Independent Expert Engineering Investigation and Review Panel

Report on Mount Polley Tailings Storage Facility Breach

Appendix D: ATTACHMENT D8–D10

Attachment D8: DMT Geophysics Interpretation

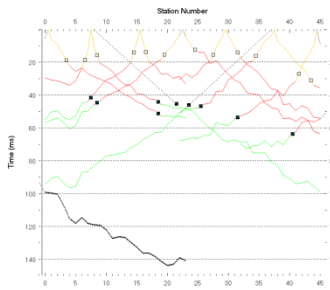
Attachment D9: CPT Tip Resistance and Moisture Content Comparison

Attachment D10: CPT Correlations to Undrained Strength and Stress History

Appendix D

Attachment 8

DMT Geophysics Interpretation



Mount Polley Geophysics Review

Final Report

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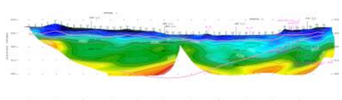

Prepared for:

Mount Polley Independent Expert Engineering Investigation and Review Panel

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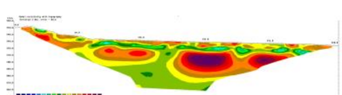

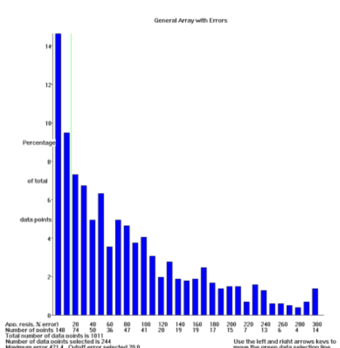

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ABBREVIATIONS

Ω·m	ohm·metre
m/s	Metres per second

GLOSSARY

Resistivity	Resistivity is a property of materials that governs their ability to pass electric current. Higher resistivity values resist electric flow. Structures in the earth can often be delineated by examining the resistivity of the earth. The units of resistivity are ohm·metres.
Apparent resistivity	Apparent resistivity is a common data point collected in resistivity surveys. It is the result of a calculation involving the receiver voltage, the source electrical current and their geometry.
Chargeability	Chargeability is a measure of the grounds ability to retain an electrical charge after the source is no longer creating a signal. It is related to capacitance.
Direct Current Induced Polarization (DCIP)	DCIP surveys are sensitive to the resistivity and the chargeability of the subsurface.
Seismic velocity	A material's seismic velocity is related to its ability to transmit vibrations. Often layers of the earth can be described because of their strongly contrasting seismic velocities. The units of seismic velocity are metres per second.
First arrivals	First arrival times are the amount of time that passes between the creation of the signal at the source and its arrival at the receiver.
Seismic refraction	Seismic refraction surveys exploit the increase in seismic velocity of earth layers with an increase in depth to identify structures in the subsurface.
Seismic tomography	Seismic tomography is a method to create a seismic velocity model of the earth. It is effective at detecting structures that vary in the horizontal direction
Source	Geophysical surveys require a source. There are many different sources used such as an explosion to create waves or an

	electrical current to create an electric field.
Receiver	Geophysical sources create a signal that interacts with the body of interest. The receiver records the result of that interaction. All of geophysics is trying to find a model of the earth that will create the same response at the receiver given the same event at the source.
Station	Stations represent the locations of receivers and sources. They are usually identified by a number and will have associated GPS coordinates.
Geometry	In a geophysical case, geometry refers to the arrangement of source and receiver instruments. The arrangement is critical for interpretation.
Universal Transverse Mercator (UTM)	Universal Transverse Mercator is a method of projecting GPS coordinates onto a regular rectangular grid. The grid squares are nominally one square metre.
Cross section	A cross section displays two dimensional information with one dimension being depth, and the other being distance in space. They are a common result of geophysical interpretation and are often meant to represent a thin slice of the earth.

1.0 INTRODUCTION

DMT Geosciences Ltd. was retained to undertake a re-processing and interpretation of a geophysical data set collected at the Mount Polley mine site in September-October 2014. Data were collected by Frontier Geosciences along six seismic refraction lines and eight resistivity lines. The objective of this study was to determine which stratigraphic features could be identified in these geophysical surveys. Of particular interest were the depth to and velocity of bedrock as well as a glaciolacustrine clay which was identified through drilling.

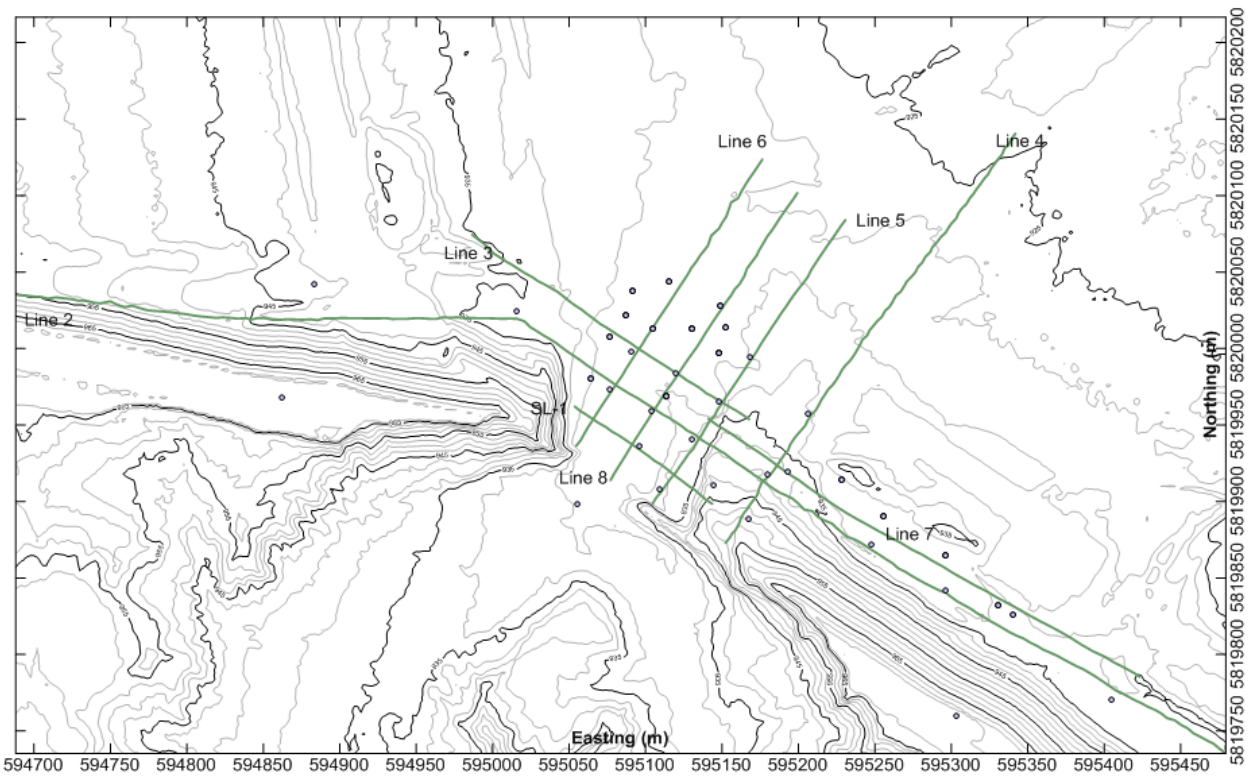

Figure 2.1-1: A plan map of all the resistivity and seismic refraction lines.

2.0 Materials Provided

2.1 Seismic Refraction

DMT was provided with SEG2 and SEGY files for six seismic refraction surveys collected by Frontier Geosciences Inc. between October 1 – 6 and October 10 -13 of 2014. Scanned field notes were also made available. A separate spread sheet was provided containing the UTM coordinates and elevations of the geophones and shot locations.

DMT was also provided with DXF files and Surfer files containing seismic refraction cross sections for the six surveyed lines as interpreted by Frontier Geosciences. These interpreted cross sections had four layers with varying depths and velocities.

2.2 Resistivity and Chargeability

DMT was provided with eleven text files containing the data for eight separate direct current induced-polarization (DCIP) survey lines collected by Frontier Geosciences. A separate spreadsheet was provided with the UTM coordinates and elevations of the stations for each of the survey lines. Scanned field notes were also made available.

DMT was provided with 16 Surfer (SRF) files which contained resistivity and chargeability models processed by Frontier Geosciences for all eight DCIP survey lines.

3.0 Acquisition

3.1 Seismic

Six lines of seismic refraction data were acquired by Frontier Geosciences Inc. between October 1 – 6 and October 10 -13 of 2014. Acquisition parameters of the seismic refraction survey are listed in Table 3-1. According to correspondence between Frontier Geosciences Inc. and DMT Geosciences Ltd., two lines of seismic (lines 4 and 7) were unable to be completed due to time constraints.

Number of Geophones	24
Geophone Spacing	5m
Shot Locations with respect to geophone location	1-2, 8-9, 16-17, 23-24
Sampling Interval	0.125ms
Record Length	2048ms
Type of Source	0.25kg Dynamite (Exgel)
Shot Delay	0ms (interior shots); 50ms (majority of off-end shots)

Table 3.1-1: Seismic acquisition parameters used in refraction survey.

3.1.1 Data Quality

The quality of the data acquired is quite good given the use of explosives as an energy source. Subsequently, the quality of a seismic shot record is dependent on the record's signal to noise ratio; the less noise in the record, the better the data. External noise can be generated from multiple sources. Vehicles; drilling activity, foot traffic, wind, and rain are all potential sources of noise. Although a shot record may have a high signal to noise ratio, velocity values can still be affected by timing delays. Delays can be result of sources triggering late or record stations initiating before sources are discharged. Sources should be initiated simultaneously with recording times to prevent erroneous velocity values in tomography inversion. Off-end shots using the 50ms delay detonators were corrected by adding a -50ms delay to records. However, correspondence between the manufacturer of the detonators and DMT, reveal that the accuracy of the 50ms delay of the detonator is questionable and may vary. In some instances, line arrays were not long enough to map bedrock depth (see Line 1).

3.2 Resistivity

Resistivity models are created based upon the acquired field data. Each acquired reading contributes to the accuracy of the final model. The culmination of these readings is used to create the final model.

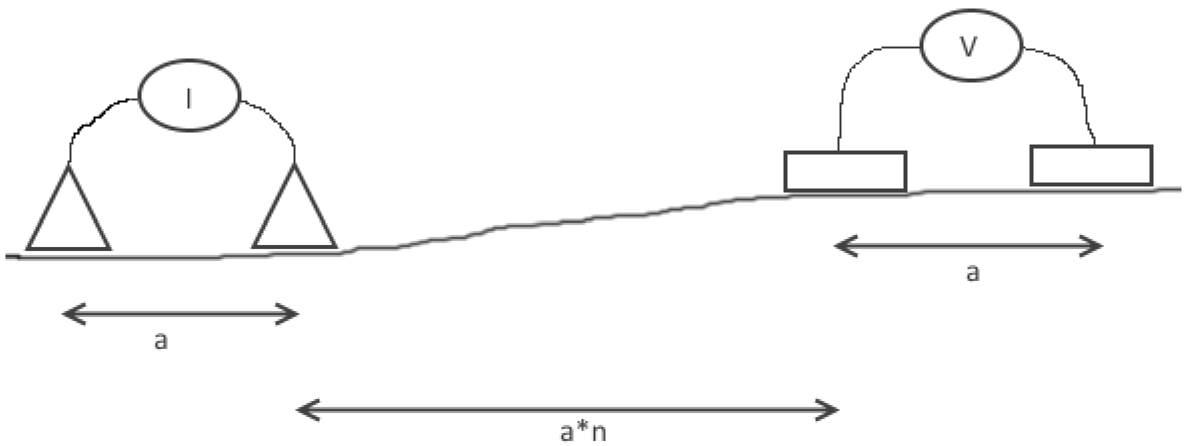

Figure 3.2-1: Geometric arrangement of the transmitter and receiver electrodes for a dipole-dipole array. a **is the distance between the electrodes and** n **is the multiplier.**

Eleven data sets were collected on eight separate lines. Lines 1 and 3 through 8 had one data set collected. Line-2 had four overlapping data sets. Each data set had 84 electrodes available for use as either receivers or transmitters. The electrodes employed a 4mspacing. A Dipole-Dipole electrode configuration was used throughout the project. Figure 3.2-1 illustrates the general Dipole-Dipole arrangement. The transmitter and receiver electrodes are separated by a set distance referred to as the **a** parameter. The sets of transmitters and receivers are separated by a distance that is a multiple of the **a** parameter. The **n** value is the multiplying factor **Table 3.2-1**compiles the geometric parameters used for each reading in each data set.

'a' value in metres	Number of readings					
	For all **n** values	**n** = 1	**n** = 2	**n** = 3	**n** = 4	**n** = 5
4	105	29	29	29	15	3
8	94	26	26	25	14	3
12	87	24	24	22	13	4
16	90	24	24	22	14	6
20	83	23	21	20	13	6
24	162	44	40	36	23	16
28	157	42	38	33	25	19
32	143	40	34	29	22	18
36	198	58	48	40	30	22
40	170	54	44	34	24	14
44	148	52	40	30	18	8

Table 3.2-1: Compilation of the geometric arrangements of the receivers and transmitters for a data set. The number of readings is the amount of different lateral positions for each arrangement.

3.2.1 Data Quality

Data quality starts and ends with collection. To maximize data quality the transmission signal and receiver sensitivity should be maximized while the external noise is minimized.

Transmitter signal is dependent on transmission power and the electrical contacts of the transmitting electrodes. Receiver sensitivity is dependent on the receiver quality and the electrical contact of the receiver electrodes. Electrical contact can be improved by adding salt water to electrode locations if ground conditions are preventing good electrical contact.

Any phenomenon that generates electrical currents can be a source of noise. Power lines, solar flares, industrial activity, and running water can all add noise to the data readings.

Figure 3.2-1 represents the raw data from Line 8. The raw data exhibits significant noise and a partially filtered portrayal of the raw data for Line 8 is presented in Figure 3.2-2. Filtering of data points has significant impact on resistivity inversions, particularly at depth.

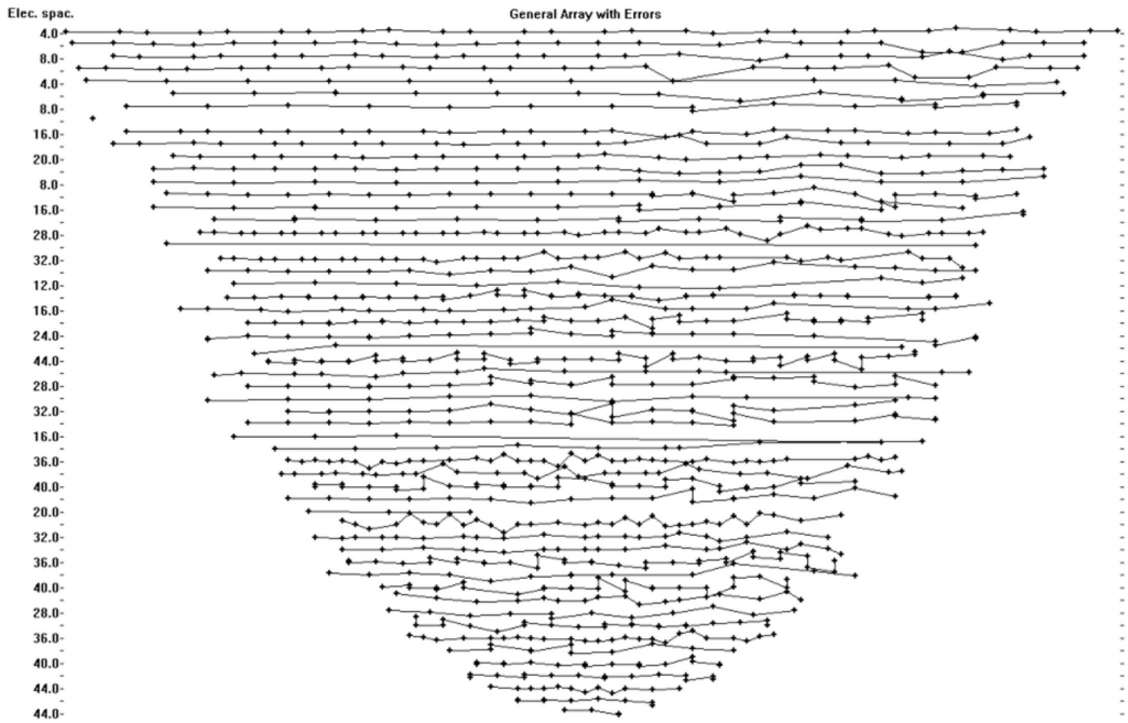

Figure 3.2-2: Unfiltered raw resistivity data from Line 8.

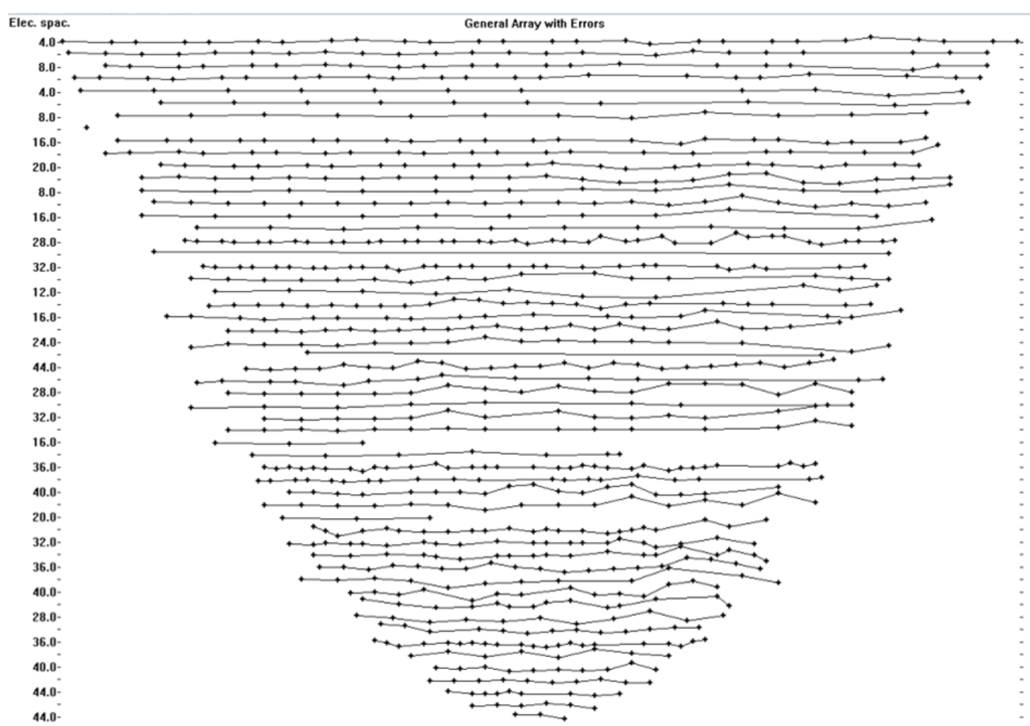

Figure 3.2-3: Filtered raw resistivity data from Line 8.

The transmission currents are quite low in general, reducing the signal to noise ratio, which has an influence on the data quality particularly at depth. Industry standard software (Res2DINV) recommends a minimum amperage of 1 Ampere to acquire good quality data. Good quality data also depends on survey ground conditions as more resistive mediums will require higher amperage to improve the signal to noise ratio. In conductive soils, it may be possible to acquire good data with lower amperage. However, the near surface soils at Mount Polley appear to be resistive. The maximum amperage for each survey line is presented in Table 3.2-2

Line	Maximum Amperage (A)
1	0.185
2	0.383
3	0.384
4	0.385
5	0.185
6	0.187
7	0.380
8	0.512

Table 3.2-2: Maximum amperage of each resistivity survey line.

The original data is noisy. DMT used this data to create inversions. The RMS error of the inversions range between 20 - 67%. Typically, RMS error below 10% is considered acceptable. Figure 3.2-4 is the distribution of the RMS error of the individual data points. Only 24% of the points have error values below 20%.

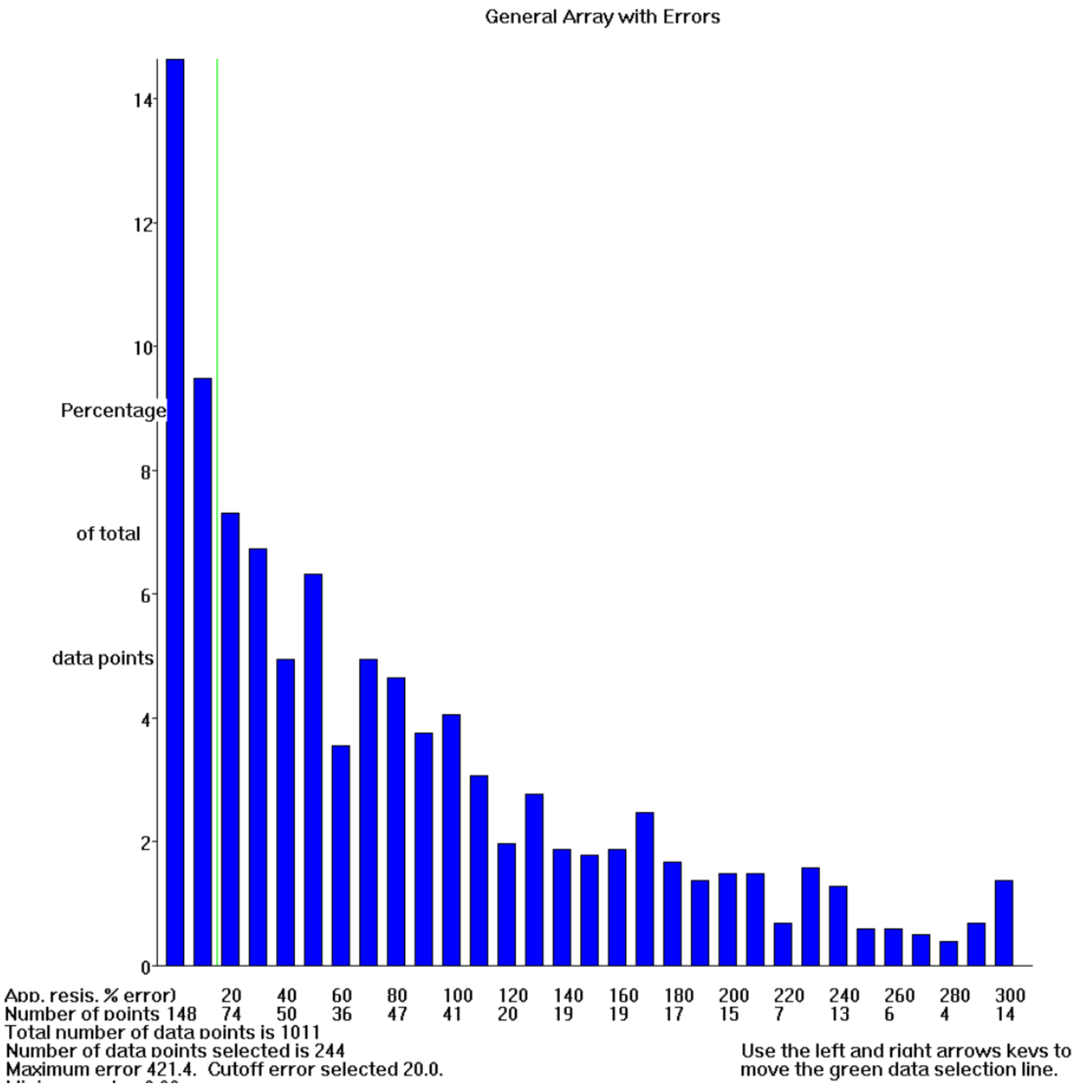

Figure 3.2-4: A histogram of the relative error of the data points. Only 244 of the 1011 data points have an error below 20%.

4.0 Processing

4.1 Seismic

Seismic data was processed using industry standard software (Rayfract, ReflexW) using two methods: Plus-minus and tomography were employed in the review and interpretation. DMT is of the opinion that the tomography inversions, presented along with well logs provided by the Mount Polley Independent Expert Engineering Investigation and Review Panel provide the best presentation of the processed seismic information (see Figures 4.1-1 through 4.1-8). Quality of tomography inversions relies primarily on the parameters used during the acquisition of seismic data. The confidence placed on an inversion is reliant upon the number of ray-paths. Ray-paths are the travel path of acoustic energy through a particular medium from source point to receiver point. Reliability of the inversion data with fewer than 15 ray-paths is considered low (see Figure 4.1-12) and should be carefully accounted for during interpretation. Below this number, accuracy of the tomography inversion begins to deteriorate (see Figures 4.1-8 and 4.1-16). Ray-path coverage plots for each line are indicated in Figures 4.1-9 through 4.1-16.

The variance of inversion velocity values and actual velocity values is expressed as a percentage of the root mean square error (RMS); generally, the lower the percentage, the better the inversion. Table 4.1-1 indicates the RMS error associated with each line.

Line	RMS Error (%)
1	2.0
2	3.2
3	2.1
5	2.0
6	1.7
8	2.1

Table 4.1-1: Root mean square error for each seismic line.

4.2 Resistivity

Line 1 had 56 of the typical 84 electrodes available while Line 2 is the combination of four overlapping data sets. The remainder of the resistivity survey lines had 84 electrodes. Resistivity data sets were edited to remove bad data points based upon the following parameters:

- Remove readings using electrodes that were not connected
- Remove readings using electrodes that were marked as bad in the field notes
- Remove readings with currents less than 25mA
- Remove readings with potentials below 0.1mV
- Remove readings with apparent resistivities less than 1 ohm*m and greater than 1000 ohm*m

The variance of inversion resistivity values and actual resistivity values is expressed as a percentage of the root mean square error (RMS); generally, the lower the percentage, the better the inversion. Table 4.2-1 indicates the RMS error associated with each line. Acceptable inversions would typically have RMS errors of less than 10%.

Line	RMS Error (%)
1	42.5
2	40.0
3	55.3
4	67.1
5	46.7
6	20.3
7	38.6
8	42.6

Table 4.2-1: Root mean square error for each resistivity line.

These parameters were selected to remove data points that had a high potential for unreliability. Table 4.2-2 shows the percentage of data points removed due to bad electrodes and from poor data quality.

Line Name	Number of readings	Remaining after bad electrodes removed	Remaining after filters	Percentage removed
RL1	610	511	382	37
RL2	5748	5187	3788	34

RL3	1437	1187	934	35
RL4	1437	956	764	47
RL5	1437	1234	1137	20
RL6	1437	1271	1221	15
RL7	1437	1234	1026	29
RL8	1437	1367	1203	16

Table 4.2-2: Tabulation of the number of readings in each data set

4.2.1 Chargeability

IP readings are much more sensitive to noise than resistivity readings. The currents in the data sets were too low to be reliably interpreted.

5.0 INTERPRETATION AND DISCUSSION

5.1 Seismic

On the basis of instruction from the Mount Polley Independent Expert Engineering Investigation and Review Panel, DMT used well logs simplified into 4 main groups;

- Upper till
- Upper glaciolacustrine
- Lower till
- Possible very weak bedrock

Two boundaries were mapped with the tomography inversions; water table and weathered bedrock. Water table was associated with the 1,500m/s velocity contour interval. Weather bedrock appears to have two distinct ranges.

The velocity of weathered bedrock was anomalously low below the former tailings dyke ranging from 1,650 – 2,000m/s. The area below the former tailings dyke corresponds with the south-west portion of lines 8, 6, and 5 (Figures 4.1-8, 4.1-7, and 4.1-6) as well a portion of line 2 (Figure 4.1-2). The highlighted wells in Table 5.1-1 indicate the velocity of weather bedrock encountered in a well. Without seismic refraction data acquired prior to failure, it is difficult to determine if the anomalously low velocity zone is a natural anomaly or a result of the dyke failure.

Away from the failed tailings dyke, weathered bedrock velocities range from 2,150 – 2,900m/s and should correlate with the degree of weathering of bedrock.

Tomography inversions were also correlated in pseudo 3D. Inversions for lines 3 and 1 correlate well with inversions completed on lines 8, 6, and 5. Line 2 (Figures 4.1-2, 4.1-3, and 4.1-4) demonstrates an example of inherent anisotropy of the subsurface. Velocity values correspond with those encountered at the intersection point of line 5, but exhibit variability at the intersection of lines 8 and 6.

Given that velocity values associated with water bearing tills and the upper glaciolacustrine unit would likely have similar values, differentiation between the units is unlikely. This is compounded by the relative thinness of the upper glaciolacustrine unit compared to the thicker upper and lower till.

Four low velocity areas exhibiting good ray-path coverage may be of interest on line 2 and may warrant further investigation. Table 5.1-2 indicates the approximate locations of these anomalous areas.

Line	Well ID	Velocity (m/s)	Note
1			
	RCPT14-14	N/A	Insufficient array length
	RCPT14-09	N/A	Insufficient array length
2			
	RCPT14-18	1850	
	RCPT14-114	N/A	Bedrock not encountered
	RCPT114-16	1650	
	RCPT14-15	2300	
	RCPT14-03	1900	
	RCPT14-06	2100	
	RCPT14-01-1A	2900	
	RCPT14-12	2150	
	RCPT14-102	N/A	Bedrock not encountered
	RCPT14-101	N/A	Bedrock not encountered
	RCPT114-13	2750	
3			
	RCPT14-115	N/A	Bedrock not encountered
	RCPT14-17	2300	
	RCPT14-108-8A	N/A	Bedrock not encountered
	RCPT14-22-22A	2300	
5			
	RCPT14-04	2250	
	RCPT14-03	1850	
	RCPT14-10	2200	
	RCPT14-11-11B	2600	
6			
	RCPT14-16	1700	
	RCPT14-17	2250	
	RCPT14-108-8A	N/A	Bedrock not encountered
	RCPT14-111-111A	N/A	Bedrock not encountered
8			
	RCPT14-14	1750	
	RCPT14-15	1750	
	RCPT14-116	N/A	Bedrock not encountered
	RCPT14-22-22A	2650	
	RCPT14-107-7A-7B	N/A	Bedrock not encountered
	RCPT14-113	N/A	Bedrock not encountered
	RCPT14-112-112A	N/A	Bedrock not encountered

Table 5.1-1: Seismic velocity of weathered bedrock associated with Well ID. Highlighted wells indicate low seismic bedrock velocity in the vicinity of the dyke failure.

Line	Start X Coordinate	Start Y Coordinate	End X Coordinate	End Y Coordinate	Chainage on Section (m)
2	594741	5820032	594789	5820024	50 – 90
2	594967	5820019	595019	5820019	280 – 330
2	595143	5819935	595177	5819914	480 – 520
2	595311	5819830	595345	5819808	680 – 720

Table 5.1-2: Coordinates of low velocity anomalies encountered on line 2.

5.2 Resistivity

Given the low currents and high noise level in the data at depth, it is unlikely that much reliance can be placed on inversion results below a depth of approximately 30m. In regions above 30m there was significant variability in the noise level with some areas showing very clean data, and other areas requiring significant manual editing. This variation is likely caused by variations in contact resistance which resulted in very low currents in many areas. While the main features observed in the inversion of the edited data in the top 30m can be reasonably relied on, it is likely that some of the subtleties and heterogeneities in the subsurface have not been captured due to the quality of the data. To lower the RMS error values of the inversion, significant damping filters were applied. These filters smooth out noise, but at the same time may result in the masking of true heterogeneities of the subsurface.

In resistivity surveys, lower resistivities generally correspond with finer grain sizes, while higher resistivities correspond with coarse grained material. In the Mount Polley survey, it appears that the weathered bedrock has been mapped as a low resistivity zone in the vicinity of the tailings dyke failure (see Figures 5.2-1 through 5.2-8). A few logs, for example RCPT-17 on line 3, indicate a slightly higher resistivity in the location of the weathered bedrock. This may be caused by a variation in the composition and/or weathering of the bedrock.

The lower till does not have a consistent relationship with the resistivity sections. This may be caused either by the poor quality of the data which necessitated significant data editing, or may be simply an indication of the variable composition of this formation.

The upper till, as with the lower, does not have a consistent relationship with the resistivity sections. Significant lateral heterogeneity exists in the resistivity sections in the upper 30m indicating that there is likely wide variation in grain size within the same till.

The glaciolacustrine clays appear to be too thin and discontinuous to be identified using the survey parameters. Modelling in previous work done by DMT indicates this clay may be mappable using different acquisition parameters.

5.3 3D Visualisation

It is instructive to view the data in three dimensions to better understand the spatial relationship of anomalies. Although best viewed in an interactive 3D viewer, snapshots of data plotted in 3D can also be a useful interpretive tool as illustrated in Figure 5.3-1 and Figure 5.3-2. , The seismic data from lines 2 and 8 are shown in Figure 5.3-1 with the low velocity zone discussed in Section 5.1 circled. Inspection of the corresponding resistivity data in Figure 5.3-2 reveals an anomalously low resistivity zone in the same region. Without historic data to compare with, it is not possible to determine the importance of this region of low seismic velocity and low electrical resistivity.

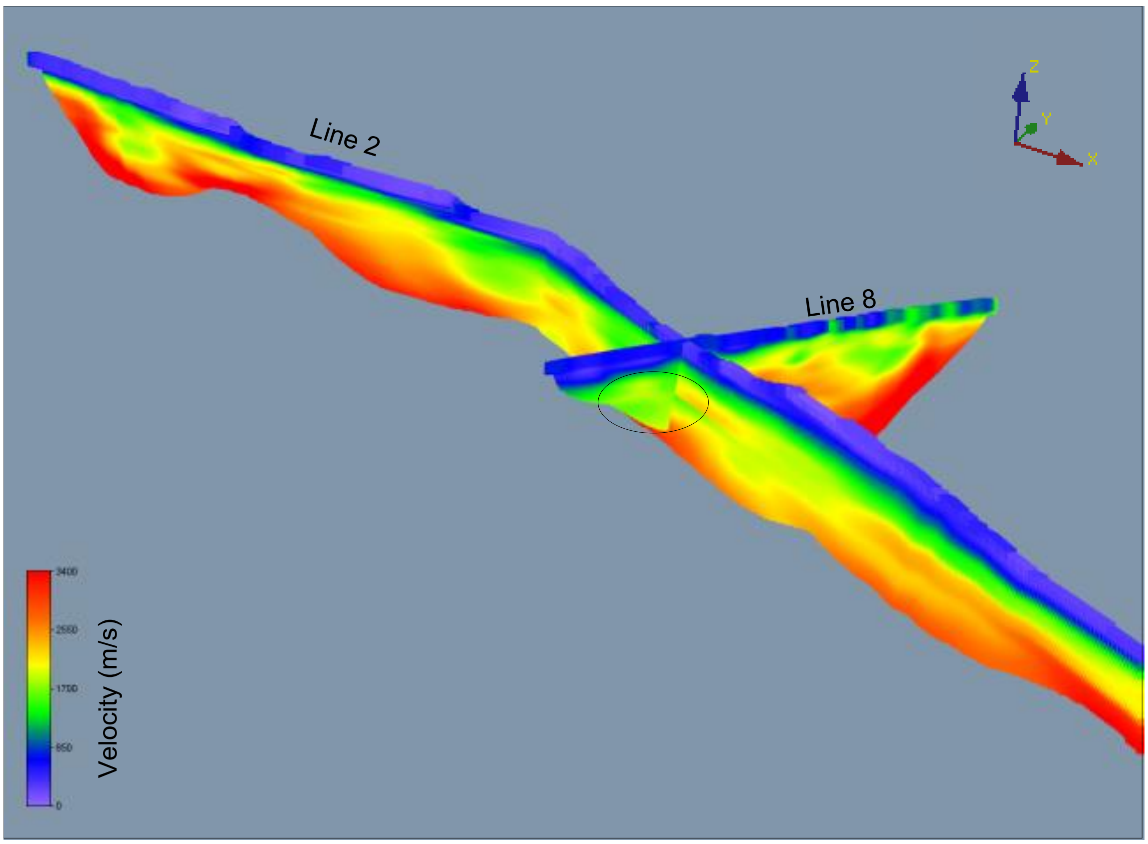

Figure 5.3-1: 3D image of seismic lines 2 and 8 with anomalous zone circled.

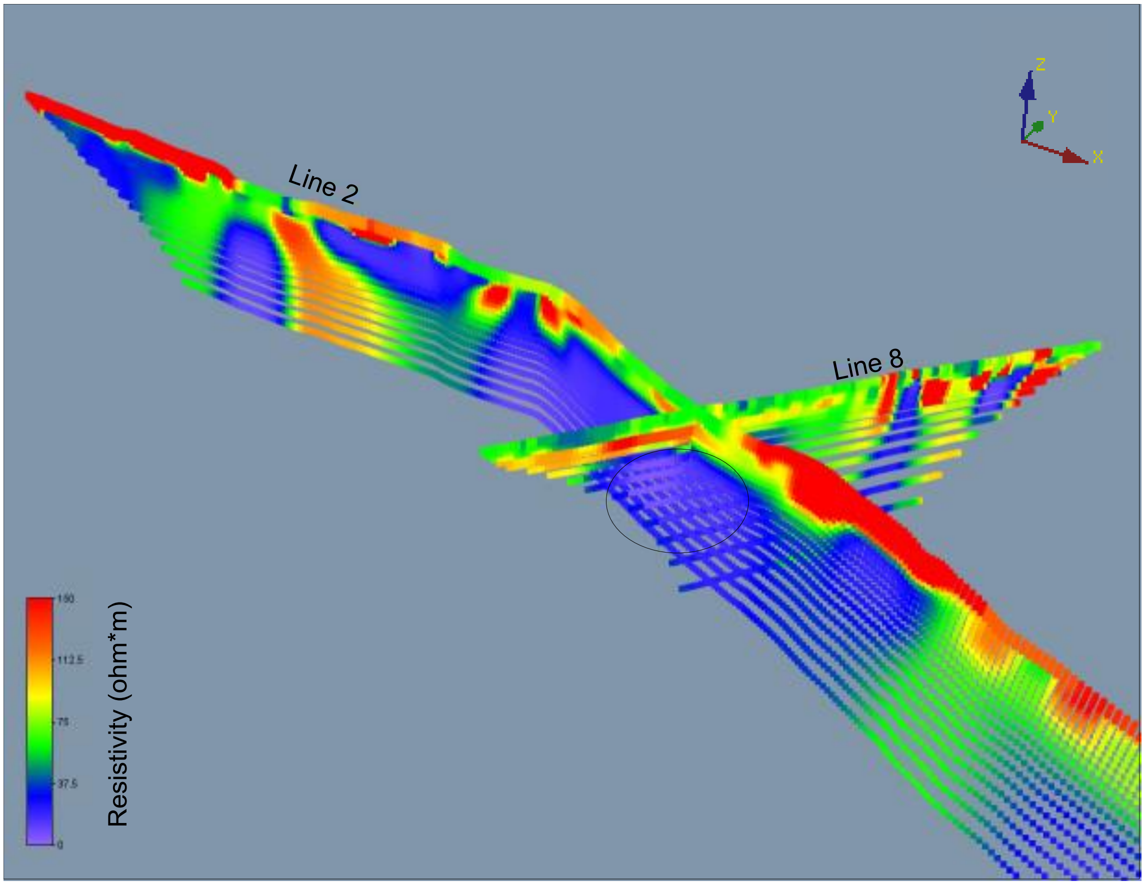

Figure 5.3-2: 3D image of resistivity lines 2 and 8 with anomalous zone circled.

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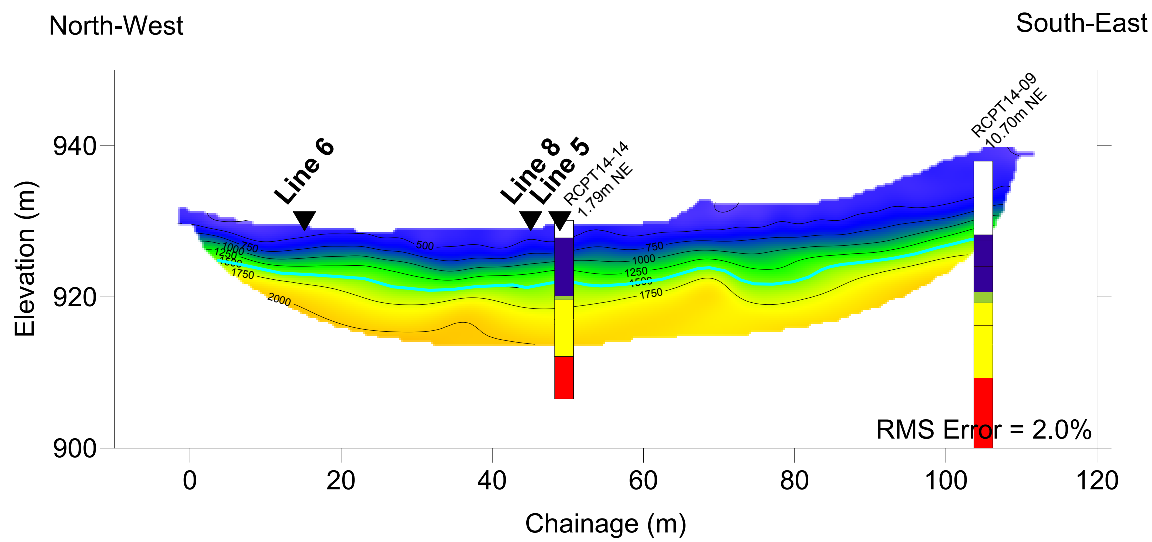
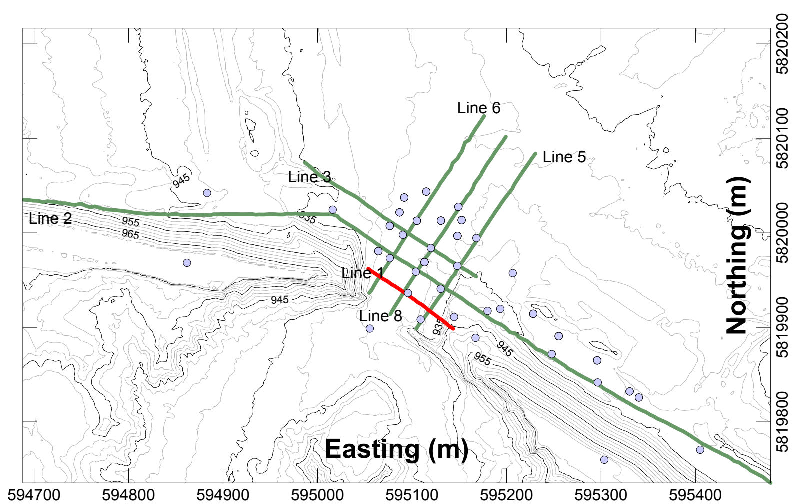
6.0 CONCLUSION

On the basis of the reprocessing and interpretation of the Mount Polley geophysical data set, it appears that the seismic velocity and the resistivity of the weathered bedrock, in the vicinity of the failed tailings dyke, are lower than in the surrounding area. In the absence of pre-dyke construction seismic and resistivity information, it is not possible to determine the significance of the lower values.

The reprocessing and interpretation has shown that there appears to be significant variation in degree of weathering of bedrock as indicated by the range of seismic velocities for the weathered bedrock. A velocity of 1,500 m/s has been selected as a potential water table boundary. Four low seismic velocity zones located away from the tailings dyke failure were identified and may warrant subsequent investigation.

The resistivity data was noisy and as a result the inversions of the data had high RMS errors. The high RMS errors places some doubt on the validity of the inversions particularly at depths greater than 30 m. In general it appears that the upper tills are quite variable in composition (grain size).





Map Legend

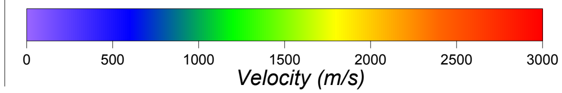
- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary
- Water Table
- Inferred Bedrock

0m 25m 50m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N



Geophysical Data Review
Mount Polley Tailings Dam

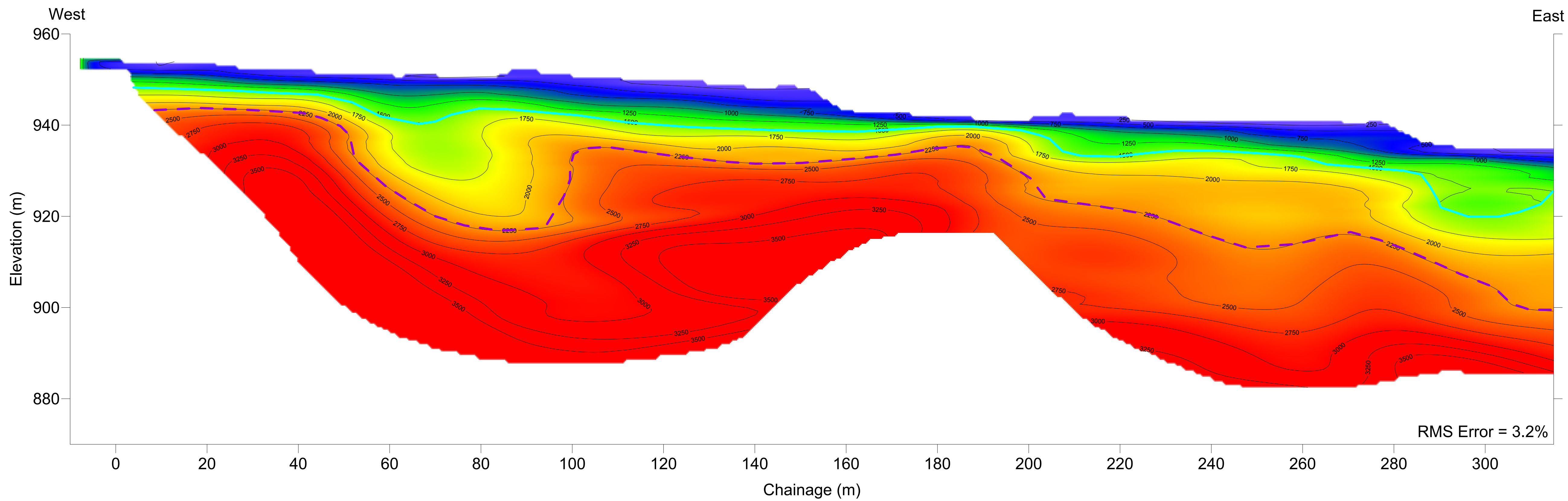
Data Acquired by Frontier Geosciences Inc.

