-MW005_SOA / N	L1746856	ALS
			CH16-102-MW005_SOB / N	L1746856	ALS
			CH16-102-MW005_SOD / N	L1746856	ALS
	12-Mar-16		CH16-102-MW005_SOJ / N	L1746856	ALS
			CH16-102-MW005_SOJMS / MS	L1746856	ALS
	17-Mar-16		CH16-102-MW007_SOA / N	L1746856	ALS
			CH16-102-MW007_SOB / N	L1746856	ALS
			CH16-102-MW007_SOC / N	L1746856	ALS

QAQC Type

N = normal environmental sample
FD = field duplicate
MS = matrix spike
EB = equipment blank

TABLE 2

Sample Chronology – Data Summary

Laboratory	SDG	Sample ID	Method	Sample Date	Receive Date	Extract Date	Analysis Date
ALS	L1742756	CH16-102-MW003_SOA	ASTM 2216	3/5/2016	3/9/2016		3/11/2016
		CH16-102-MW003_SOA	ASTM D422-63	3/5/2016	3/9/2016	3/17/2016	3/17/2016
		CH16-102-MW003_SOB	ASTM 2216	3/5/2016	3/9/2016		3/11/2016
		CH16-102-MW003_SOB	ASTM D422-63	3/5/2016	3/9/2016	3/17/2016	3/17/2016
		CH16-102-MW003_SOB	ASTM D4318	3/5/2016	3/9/2016	3/21/2016	3/21/2016
		CH16-102-MW003_SOC	CSSS/APHA 4500H	3/5/2016	3/9/2016		3/14/2016
		CH16-102-MW003_SOC	CSSS/APHA 4500H	3/5/2016	3/9/2016		3/15/2016
		CH16-102-MW003_SOC	E1631E	3/5/2016	3/9/2016	3/11/2016	3/17/2016
		CH16-102-MW003_SOC	ISO 15178:2000	3/5/2016	3/9/2016	3/17/2016	3/17/2016
		CH16-102-MW003_SOC	SW6010B	3/5/2016	3/9/2016	3/11/2016	3/17/2016
		CH16-102-MW006_SOE	ASTM 2216	3/3/2016	3/9/2016		3/11/2016
		CH16-102-MW006_SOE	ASTM D422-63	3/3/2016	3/9/2016	3/17/2016	3/17/2016
		CH16-102-MW006_SOE	ASTM D4318	3/3/2016	3/9/2016	3/21/2016	3/21/2016
		CH16-102-MW006_SOI	ASTM 2216	3/3/2016	3/9/2016		3/11/2016
		CH16-102-MW006_SOI	ASTM D422-63	3/3/2016	3/9/2016	3/17/2016	3/17/2016
		CH16-102-MW006_SOI	ASTM D4318	3/3/2016	3/9/2016	3/21/2016	3/21/2016
		CH16-102-MW006_SOQ	CSSS/APHA 4500H	3/4/2016	3/9/2016		3/14/2016
		CH16-102-MW006_SOQ	CSSS/APHA 4500H	3/4/2016	3/9/2016		3/15/2016
		CH16-102-MW006_SOQ	E1631E	3/4/2016	3/9/2016	3/11/2016	3/17/2016
		CH16-102-MW006_SOQ	ISO 15178:2000	3/4/2016	3/9/2016	3/17/2016	3/17/2016
		CH16-102-MW006_SOQ	SW6010B	3/4/2016	3/9/2016	3/11/2016	3/17/2016
		CH16-102-MW006_SOQMS	E1631E	3/4/2016	3/11/2016	3/11/2016	3/17/2016
		CH16-102-MW006_SOQMS	SW6010B	3/4/2016	3/11/2016	3/11/2016	3/17/2016
		CH16-102-MW903_SOC	CSSS/APHA 4500H	3/5/2016	3/9/2016		3/14/2016
		CH16-102-MW903_SOC	CSSS/APHA 4500H	3/5/2016	3/9/2016		3/15/2016
		CH16-102-MW903_SOC	E1631E	3/5/2016	3/9/2016	3/11/2016	3/17/2016
		CH16-102-MW903_SOC	ISO 15178:2000	3/5/2016	3/9/2016	3/17/2016	3/17/2016
		CH16-102-MW903_SOC	SW6010B	3/5/2016	3/9/2016	3/11/2016	3/17/2016
	L1745580	E_102_16_001	E1631E	3/12/2016	3/16/2016		3/20/2016
		E_102_16_001	E1631E	3/12/2016	3/16/2016	3/18/2016	3/20/2016
		E_102_16_001	SM2340B_CALC	3/12/2016	3/16/2016		3/29/2016
		E_102_16_001	SM4110B	3/12/2016	3/16/2016		3/18/2016
		E_102_16_001	SW6010B	3/12/2016	3/16/2016		3/27/2016
		E_102_16_001	SW6010B	3/12/2016	3/16/2016		3/28/2016
		E_102_16_001	SW6010B	3/12/2016	3/16/2016		3/29/2016

