2013 ANNUAL REPORT

QUARTZ MINING LICENSE QML-0009

March 2014

Prepared for:

YUKON GOVERNMENT - ENERGY, MINES AND RESOURCES

Distribution:

YG EMR	2 original bound 1 CD
AKHM	1 original bound
First Nation of Na-cho Nyak Dun	1 original bound

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

Alexco Keno Hill Mining Corp. (AKHM) was issued Quartz Mining License (QML) QML-0009 on November 17th, 2009. A request for amendment of this License to include mining activities at the Lucky Queen and Onek 990 Mines was submitted in 2012 and approved January 13, 2013. Prior to this, letters of approval for preliminary development of the Onek 990 and Lucky Queen Mines were received in November 2012.

On August 20th, 2010, type A Water Licence QZ09-092 was issued to Alexco Keno Hill Mining Corp. for operation of the Bellekeno Mine and Mill. Subsequently, on September 7th, 2010, the Bellekeno Mine became a "mine under development" as defined in subsection 1(1) and subsection 1(2) of the federal Metal Mining Effluent Regulations. On May 16, 2013, AKHM received an amendment (QZ12-053) to Water Licence QZ09-092 to similarly include the Lucky Queen and Onek 990 Mines. This report serves to fulfill the reporting requirements of the QML as defined under paragraphs 12.5 of QML-0009 and Section 14.0 of the Monitoring and Surveillance Plan.

1.1 LOCATION

The Bellekeno Mine, owned and operated by Alexco Keno Hill Mining Corp. (AKHM), is located in the vicinity of Keno City (63˚ 55'N, 135˚ 29'W), in central Yukon, 354 km (by air) due north of Whitehorse. Access to the property is via a paved, two-lane highway from Whitehorse to Mayo (407 km) and an all-weather gravel road northeast from Mayo to Elsa (45 km); a total distance of 452 km. The property lies along the broad McQuesten River valley with three prominent hills to the south of the valley. Figure 1-1 shows the general project location within Yukon while Figure 1-2 shows the location on a smaller scale. The Bellekeno area is located about 3 km east of Keno City, the Onek 990 Mine is about 0.5 km to the northeast of Keno City ,the Keno Hill District Mill site is about 1.2 km to the west (Figure 1-3), while the Lucky Queen Mine is about 4 km to the north of Keno City.