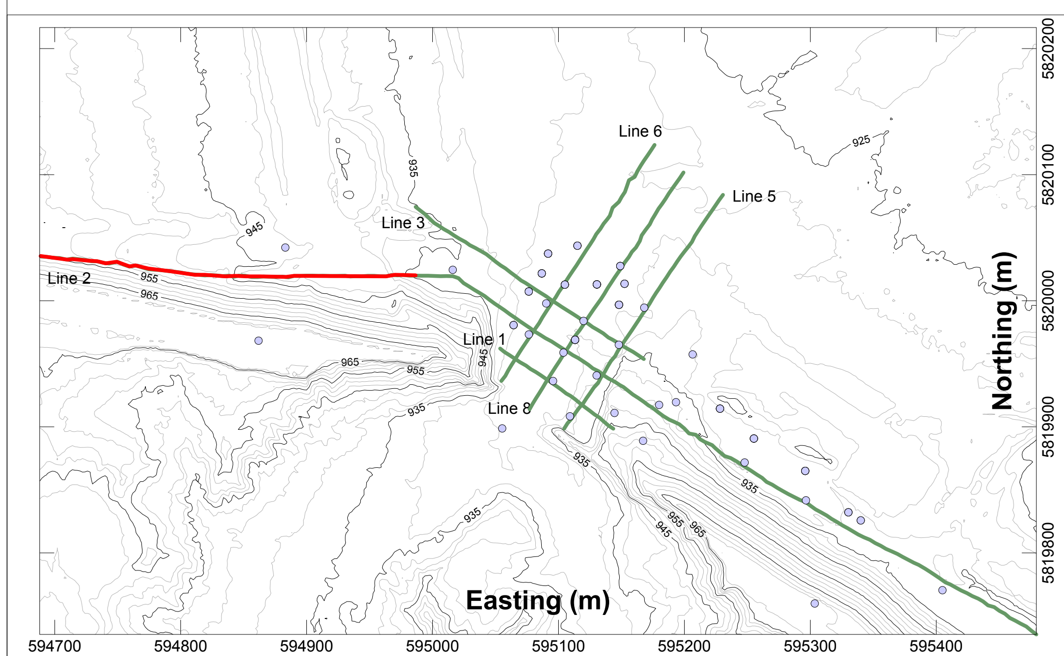
Line 1
Seismic Refraction Tomography

Figure 4.1.1
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT EXPERT ENGINEERING INVESTIGATION AND REVIEW PANEL

DMT Geosciences





Map Legend

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- Survey Line
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Cross Section Legend

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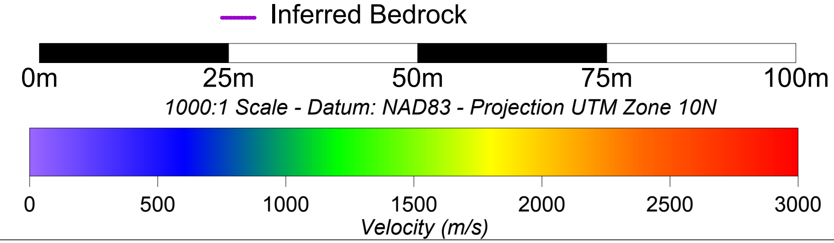

Geophysical Data Review
Mount Polley Tailings Dam

Data Acquired by Frontier Geosciences Inc.

Line 2a
Seismic Refraction Tomography

Figure 4.1.2
Project: CGAA.262
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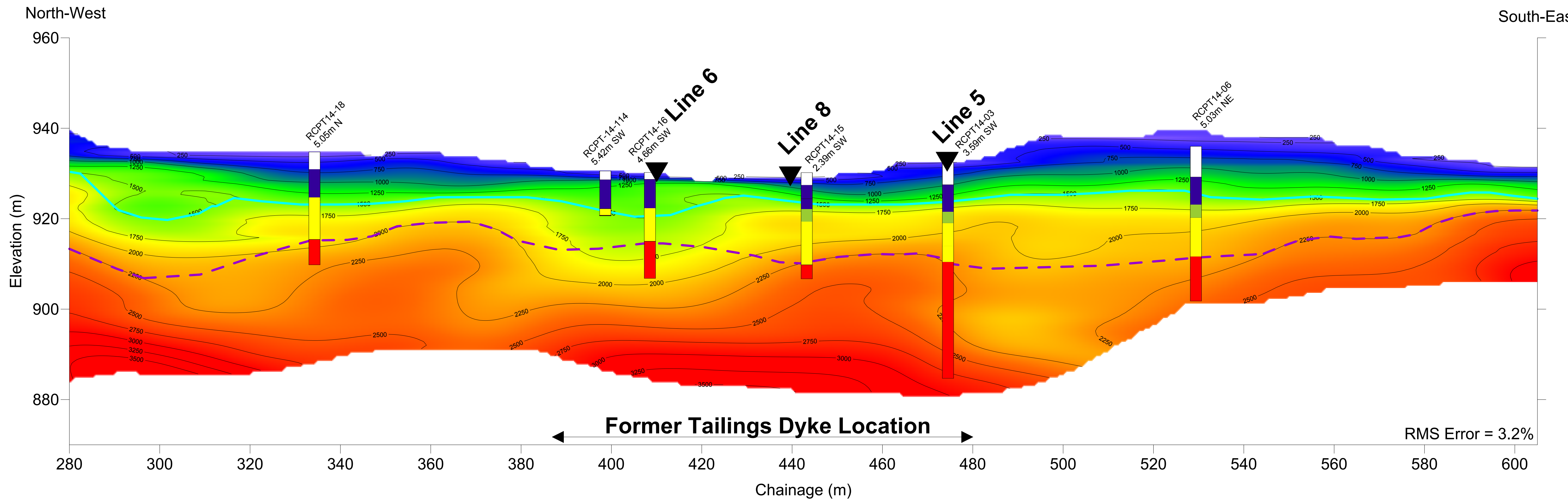

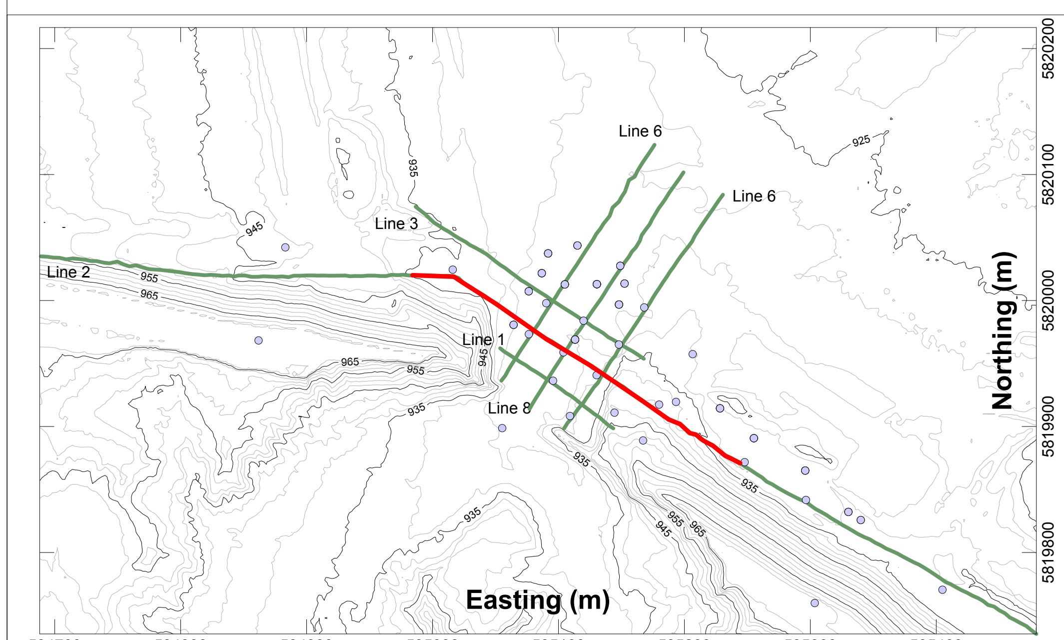

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Cross Section Legend

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- No Data
- Inconclusive Boundary
- Water Table
- Inferred Bedrock

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 500 1000 1500 2000 2500 3000

Velocity (m/s)

Geophysical Data Review
Mount Polley Tailings Dam

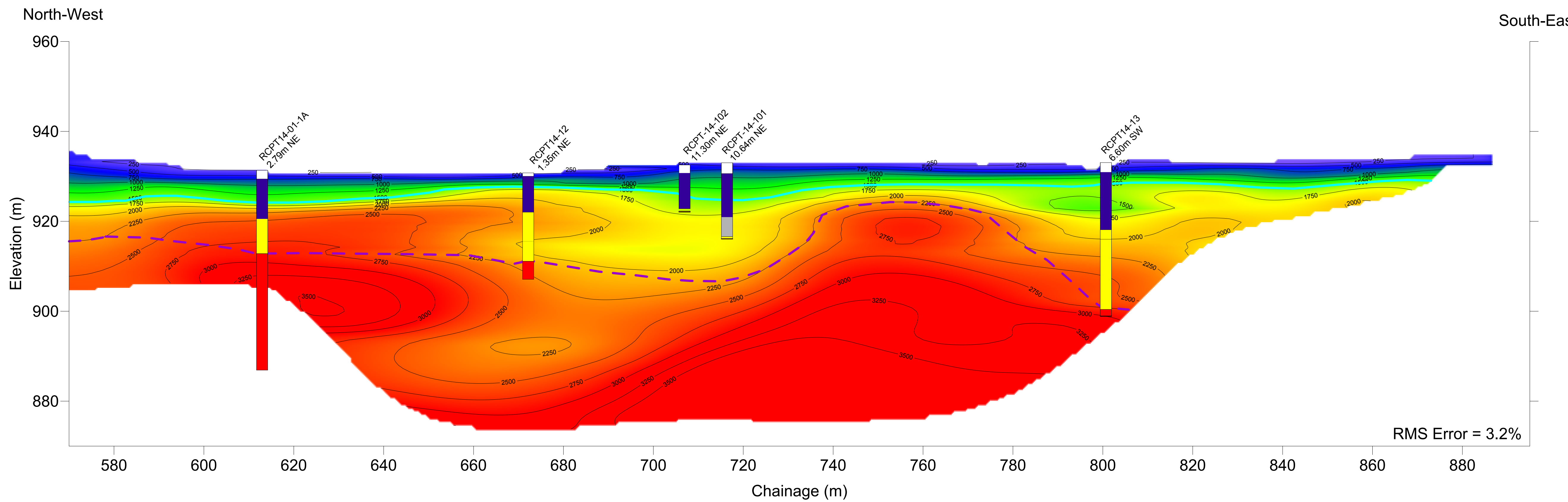
Data Acquired by Frontier Geosciences Inc.

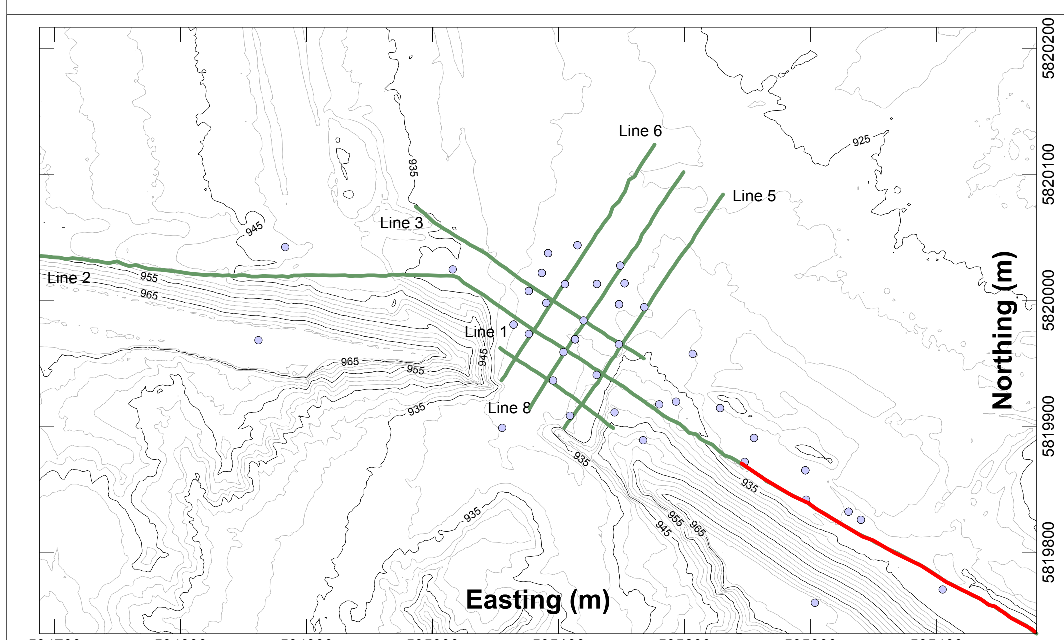
Line 2b
Seismic Refraction Tomography

Figure 4.1.3
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary
- Water Table
- Inferred Bedrock

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 500 1000 1500 2000 2500 3000

Velocity (m/s)

Geophysical Data Review
Mount Polley Tailings Dam

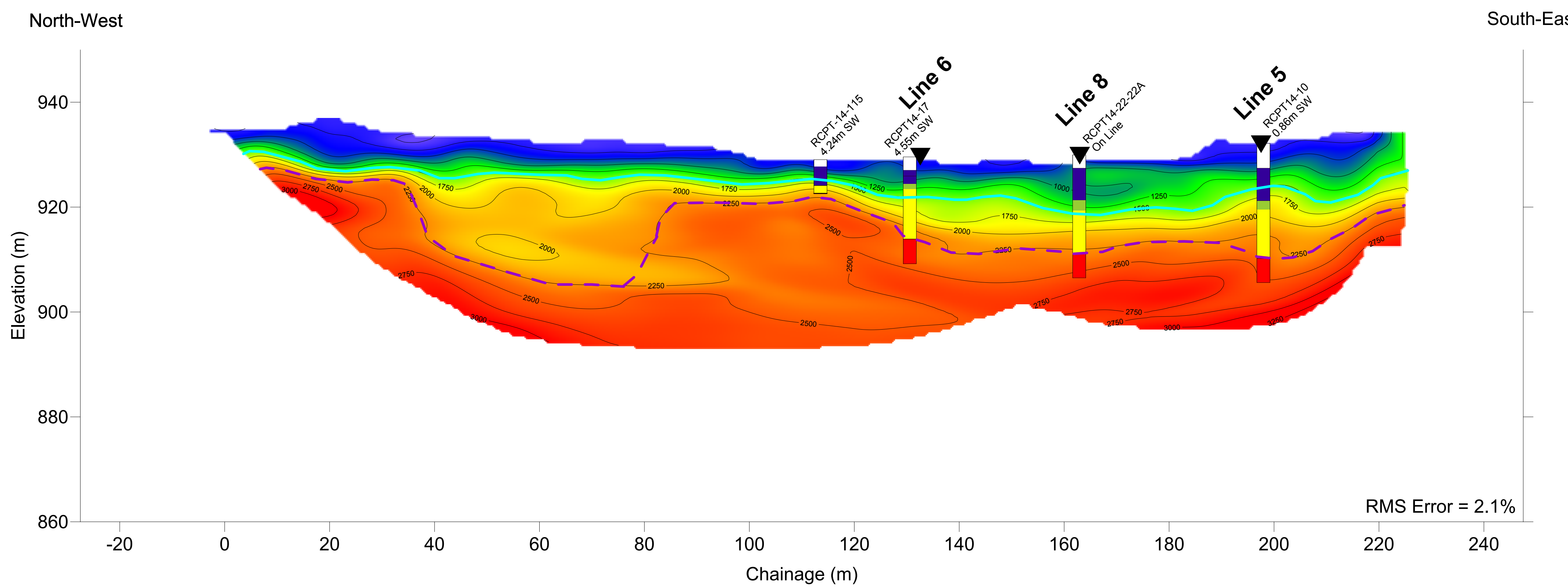
Data Acquired by Frontier Geosciences Inc.

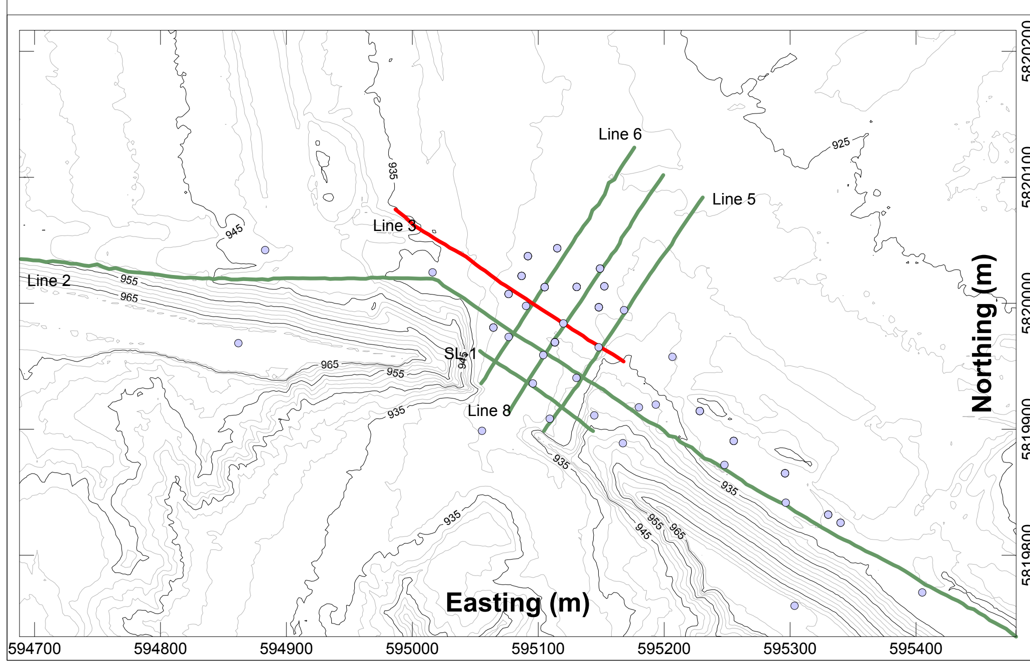
Line 2c
Seismic Refraction Tomography

Figure 4.1.4
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary
- Water Table
- Inferred Bedrock

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 500 1000 1500 2000 2500 3000

Velocity (m/s)

Geophysical Data Review Mount Polley Tailings Dam

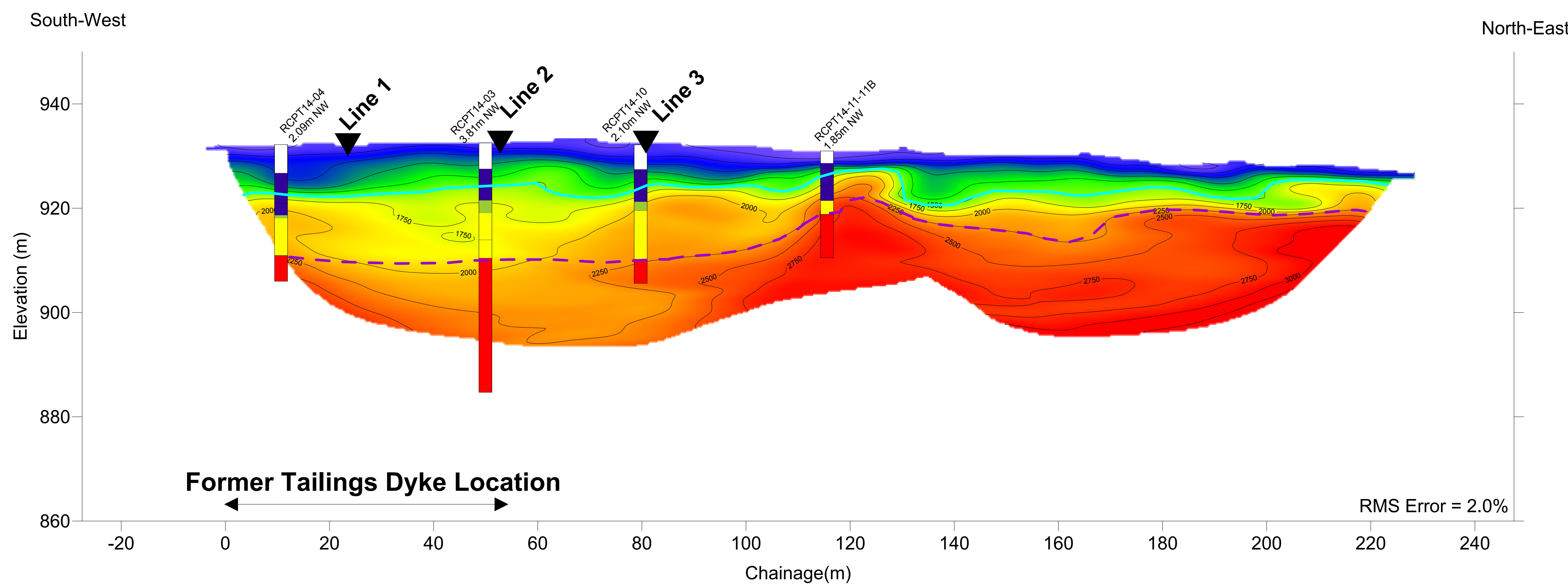
Data Acquired by Frontier Geosciences Inc.

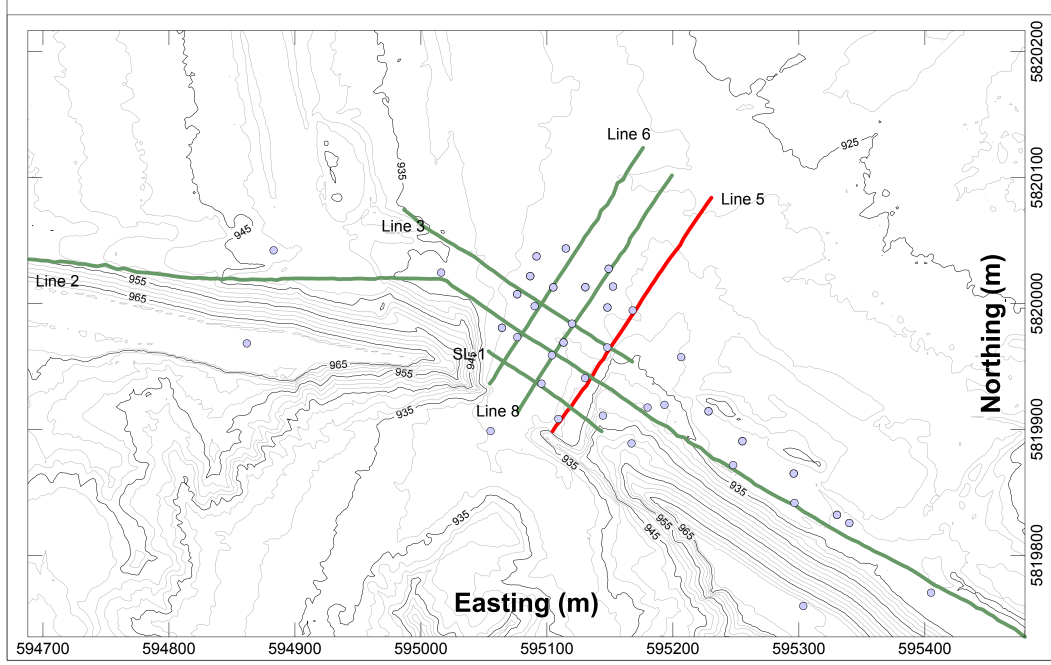
Line 3
Seismic Refraction Tomography

Figure 4.1.5
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT EXPERT ENGINEERING INVESTIGATION AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary
- Inferred Water Table
- Inferred Bedrock

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 500 1000 1500 2000 2500 3000

Velocity (m/s)

Geophysical Data Review
Mount Polley Tailings Dam

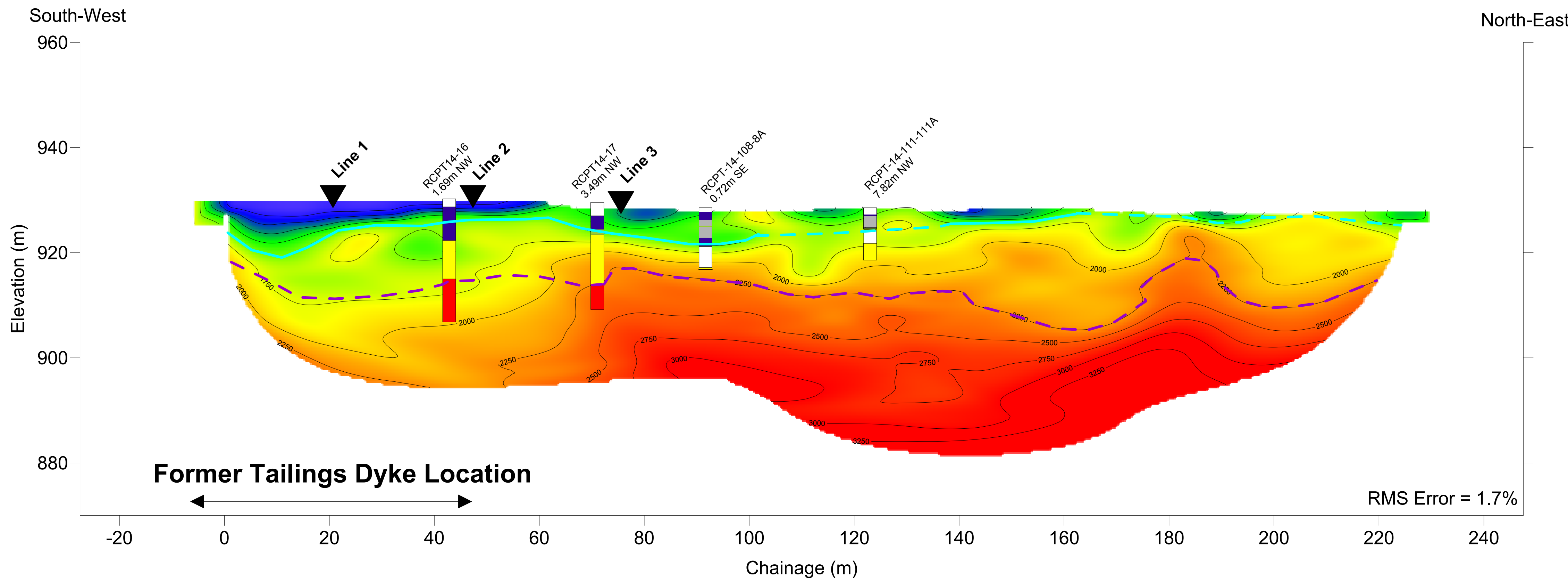
Data Acquired by Frontier Geosciences Inc.

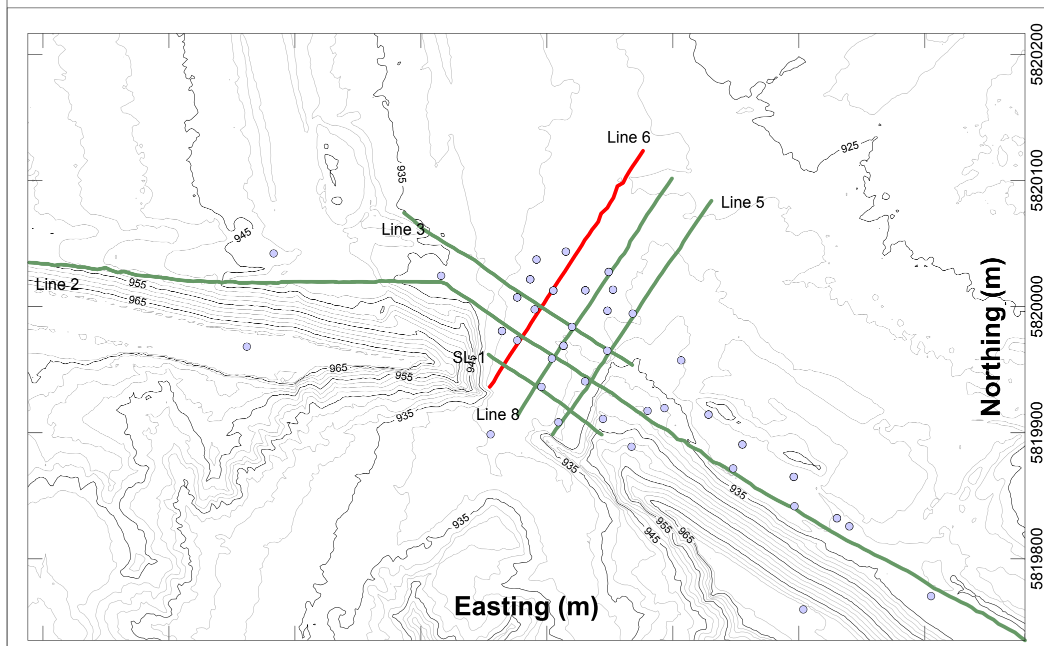
Line 5
Seismic Refraction Tomography

Figure 4.1.6
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary
- Inferred Water Table
- Inferred Bedrock

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 500 1000 1500 2000 2500 3000

Velocity (m/s)

Geophysical Data Review
Mount Polley Tailings Dam

Data Acquired by Frontier Geosciences Inc.

Line 6
Seismic Refraction Tomography

Figure 4.1.7
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

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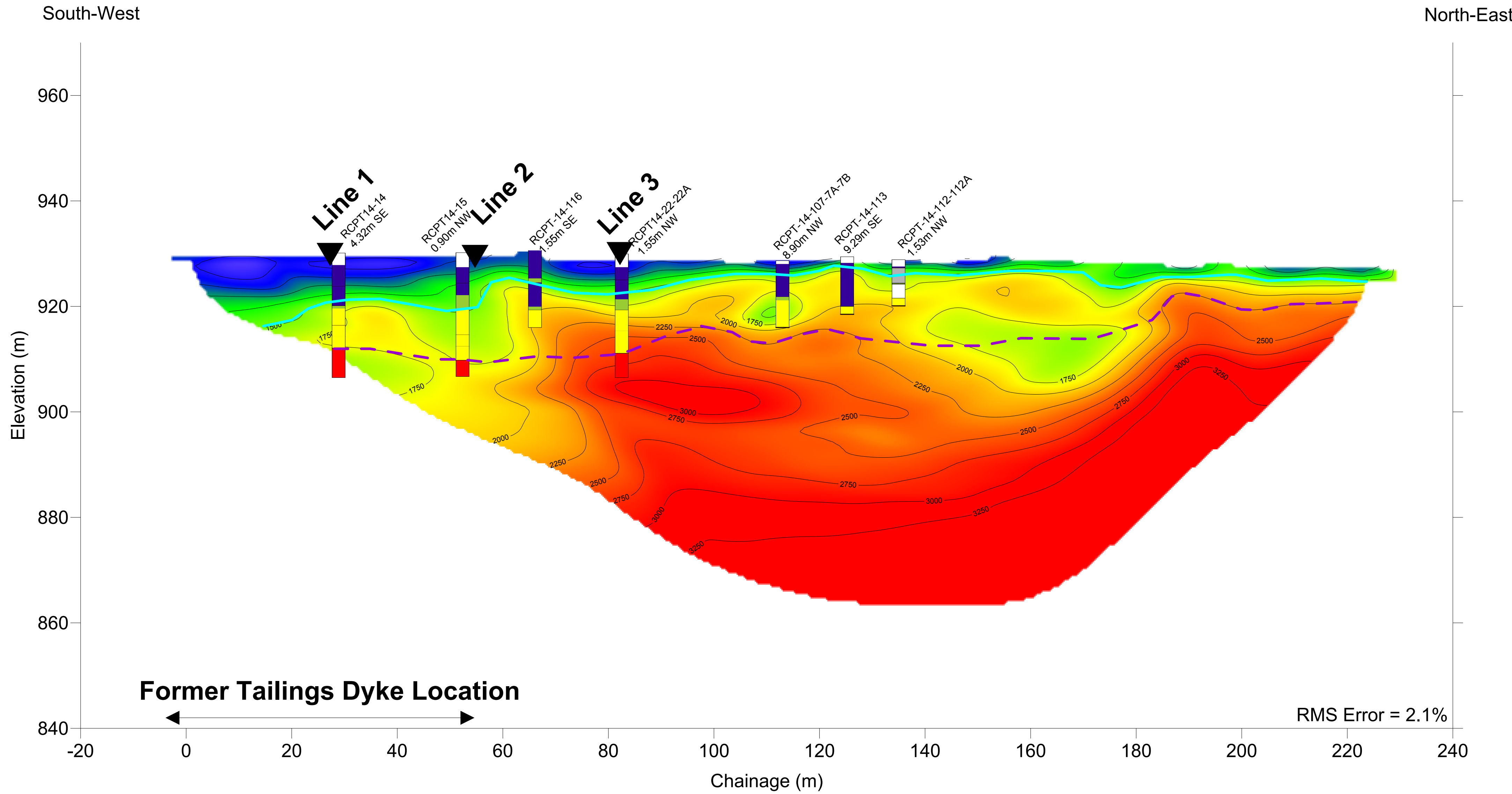
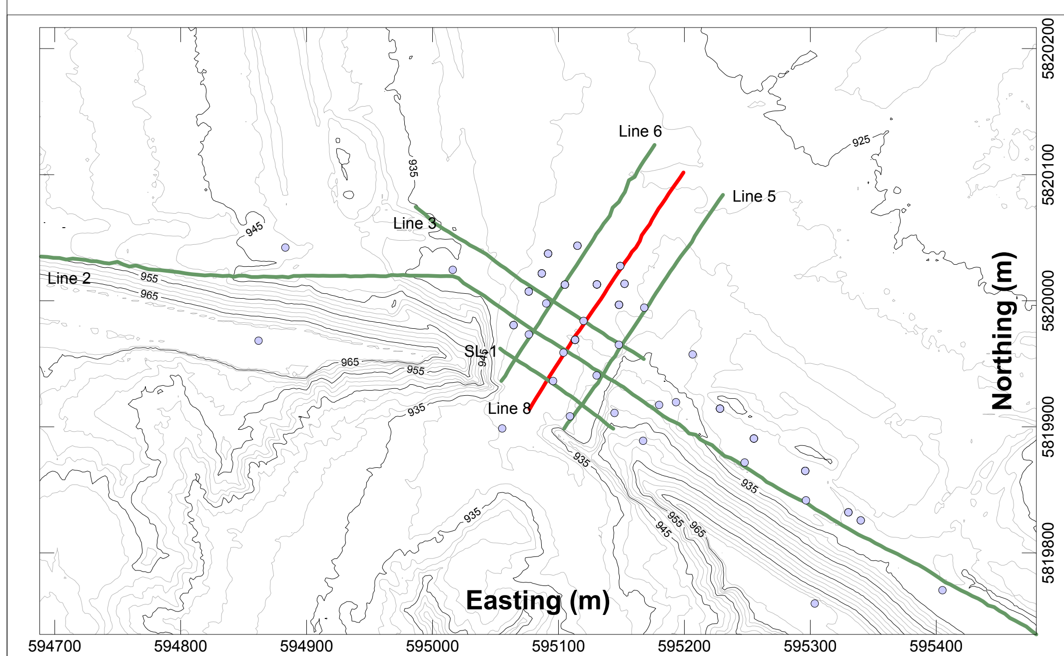




Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary
- Inferred Water Table
- Inferred Bedrock

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 500 1000 1500 2000 2500 3000

Velocity (m/s)

Geophysical Data Review
Mount Polley Tailings Dam

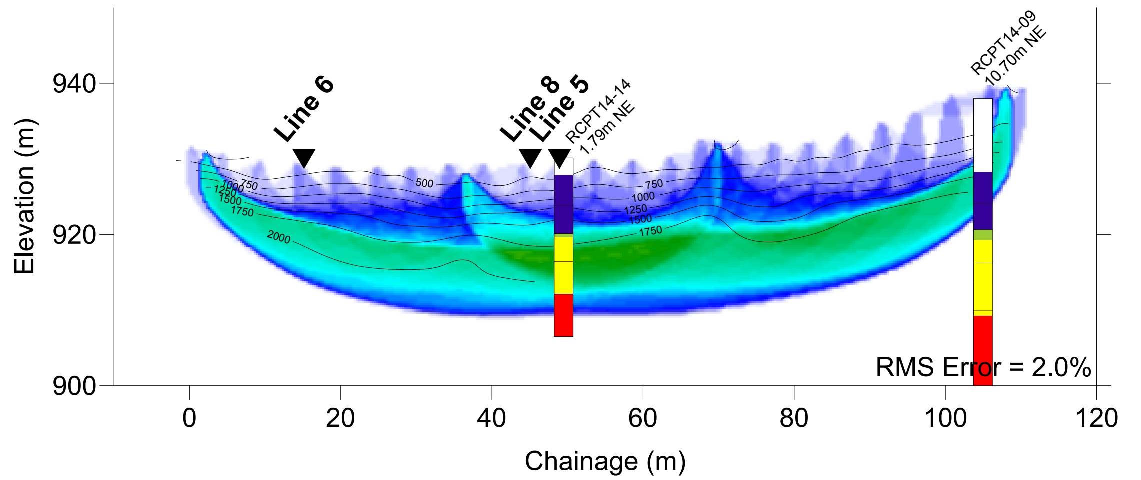
Data Acquired by Frontier Geosciences Inc.

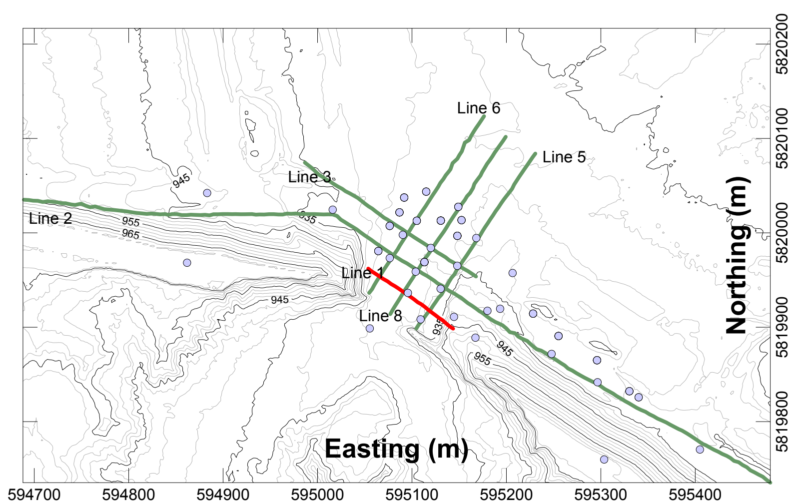
Line 8
Seismic Refraction Tomography

Figure 4.1.8
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

DMT Geosciences





Map Legend

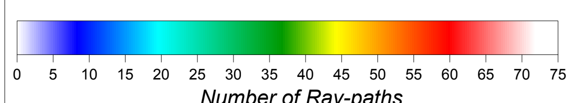
- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary
- Velocity Contour (m/s)

0m 25m 50m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N



Geophysical Data Review
Mount Polley Tailings Dam

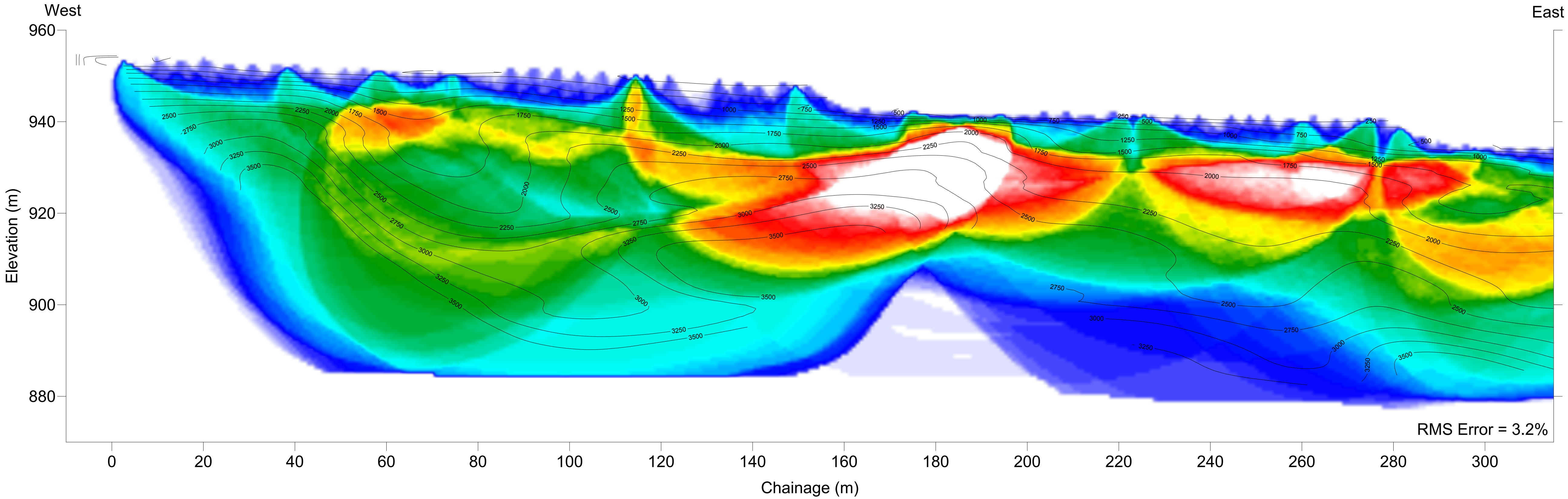
Data Acquired by Frontier Geosciences Inc.

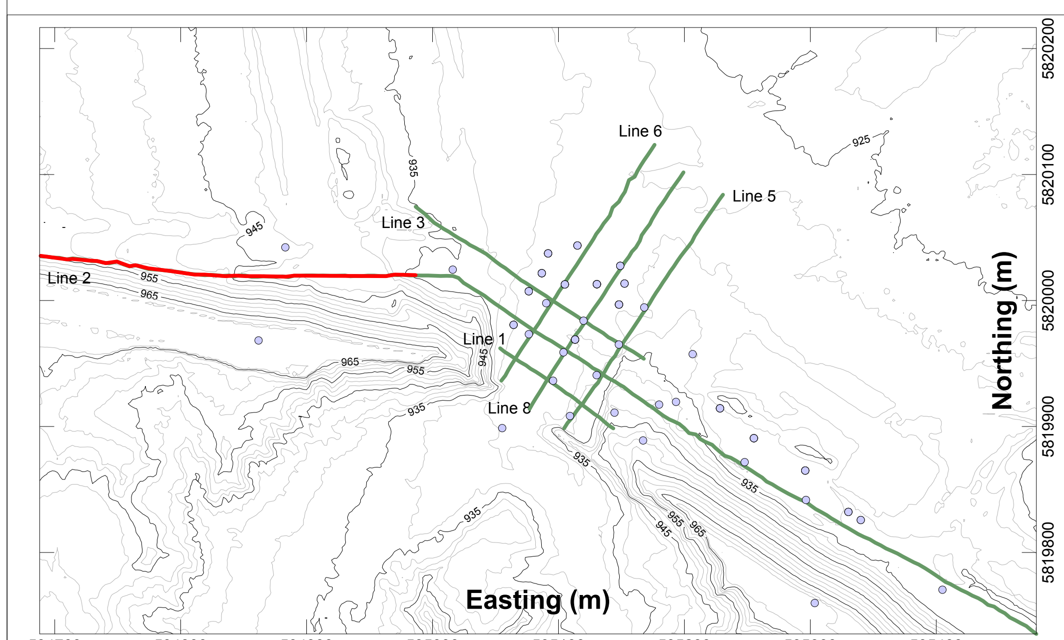
Line 1
Ray-path Coverage Plot

Figure 4.1.9
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

DMT Geosciences





Map Legend

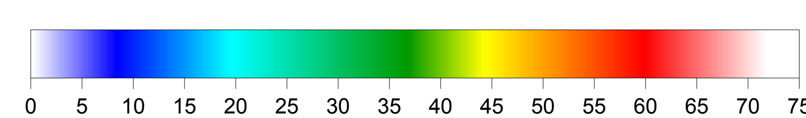
- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary
- Velocity Contour (m/s)

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N



Number of Ray-paths

Geophysical Data Review
Mount Polley Tailings Dam

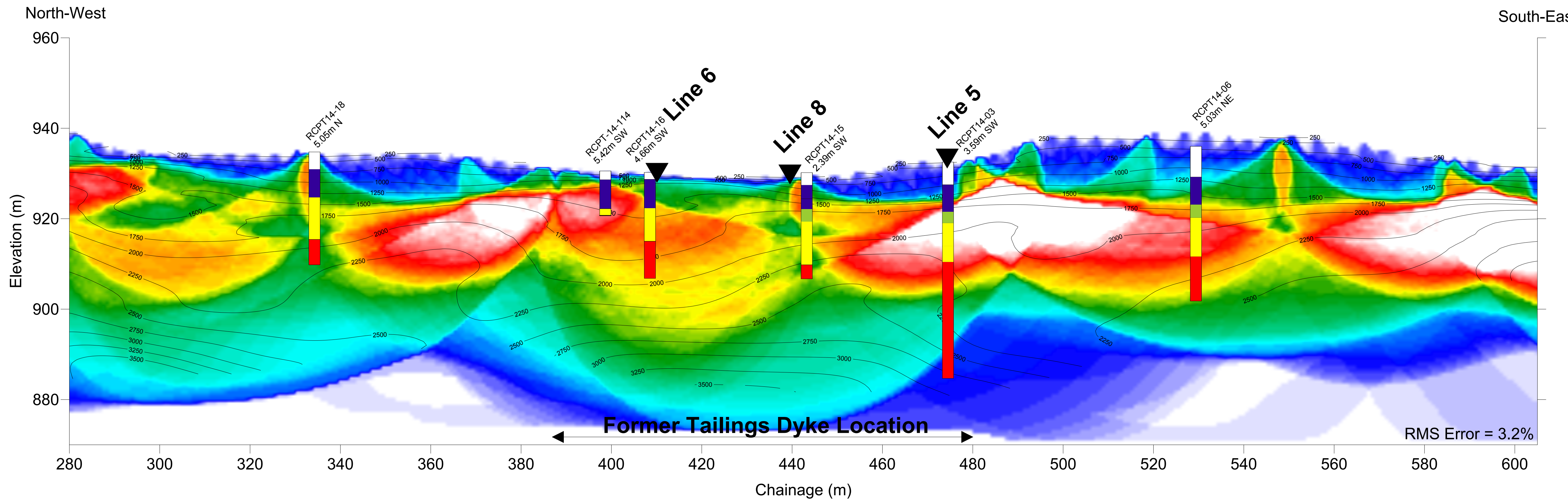
Data Acquired by Frontier Geosciences Inc.