TABLE 2

Sample Chronology – Data Summary

Laboratory	SDG	Sample ID	Method	Sample Date	Receive Date	Extract Date	Analysis Date
ALS	L1745580	E_102_16_001	SW6010B	3/12/2016	3/16/2016	3/18/2016	3/27/2016
		E_102_16_001	SW6020A	3/12/2016	3/16/2016	3/18/2016	3/29/2016
		E_102_16_001MS	SM4110B	3/12/2016	3/18/2016		3/18/2016
		E_102_16_001MS	SW6010B	3/12/2016	3/18/2016	3/18/2016	3/27/2016
		E_102_16_001MS	SW6010B	3/12/2016	3/27/2016		3/27/2016
		E_102_16_001MS	SW6010B	3/12/2016	3/29/2016		3/29/2016
		E_102_16_001MS	SW6020A	3/12/2016	3/18/2016	3/18/2016	3/29/2016
	L1746856	CH16-102-MW004_SOB	ASTM 2216	3/6/2016	3/19/2016		3/29/2016
		CH16-102-MW004_SOC	ASTM 2216	3/6/2016	3/19/2016		3/29/2016
		CH16-102-MW004_SOC	ASTM D422-63	3/6/2016	3/19/2016	3/29/2016	3/29/2016
		CH16-102-MW004_SOC	ASTM D4318	3/6/2016	3/19/2016	3/31/2016	3/31/2016
		CH16-102-MW004_SOC	CSSS/APHA 4500H	3/6/2016	3/19/2016		3/30/2016
		CH16-102-MW004_SOC	CSSS/APHA 4500H	3/6/2016	3/19/2016		4/4/2016
		CH16-102-MW004_SOC	E1631E	3/6/2016	3/19/2016	3/29/2016	3/30/2016
		CH16-102-MW004_SOC	ISO 15178:2000	3/6/2016	3/19/2016	3/28/2016	3/28/2016
		CH16-102-MW004_SOC	SW6010B	3/6/2016	3/19/2016	3/29/2016	3/30/2016
		CH16-102-MW005_SOA	ASTM 2216	3/11/2016	3/19/2016		3/24/2016
		CH16-102-MW005_SOA	ASTM D1140	3/11/2016	3/19/2016	3/29/2016	3/30/2016
		CH16-102-MW005_SOB	ASTM D422-63	3/11/2016	3/19/2016	3/29/2016	3/29/2016
		CH16-102-MW005_SOB	ASTM D4318	3/11/2016	3/19/2016	3/31/2016	3/31/2016
		CH16-102-MW005_SOD	ASTM D422-63	3/11/2016	3/19/2016	3/29/2016	3/29/2016
		CH16-102-MW005_SOD	ASTM D4318	3/11/2016	3/19/2016	3/31/2016	3/31/2016
		CH16-102-MW005_SOJ	CSSS/APHA 4500H	3/12/2016	3/19/2016		3/30/2016
		CH16-102-MW005_SOJ	CSSS/APHA 4500H	3/12/2016	3/19/2016		4/4/2016
		CH16-102-MW005_SOJ	E1631E	3/12/2016	3/19/2016	3/29/2016	3/30/2016
		CH16-102-MW005_SOJ	ISO 15178:2000	3/12/2016	3/19/2016	3/28/2016	3/28/2016
		CH16-102-MW005_SOJ	SW6010B	3/12/2016	3/19/2016	3/29/2016	3/30/2016
		CH16-102-MW005_SOJMS	E1631E	3/12/2016	3/29/2016	3/29/2016	3/30/2016
		CH16-102-MW005_SOJMS	SW6010B	3/12/2016	3/29/2016	3/29/2016	4/1/2016
		CH16-102-MW007_SOA	ASTM 2216	3/17/2016	3/19/2016		3/29/2016
		CH16-102-MW007_SOA	ASTM D422-63	3/17/2016	3/19/2016	3/29/2016	3/29/2016
		CH16-102-MW007_SOA	ASTM D4318	3/17/2016	3/19/2016	3/31/2016	3/31/2016
		CH16-102-MW007_SOB	CSSS/APHA 4500H	3/17/2016	3/19/2016		3/30/2016
		CH16-102-MW007_SOB	CSSS/APHA 4500H	3/17/2016	3/19/2016		4/4/2016
		CH16-102-MW007_SOB	E1631E	3/17/2016	3/19/2016	3/29/2016	3/30/2016