AKHM

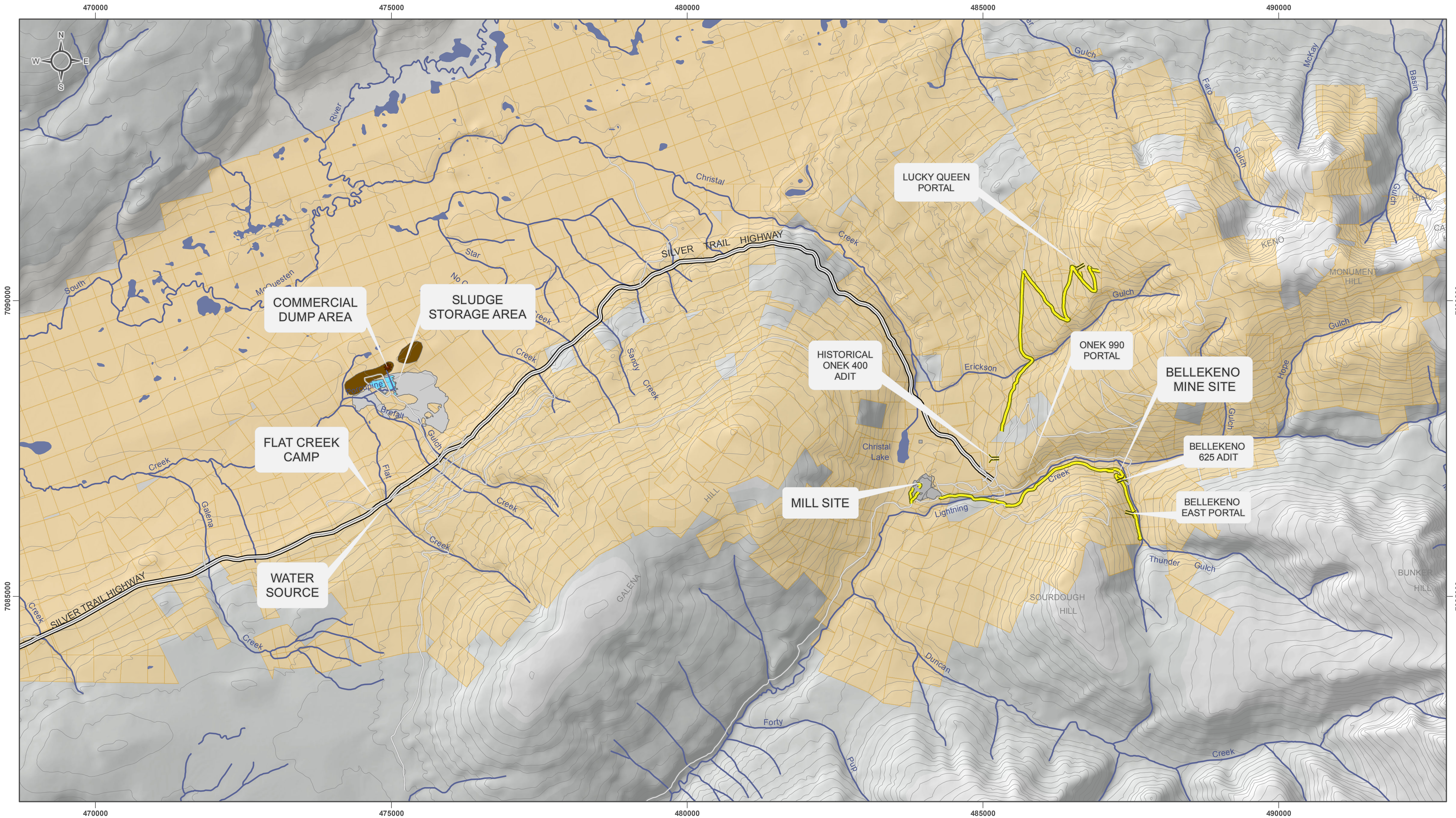
ACCESS

ALEXCO KENO HILL MINING CORP.

QML ANNUAL REPORT

FIGURE 1-1
PROJECT LOCATION

I:\ALEX-05-01\Bellekeno\GIS\mxd\Annual_Reports\2013\Project_Location_20140210.mxd
(Last edited by: jpan; 3/5/2014/09:35 AM)



National Topographic Data Base (NTDB) compiled by Natural Resources Canada at a scale of 1:50,000. Cadastral data compiled by Natural Resources Canada. Reproduced underlicense from Her Majesty the Queen in Right of Canada, Department of Natural Resources Canada. All rights reserved. Quartz claim boundaries and ownership current as of February 24th, 2011. Data source: http://geomaticsyukon.ca.

Datum: NAD 83; Map Projection: UTM Zone 8N

1:60,000 (when printed on 11 x17 inch paper)

0 0.5 1 2 3 Kilometers

- Adit
- Alexco Quartz Claims
- Silver Trail Highway
- Haul Road
- Local
- 100 meter contour
- Watercourse
- Waterbody