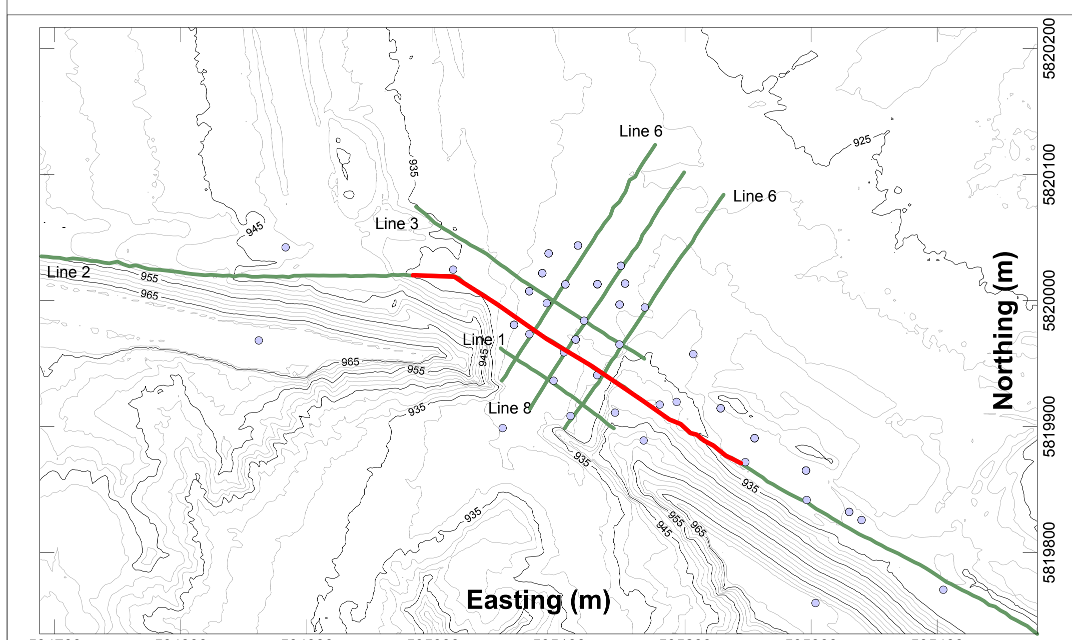
Line 2a
Ray-path Coverage Plot

Figure 4.1.10
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT EXPERT ENGINEERING INVESTIGATION AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary
- Velocity Contour (m/s)

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

Number of Ray-paths

Geophysical Data Review
Mount Polley Tailings Dam

Data Acquired by Frontier Geosciences Inc.

Line 2b
Ray-path Coverage Plot

Figure 4.1.11
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
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INVESTIGATION
AND REVIEW PANEL

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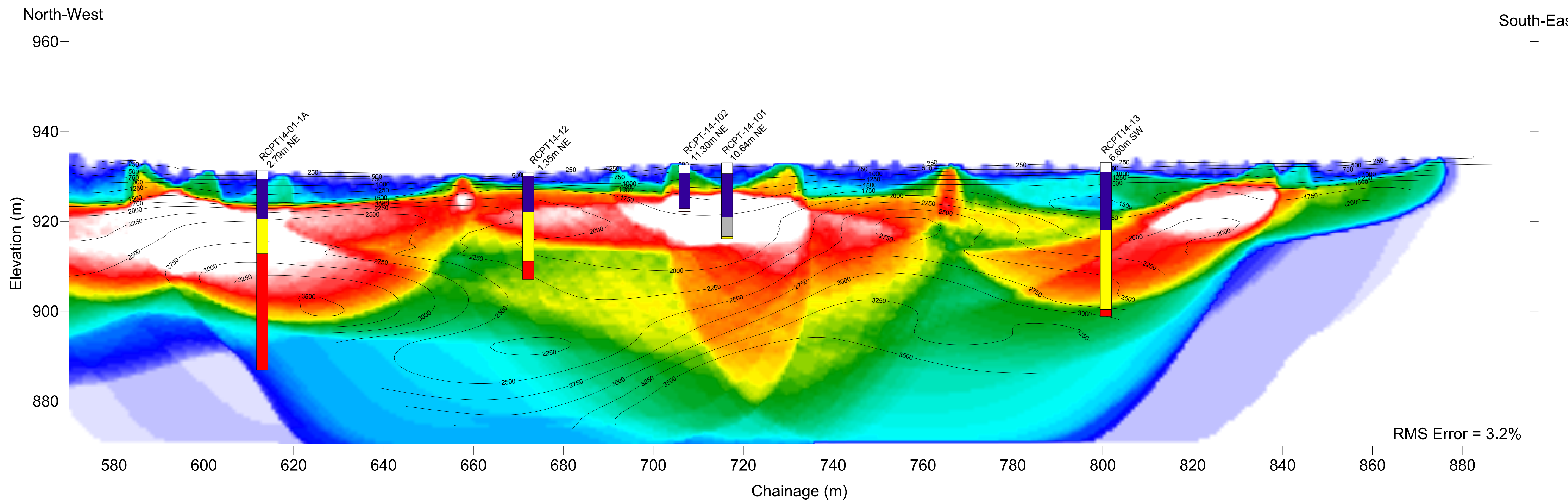
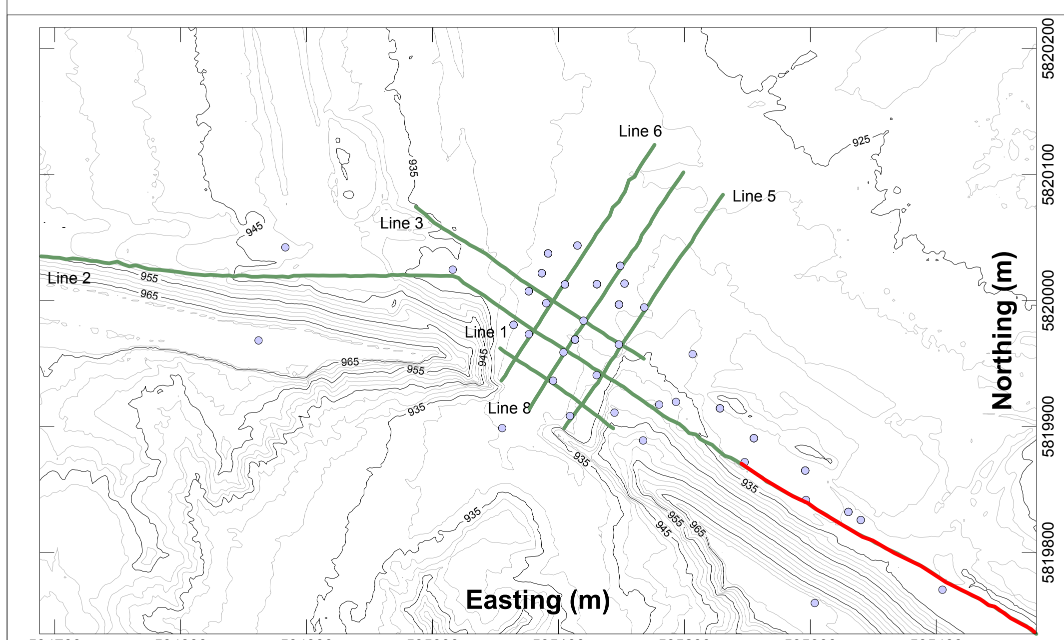




Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary
- Velocity Contour (m/s)

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

Number of Ray-paths

Geophysical Data Review Mount Polley Tailings Dam

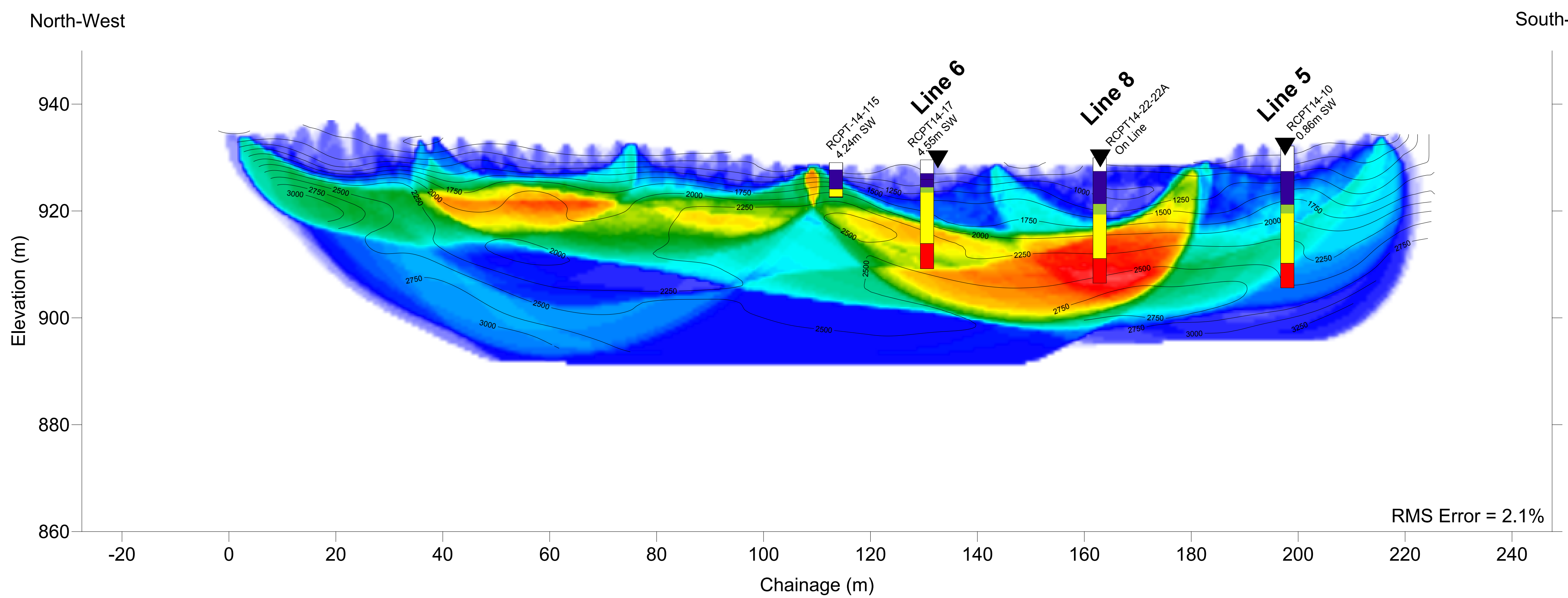
Data Acquired by Frontier Geosciences Inc.

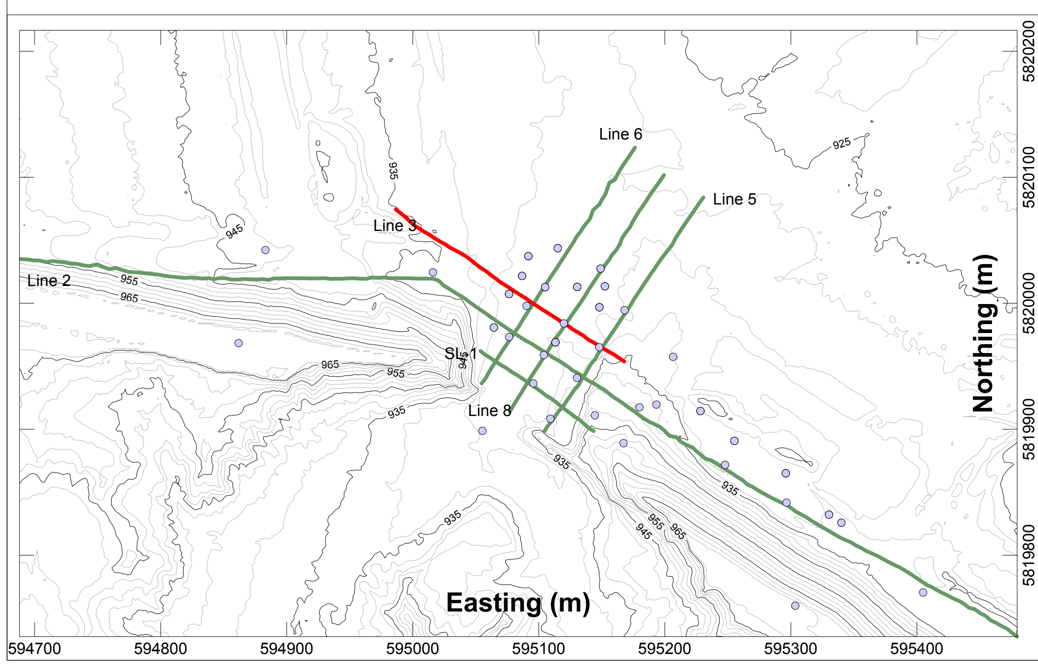
Line 2c
Ray-path Coverage Plot

Figure 4.1.12
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT EXPERT ENGINEERING INVESTIGATION AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary
- Velocity Contour (m/s)

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

Number of Ray-paths

Geophysical Data Review
Mount Polley Tailings Dam

Data Acquired by Frontier Geosciences Inc.

Line 3
Ray-path Coverage Plot

Figure 4.1.13
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
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INVESTIGATION
AND REVIEW PANEL

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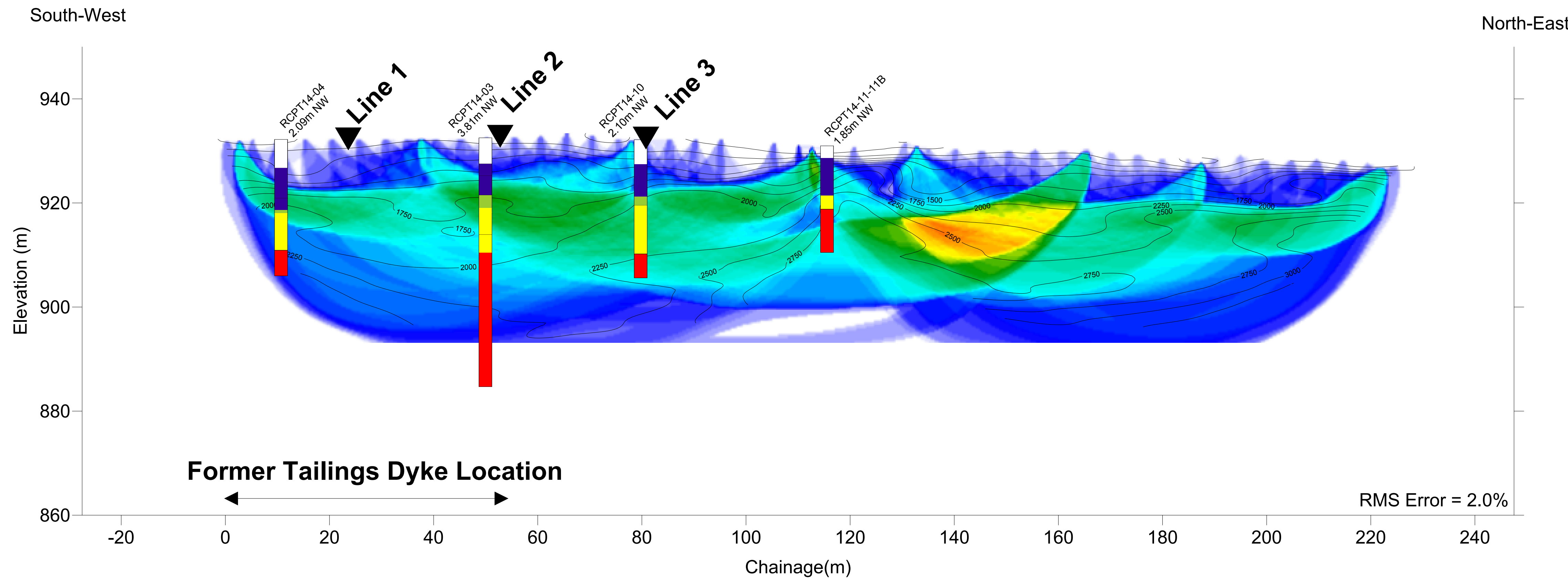
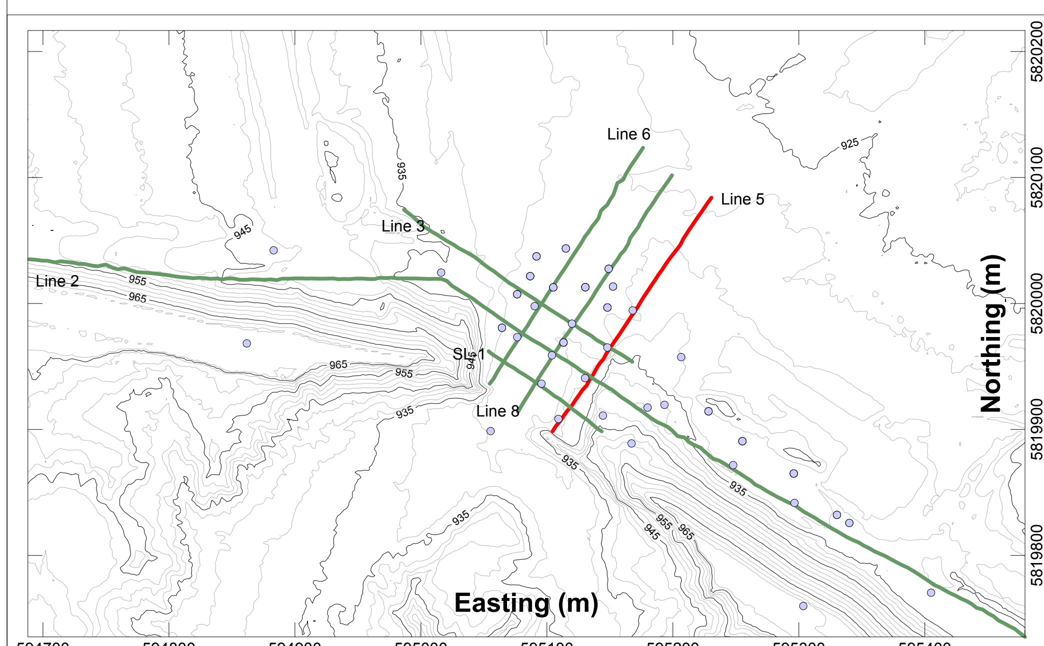




Map Legend

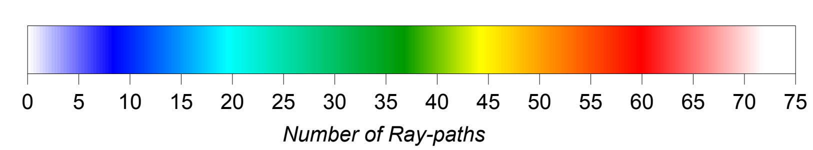
- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary
- Velocity Contour (m/s)

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N



Geophysical Data Review
Mount Polley Tailings Dam

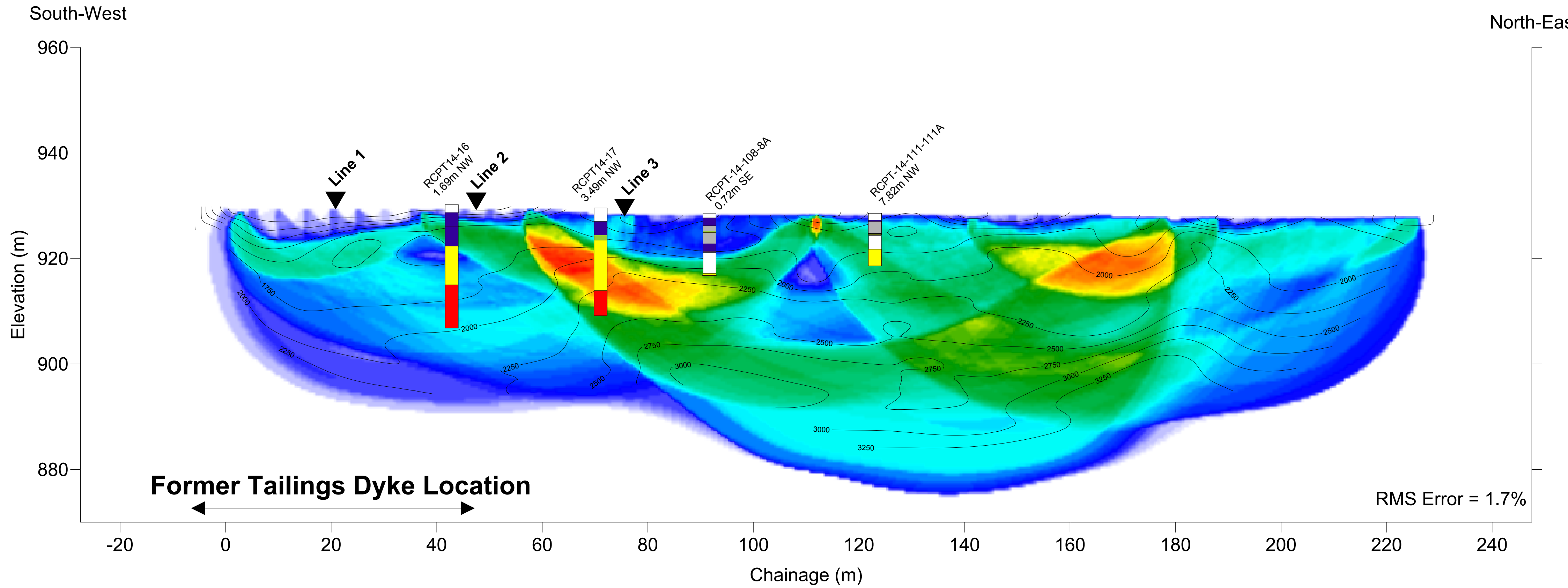
Data Acquired by Frontier Geosciences Inc.

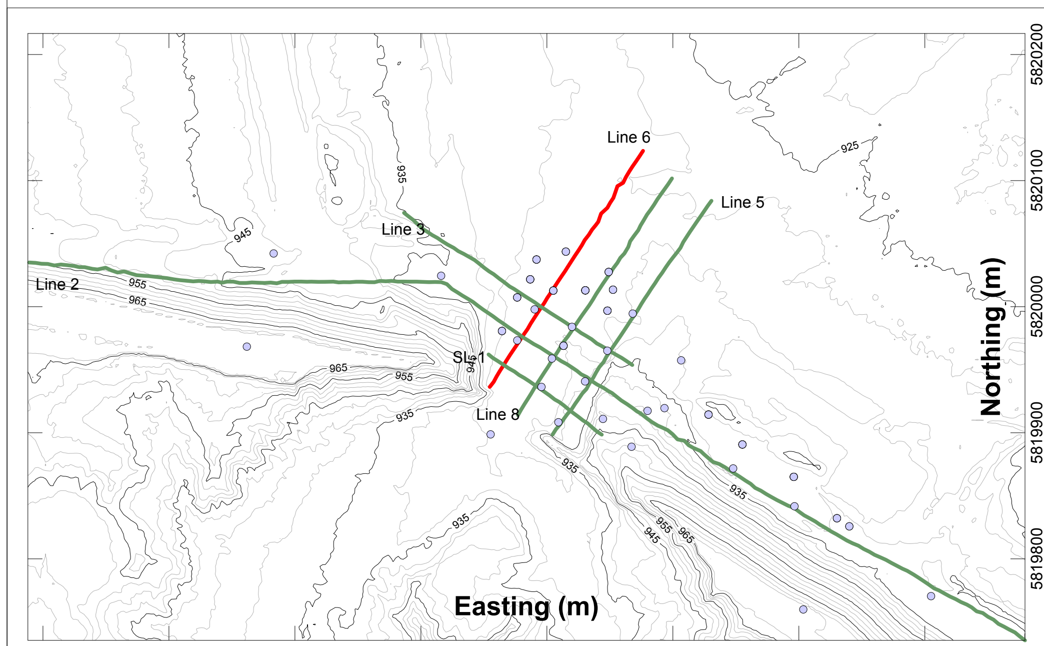
Line 5
Ray-path Coverage Plot

Figure 4.1.14
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary
- Velocity Contour (m/s)

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

Number of Ray-paths

Geophysical Data Review
Mount Polley Tailings Dam

Data Acquired by Frontier Geosciences Inc.

Line 6
Ray-path Coverage Plot

Figure 4.1.15
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

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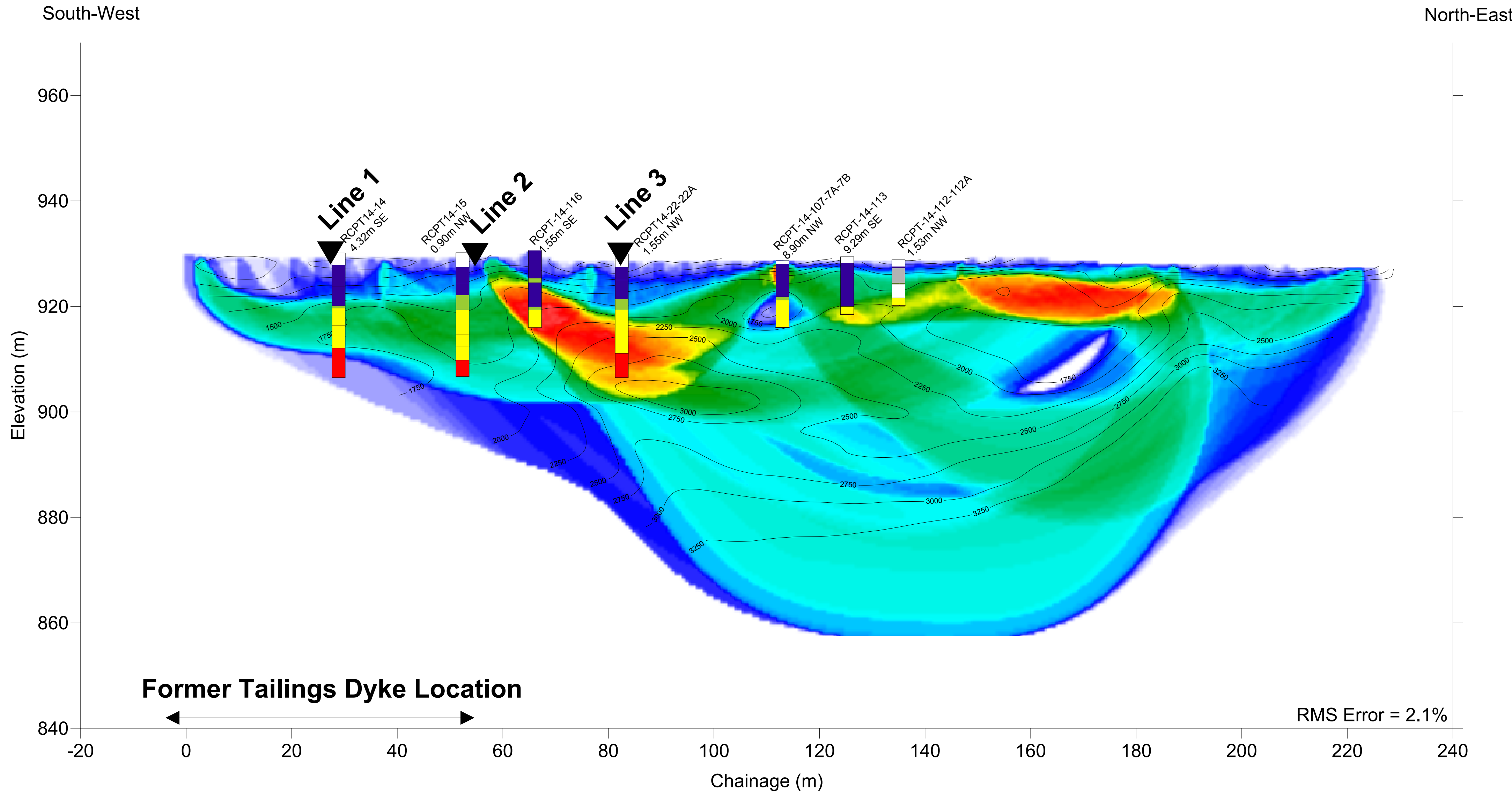

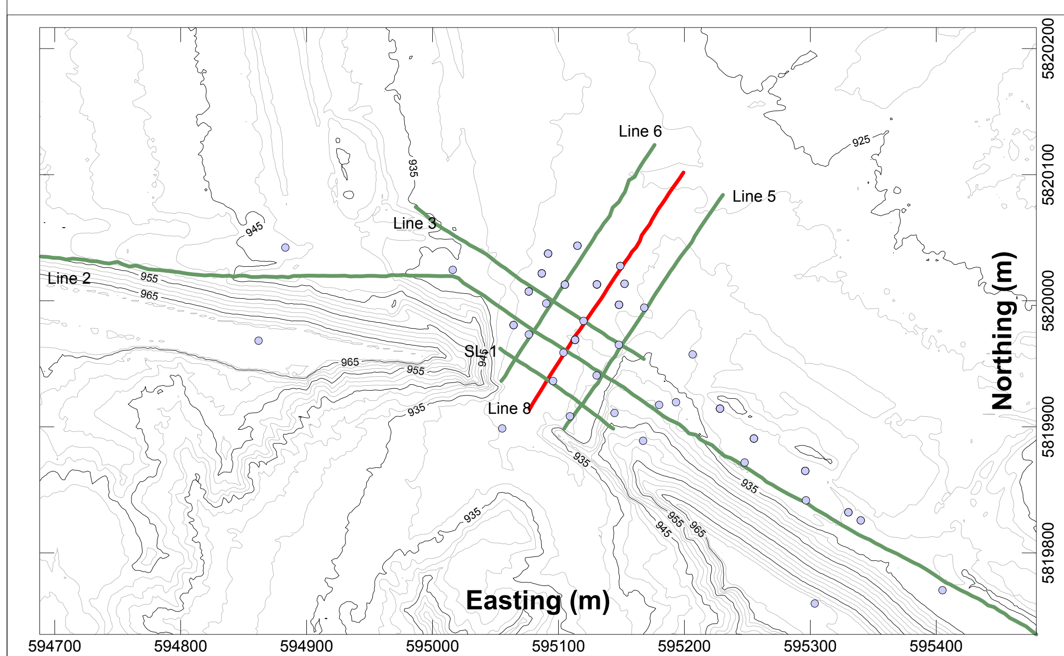

Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary
- Velocity Contour (m/s)

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

Number of Ray-paths

Geophysical Data Review
Mount Polley Tailings Dam

Data Acquired by Frontier Geosciences Inc.

Line 8
Ray-path Coverage Plot

Figure 4.1.16
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

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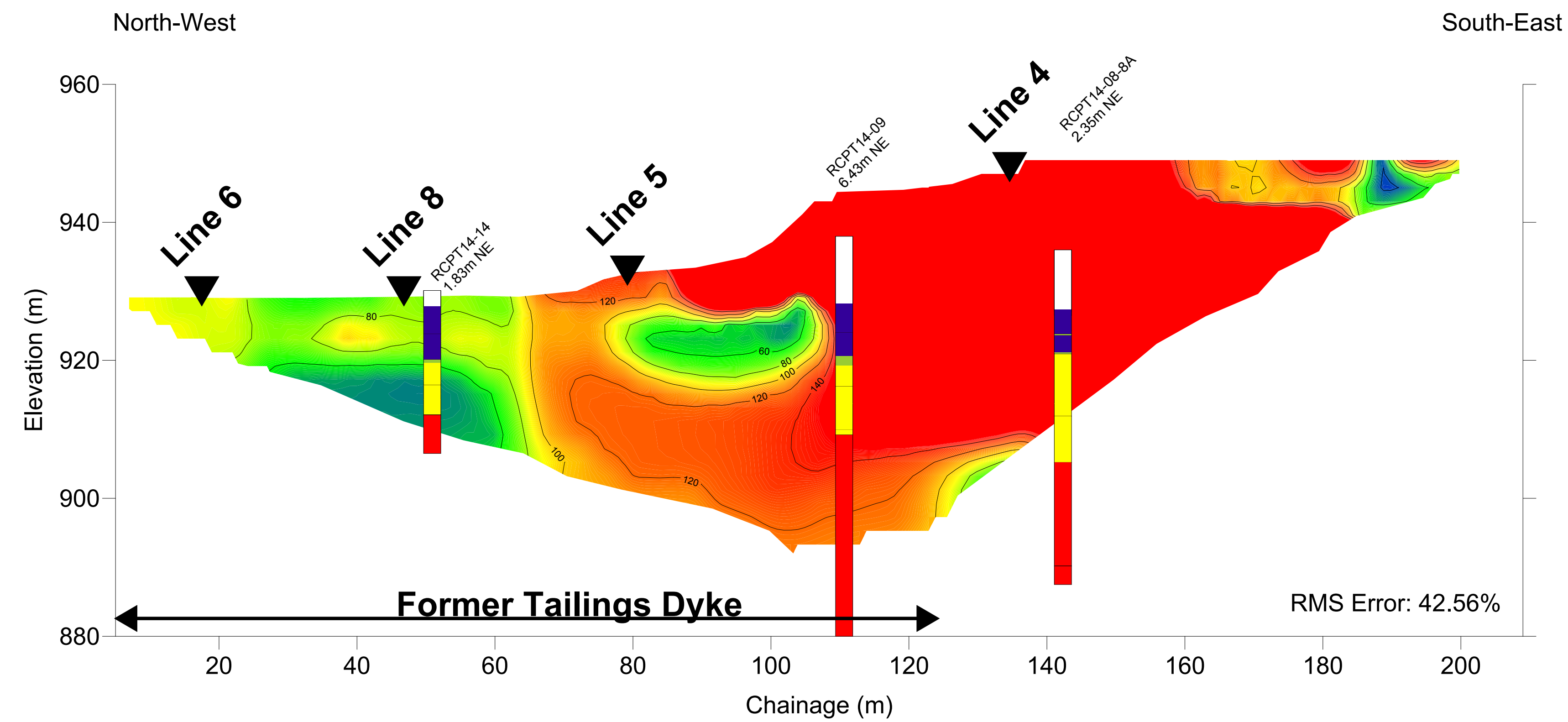
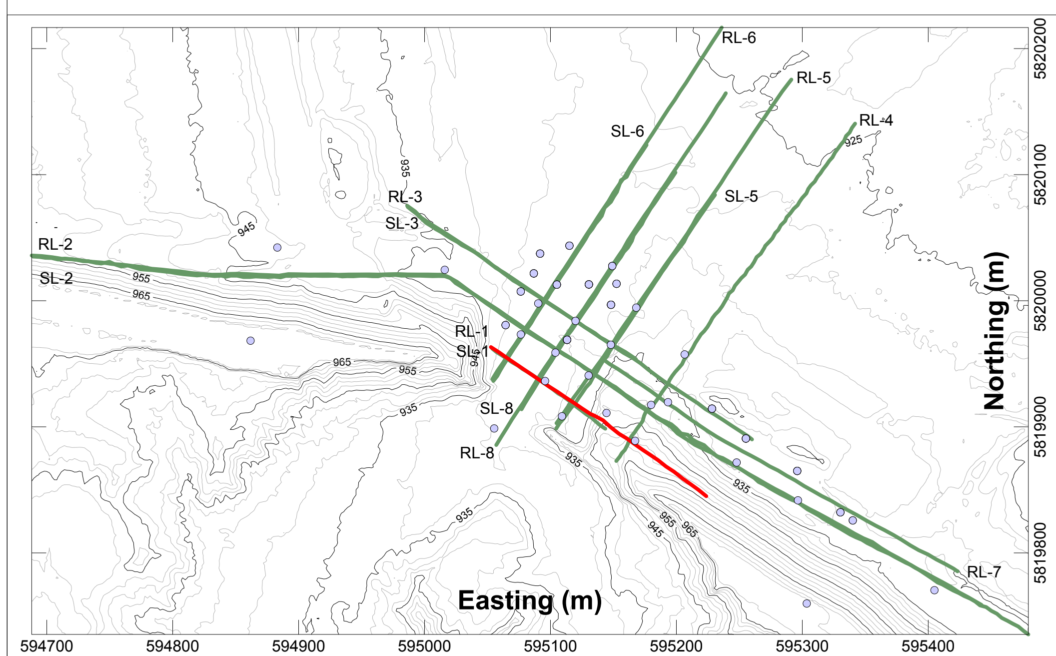




Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive boundary

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

*Resistivity (Ohm*m)*

Geophysical Data Review
Mount Polley Tailings Dam

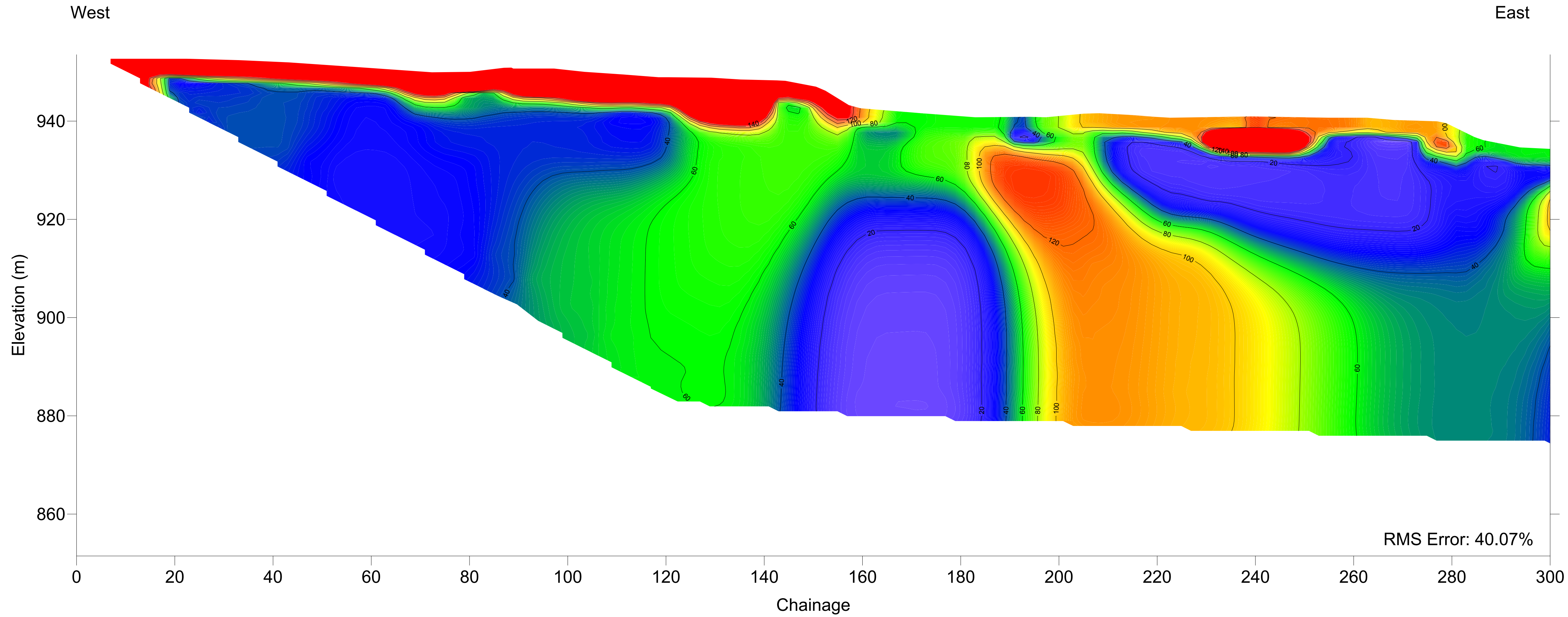
Data Aquired by Frontier Geosciences Inc.

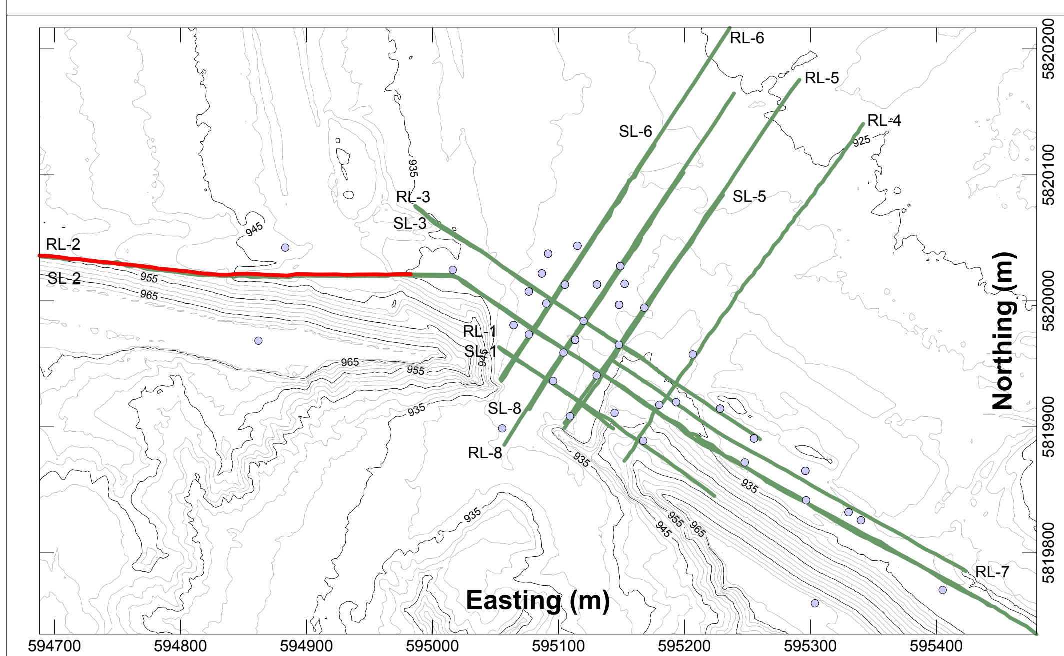
Line 1
Resistivity Inversion

Figure 5.2.1
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive boundary

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

*Resistivity (Ohm*m)*

Geophysical Data Review
Mount Polley Tailings Dam

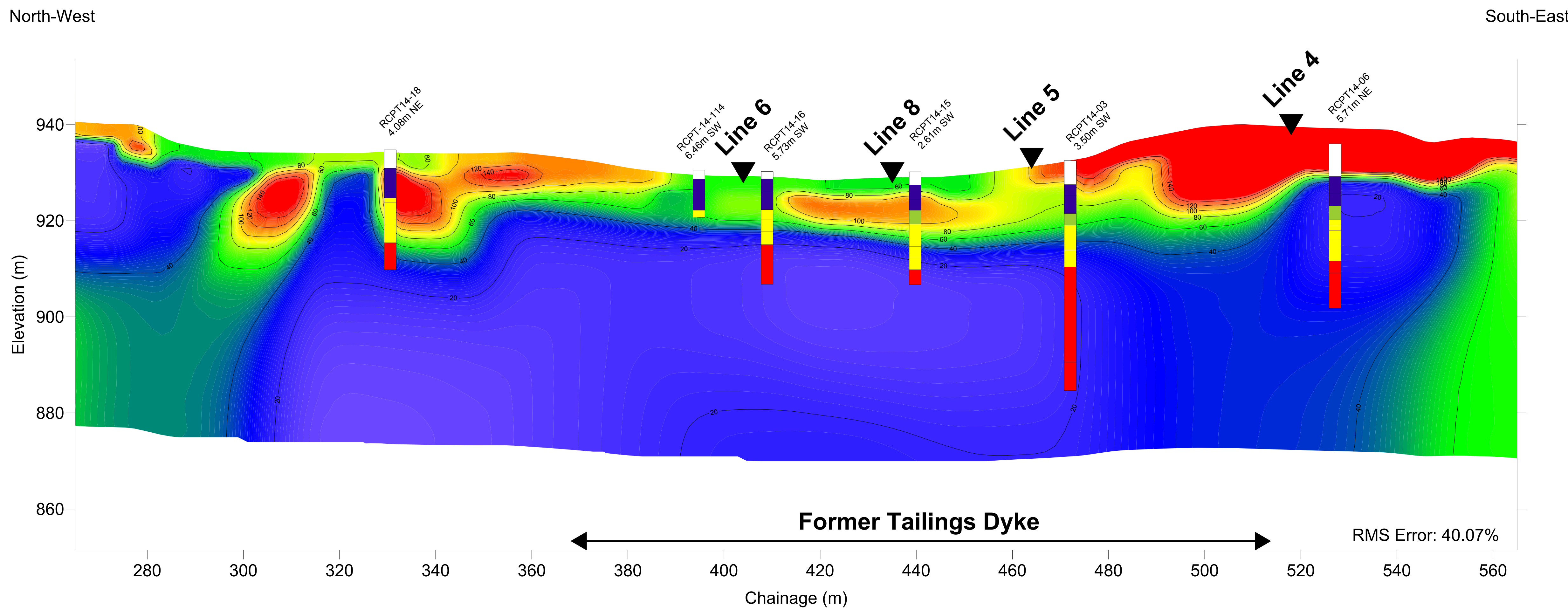
Data Aquired by Frontier Geosciences Inc.

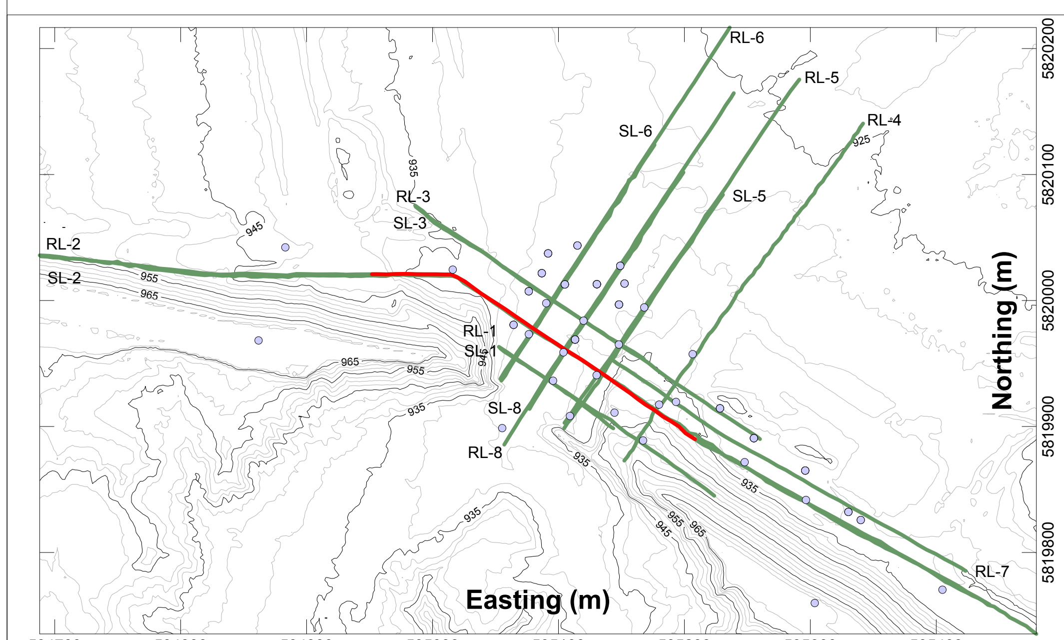
Line 2 part 1
Resistivity Inversion

Figure 5.2.2
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive boundary

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

*Resistivity (Ohm*m)*

Geophysical Data Review
Mount Polley Tailings Dam

Data Aquired by Frontier Geosciences Inc.