TABLE 2

Sample Chronology – Data Summary

Laboratory	SDG	Sample ID	Method	Sample Date	Receive Date	Extract Date	Analysis Date
ALS	L1746856	CH16-102-MW007_SOB	ISO 15178:2000	3/17/2016	3/19/2016	3/28/2016	3/28/2016
		CH16-102-MW007_SOB	SW6010B	3/17/2016	3/19/2016	3/29/2016	3/30/2016
		CH16-102-MW007_SOC	ASTM D422-63	3/17/2016	3/19/2016	3/29/2016	3/29/2016
		CH16-102-MW007_SOC	ASTM D4318	3/17/2016	3/19/2016	3/31/2016	3/31/2016

TABLE 3

Overall Flagging Summary

Method	Matrix	Validation Reason	Qualifier*	Qualifier Type	Number of Affected Analytes
ASTM 2216	SOIL				
Category = HoldingTime		Holding time exceeded			
			J	Protocol	2
ASTM D1140	SOIL				
Category = Matrix		Lab duplicate RPD criteria exceeded			
			J	Other	1
SW6010B	SOIL				
Category = Blank		Equipment blank concentration greater than the RL			
			U	Protocol	20

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = Analyte was present but the reported value may not be accurate or precise.

U = This analyte was analyzed for but not detected at the specified detection limit.

Qualifier Type:

Protocol = Flagging due to contractor/laboratory protocol violations.
Other = Flagging due to sample, matrix, or field issues not related to Quality Assurance Project Plan (QAPP) or Sampling and Analysis Plan (SAP) protocol.

TABLE 4

Holding Times – Qualified Data

Method	Matrix	Sample ID	Analyte	Holding Time	Result	Holding Time Qualifier	Final Flag*
ASTM 2216	SOIL	CH16-102-MW004_SOB					
			Moisture	23 Days	4.96 %	J	J
ASTM 2216	SOIL	CH16-102-MW004_SOC					
			Moisture	23 Days	9.3 %	J	J

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = Analyte was present but the reported value may not be accurate or precise.

Criteria:

HTa>UCL = Holding time exceeded

TABLE 5

Blank Contamination – Qualified Data

Method	Matrix	Analyte / Sample ID	Result	Blank Contamination Qualifier*	Criteria	Comments
SW6010B	SOIL	**Calcium**				
		CH16-102-MW003_SOC	1810 mg/kg	U	EB>RL	blank target = 55.2mg/L
		CH16-102-MW004_SOC	5020 mg/kg	U	EB>RL	blank target = 55.2mg/L
		CH16-102-MW005_SOJ	2430 mg/kg	U	EB>RL	blank target = 55.2mg/L
		CH16-102-MW006_SOQ	2400 mg/kg	U	EB>RL	blank target = 55.2mg/L
		CH16-102-MW007_SOB	5240 mg/kg	U	EB>RL	blank target = 55.2mg/L
		CH16-102-MW903_SOC	1760 mg/kg	U	EB>RL	blank target = 55.2mg/L
SW6010B	SOIL	**Magnesium**				
		CH16-102-MW005_SOJ	4090 mg/kg	U	EB>RL	blank target = 24.6mg/L
		CH16-102-MW006_SOQ	3180 mg/kg	U	EB>RL	blank target = 24.6mg/L
SW6010B	SOIL	**Sodium**				
		CH16-102-MW003_SOC	243 mg/kg	U	EB>RL	blank target = 16.7mg/L
		CH16-102-MW004_SOC	202 mg/kg	U	EB>RL	blank target = 16.7mg/L
		CH16-102-MW005_SOJ	145 mg/kg	U	EB>RL	blank target = 16.7mg/L
		CH16-102-MW006_SOQ	118 mg/kg	U	EB>RL	blank target = 16.7mg/L
		CH16-102-MW007_SOB	141 mg/kg	U	EB>RL	blank target = 16.7mg/L
		CH16-102-MW903_SOC	234 mg/kg	U	EB>RL	blank target = 16.7mg/L
SW6010B	SOIL	**Strontium**				
		CH16-102-MW003_SOC	6.83 mg/kg	U	EB>RL	blank target = 0.757mg/L
		CH16-102-MW004_SOC	21.1 mg/kg	U	EB>RL	blank target = 0.757mg/L
		CH16-102-MW005_SOJ	12.6 mg/kg	U	EB>RL	blank target = 0.757mg/L
		CH16-102-MW006_SOQ	13.7 mg/kg	U	EB>RL	blank target = 0.757mg/L
		CH16-102-MW007_SOB	17.8 mg/kg	U	EB>RL	blank target = 0.757mg/L
		CH16-102-MW903_SOC	6.73 mg/kg	U	EB>RL	blank target = 0.757mg/L

Blank target = concentration of field or laboratory blank.