AKHM

ACCESS

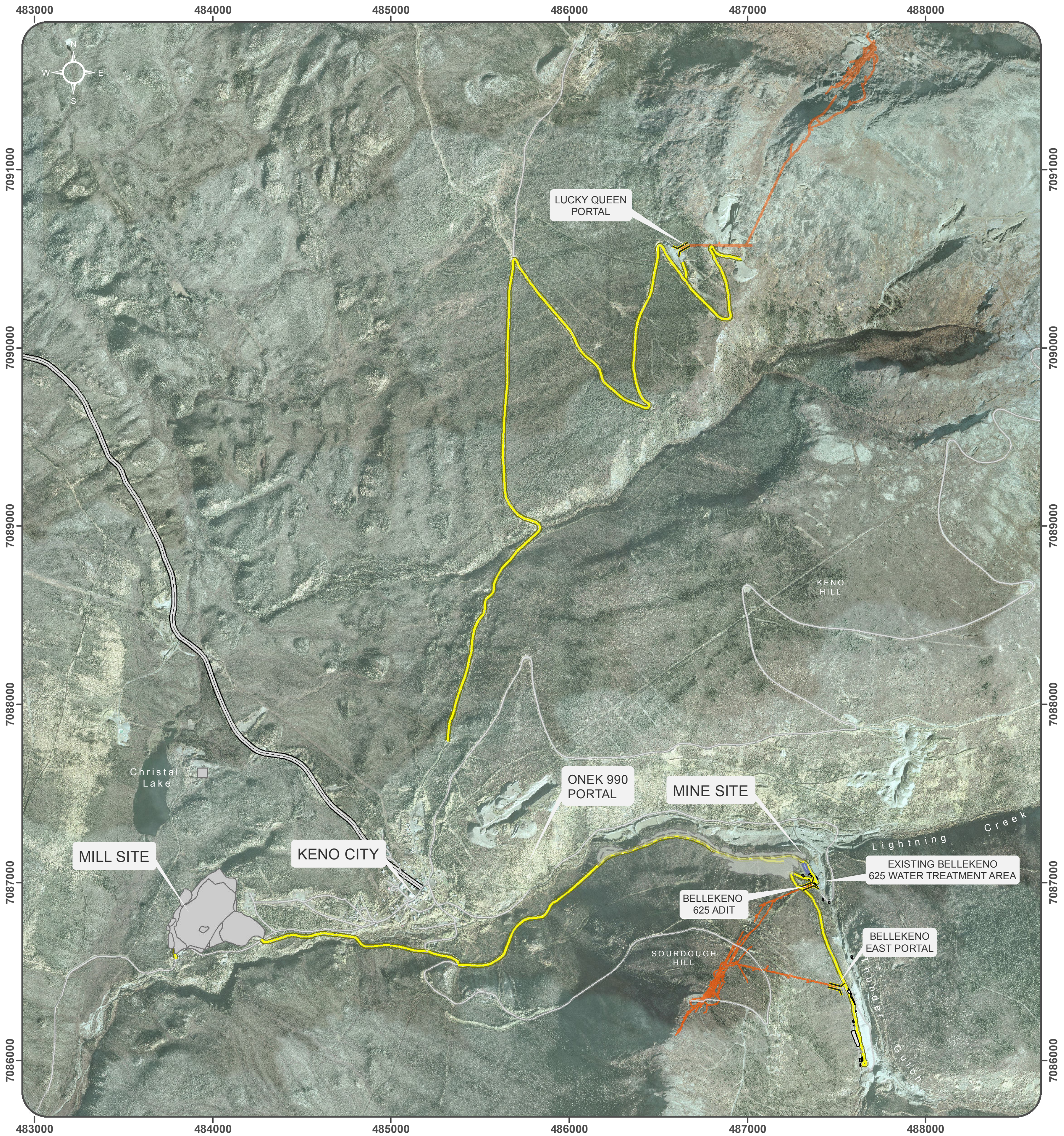
ANNUAL QUARTZ MINING LICENCE REPORT, QML-0009

FIGURE 1-2

KENO HILL PROPERTY LOCATION MAP

MARCH 2014

I:\ALEX-05-01\Bellekeno\GIS\mxd\Annual_Reports\2013\Fig_1-2_KenoHill_Property20140305.mxd
(Last edited by: jpan;3/5/2014/10:13 AM)



Silver Trail Highway

Haul Road

Local

Underground workings

1:30,000 *When printed on 8.5 be 11 inch paper*

0 500 1,000 Meters

ANNUAL QUARTZ MINING LICENCE REPORT, QML-0009

FIGURE 1-3

BELLEKENO, ONEK 990 AND LUCKY QUEEN LOCATION MAP

AKHM ACCESS

MARCH 2014

Aerial photograph obtained from Geodesy Remote Sensing Inc., Calgary Alberta. Imagery acquired September 13 and 14 2006.

Datum: NAD 83; Map Projection: UTM Zone 8N

This drawing has been prepared for the use of Access Mining Consultants Ltd.'s client and may not be used, reproduced or relied upon by third parties, except as agreed by Access Mining Consultants Ltd. and its client, as required by law or for use of governmental reviewing agencies. Access Mining Consultants Ltd. accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without Access Mining Consultants Ltd.'s express written consent.