Line 2 part 2
Resistivity Inversion

Figure 5.2.3
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
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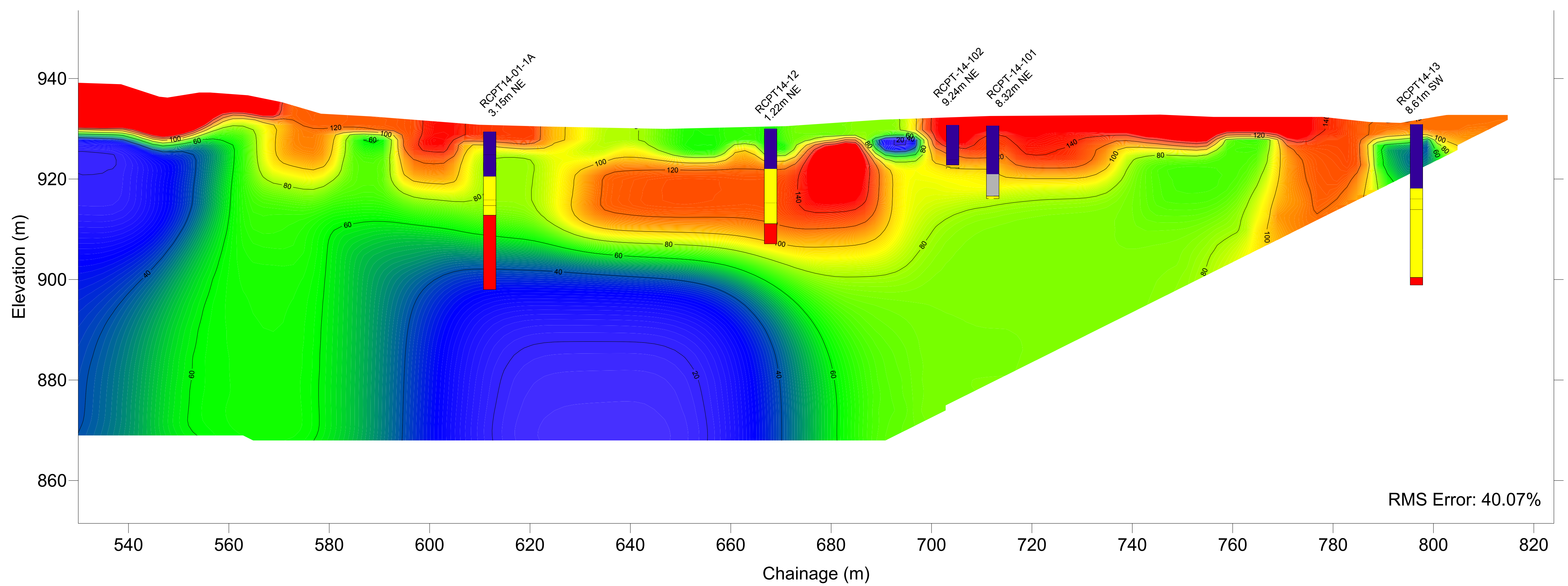
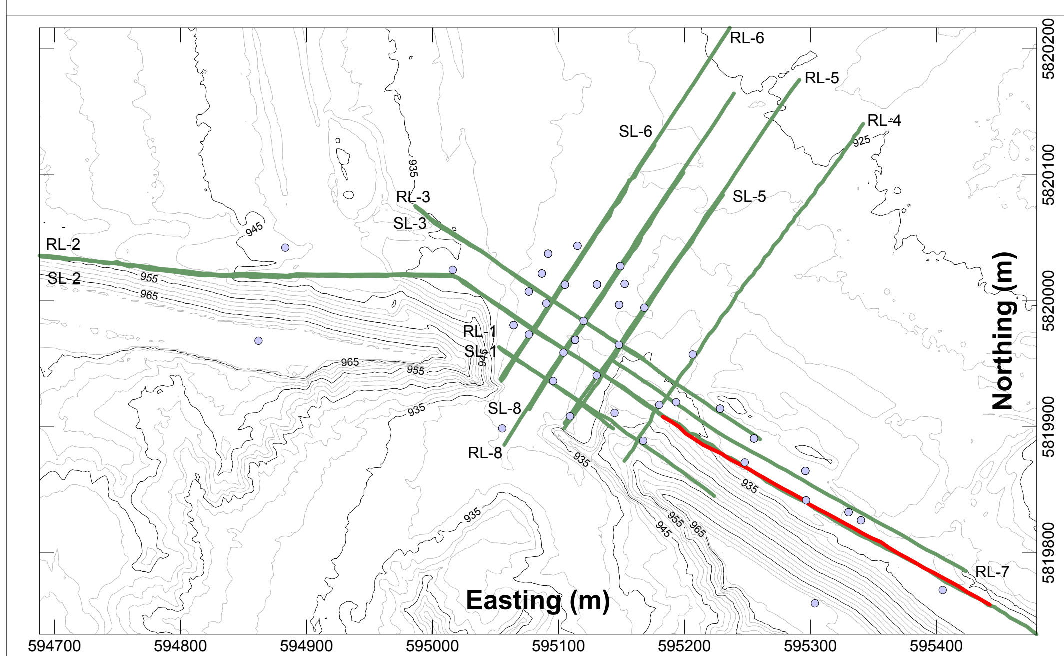
North-West

South-East





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive boundary

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

*Resistivity (Ohm*m)*

Geophysical Data Review
Mount Polley Tailings Dam

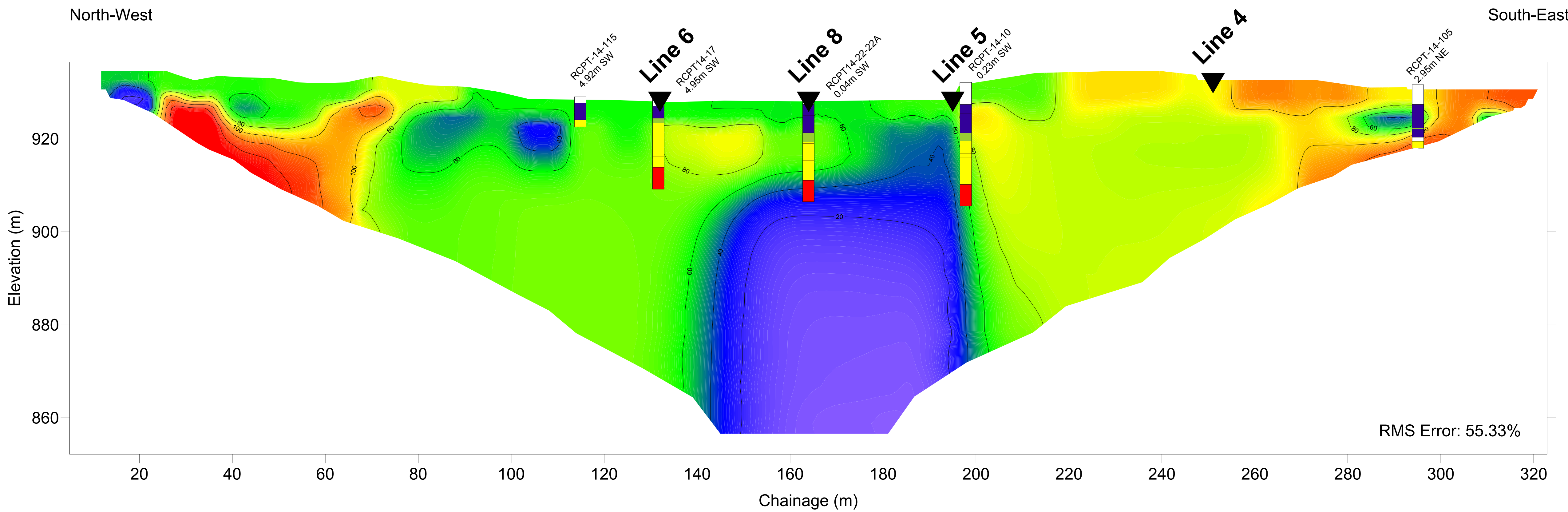
Data Aquired by Frontier Geosciences Inc.

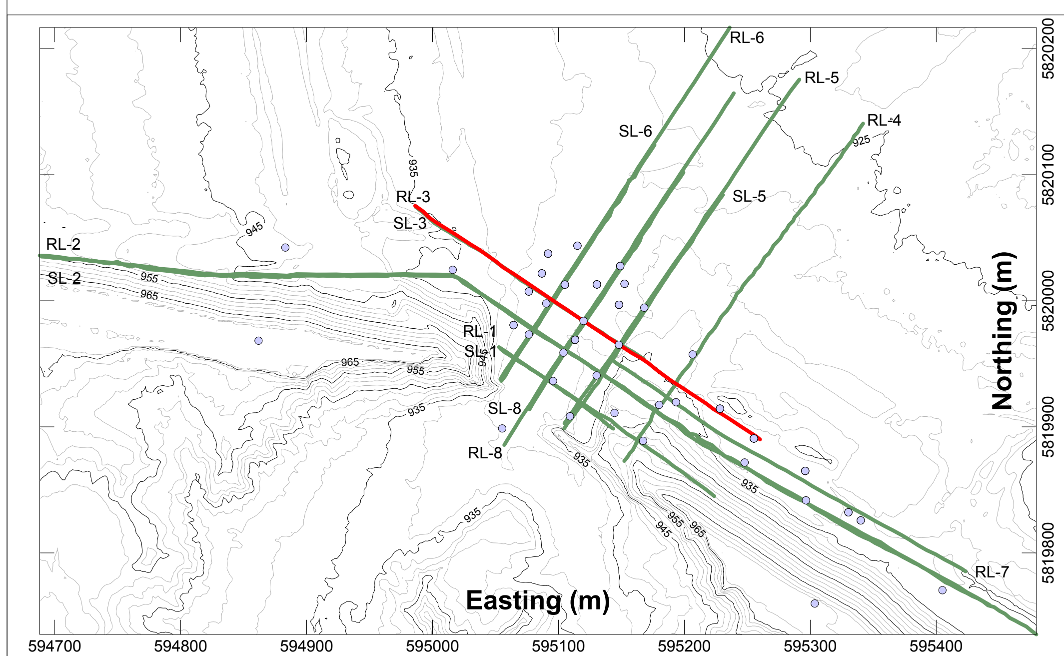
Line 2 part 3
Resistivity Inversion

Figure 5.2.4
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive boundary

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

*Resistivity (Ohm*m)*

Geophysical Data Review Mount Polley Tailings Dam

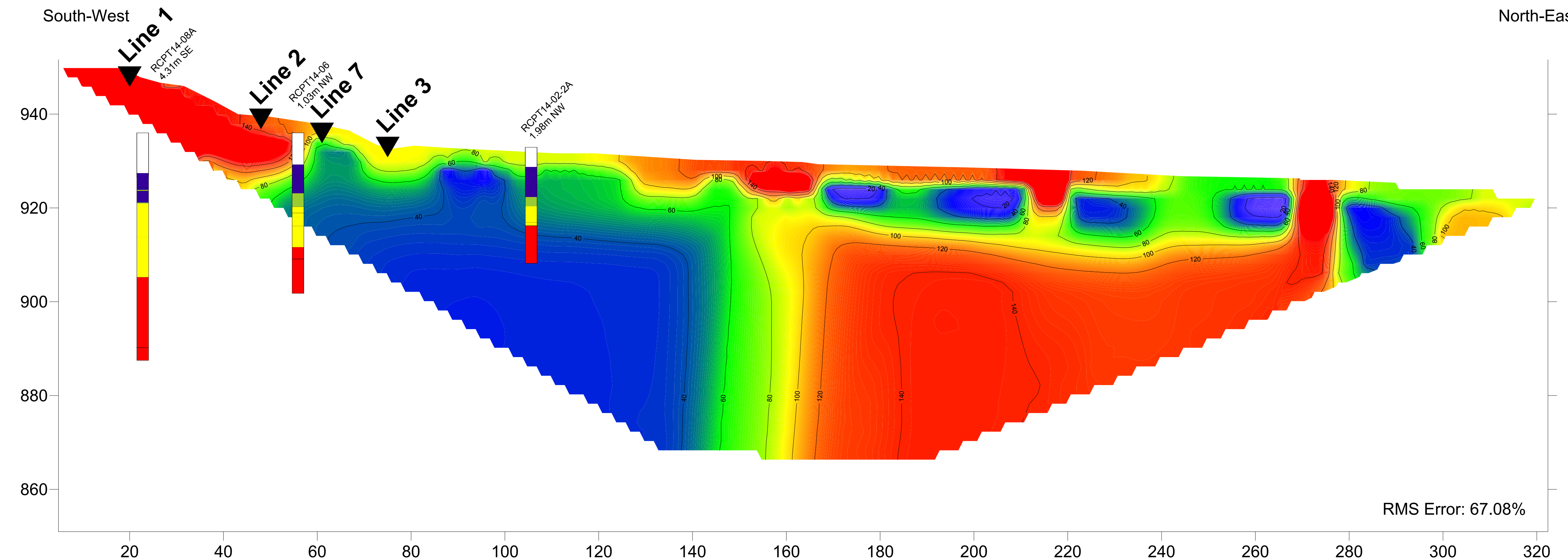
Data Aquired by Frontier Geosciences Inc.

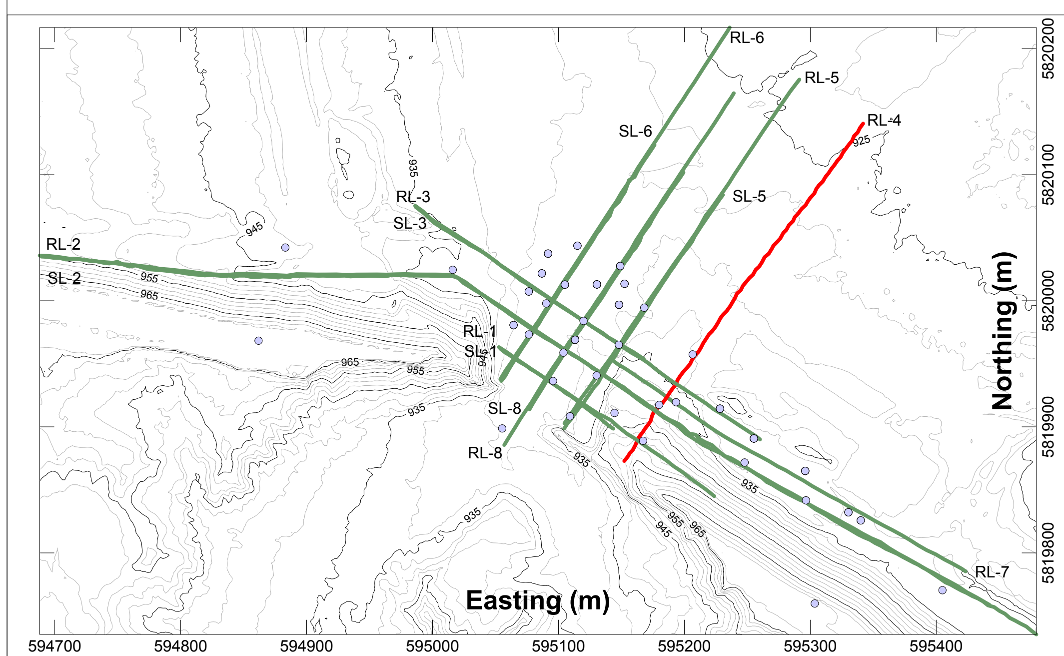
Line 3
Resistivity Inversion

Figure 5.2.5
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT EXPERT ENGINEERING INVESTIGATION AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive boundary

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

Resistivity (ohm-m)

Geophysical Data Review
Mount Polley Tailings Dam

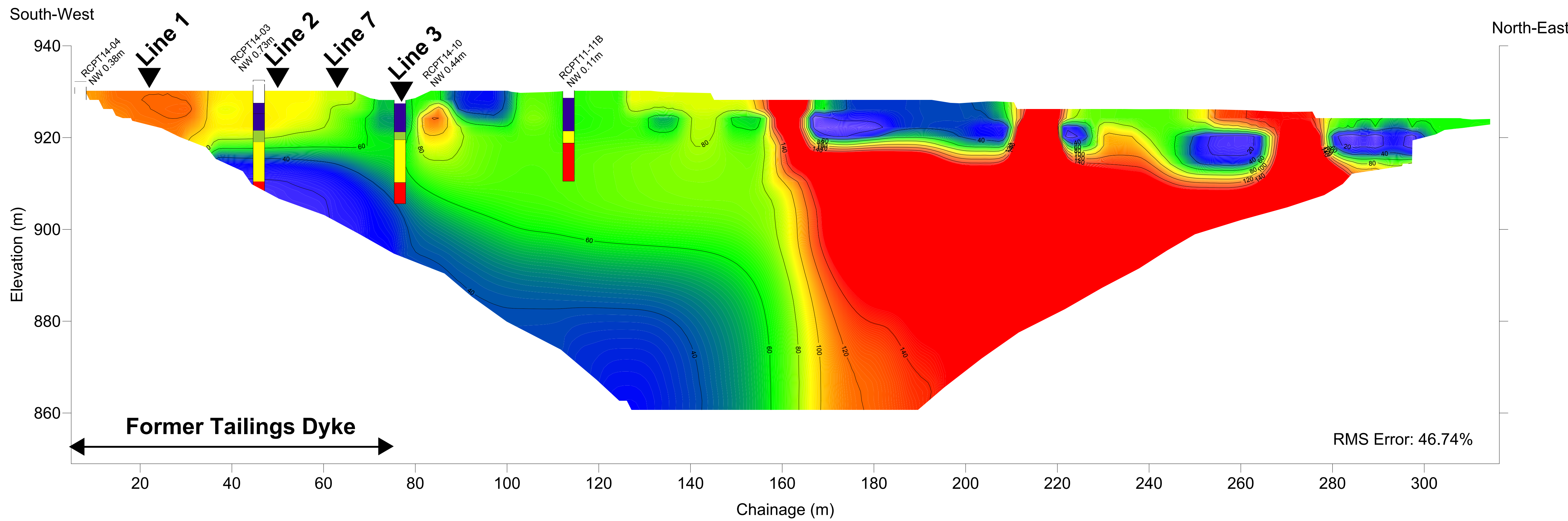
Data Aquired by Frontier Geosciences Inc.

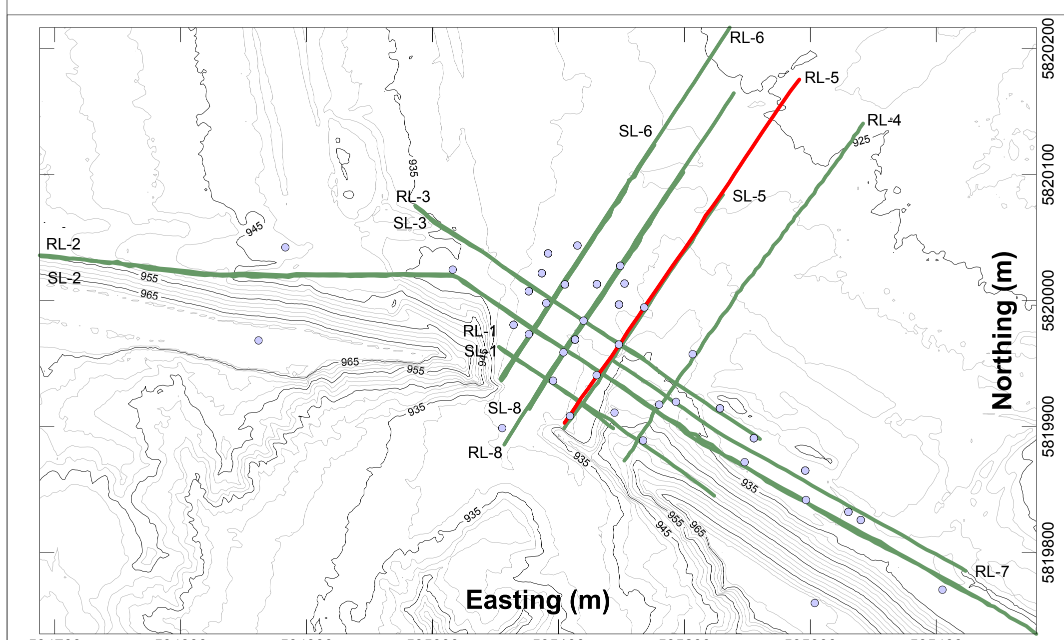
Line 4
Resistivity Inversion

Figure 5.2.6
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive Boundary

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

Resistivity (ohm-m)

Geophysical Data Review
Mount Polley Tailings Dam

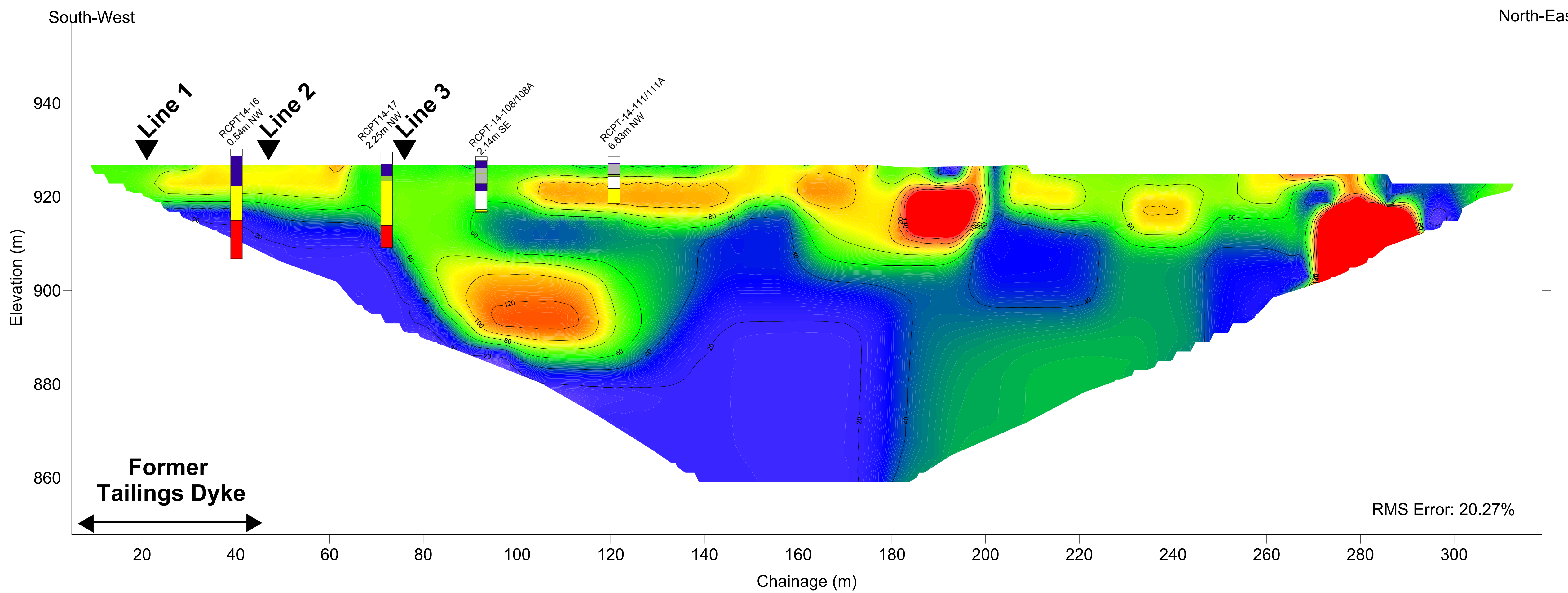
Data Aquired by Frontier Geosciences Inc.

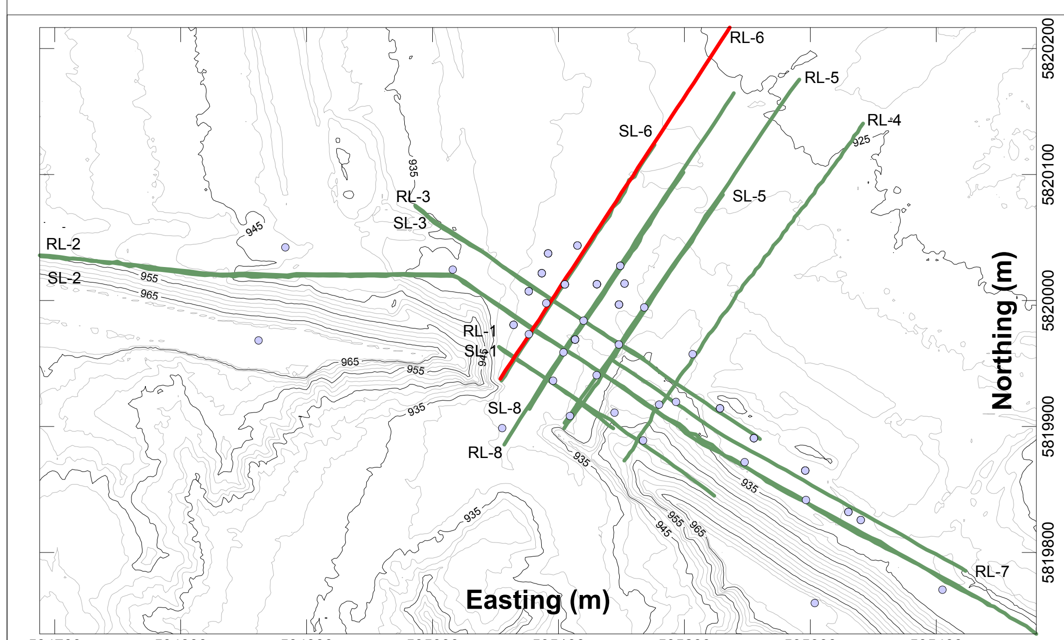
Line 5
Resistivity Inversion

Figure 5.2.7
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive boundary

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

Resistivity (ohm-m)

Geophysical Data Review
Mount Polley Tailings Dam

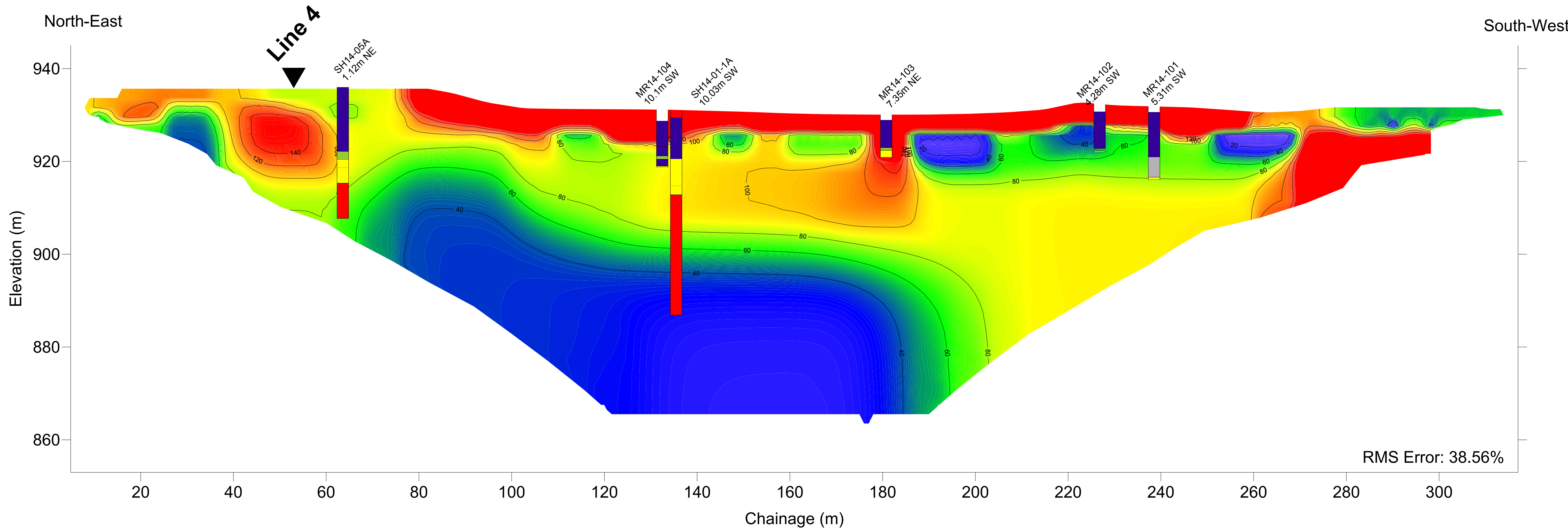
Data Aquired by Frontier Geosciences Inc.

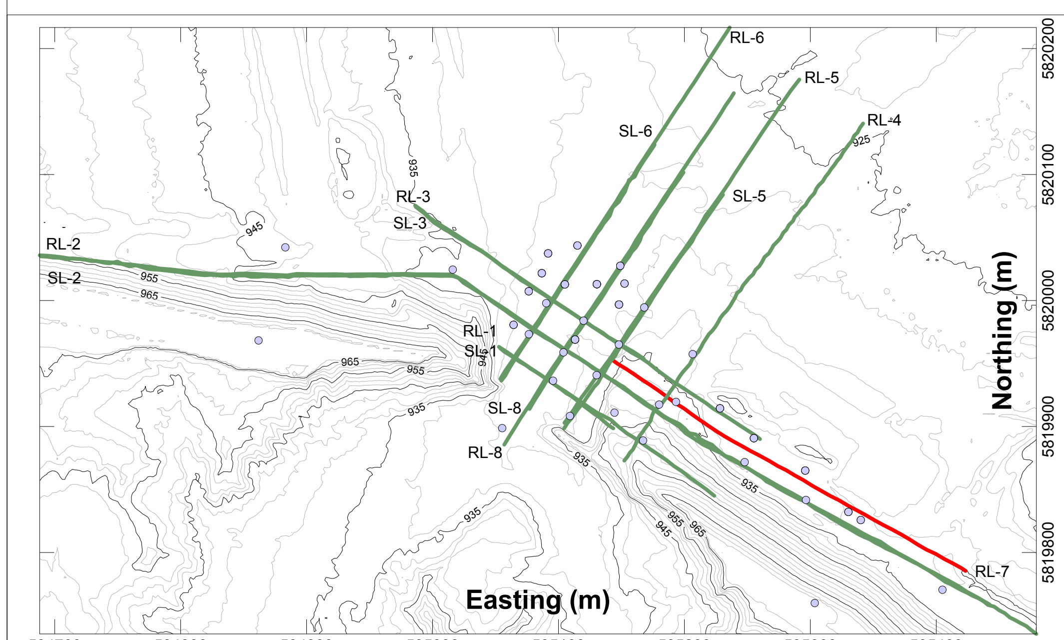
Line 6
Resistivity Inversion

Figure 5.2.8
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive boundary

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

*Resistivity (ohm*m)*

Geophysical Data Review
Mount Polley Tailings Dam

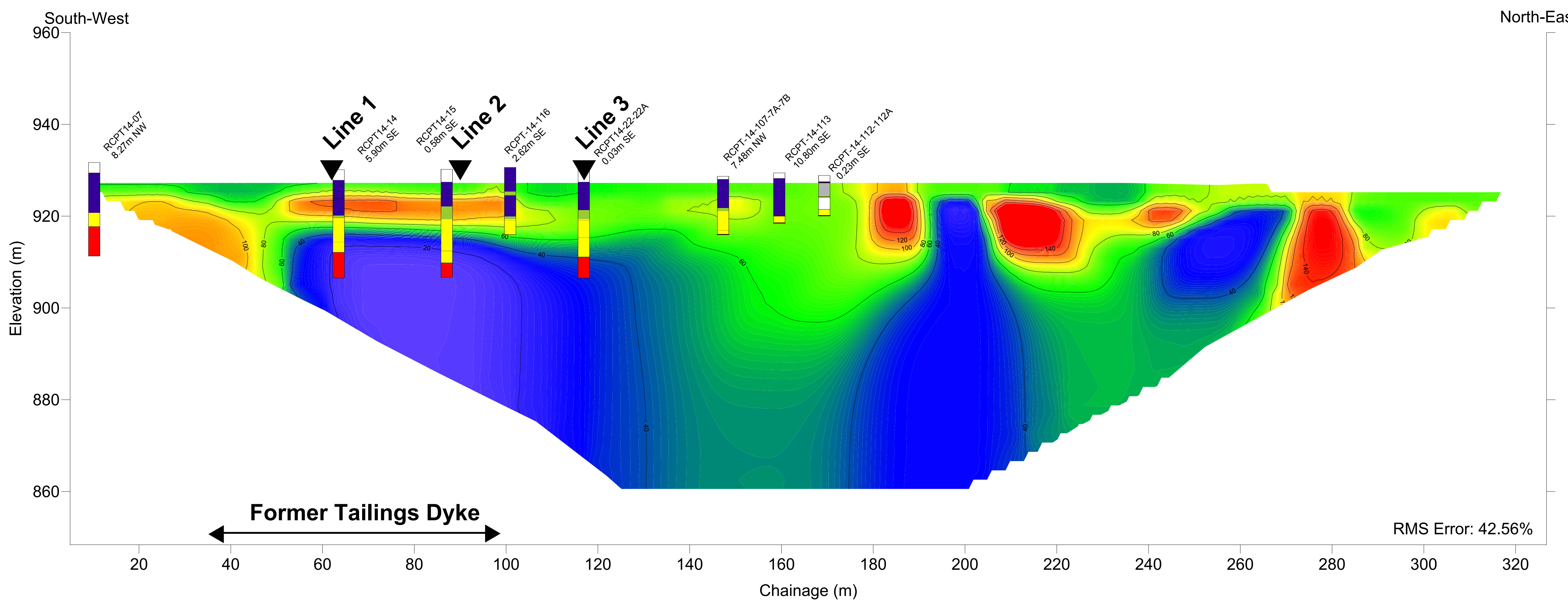
Data Aquired by Frontier Geosciences Inc.

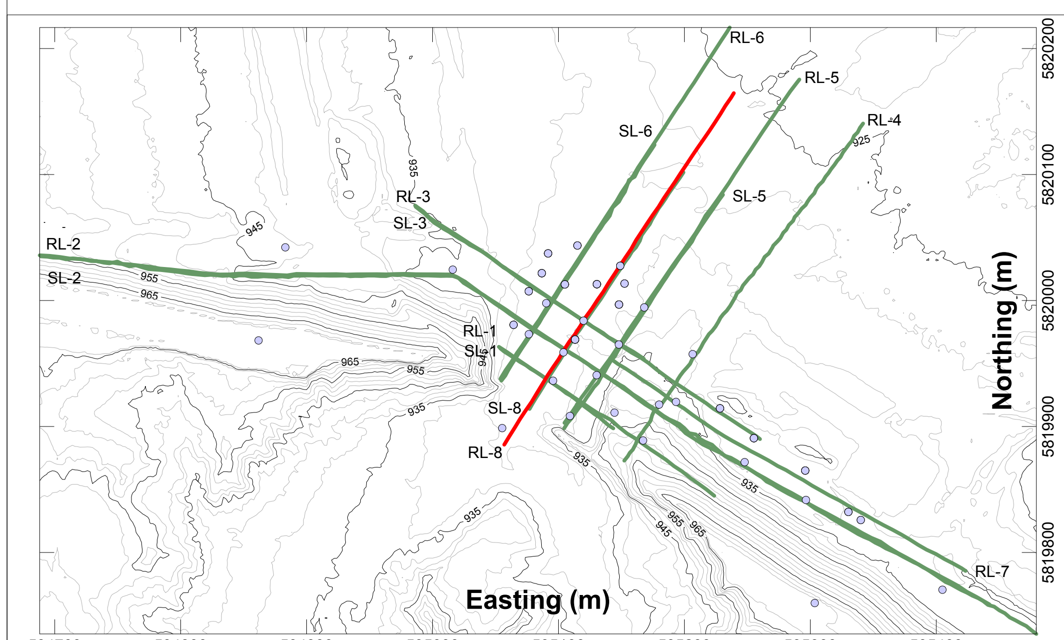
Line 7
Resistivity Inversion

Figure 5.2.9
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

DMT Geosciences





Map Legend

- Drill Site
- Survey Line
- Cross Section Line

Cross Section Legend

- Upper Till
- Upper Glaciolacustrine
- Lower Till
- Possible Very Weak Bedrock
- Inconclusive
- No Data
- Inconclusive boundary

0m 25m 50m 75m 100m

1000:1 Scale - Datum: NAD83 - Projection UTM Zone 10N

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

*Resistivity (ohm*m)*

Geophysical Data Review
Mount Polley Tailings Dam

Data Aquired by Frontier Geosciences Inc.

Line 8
Resistivity Inversion

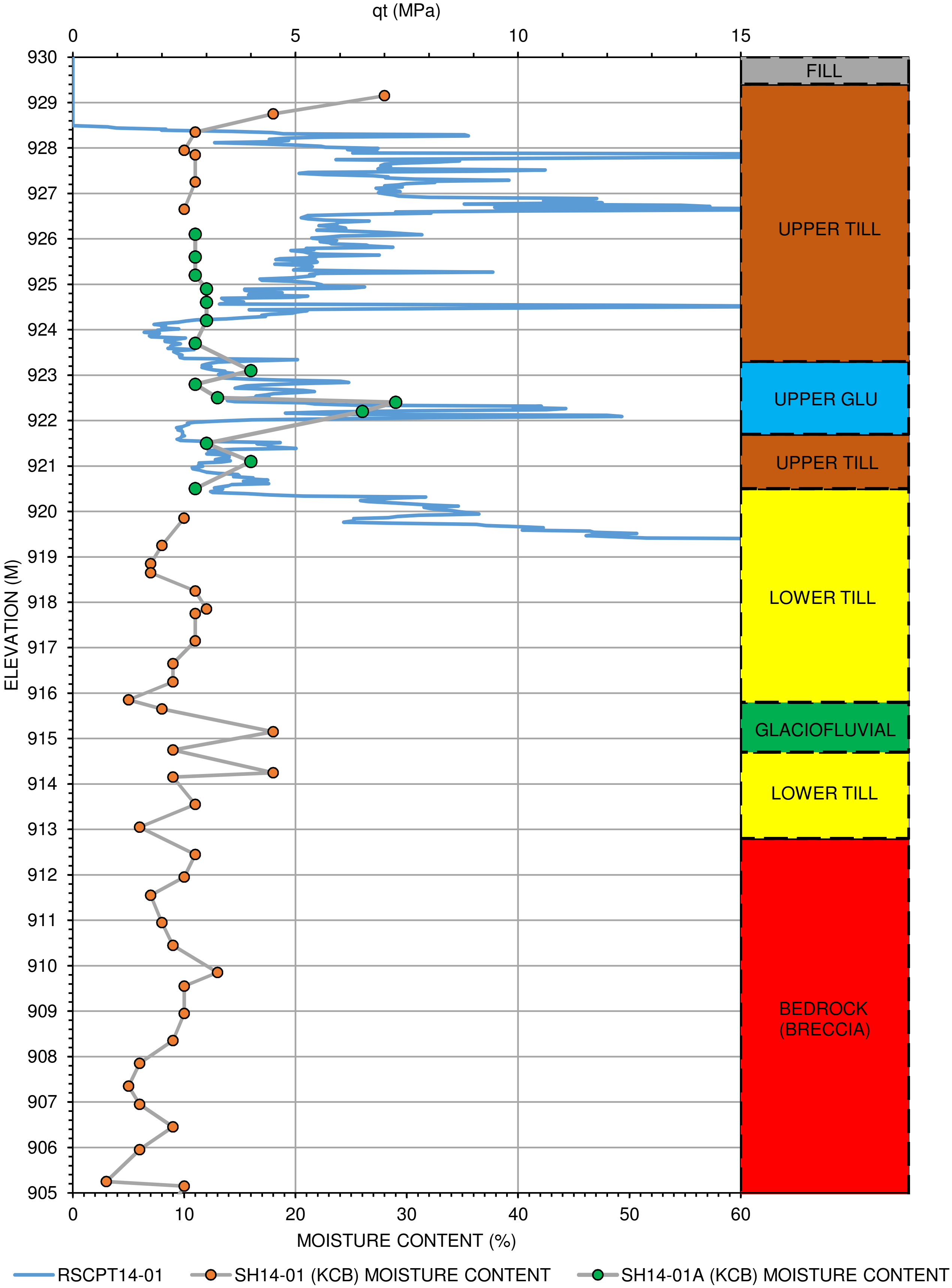
Figure 5.2.10
Project: CGAA.262
Date: December 2014