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

U = This analyte was analyzed for but not detected at the specified detection limit.

Criteria:

EB>RL = Equipment blank concentration greater than the RL

TABLE 6

Laboratory Duplicate Precision – Qualified Data

Method	Matrix	Sample ID	Analyte	Result	Lab Dup Qualifier*	Lab Dup Criteria	Criteria
ASTM D1140	SOIL		**PSA % < 75UM**				
		CH16-102-MW005_SOA		28.2 %	J	%RPD = 5.52 vs 5	LabDupRPD

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = Analyte was present but the reported value may not be accurate or precise.

Criteria:

LabDupRPD = Lab duplicate RPD criteria exceeded

TABLE 7

Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Number of Occurrences						Completeness (%)	
			Analyses	Detects	Non-detects	Blank Flags	J-Flags	Contractor Total R-Flags	Contractor	Overall
ASTM 2216	Moisture	%	8	8			2		100	100
ASTM D1140	PSA % < 75UM	%	1	1			1		100	100
ASTM D422-63	% Clay	%	9	9					100	100
ASTM D422-63	% Coarse Sand	%	9	9					100	100
ASTM D422-63	% Fine Sand	%	9	9					100	100
ASTM D422-63	% Gravel	%	9	9					100	100
ASTM D422-63	% Medium Sand	%	9	9					100	100
ASTM D422-63	% Silt	%	9	9					100	100
ASTM D4318	MOISTURE AT LIQUID LIMIT	%	8	8					100	100
ASTM D4318	PLASTICITY INDEX	%	8	8					100	100
CSSS/APHA 4500H	Paste pH	PH	6	6					100	100
CSSS/APHA 4500H	pH (1:2 soil:water)	PH	6	6					100	100
E1631E	Mercury	MG/KG	6	5	1				100	100
ISO 15178:2000	Sulfur	MG/KG	6	6					100	100
SW6010B	Aluminum	MG/KG	6	6					100	100
SW6010B	Antimony	MG/KG	6	4	2				100	100
SW6010B	Arsenic	MG/KG	6	6					100	100
SW6010B	Barium	MG/KG	6	6					100	100
SW6010B	Beryllium	MG/KG	6	6					100	100
SW6010B	Bismuth	MG/KG	6	6					100	100
SW6010B	Boron	MG/KG	6		6				100	100
SW6010B	Cadmium	MG/KG	6	6					100	100
SW6010B	Calcium	MG/KG	6		6				100	100
SW6010B	Chromium	MG/KG	6	6					100	100
SW6010B	Cobalt	MG/KG	6	6					100	100
SW6010B	Copper	MG/KG	6	6					100	100
SW6010B	Iron	MG/KG	6	6					100	100
SW6010B	Lead	MG/KG	6	6					100	100
SW6010B	Lithium	MG/KG	6	6					100	100
SW6010B	Magnesium	MG/KG	6	4	2				100	100

TABLE 7

Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Number of Occurrences						Contractor Completeness (%)	Overall Completeness (%)
			Analyses	Detects	Non-detects	Blank Flags	J-Flags	Contractor Total R-Flags		
SW6010B	Manganese	MG/KG	6	6					100	100
SW6010B	Molybdenum	MG/KG	6	6					100	100
SW6010B	Nickel	MG/KG	6	6					100	100
SW6010B	Phosphorus	MG/KG	6	6					100	100
SW6010B	Potassium	MG/KG	6	6					100	100
SW6010B	Selenium	MG/KG	6	2	4				100	100
SW6010B	Silver	MG/KG	6	3	3				100	100
SW6010B	Sodium	MG/KG	6		6				100	100
SW6010B	Strontium	MG/KG	6		6				100	100
SW6010B	Thallium	MG/KG	6	6					100	100
SW6010B	Tin	MG/KG	6		6				100	100
SW6010B	Titanium	MG/KG	6	6					100	100
SW6010B	Uranium	MG/KG	6	6					100	100
SW6010B	Vanadium	MG/KG	6	6					100	100
SW6010B	Zinc	MG/KG	6	6					100	100
SW6010B	Zirconium	MG/KG	6	6					100	100

Description:

MG/KG = milligram per kilogram