MOUNT POLLEY INDEPENDENT
EXPERT ENGINEERING
INVESTIGATION
AND REVIEW PANEL

DMT Geosciences

Appendix D
Attachment 9
CPT Tip Resistance and Moisture Content Comparison

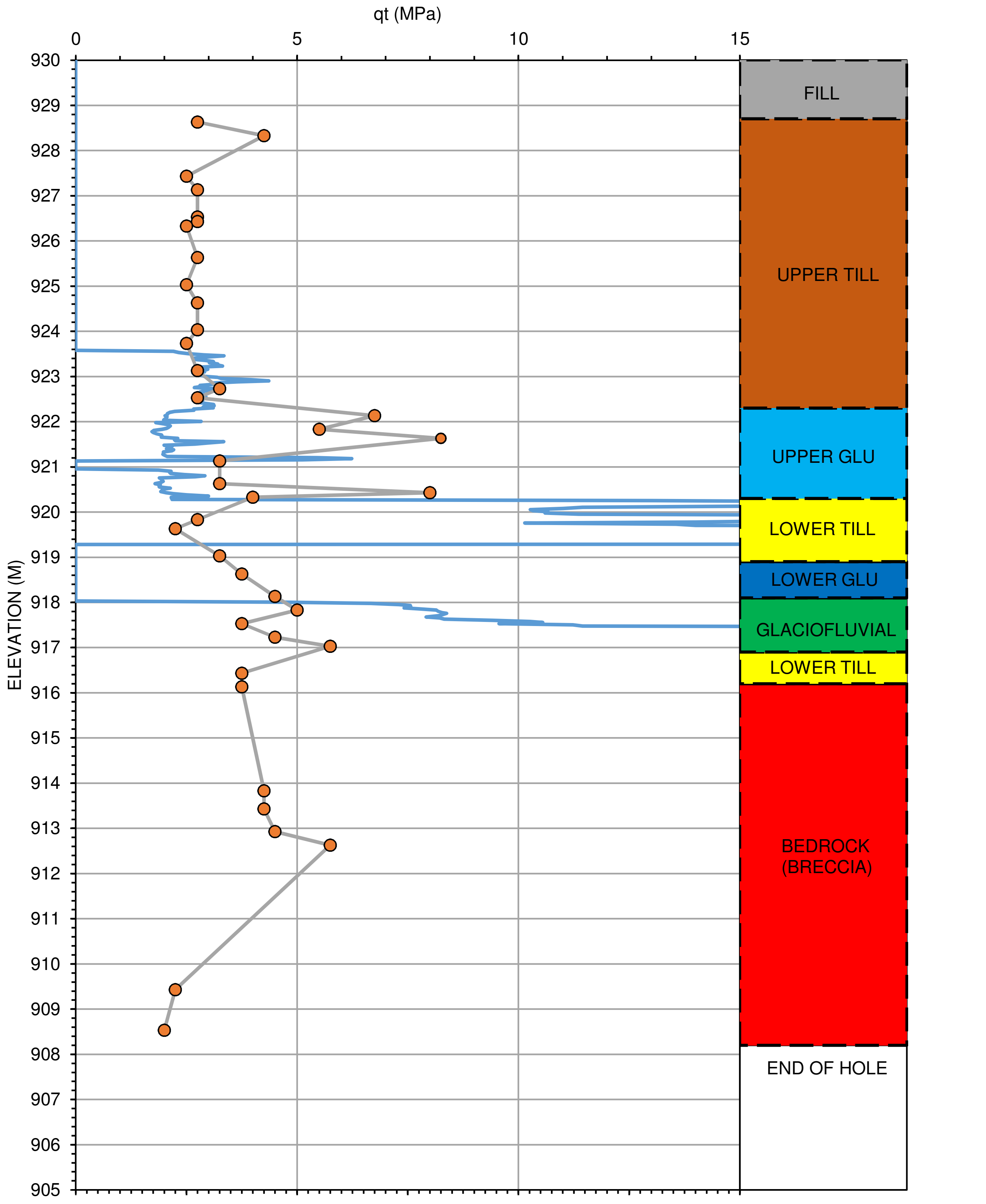
RSCPT14-01, SH14-01 AND SH14-01A



Date: January 7, 2015

Compiled by: D. MA
Approved by: D. VAN ZYL

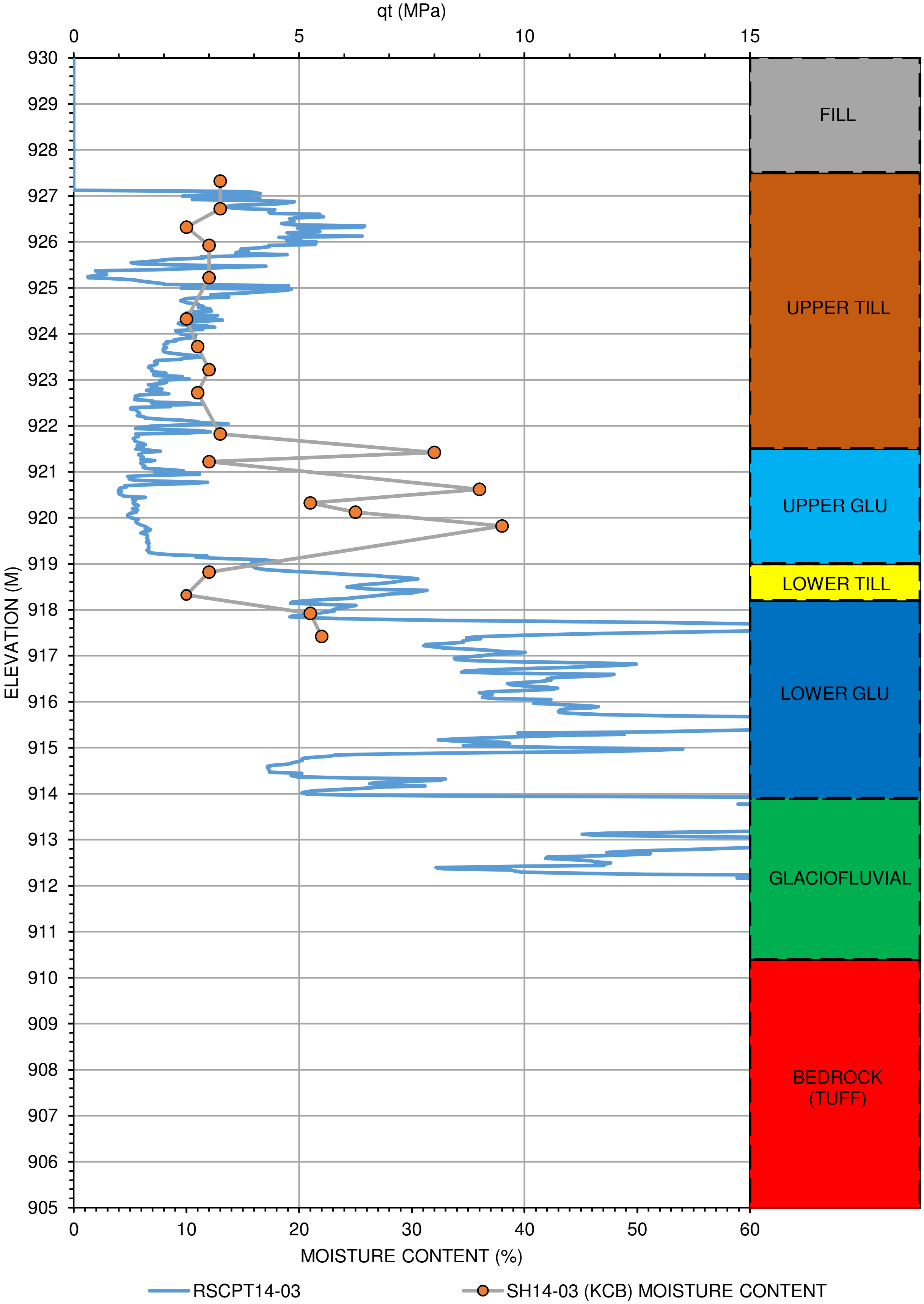
RSCPT14-02 AND SH14-02A



Date: January 7, 2015

Compiled by: D. MA
Approved by: D. VAN ZYL

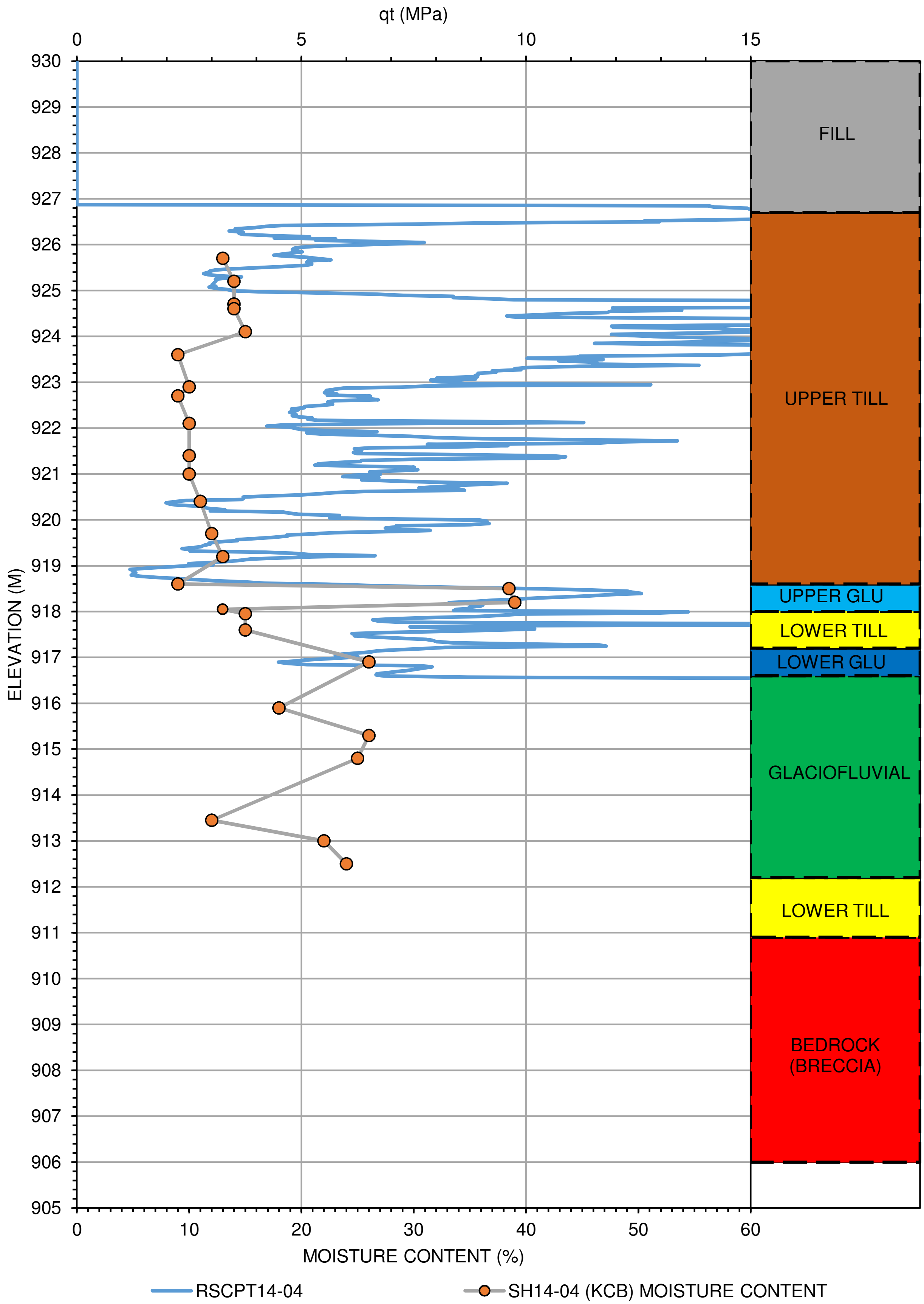
RSCPT14-03 AND SH14-03



Date: January 7, 2015

Compiled by: D. MA
Approved by: D. VAN ZYL

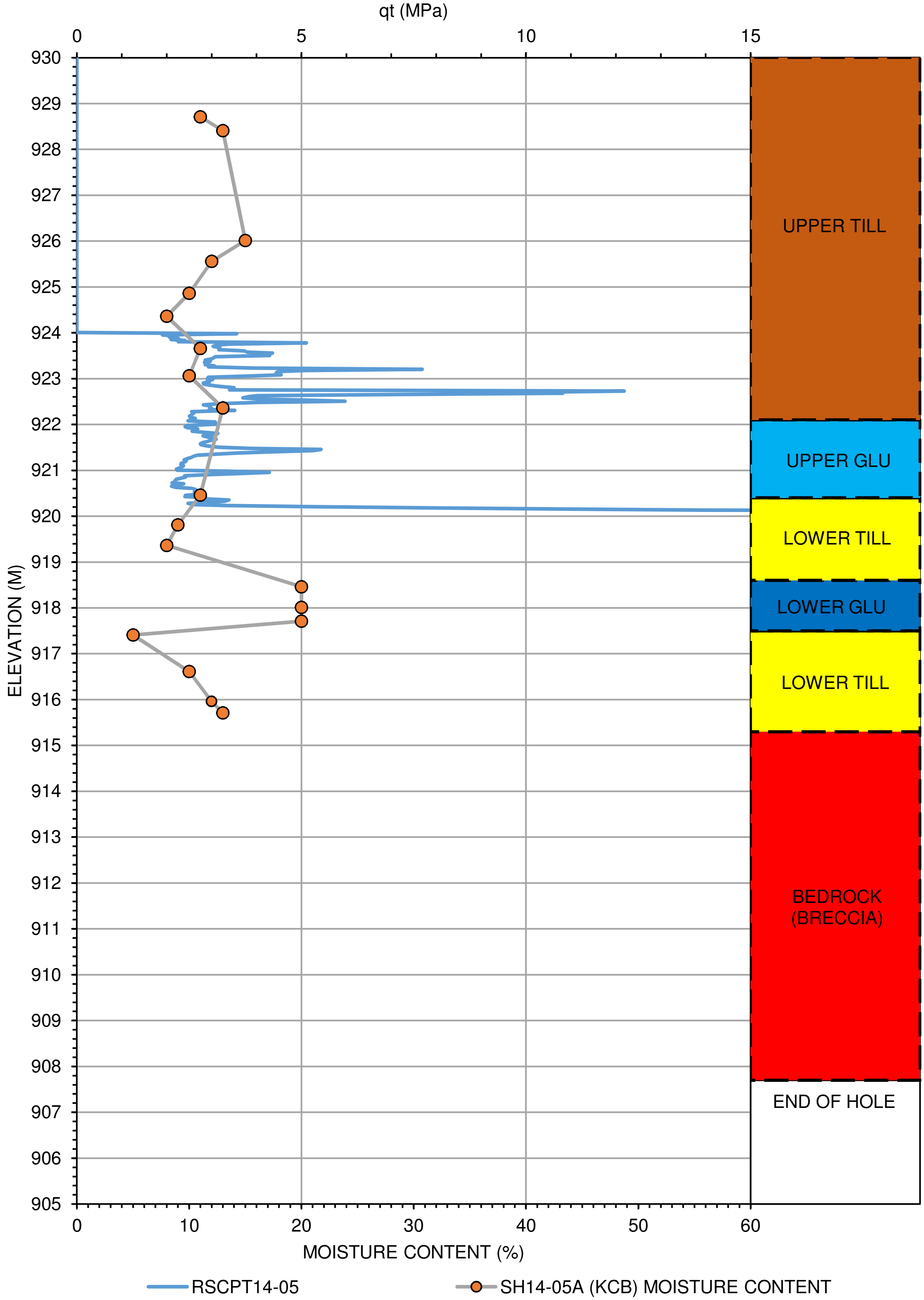
RSCPT14-04 AND SH14-04



Date: January 7, 2015

Compiled by: D. MA
Approved by: D. VAN ZYL

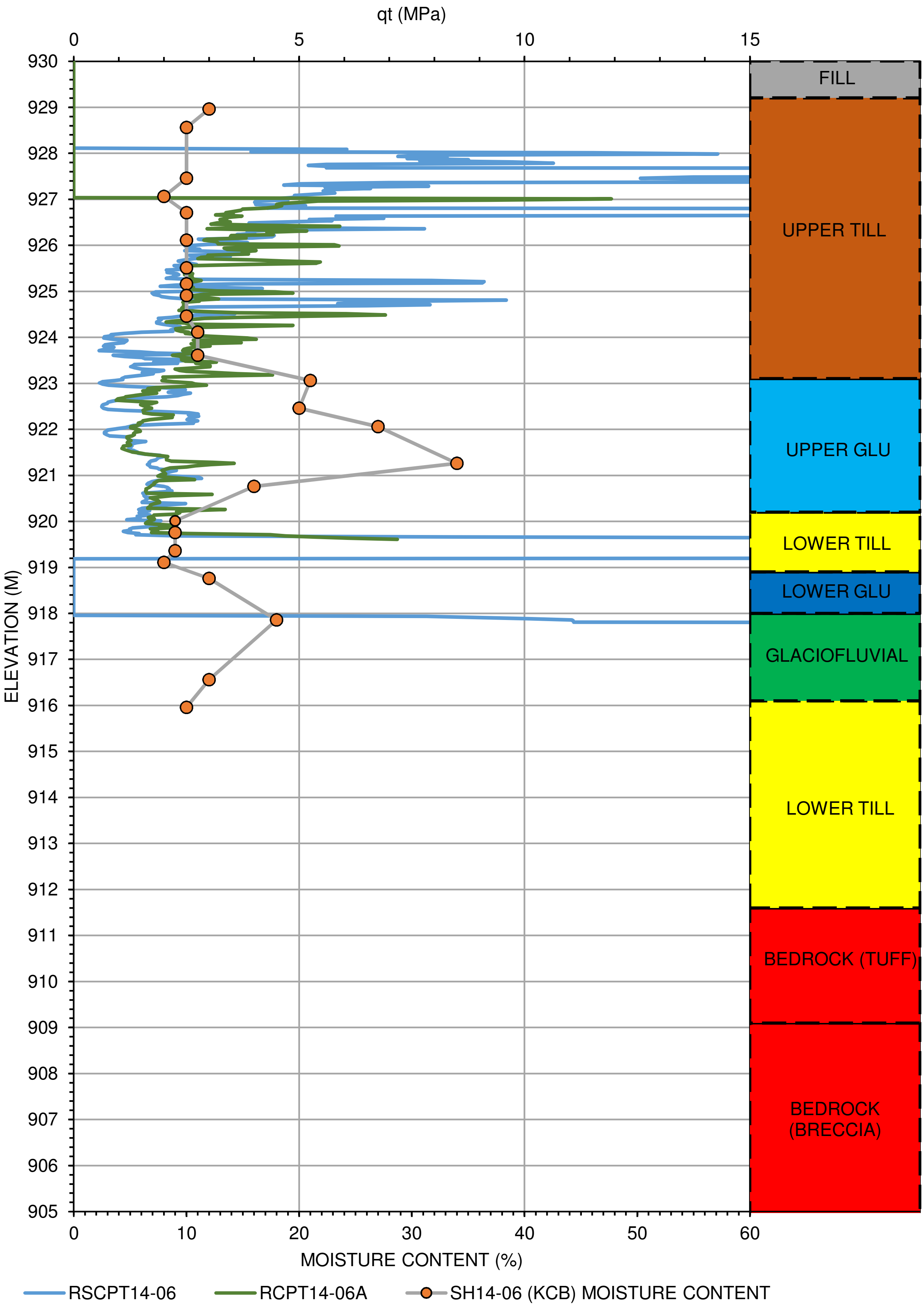
RSCPT14-05 AND SH14-05A



Date: January 7, 2015

Compiled by: D. MA
Approved by: D. VAN ZYL

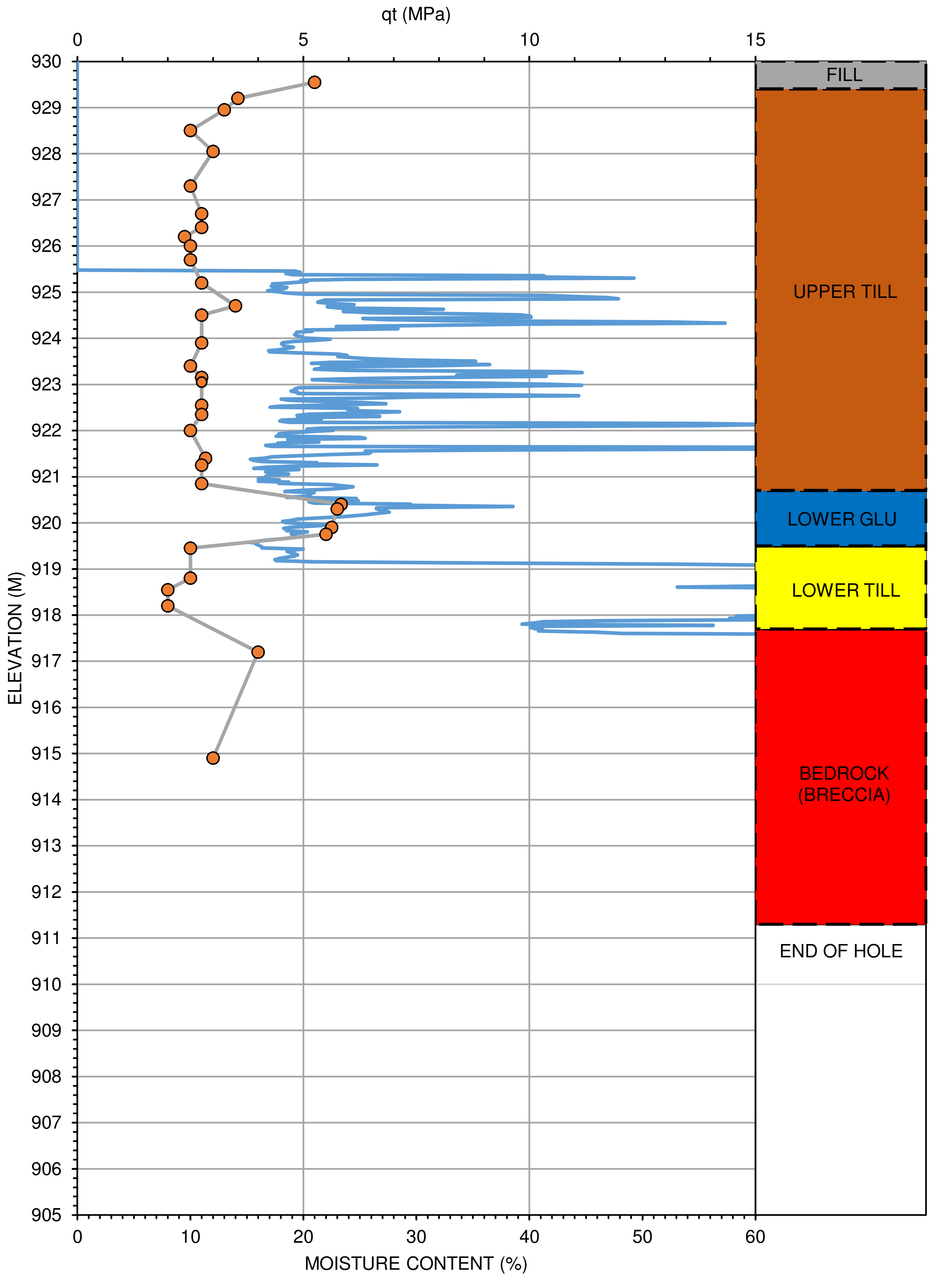
RSCPT14-06, RCPT14-06A AND SH14-06



Date: January 7, 2015

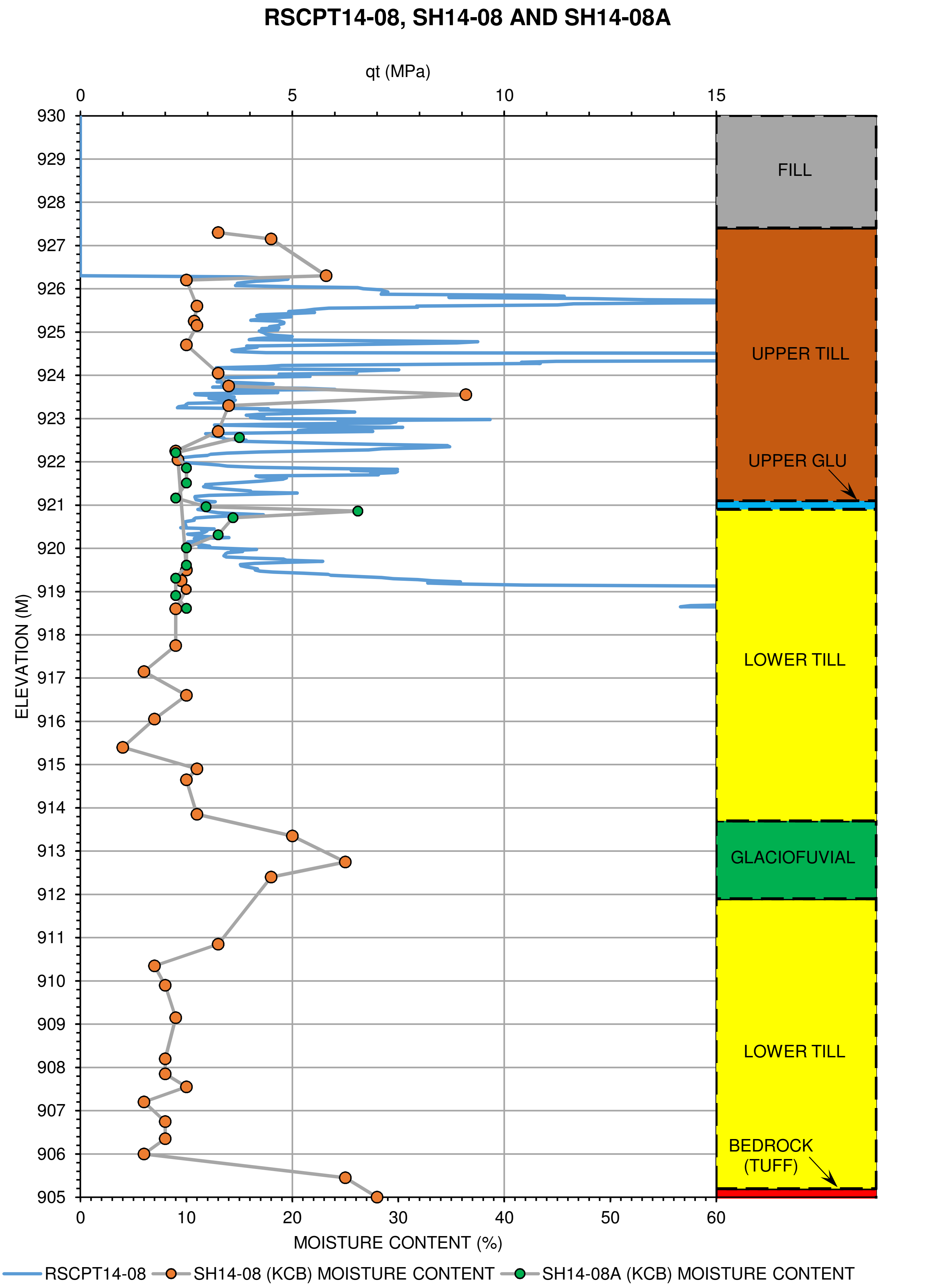
Compiled by: D. MA
Approved by: D. VAN ZYL

RSCPT14-07 AND SH14-07



Date: January 7, 2015

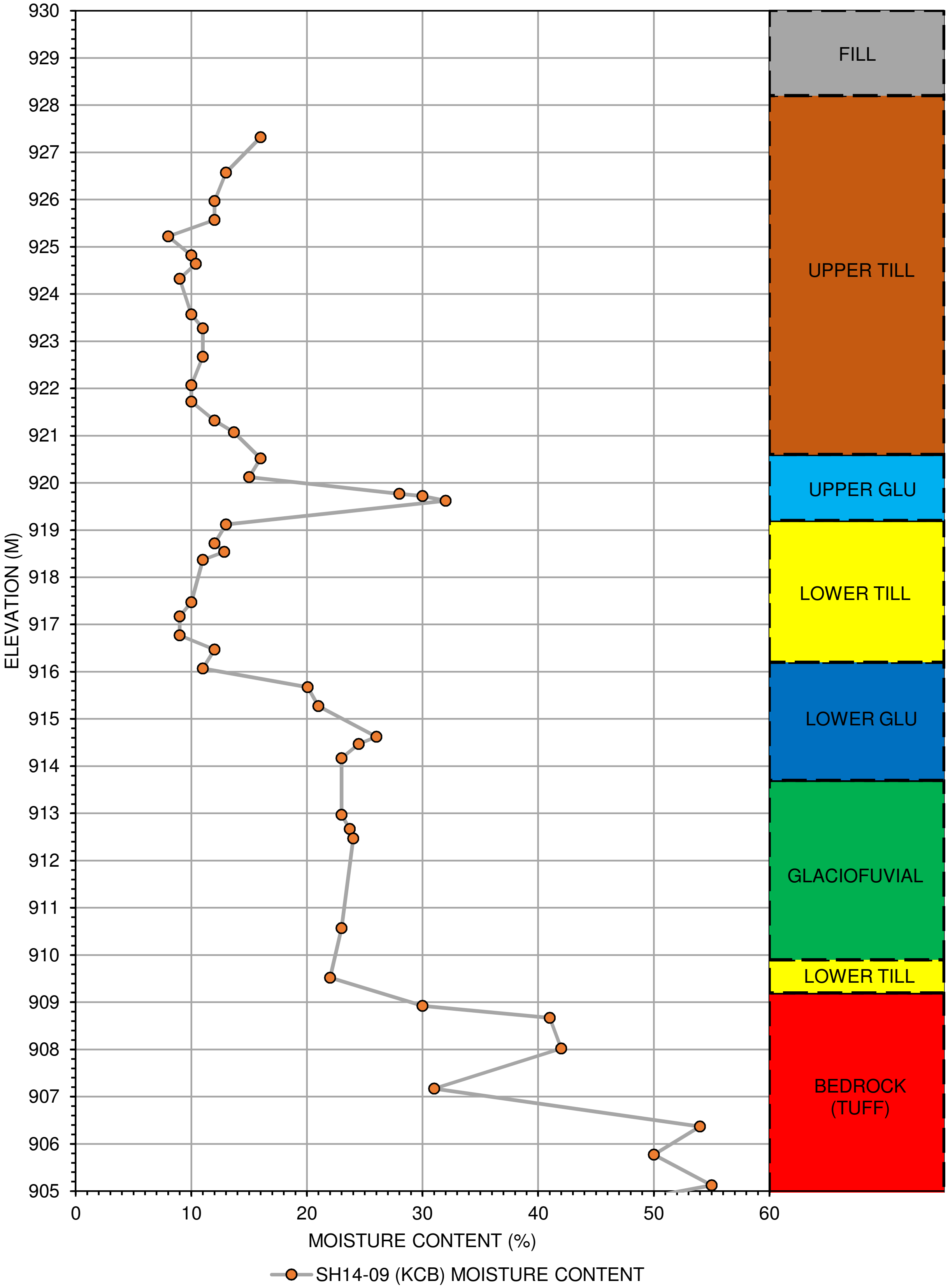
Compiled by: D. MA
Approved by: D. VAN ZYL



Date: January 7, 2015

Compiled by: D. MA
Approved by: D. VAN ZYL

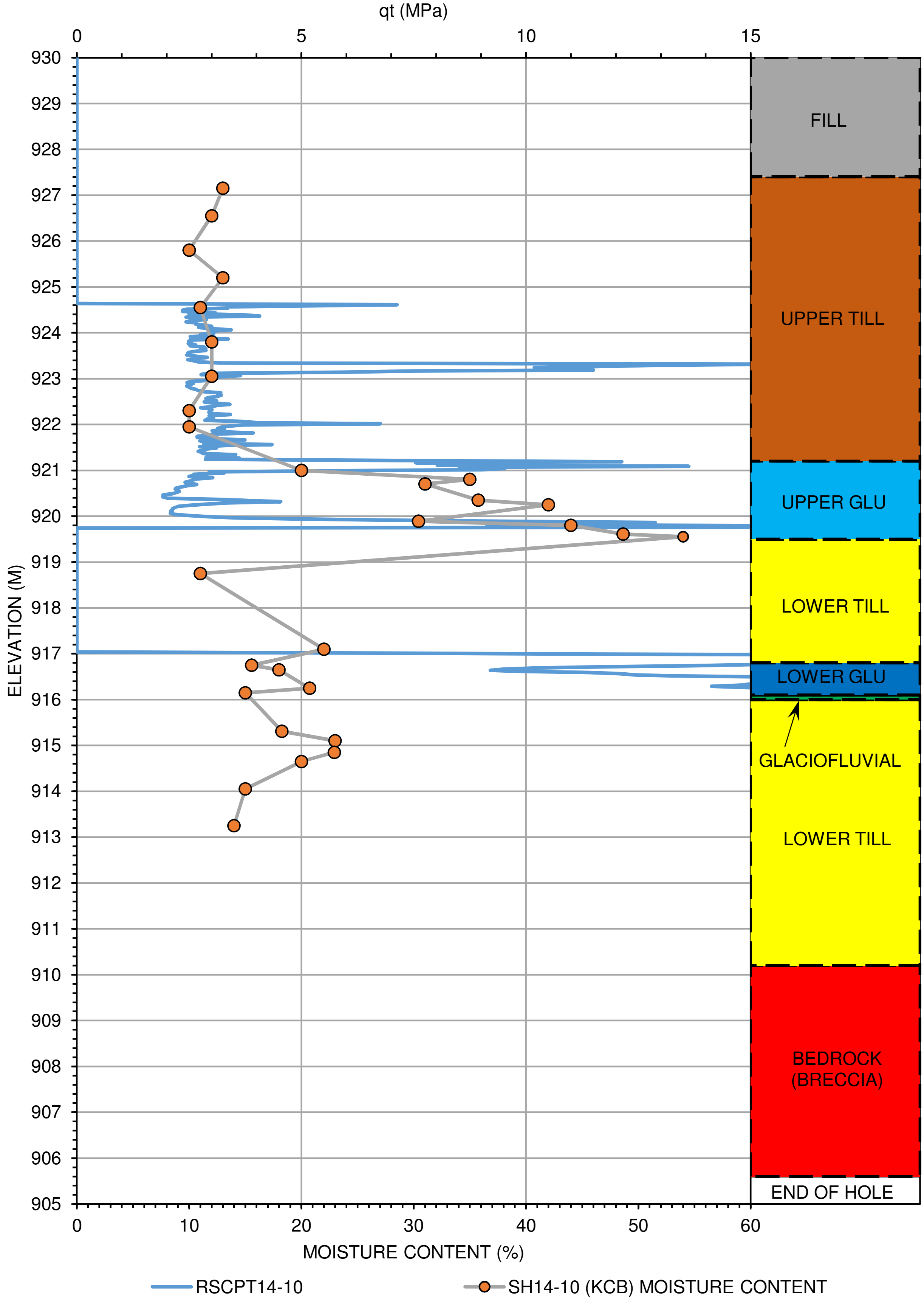
SH14-09



Date: January 7, 2015

Compiled by: D. MA
Approved by: D. VAN ZYL

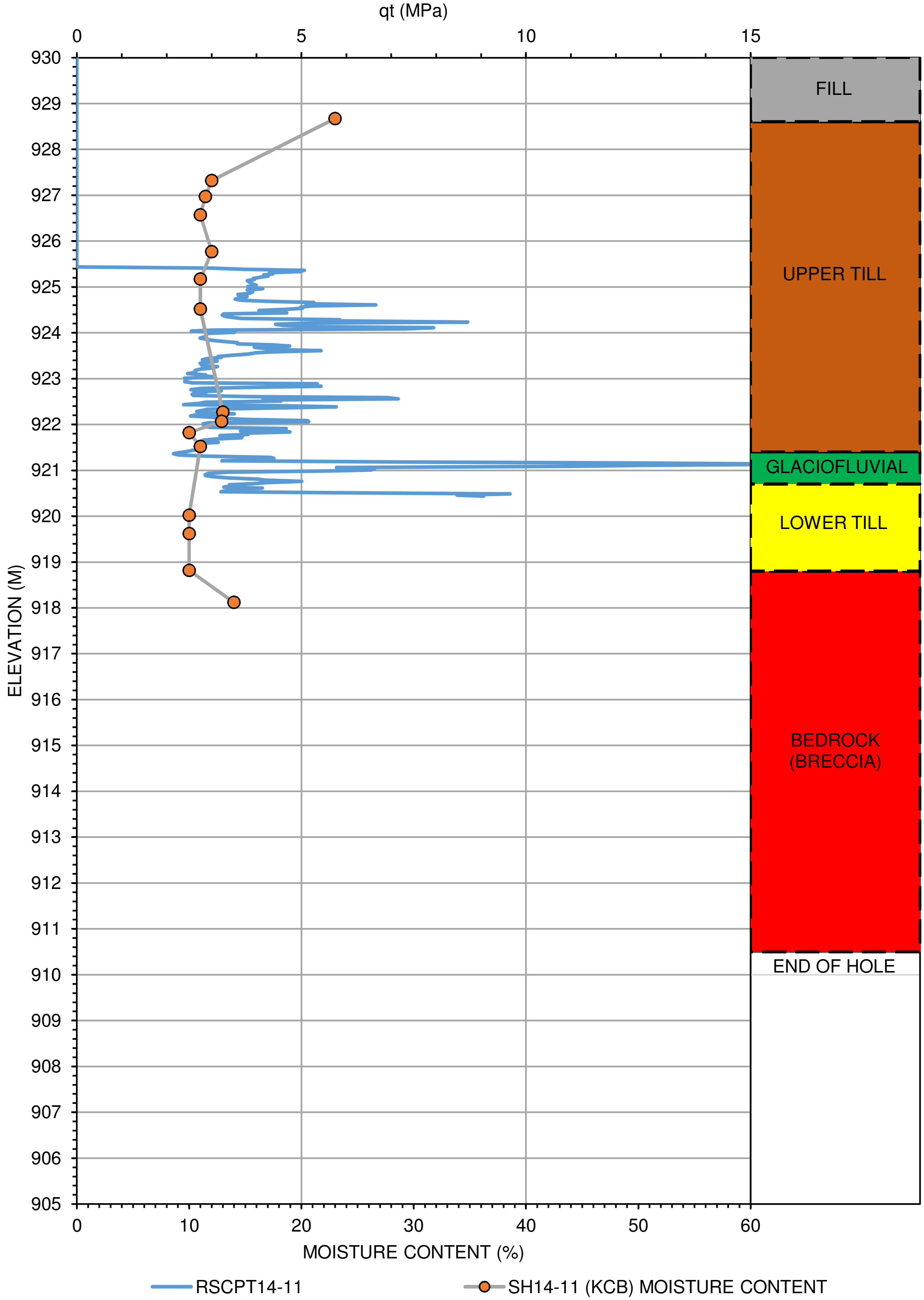
RSCPT14-10 AND SH14-10



Date: January 7, 2015

Compiled by: D. MA
Approved by: D. VAN ZYL

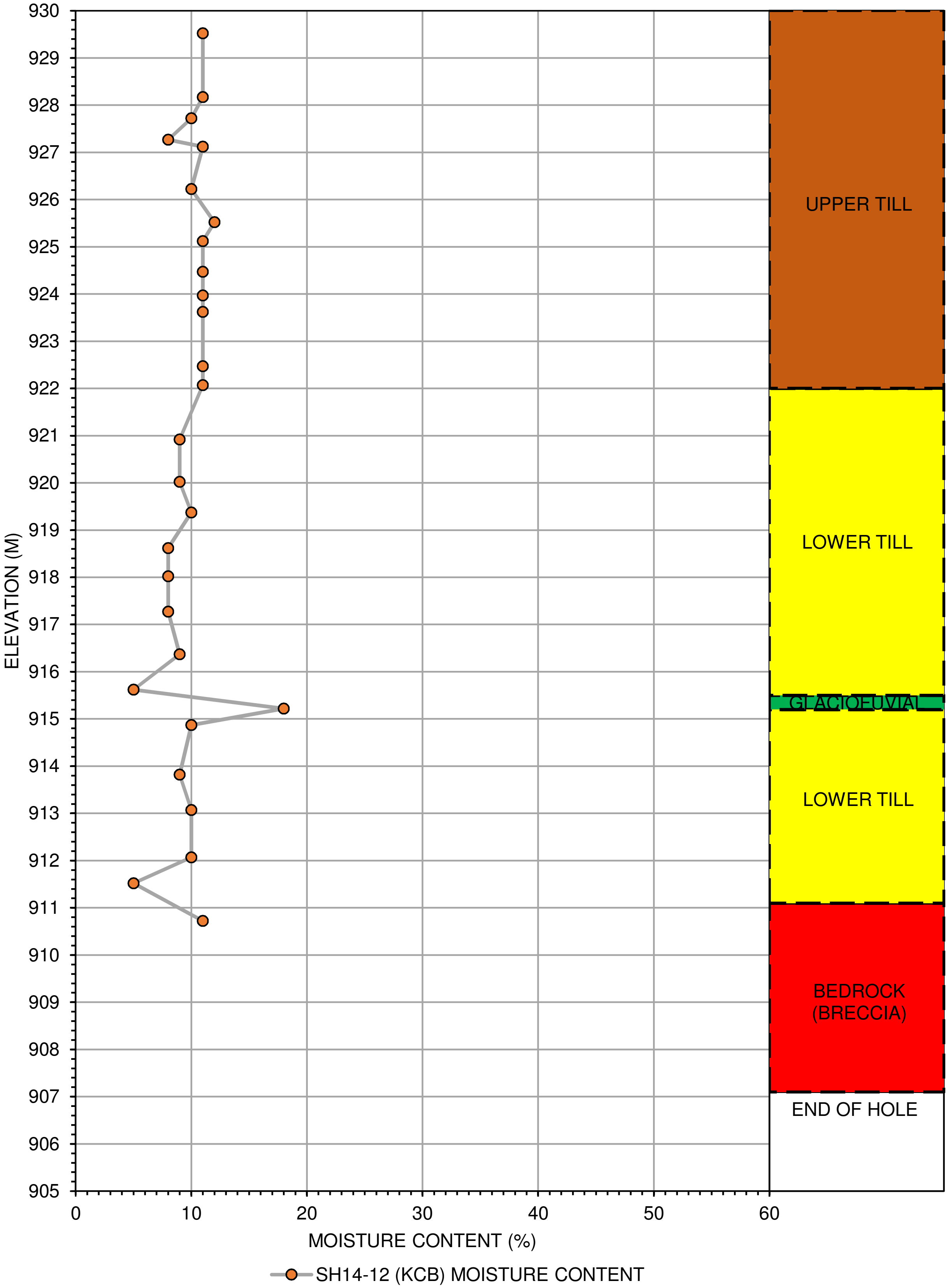
RSCPT14-11 AND SH14-11



Date: January 7, 2015

Compiled by: D. MA
Approved by: D. VAN ZYL

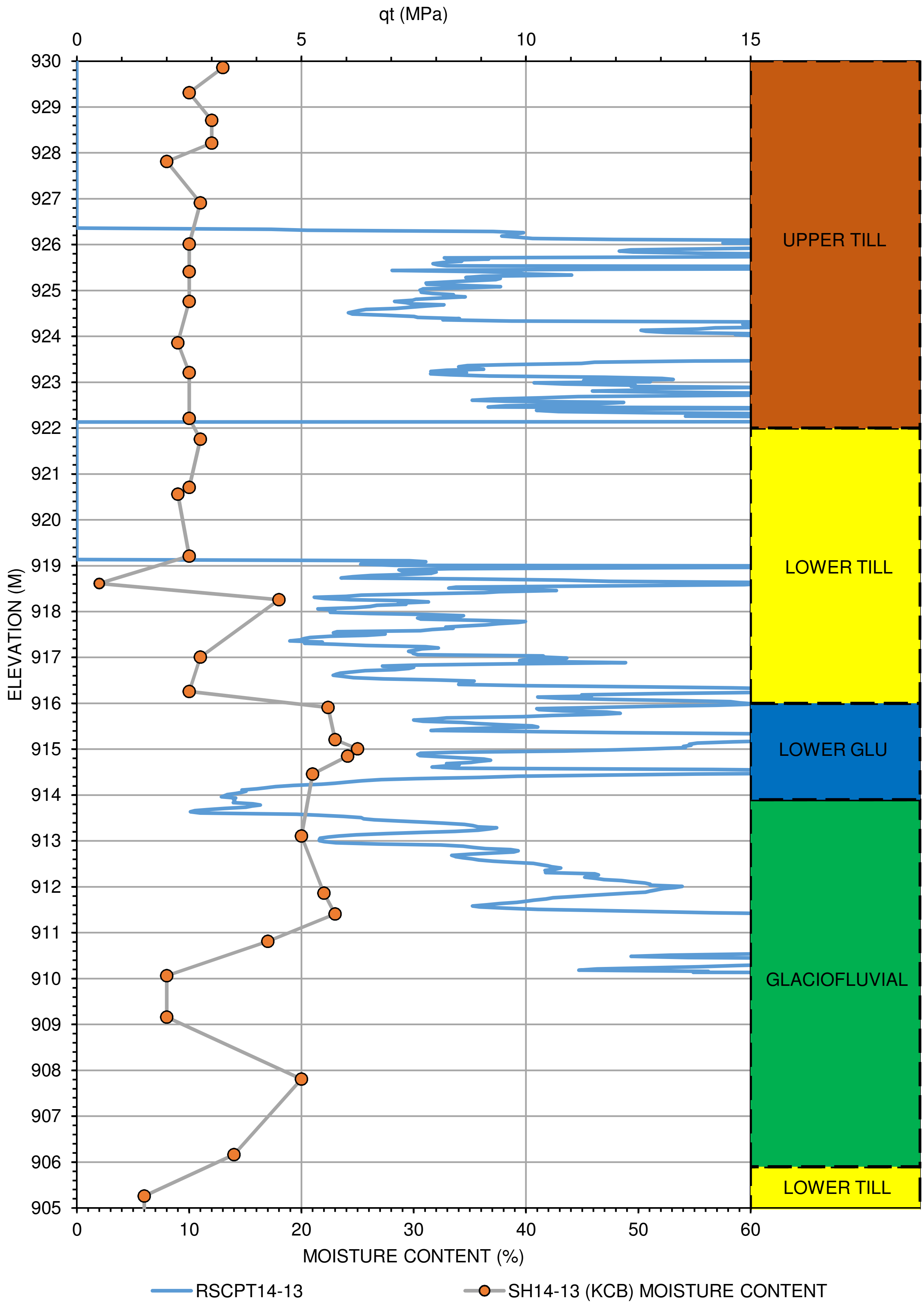
SH14-12



Date: January 7, 2015

Compiled by: D. MA
Approved by: D. VAN ZYL

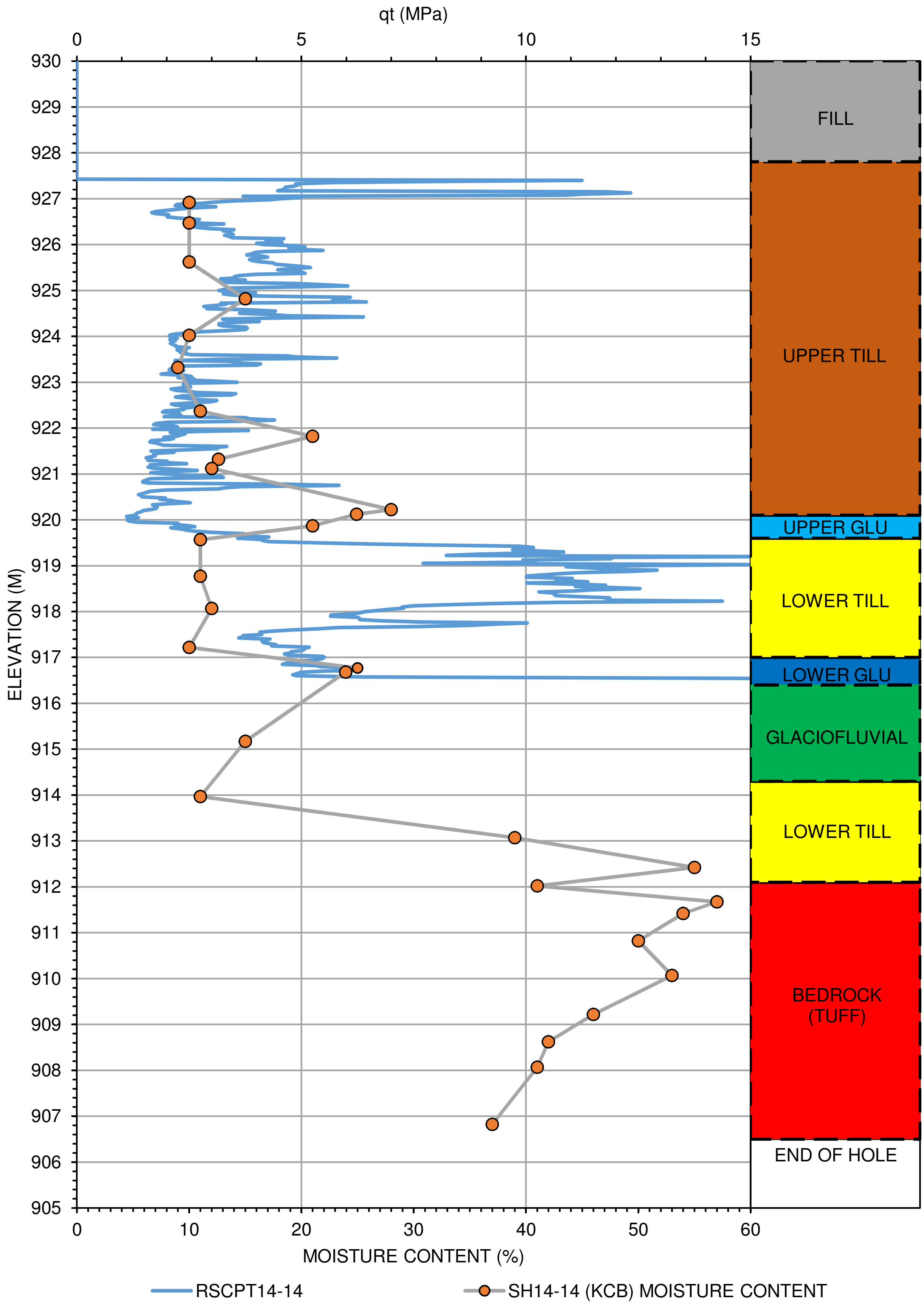
RSCPT14-13 AND SH14-13



Date: January 7, 2015

Compiled by: D. MA
Approved by: D. VAN ZYL

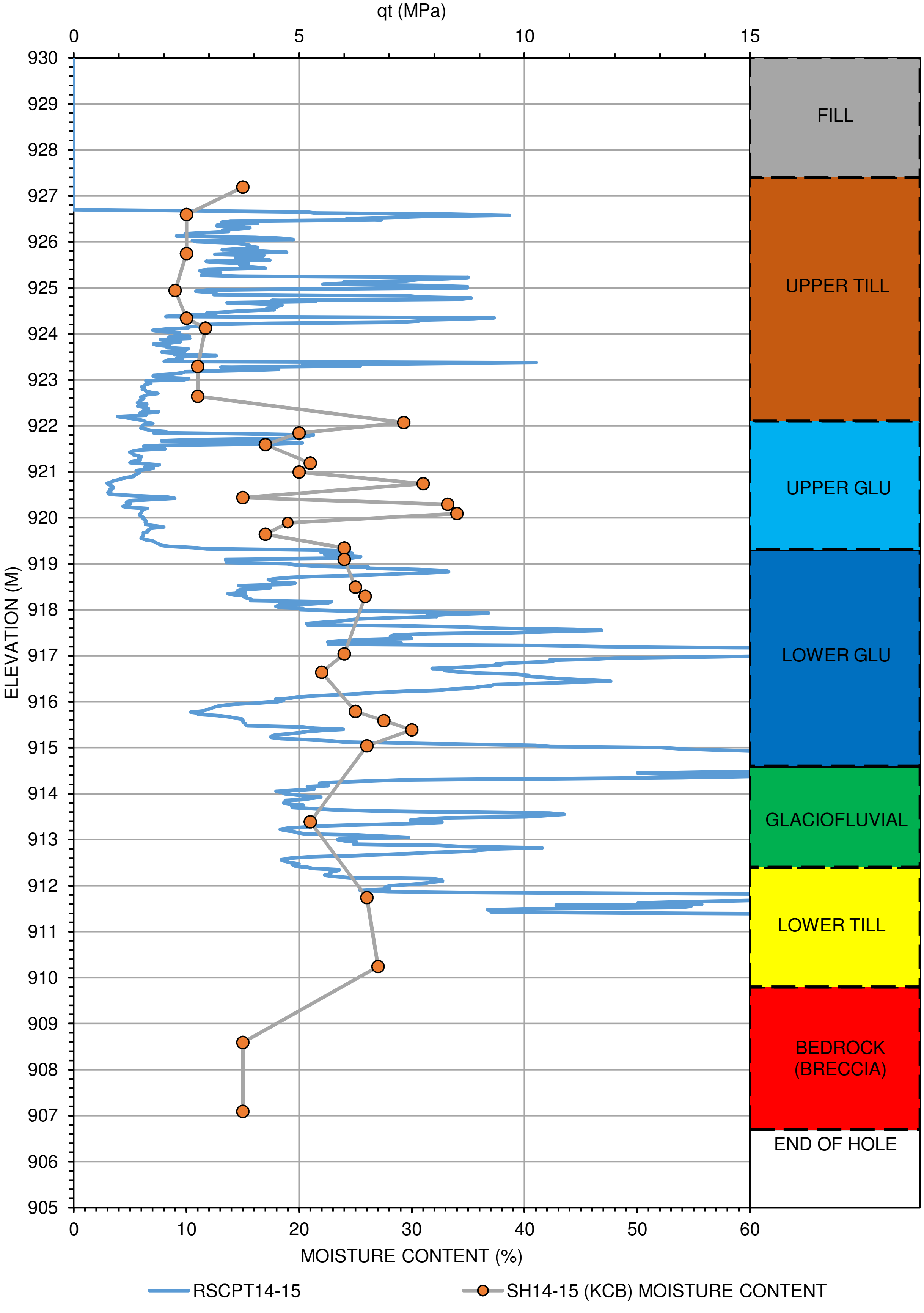
RSCPT14-14 AND SH14-14



Date: January 7, 2015

Compiled by: D. MA
Approved by: D. VAN ZYL

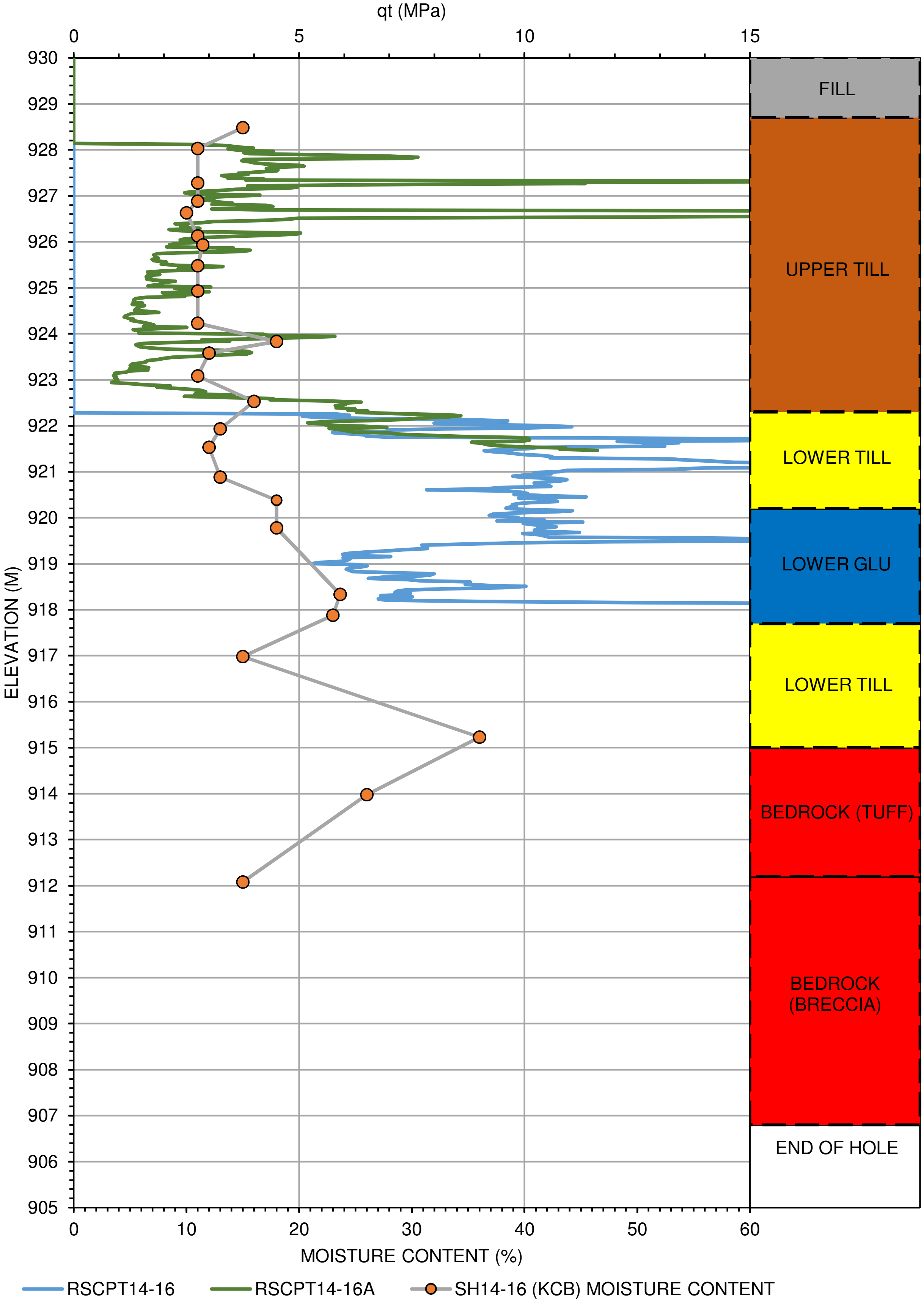
RSCPT14-15 AND SH14-15



Date: January 7, 2015

Compiled by: D. MA
Approved by: D. VAN ZYL

RSCPT14-16, RSCPT14-16A AND SH14-16



Date: January 7, 2015

Compiled by: D. MA
Approved by: D. VAN ZYL

Appendix D
Attachment 1л
CPT Correlations to Undrained Strength and Stress History

Advanced CPT Interpretation of Panel Results

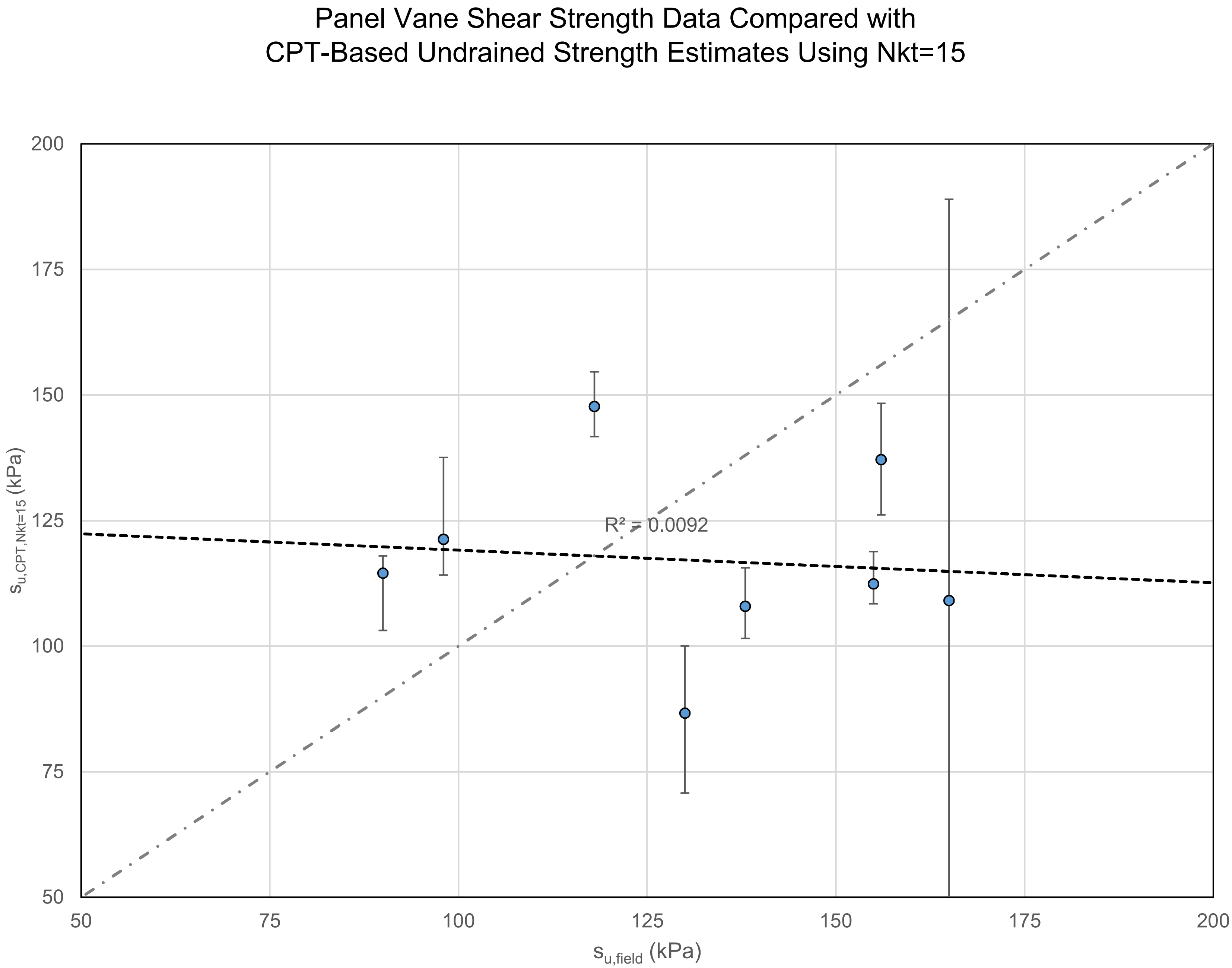
CPT Name	Top El. (m)	Assumed Water Table El. (m)	Available Test Data	
			Vane Shear	Oedometer
CPT14-101	933.02	929.0		
CPT14-102	932.48	929.0		
RCPT14-103	930.58	929.0		
RCPT14-104	931.74	929.0		
RCPT14-105	931.61	929.0	X	X
RCPT14-106	928.65	928.7	X	X
RCPT14-107	928.41	928.4	X	X
RCPT14-108	928.26	928.3		
RCPT14-108B	928.44	928.4		
RCPT14-109	928.63	928.6		
RCPT14-110	928.65	928.7		X
RCPT14-111	928.41	928.4		X
RCPT14-112	928.63	928.6		
RCPT14-113	929.17	929.0		X
RCPT14-114B	930.63	930.0		
RCPT14-115	929.11	929.0		

Notes:

1. Soil units shown on colour inferred by panel using CPT profiles and thin-walled tube samples and are approximate.
2. Undrained strength from CPT data estimated using Nkt=15
3. Undrained strengths measured using vane shear tests are contained in Attachment #4.
4. Preconsolidation pressures measured from oedometer testing are summarized in Appendix E, Attachment 2.

Date: January 7, 2015

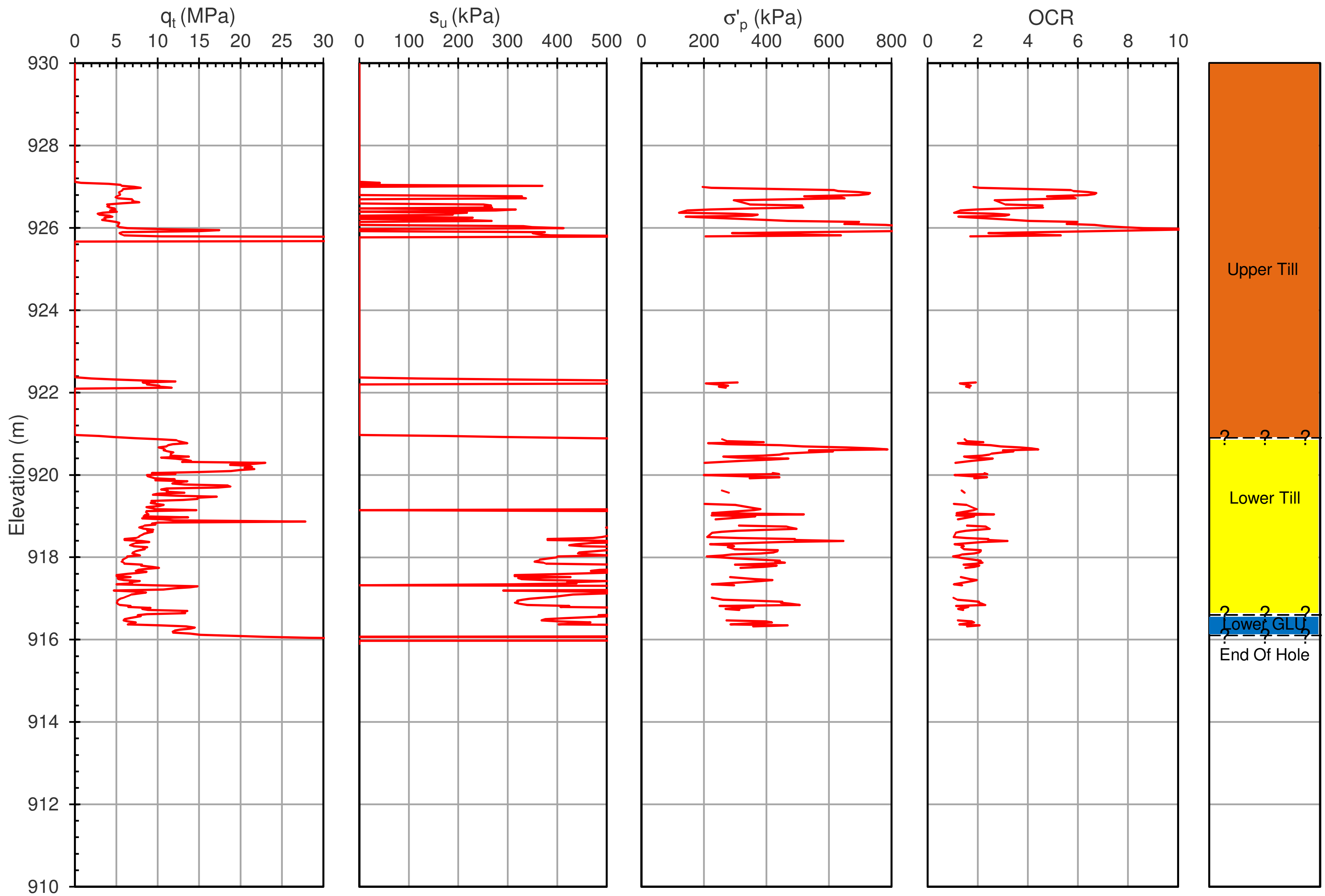
Compiled By: ACL
Approved By:D. VAN ZYL



Panel Vane Shear Strength Data Compared with
CPT-Based Undrained Strength Estimates Using Nkt=15
200
175
150
125
100
75
50
50
75
100
125
150
175
200
$s_{u,CPT,Nkt=15}$ (kPa)
$s_{u,field}$ (kPa)
$R^2 = 0.0092$

Mount Polley Independent Expert Engineering Investigation and Review Panel

CPT14-101

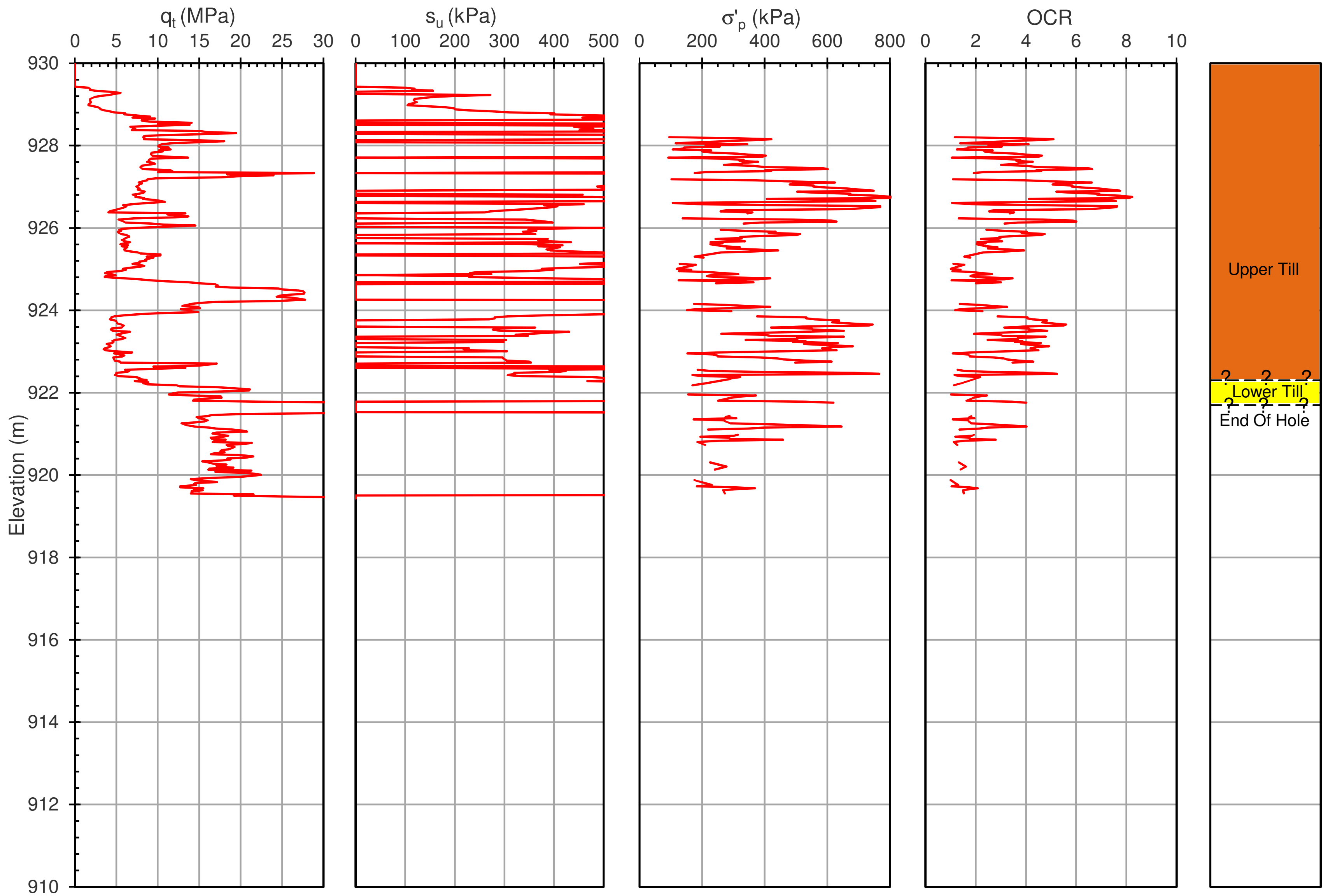


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

CPT14-102

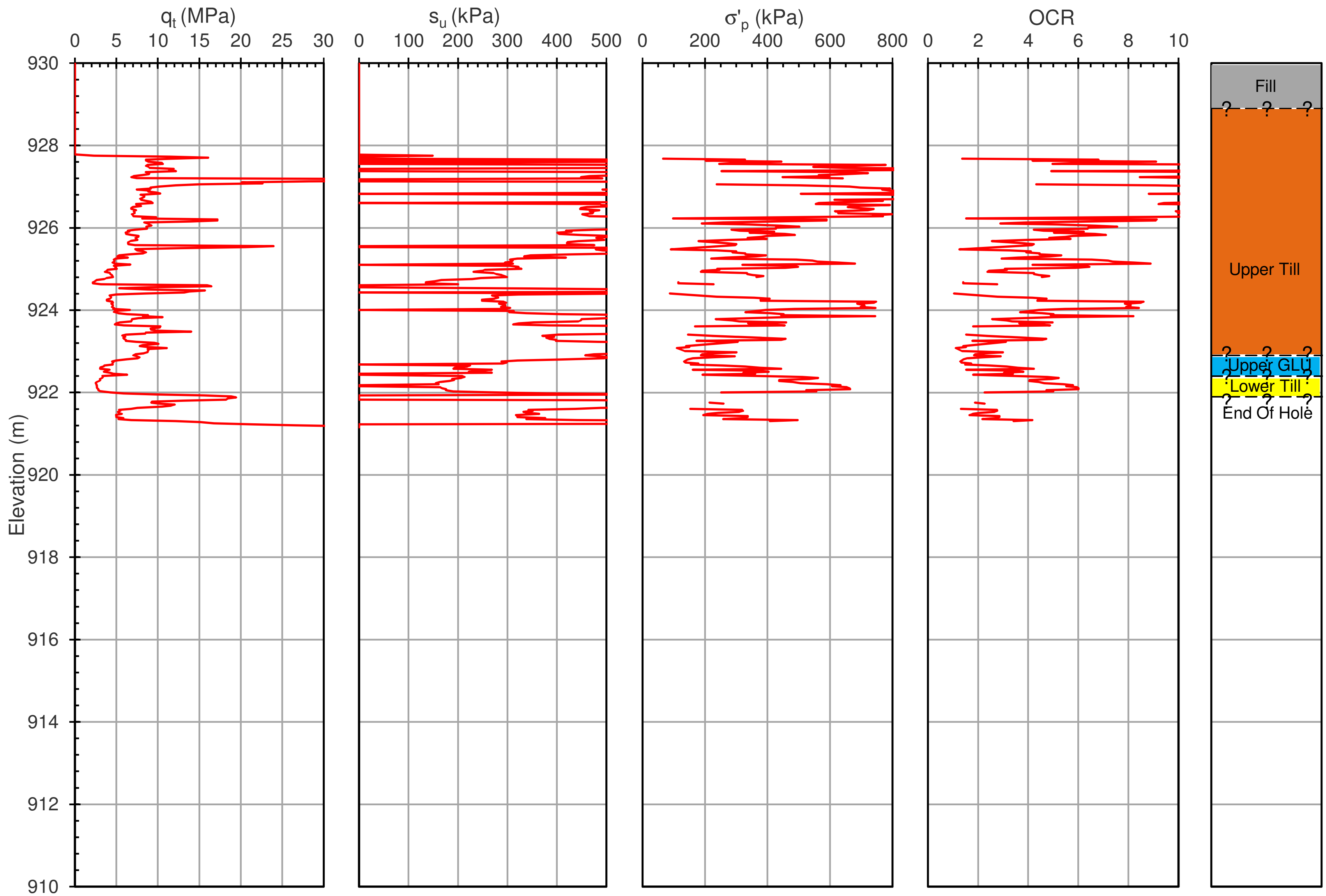


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RCPT14-103

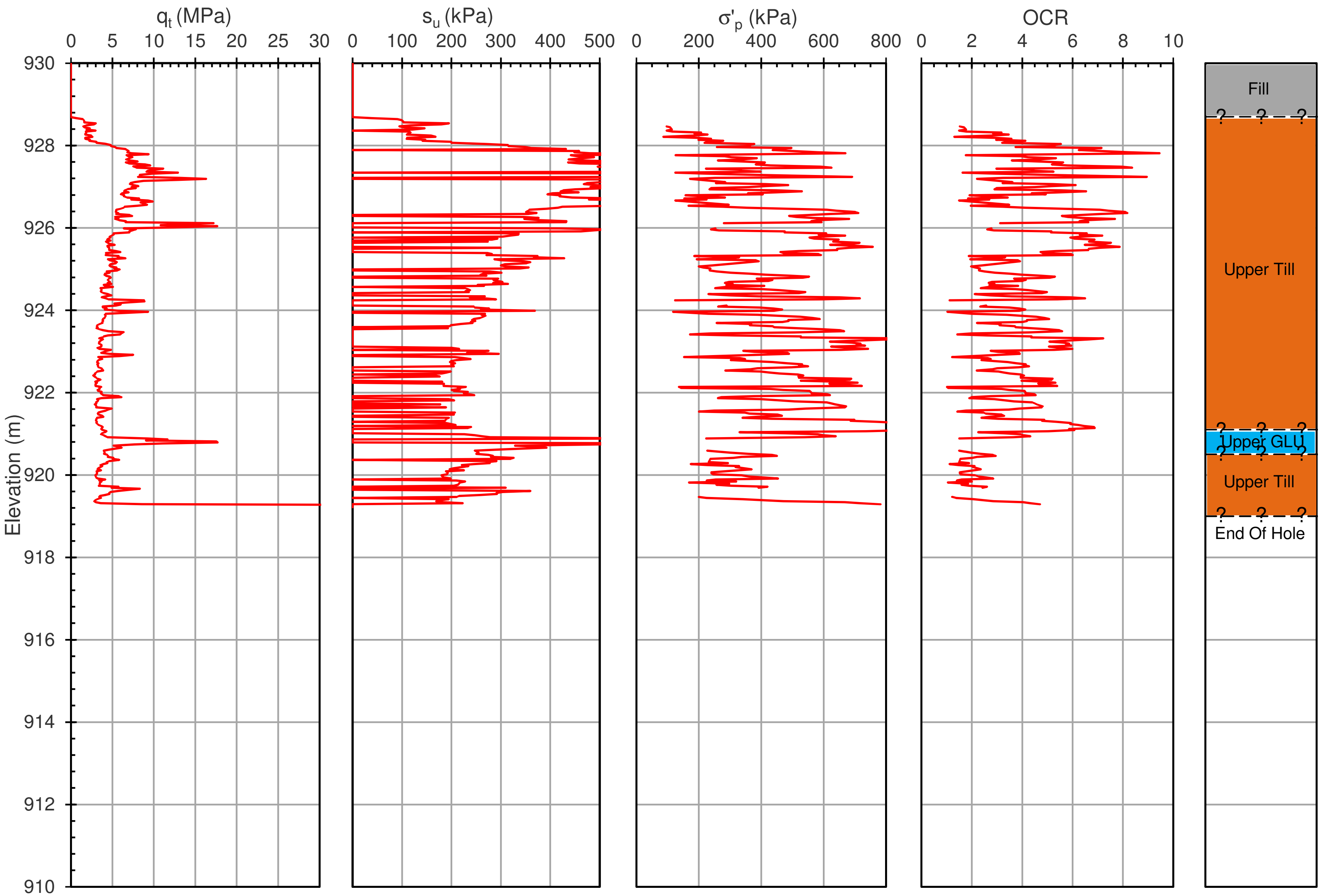


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RCPT14-104

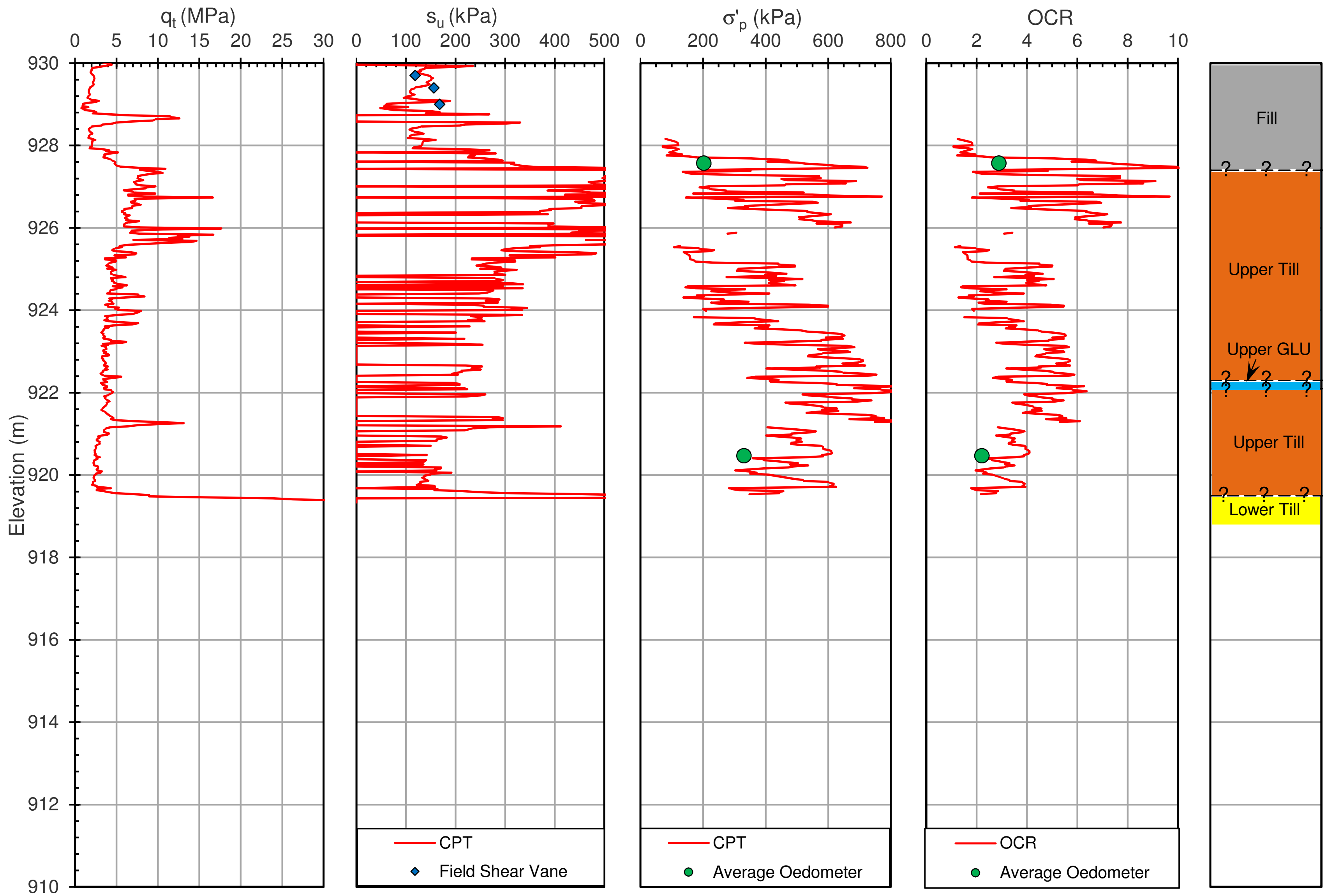


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RCPT14-105

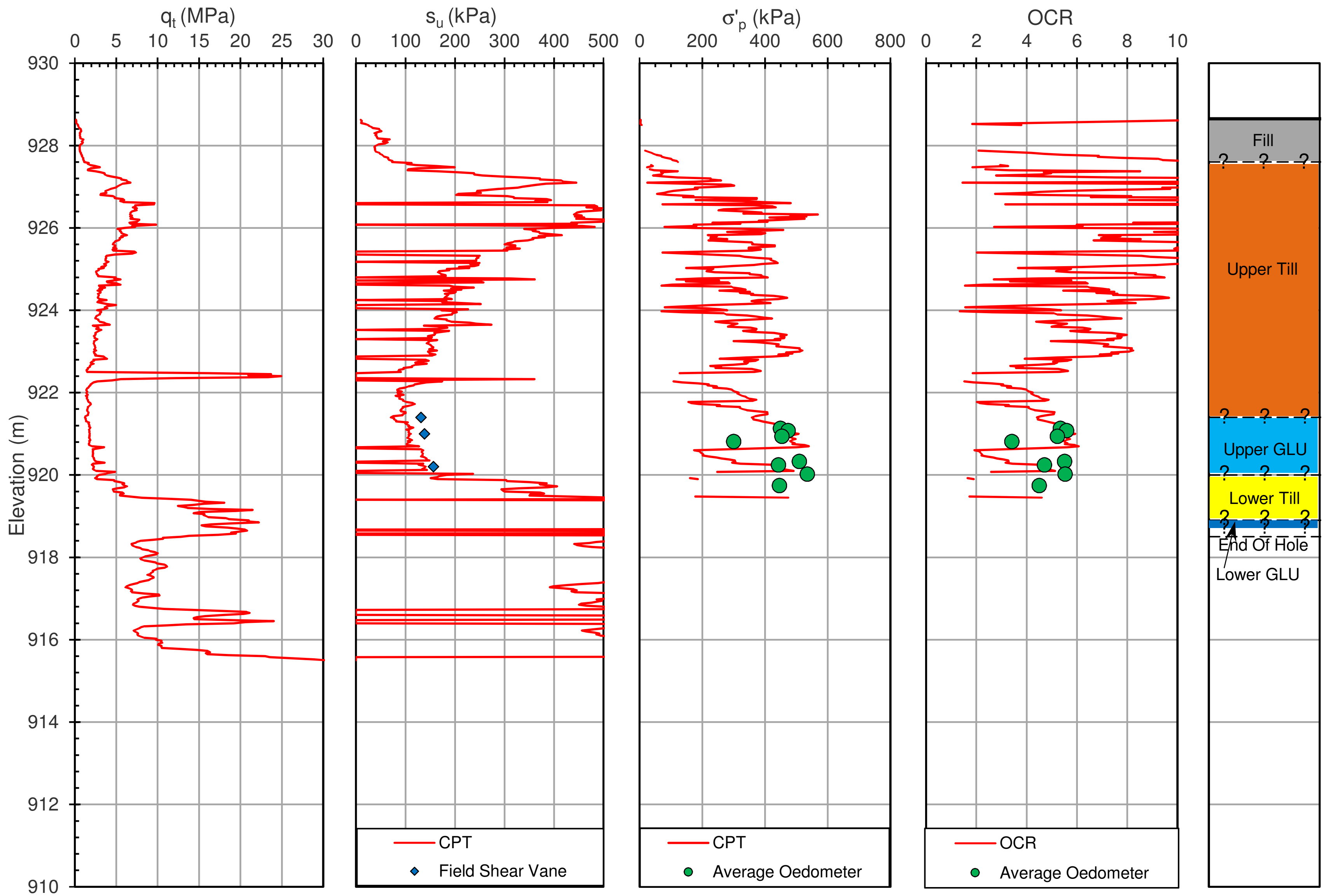


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RCPT14-106

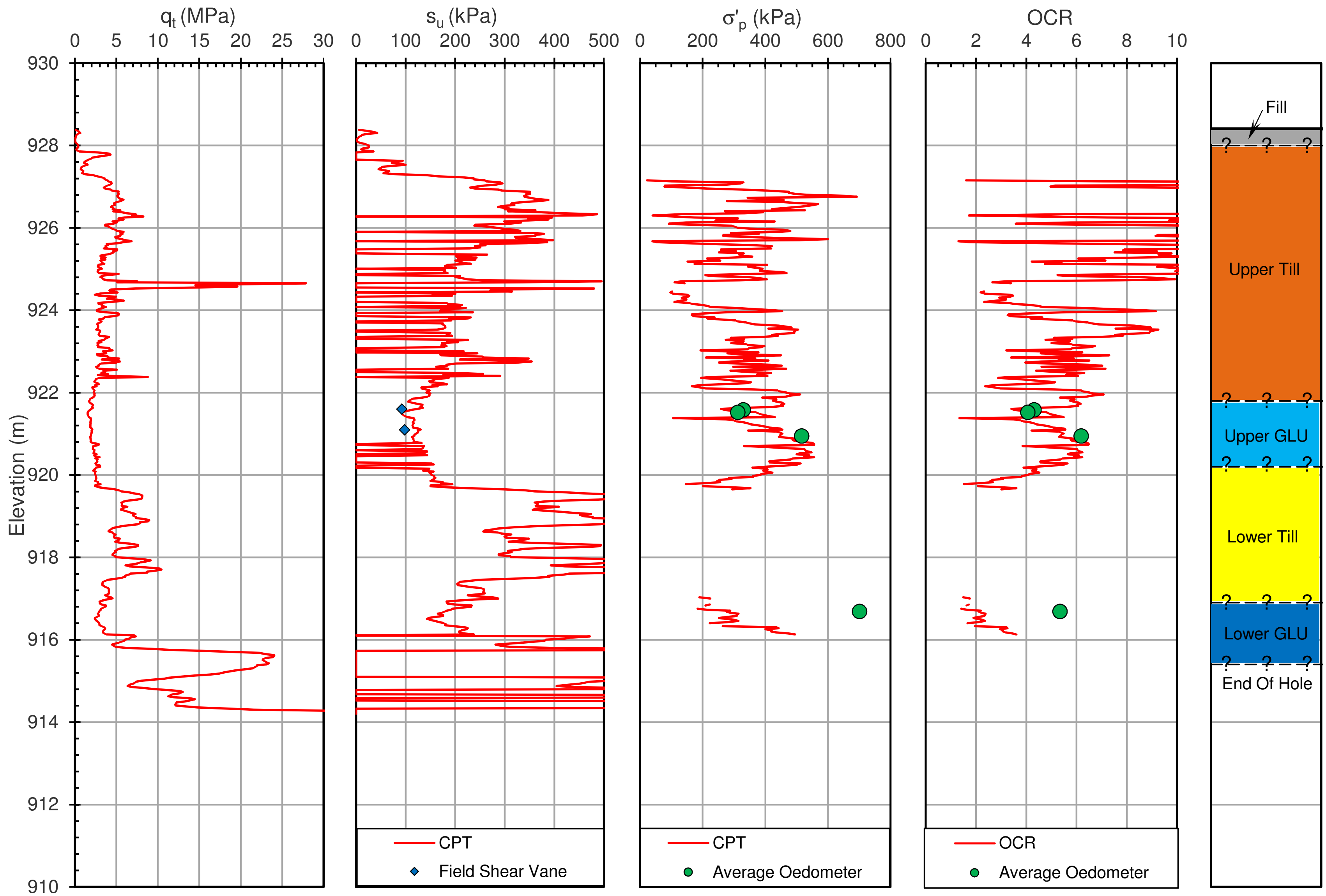


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RCPT14-107

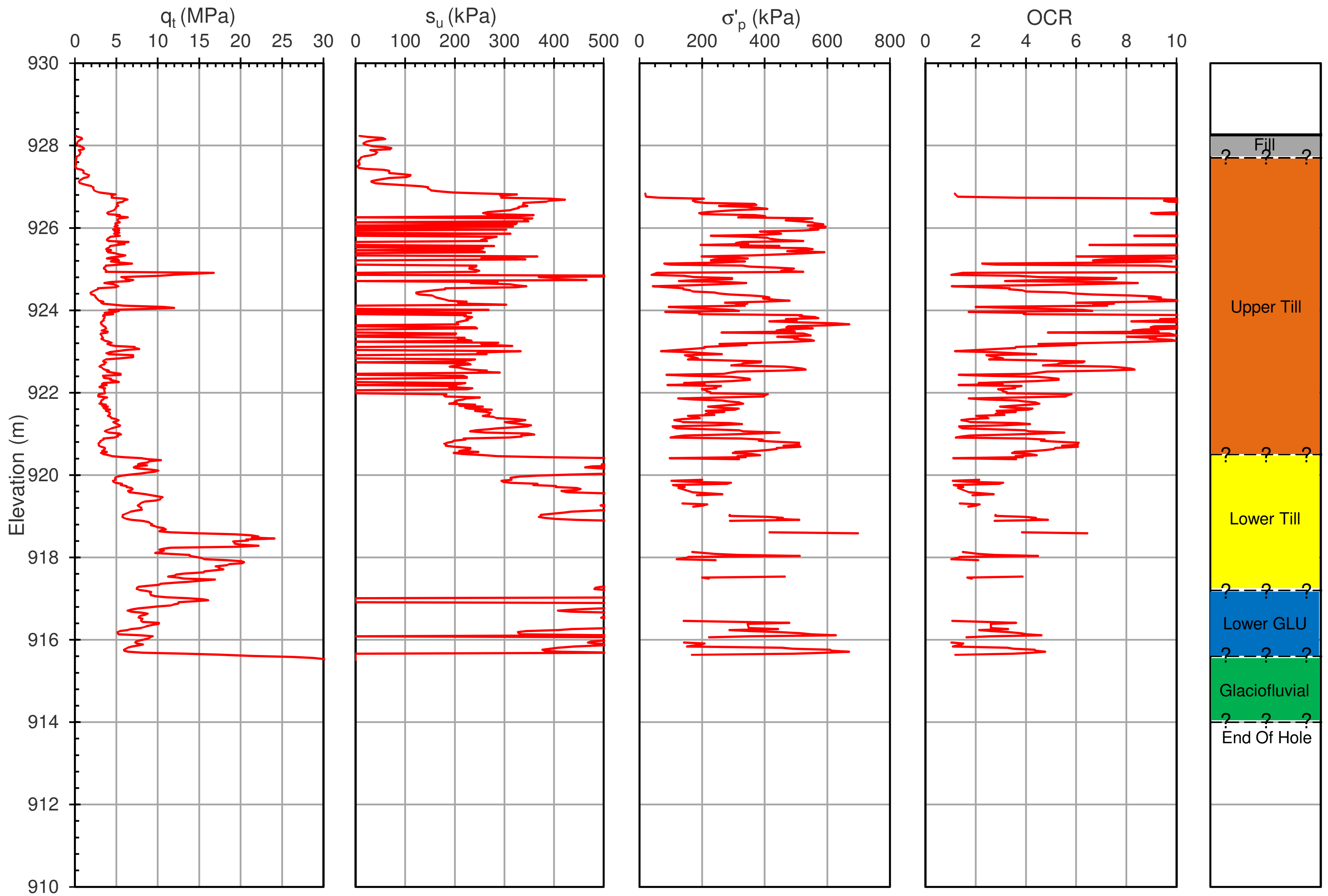


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RCPT14-108

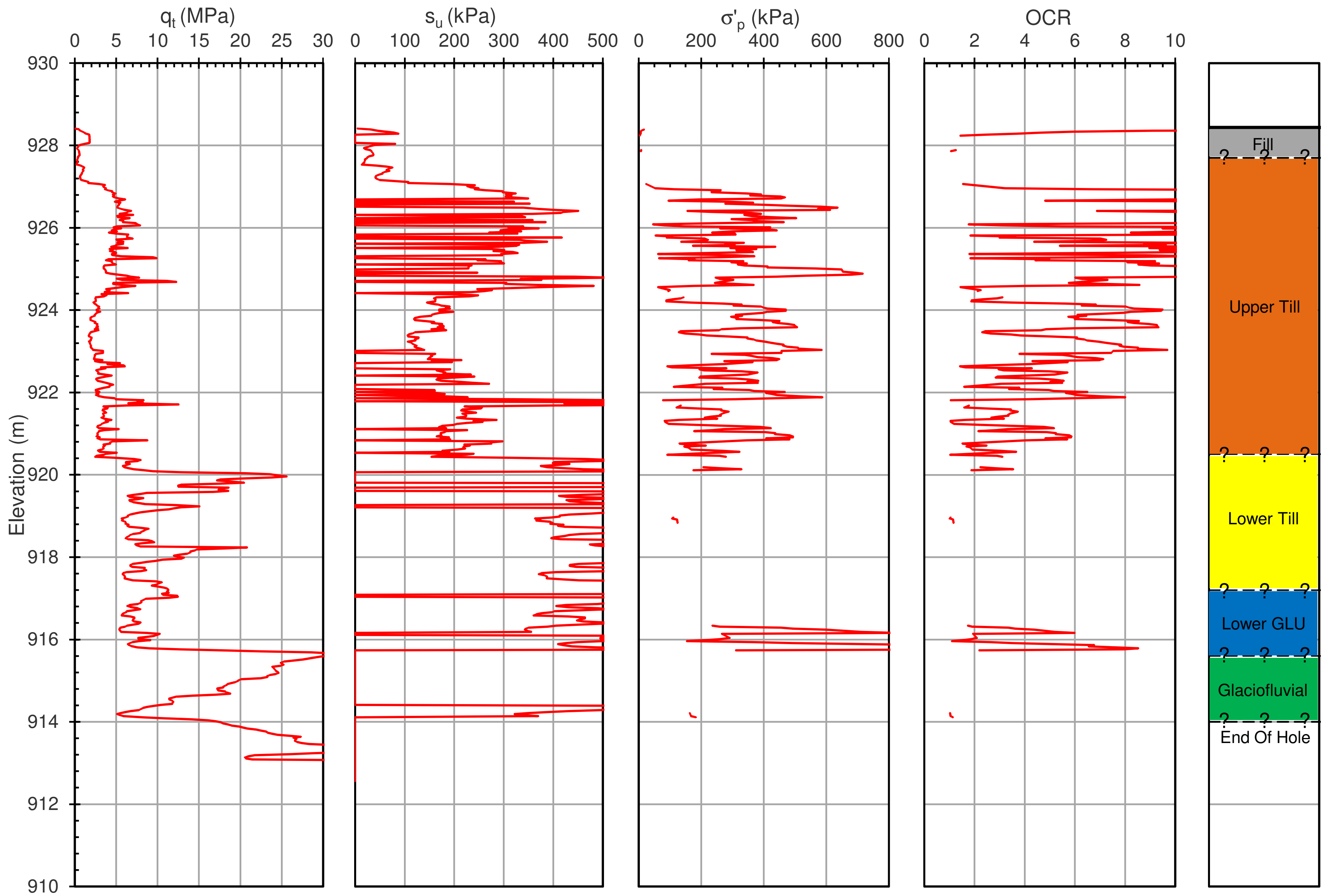


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RCPT14-108B

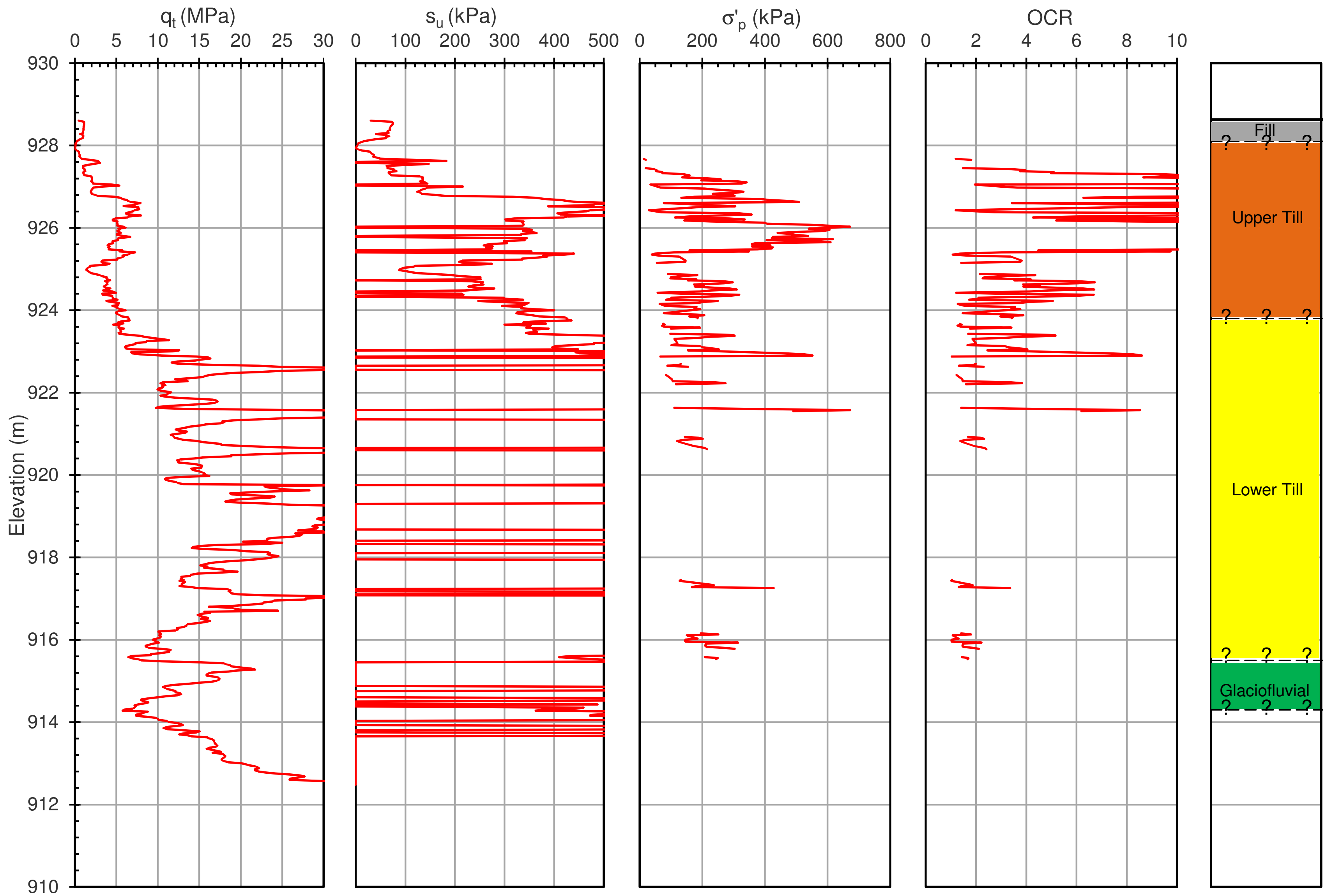


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RCPT14-109

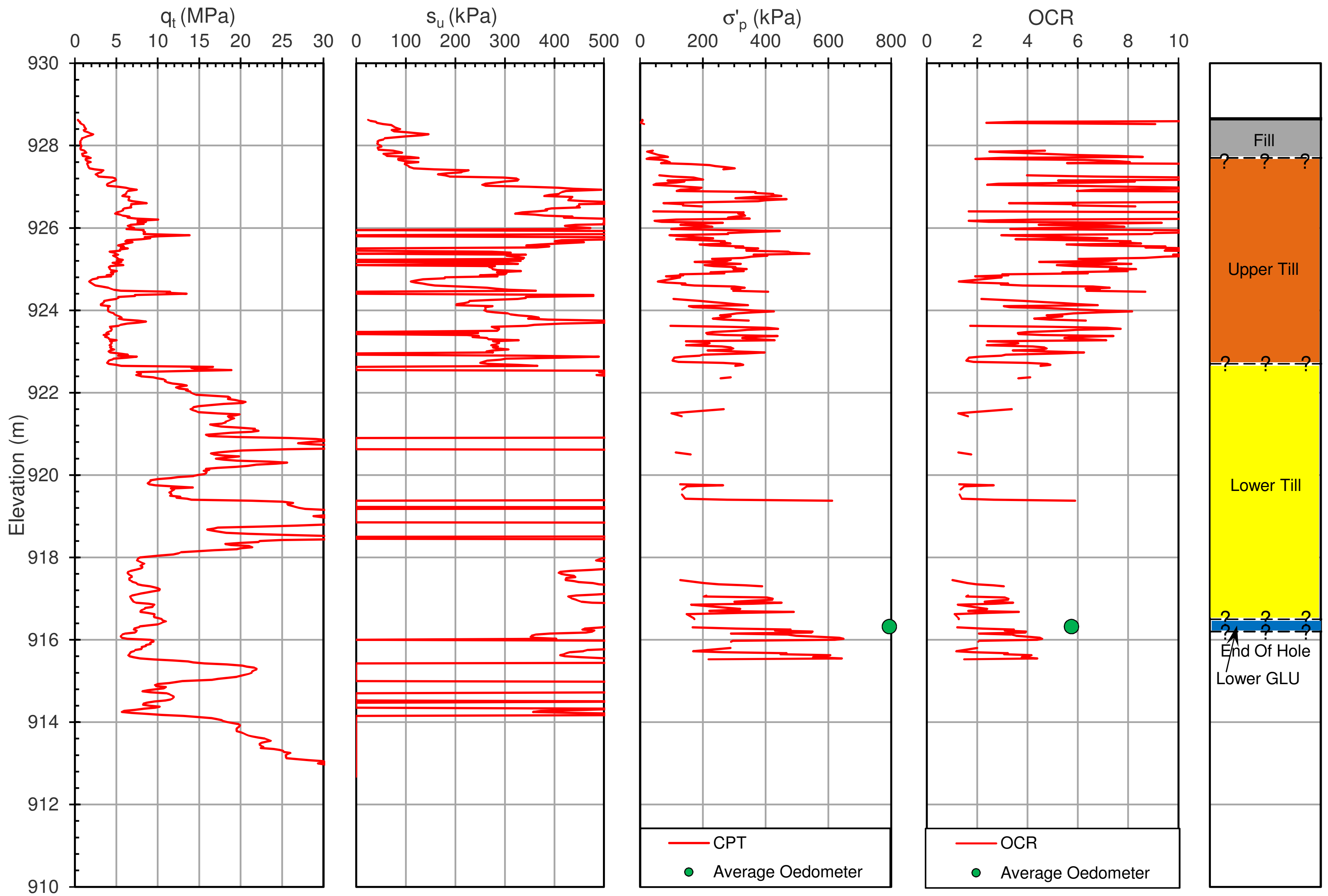


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RCPT14-110

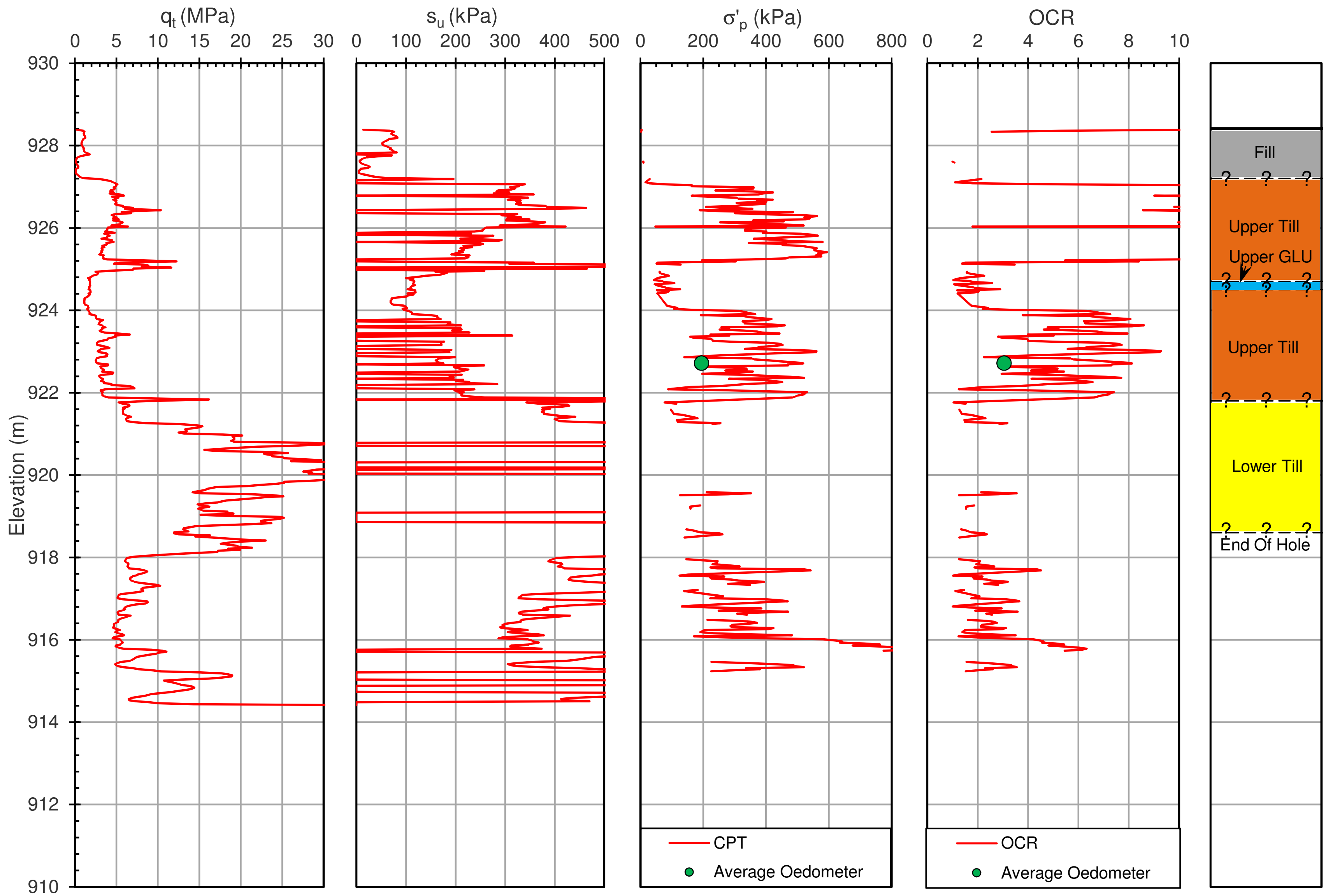


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RCPT14-111

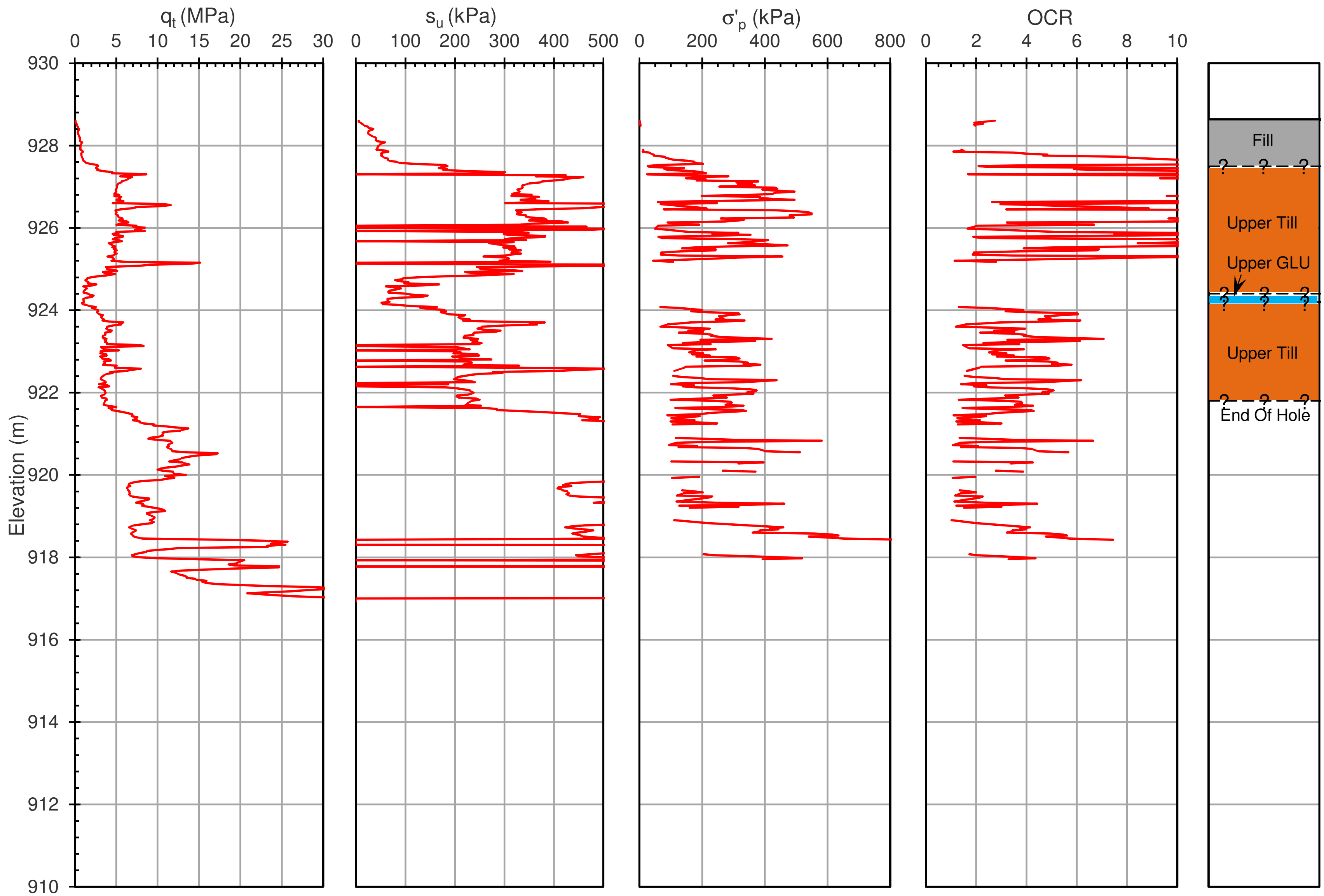


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RCPT14-112

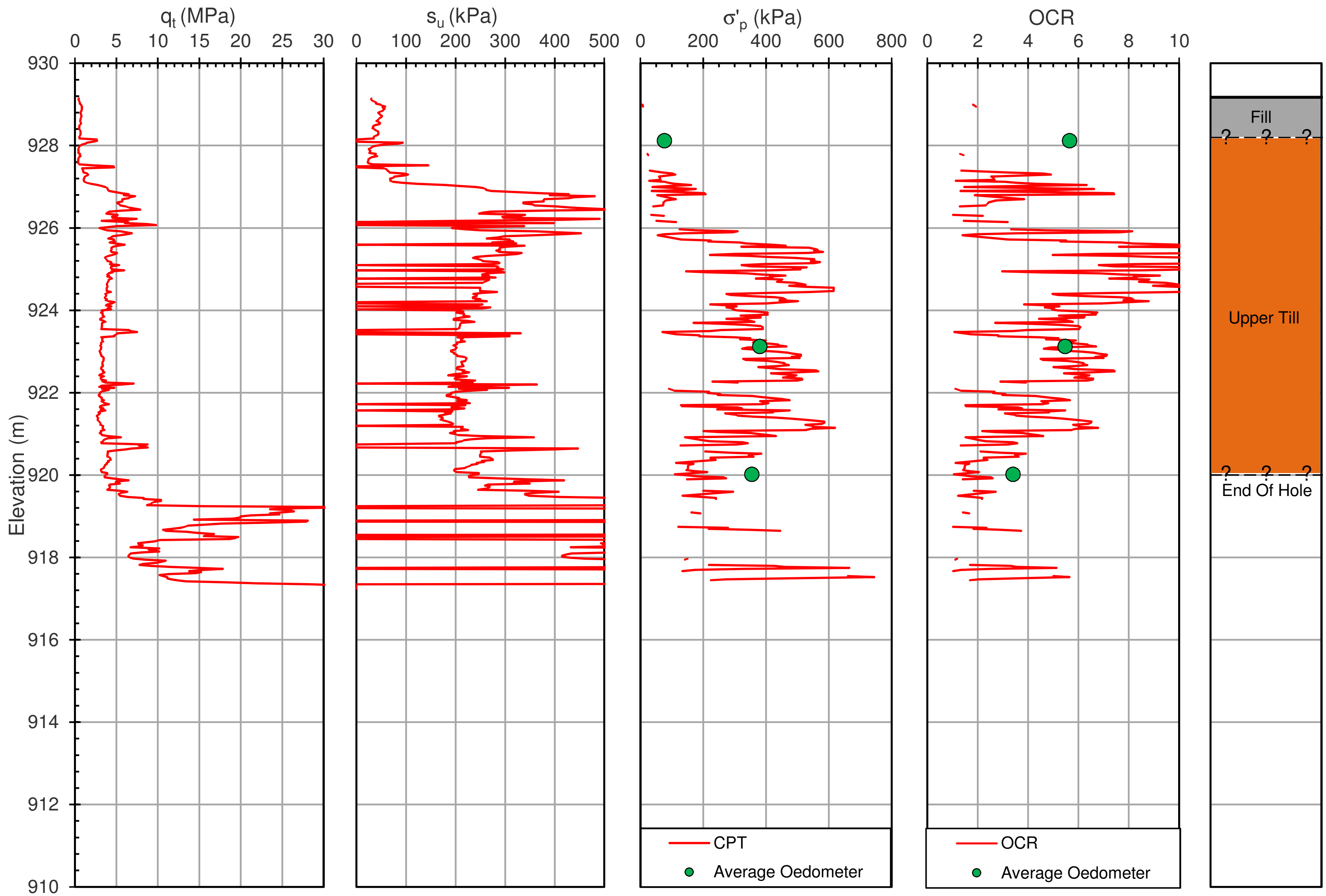


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RCPT14-113

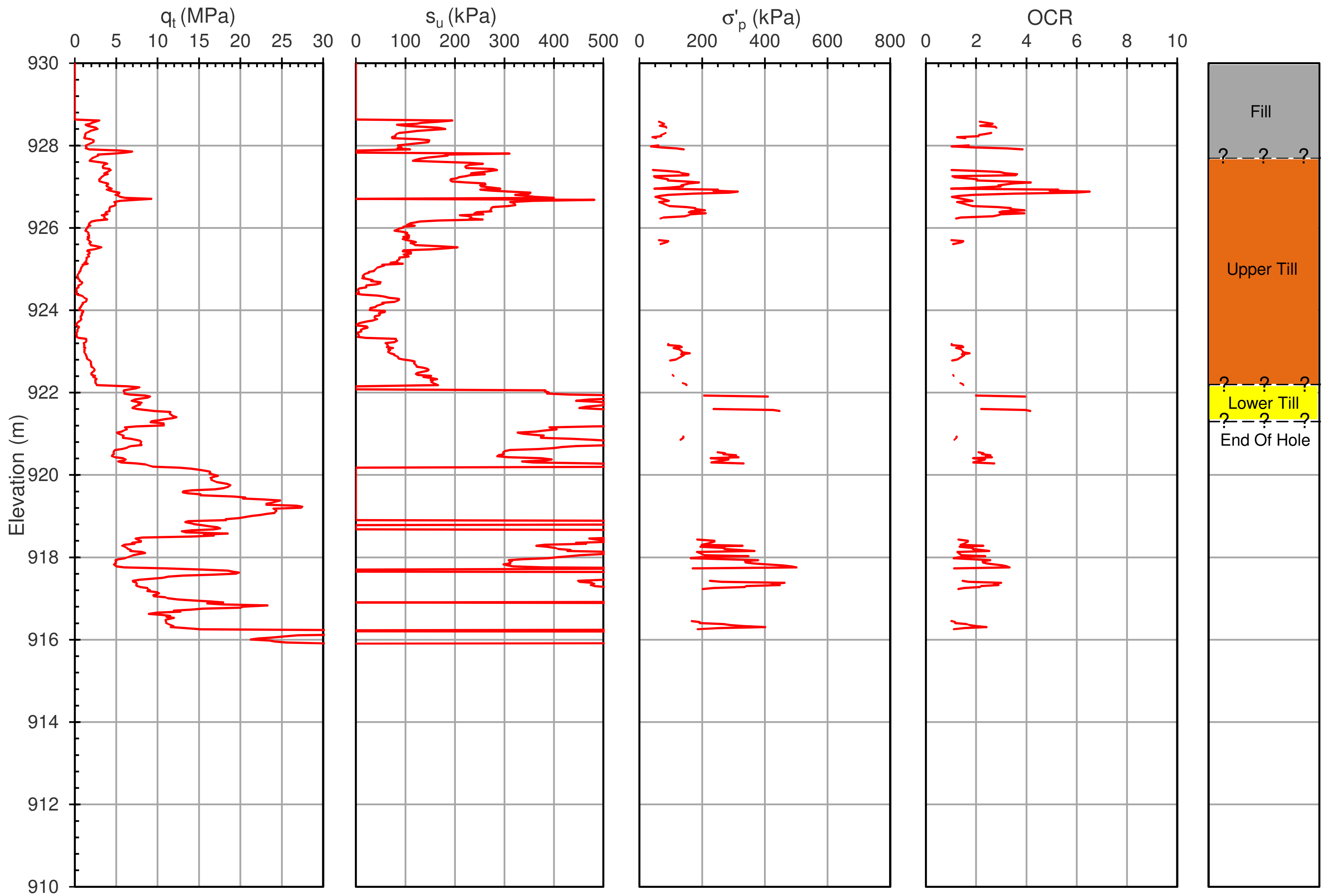


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RCPT14-114B

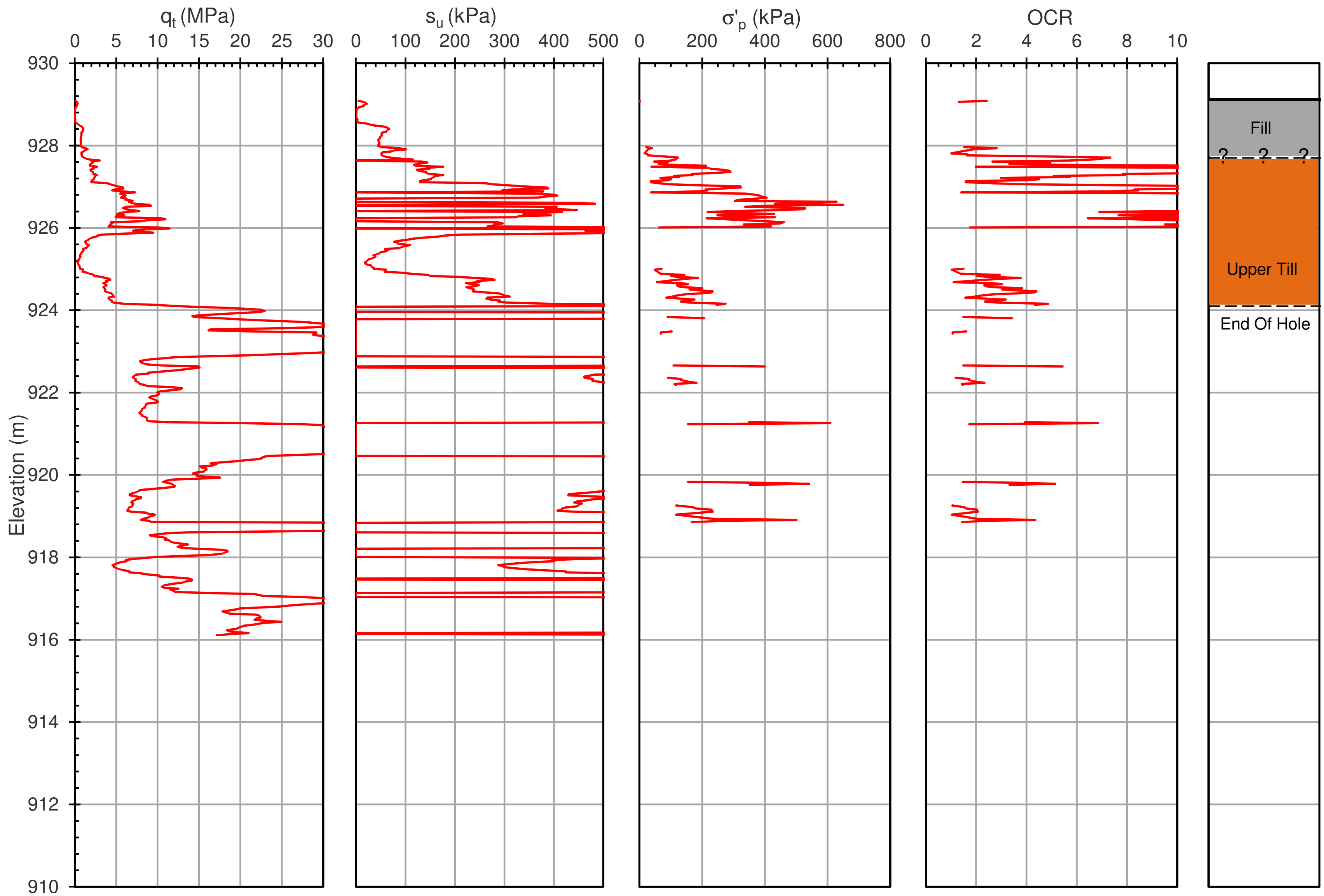


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RCPT14-115



Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Advanced CPT Interpretation of KCB Results

CPT Name	Top El. (m)	Assumed Water Table El. (m)	Available Test Data		
			Vane Shear	Oedometer	Piezometer
RSCPT14-01	931.29	929.0			X
RSCPT14-02	933.03	929.5			X
RSCPT14-03	932.47	930.0	X		
RSCPT14-04	932.27	930.5			
RSCPT14-05	937.43	926.5			X
RSCPT14-06	937.76	930.0			
RCPT14-06	937.71	930.0			
RSCPT14-07	931.58	931.0			X
RSCPT14-08	947.50	930.0			X
RSCPT14-10	932.24	929.0	X		
RSCPT14-11	931.06	929.0			
RSCPT14-13	933.06	929.0			
RSCPT14-14	930.45	930.0			
RSCPT14-15	930.20	930.0			
RSCPT14-16	930.28	930.0			
RSCPT14-16A	930.44	930.0			
RSCPT14-17	929.99	929.5			
RSCPT14-18	934.84	932.5			
RSCPT14-22	929.77	929.0	X		

Notes:

1. Soil units shown on colour determined by panel based on Sonic Hole logs
2. Undrained strength from CPT data estimated using Nkt=15
3. Undrained strengths measured using vane shear tests are contained in Attachment 4.
4. KCB oedometer test data is available but has not been plotted.

Date: January 7, 2015

Compiled By: ACL
Approved By:D VAN ZYL

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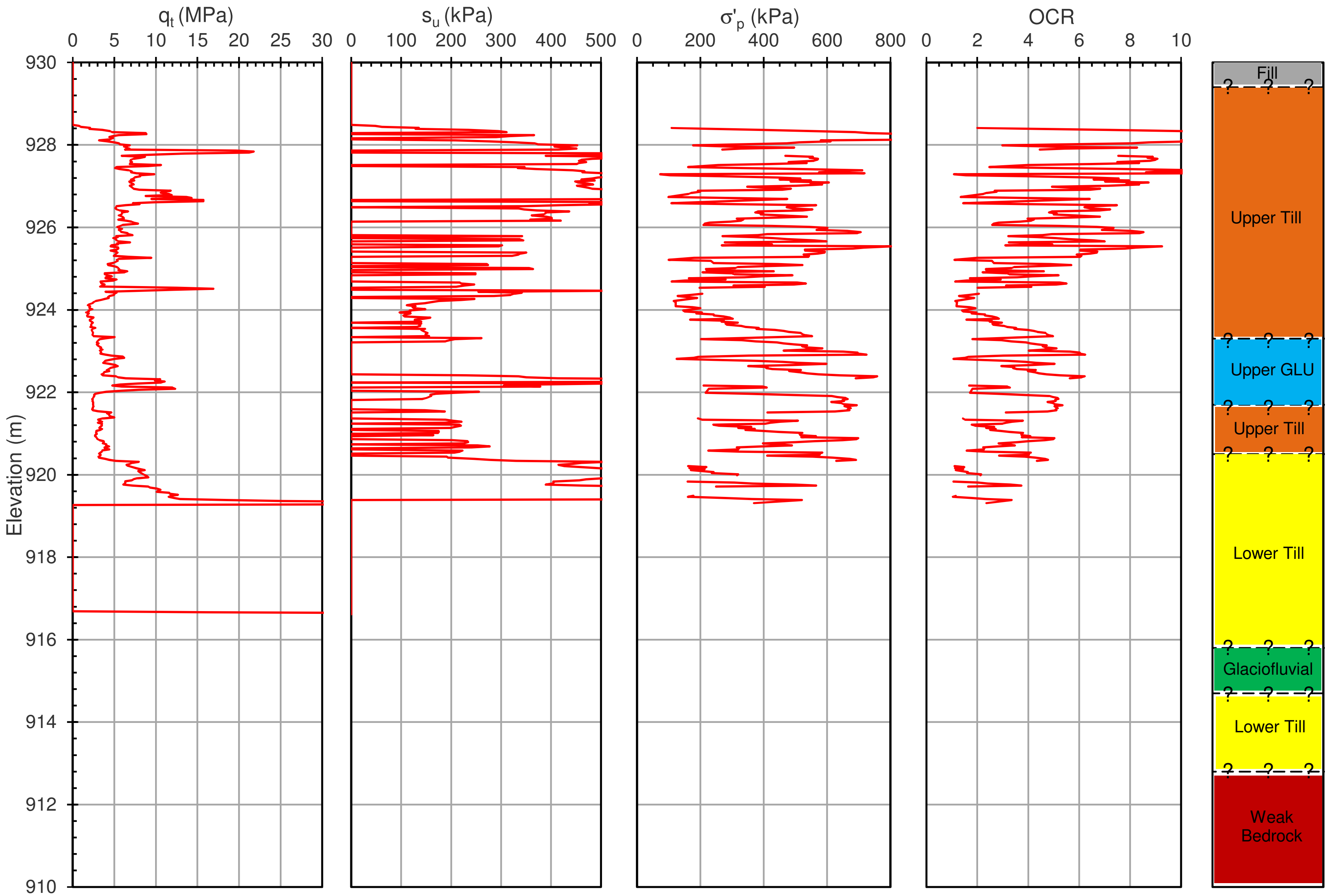
RSCPT14-01



Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

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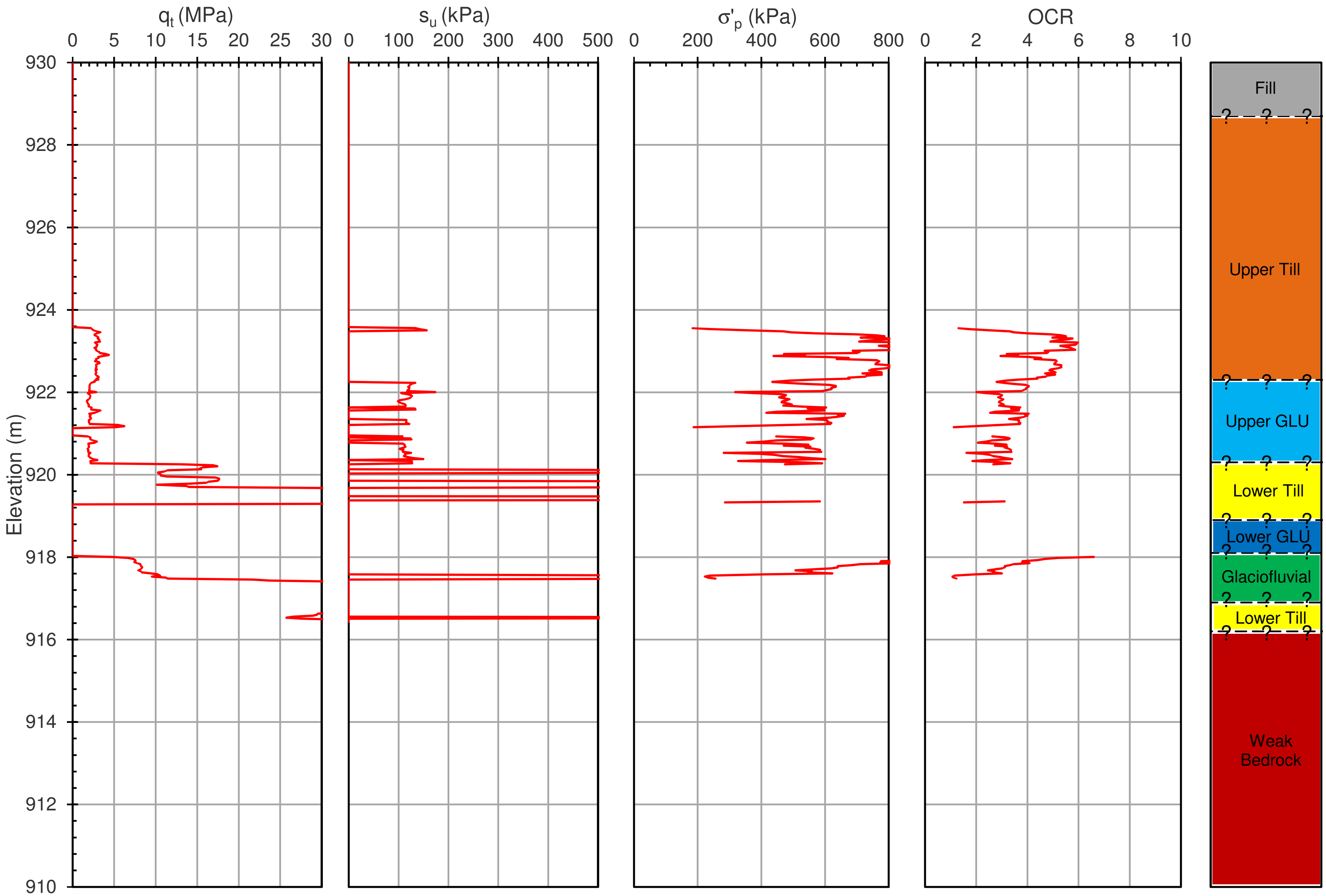
RSCPT14-02



Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

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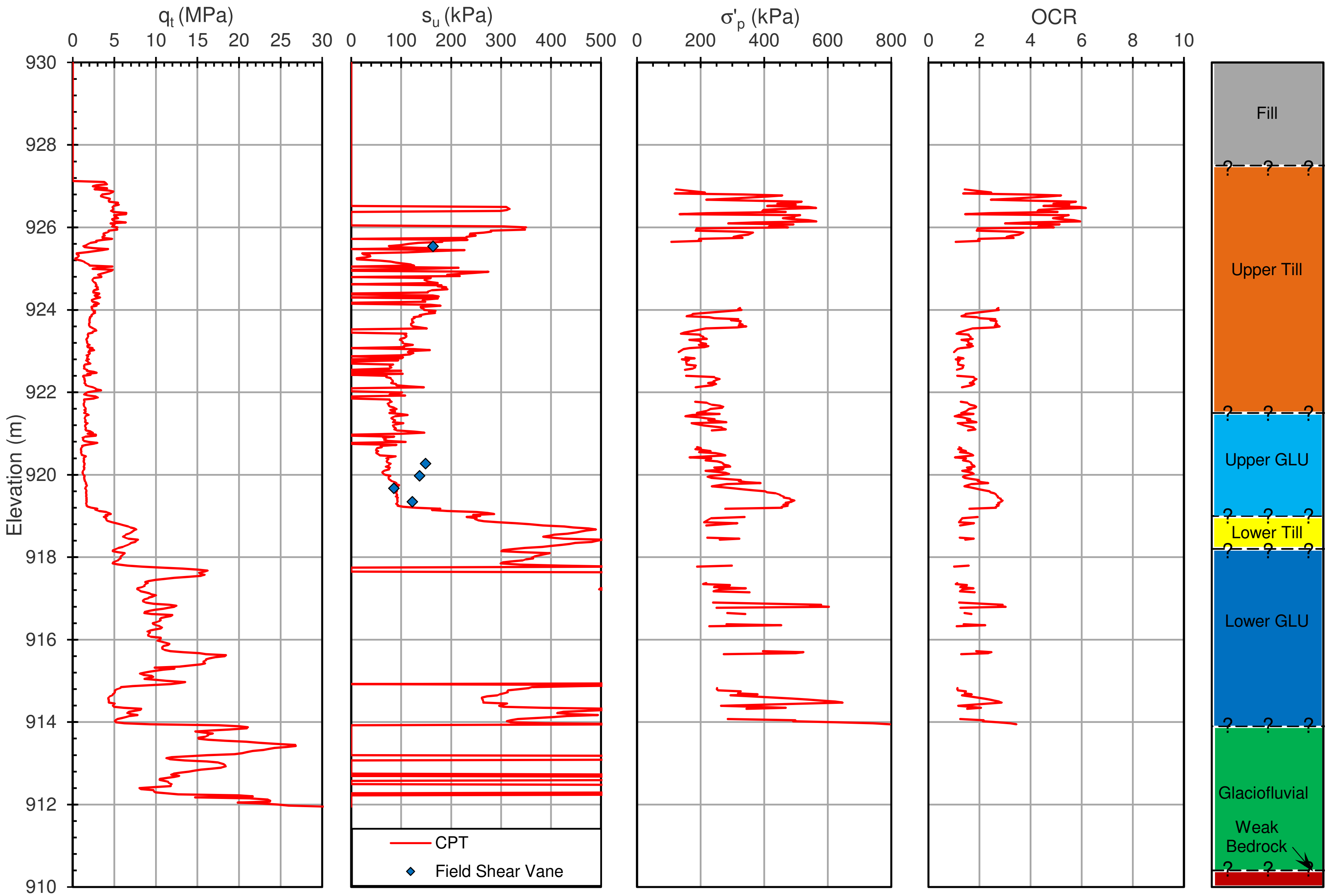
RSCPT14-03



Date: January 6, 2015

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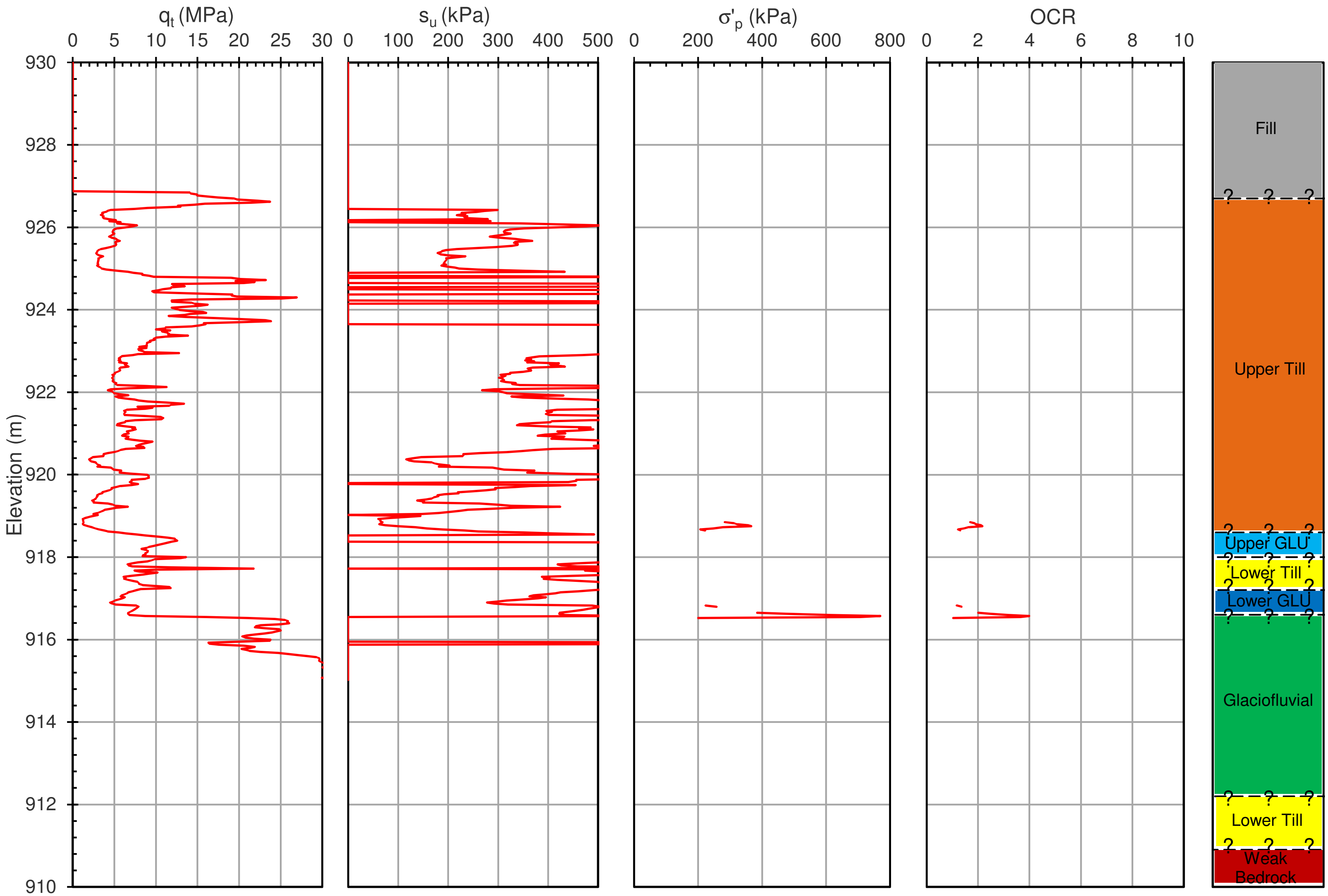
RSCPT14-04



Date: January 6, 2015

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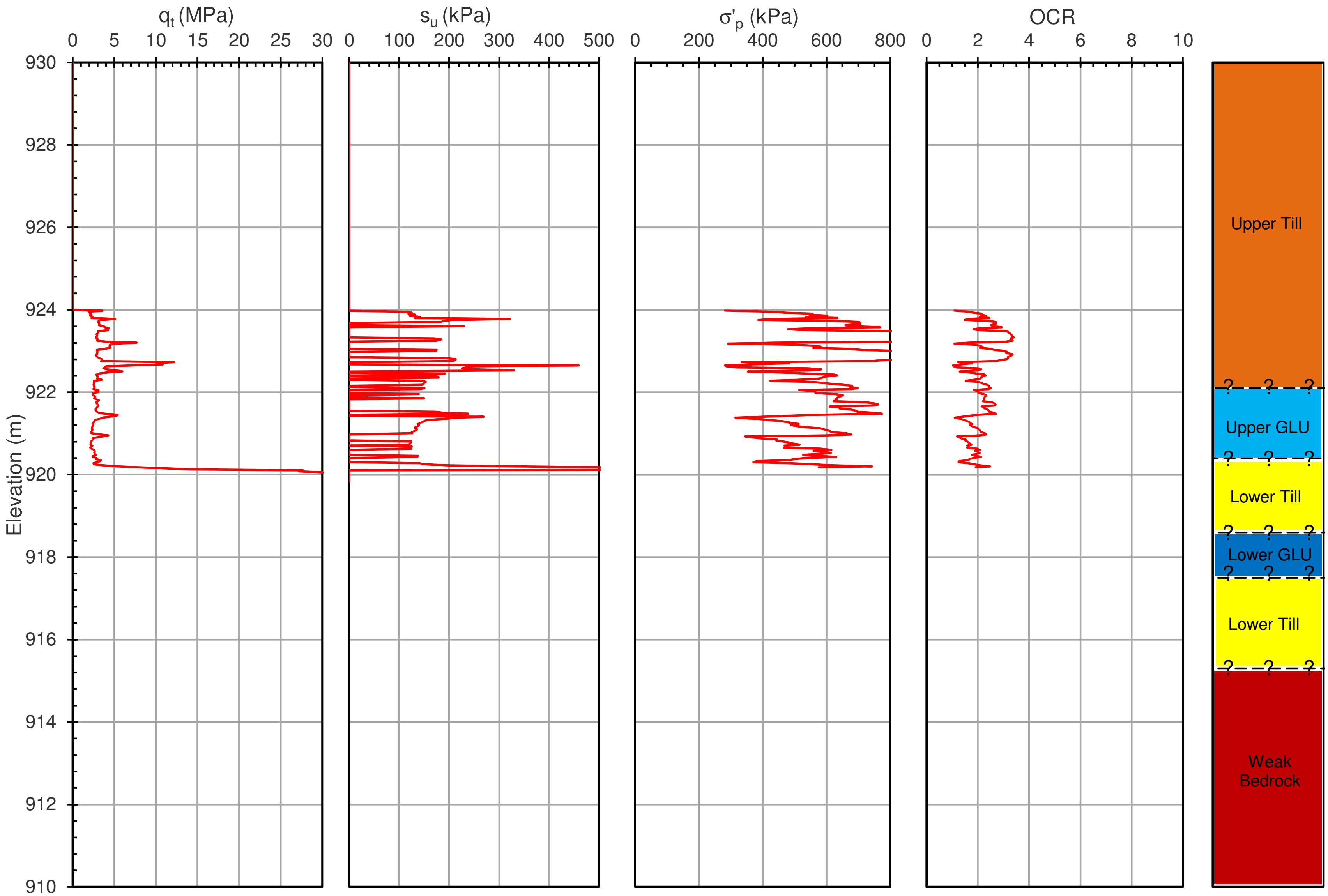
RSCPT14-05



Date: January 6, 2015

Compiled By: ACL
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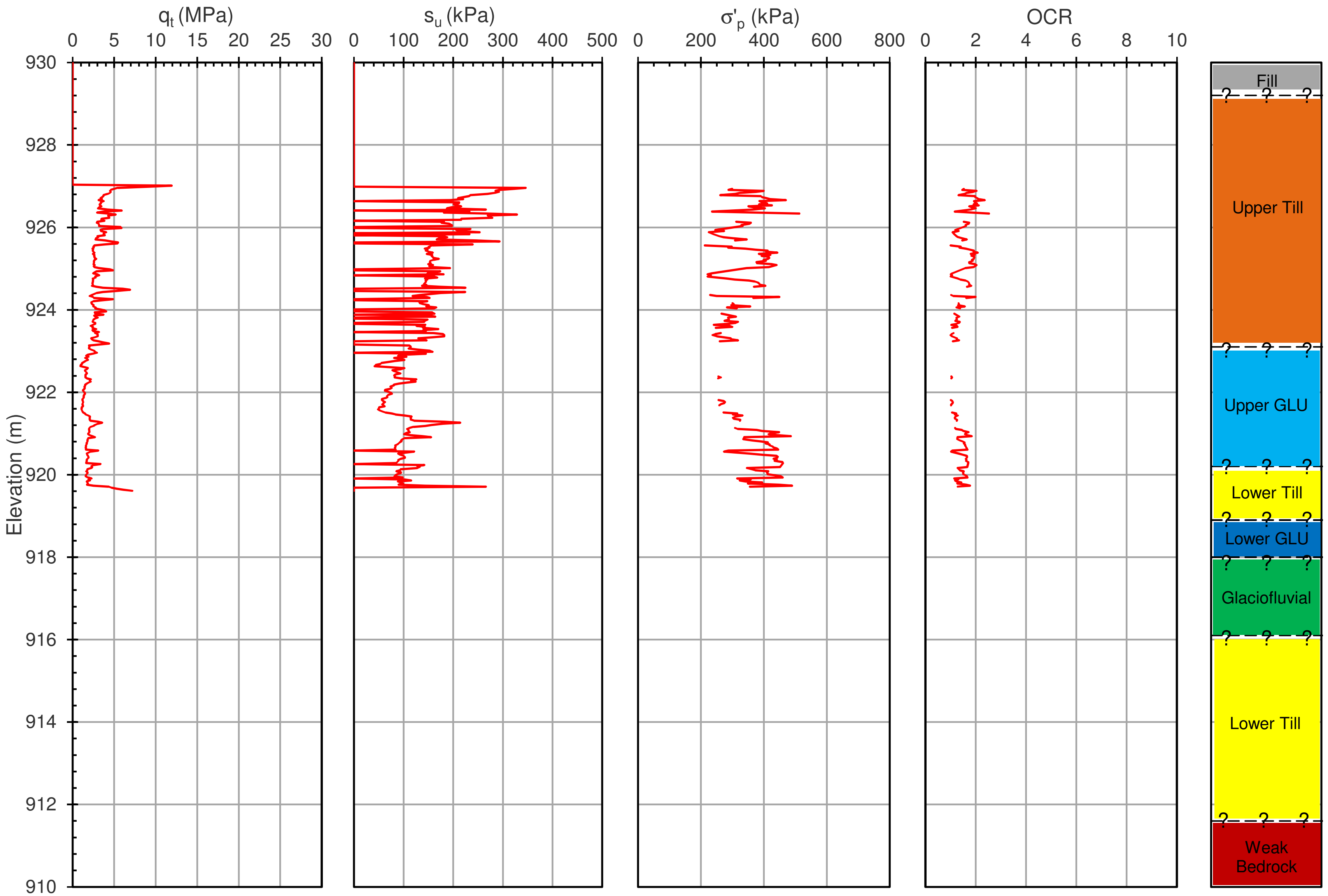
RCPT14-06



Date: January 6, 2015

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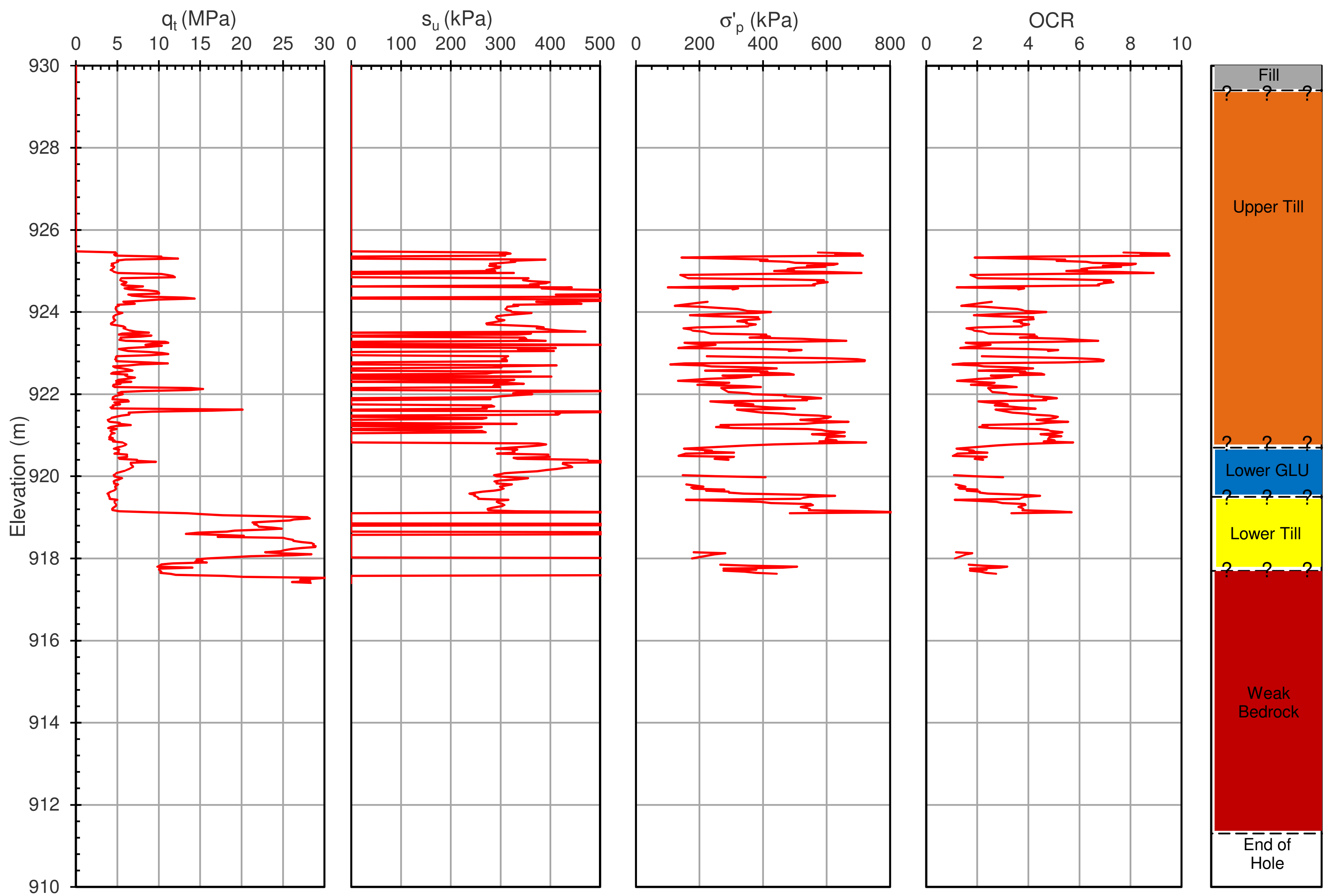
RSCPT14-07

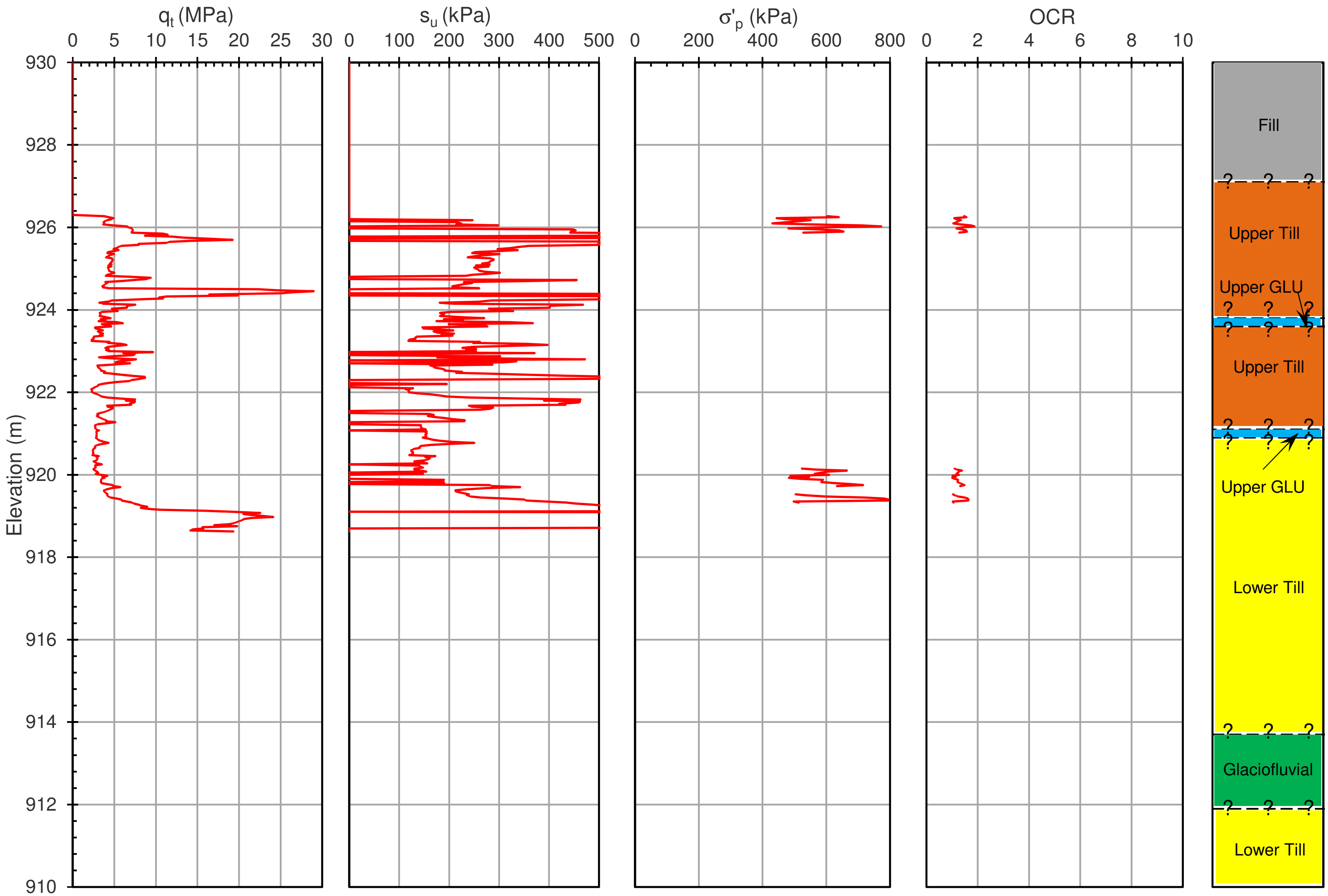


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RSCPT14-08



Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

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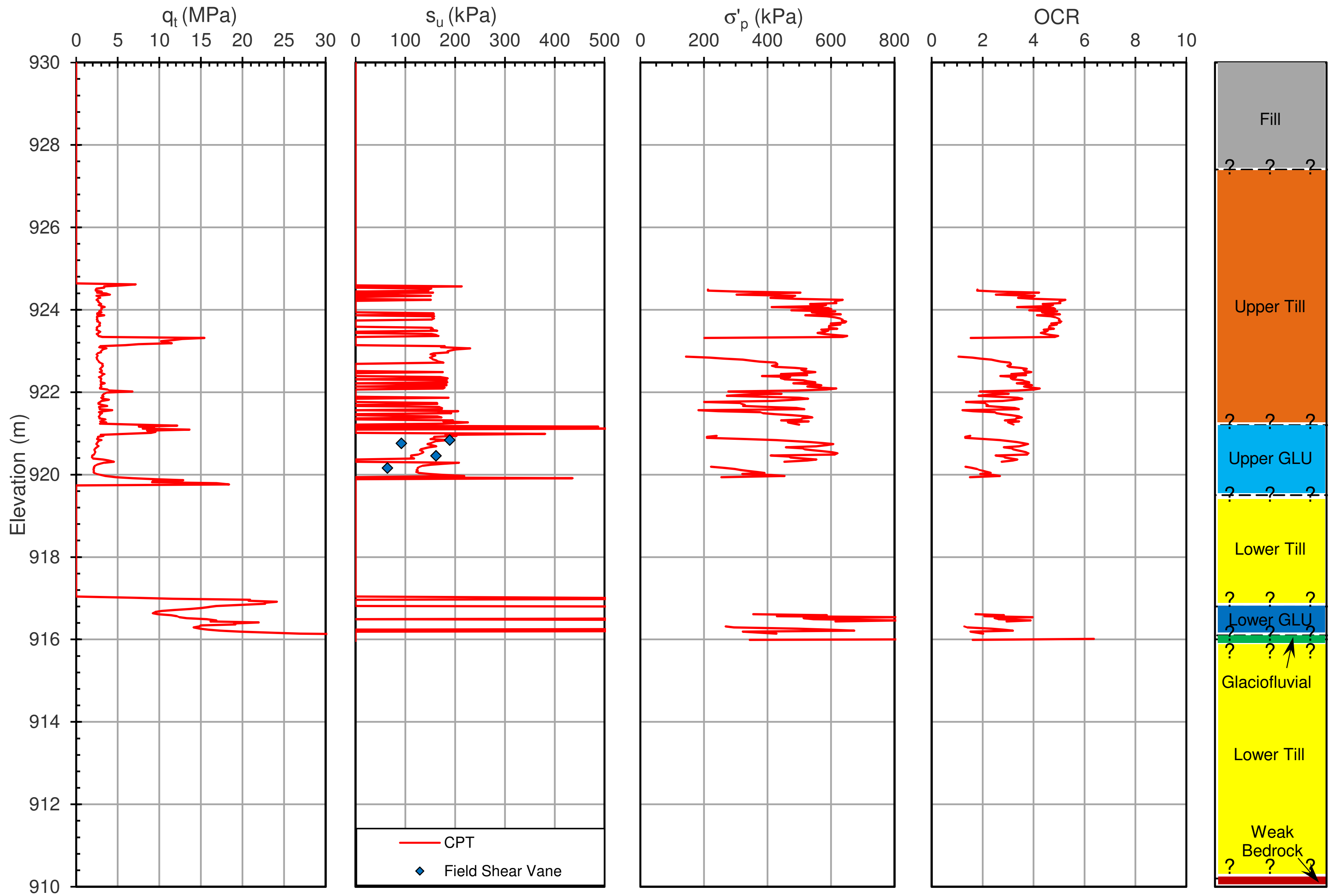
RSCPT14-10



Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

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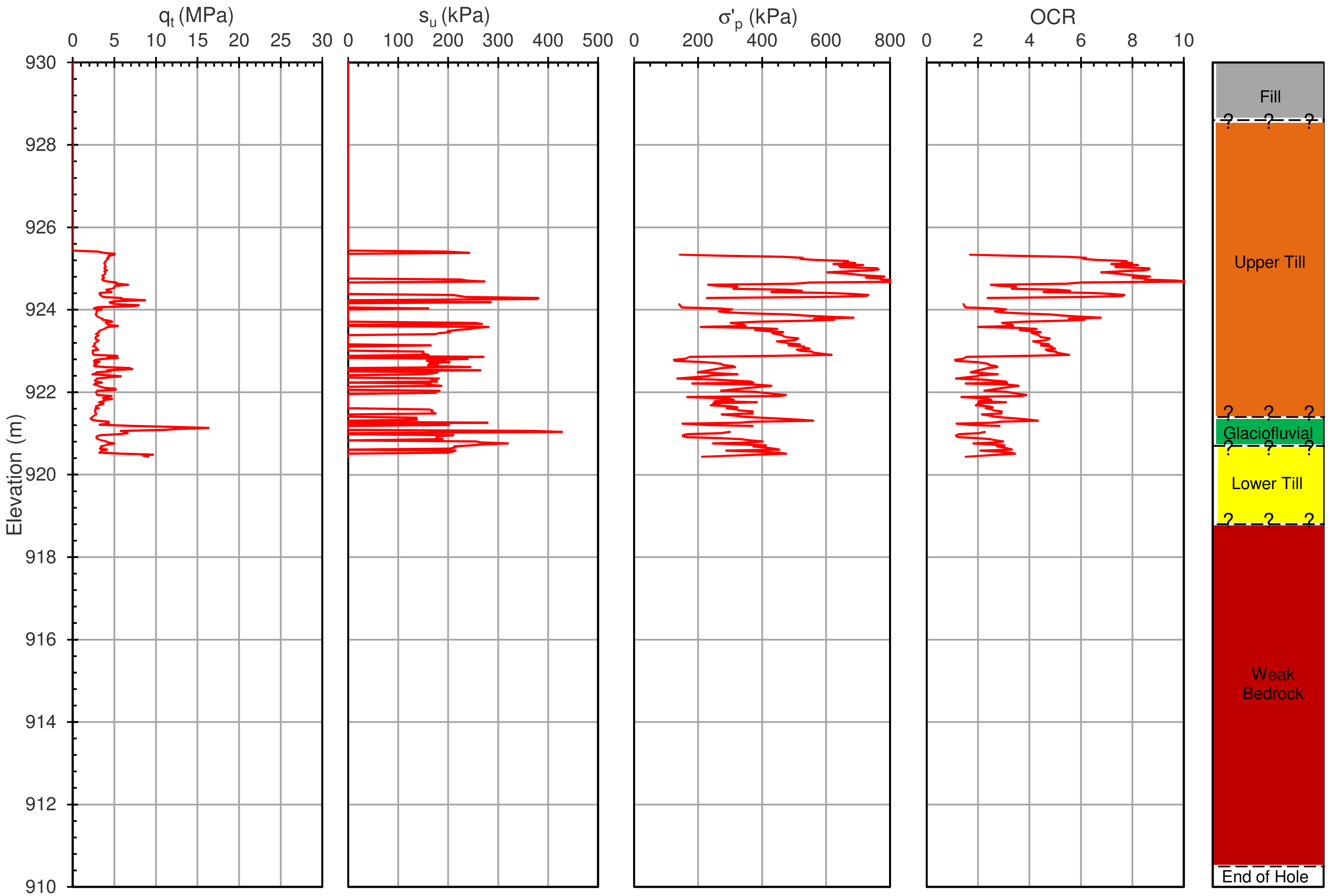
RSCPT14-11

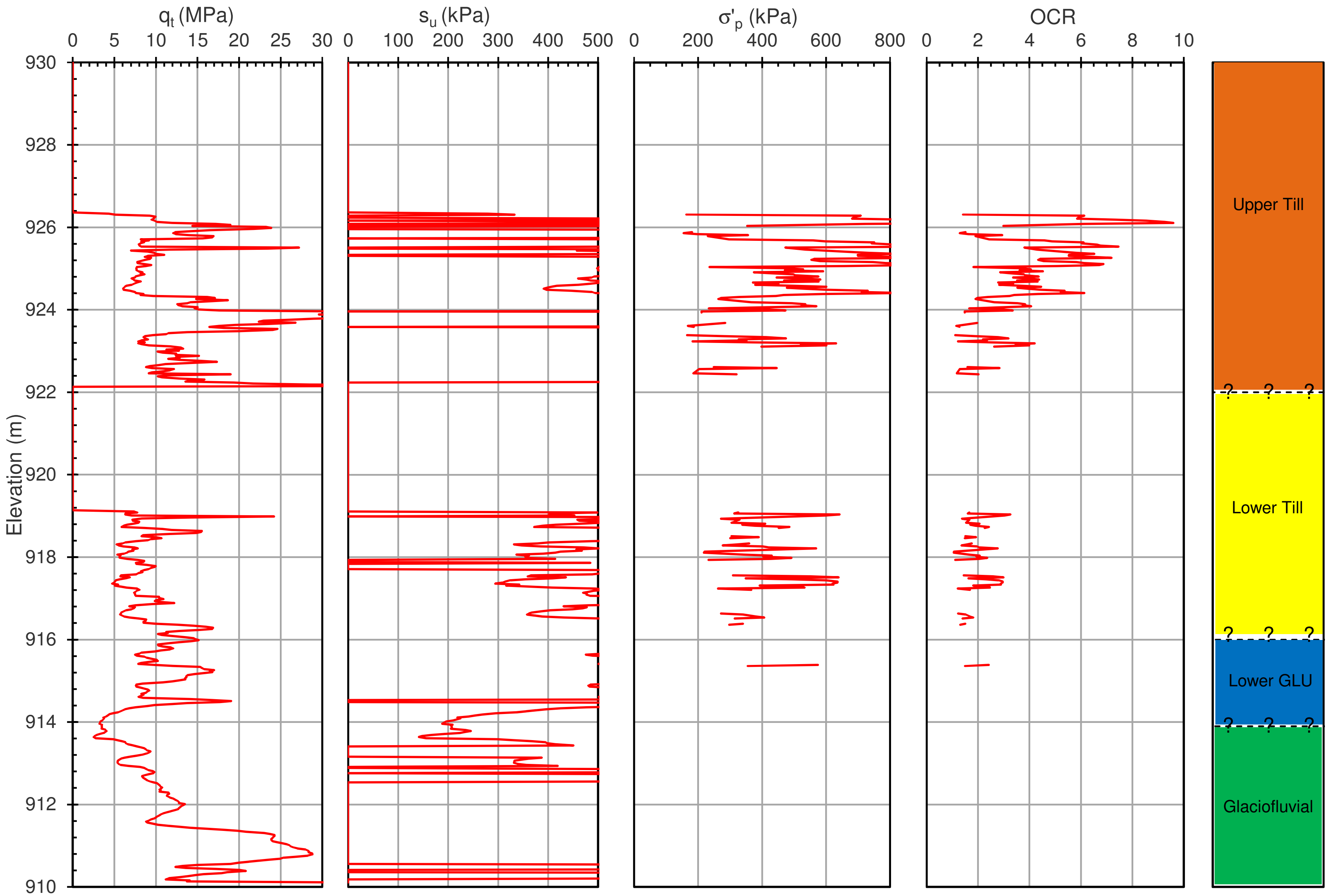


Date: December 22, 2014

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RSCPT14-13



Date: January 6, 2015

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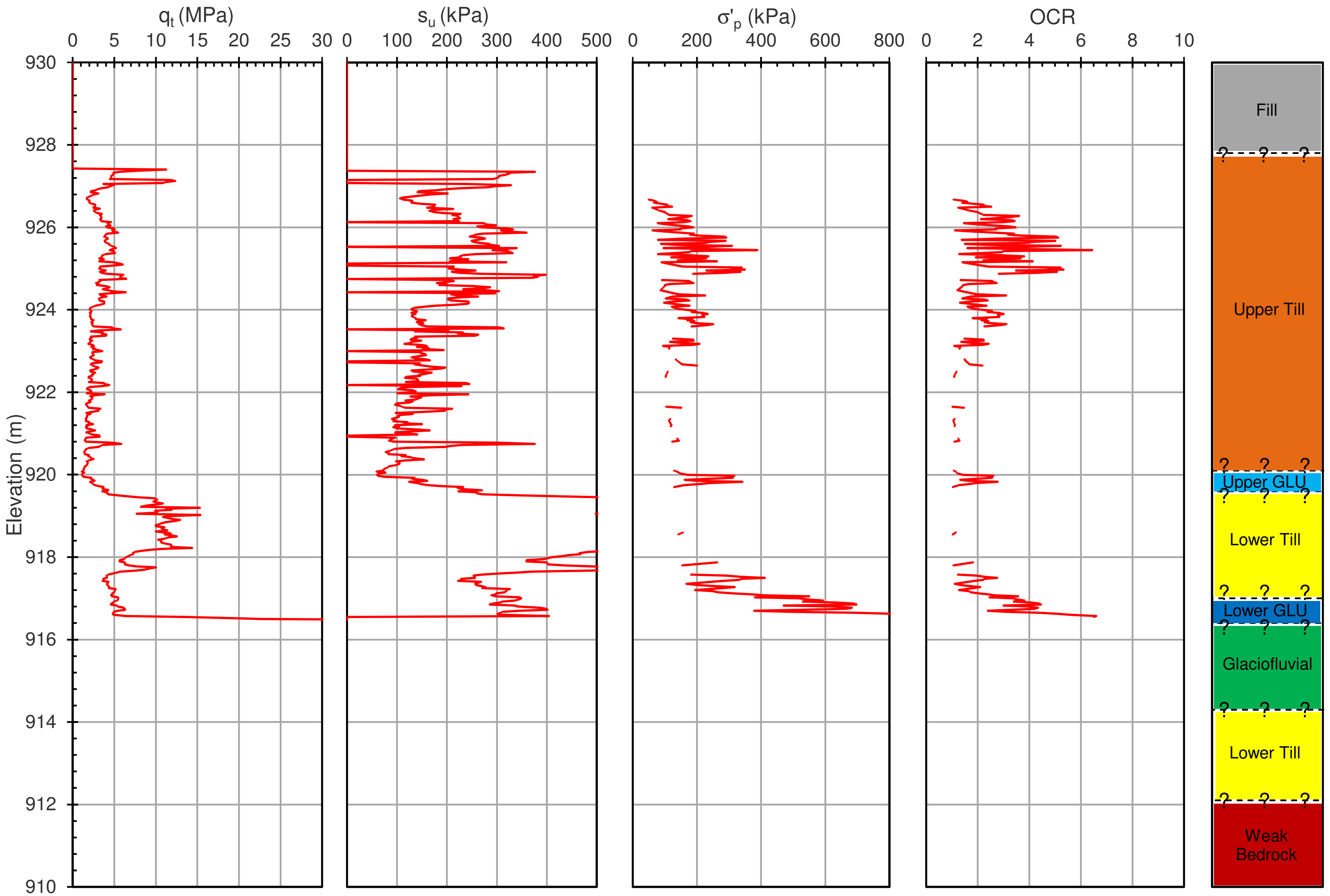
RSCPT14-14



Date: January 6, 2015

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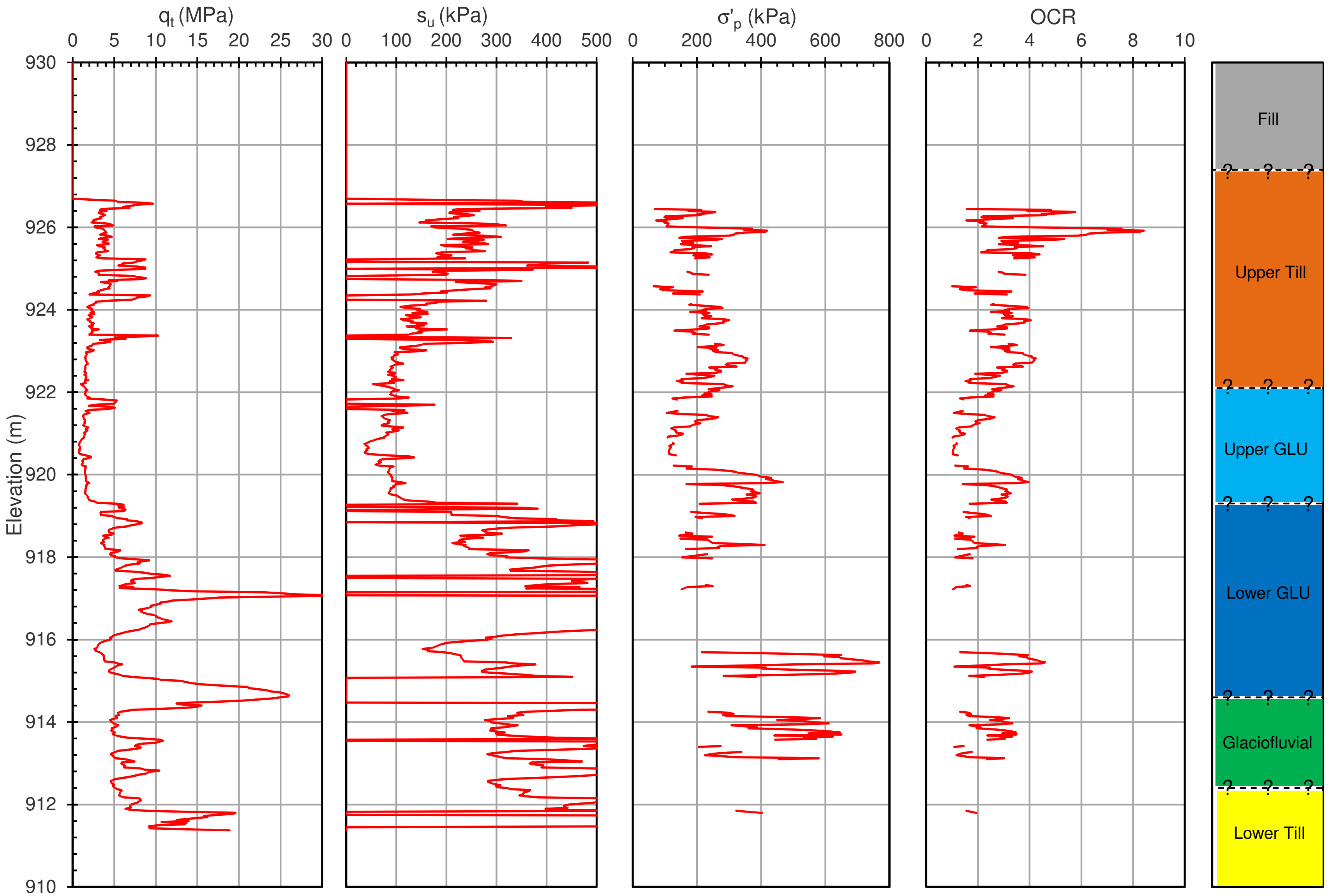
RSCPT14-15



Date: January 6, 2015

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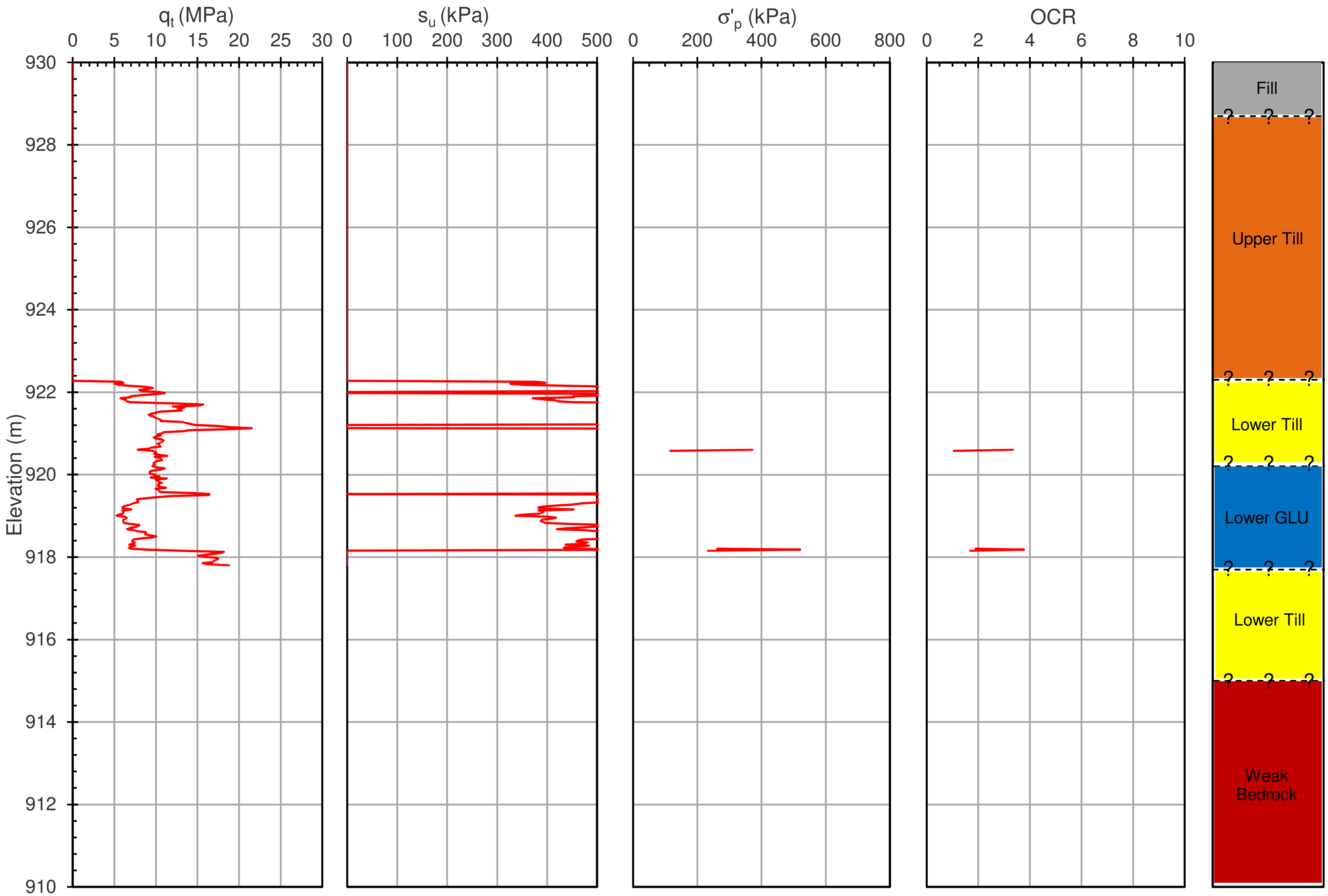
RSCPT14-16



Date: January 6, 2015

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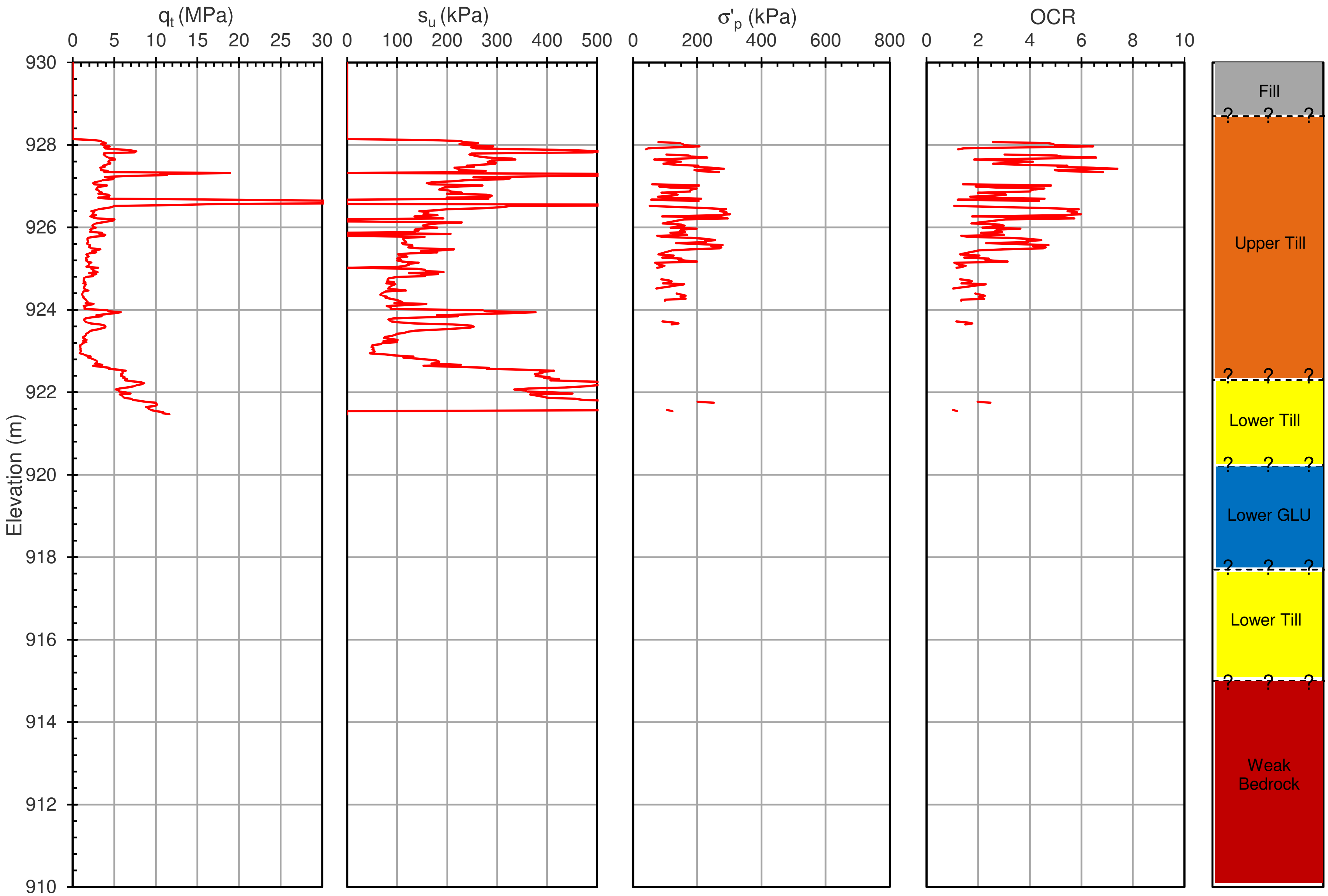
RSCPT14-16A

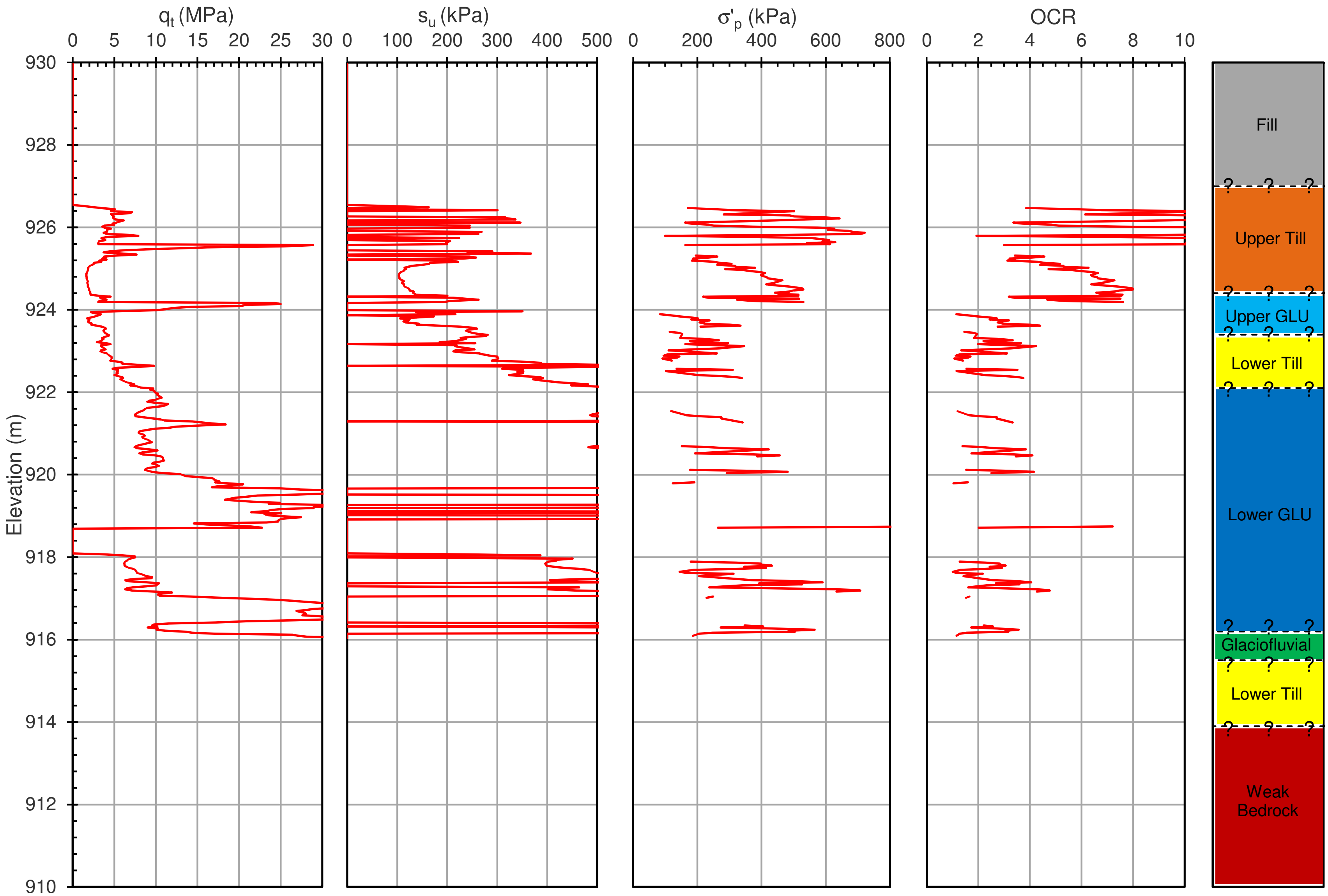


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RSCPT14-17

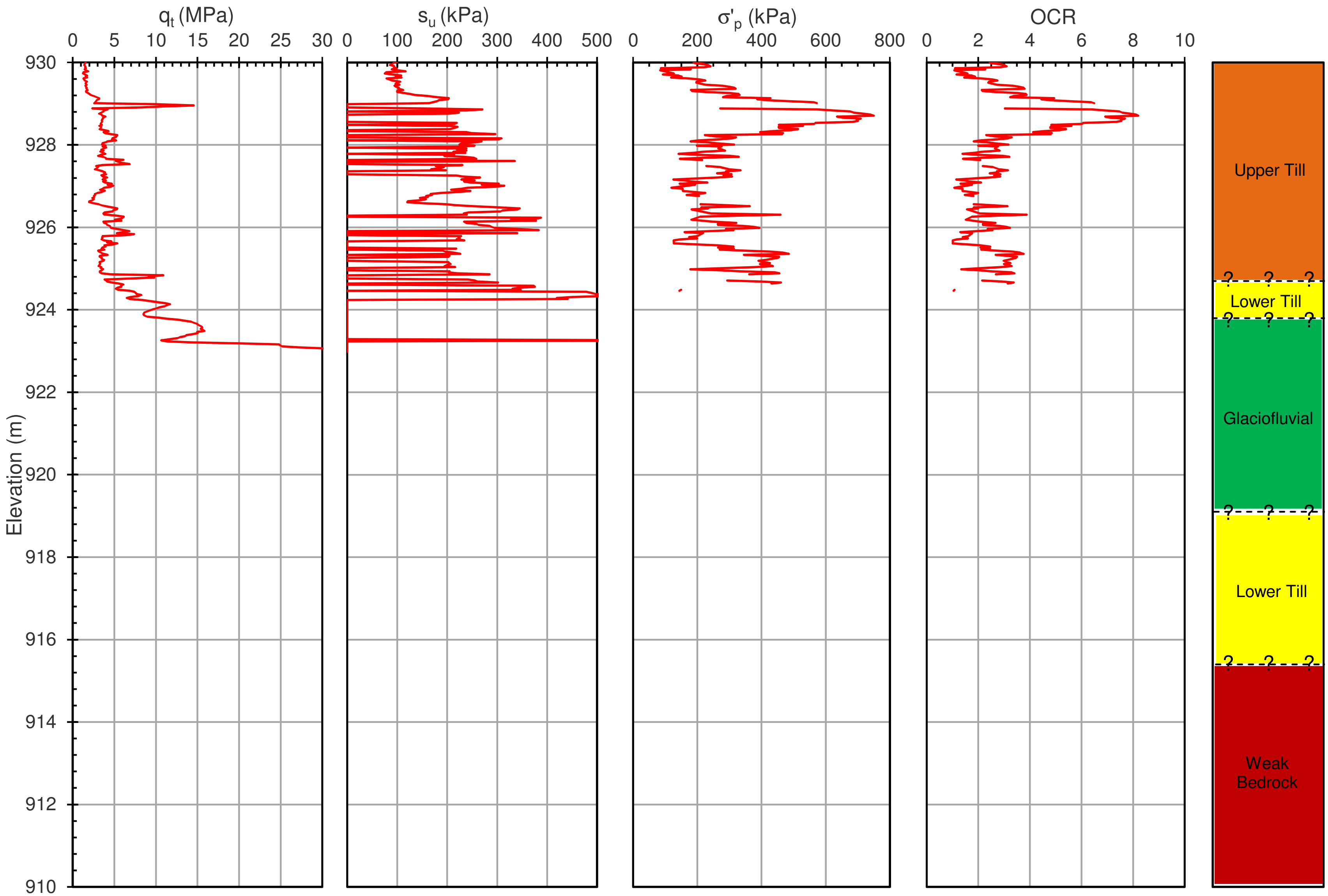


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RSCPT14-18

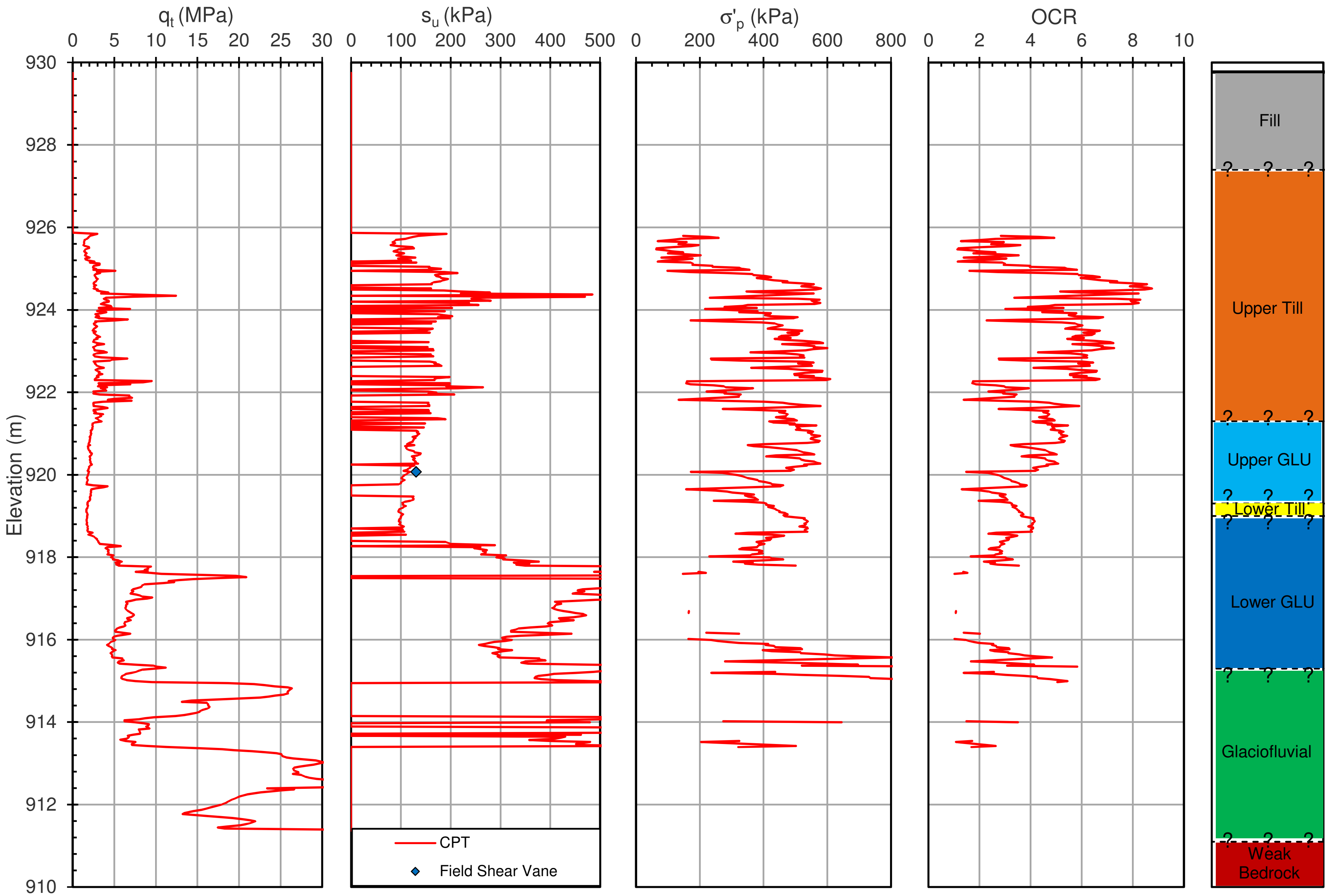


Date: January 6, 2015

Compiled By: ACL
Approved By: D. VAN ZYL

Mount Polley Independent Expert Engineering Investigation and Review Panel

RSCPT14-22



Compiled By: ACL
Approved By: D. VAN ZYL

Date: January 6, 2015