I:\ALEX-05-01\Bellekeno\GIS\mxd\Annual_Reports\2013\Fig_1-3_Bellekeno_Overview20140305.mxd
(*Last edited by: jpan; 3/5/2014/10:13 AM*)

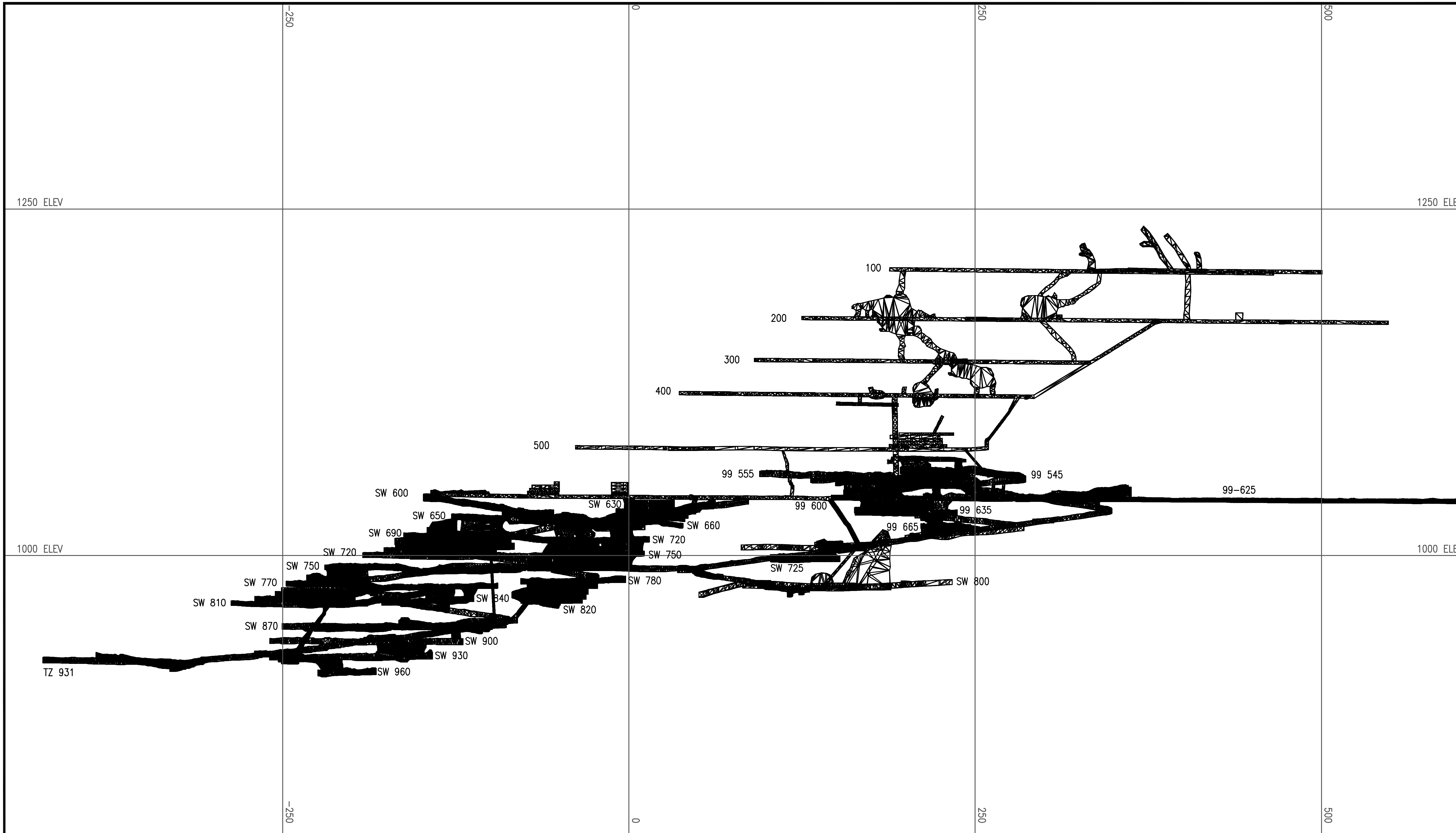
2 MINING ACTIVITIES

2.1 MINE SITES

2.1.1 Bellekeno

Underground development at Bellekeno continued in 2013 up until the end of August when the mine was put in temporary closure. Production in 2013 focused mainly in the Southwest and 99 zones of the mine. The majority of development consisted of production mining of the Bellekeno ore body, specifically the SW and 99 Zone. In 2013 the CAPEX development was sustained in these zones. The waste rock development in 2013 focused on additional stope access within the Southwest and 99 zone as well as minor long term infrastructure development. The SW Main Ramp was extended down to the 930 and 960 levels for access to the lowest portion of the mine. Exploration drifting to the south of the known resources is continuing along what is termed the "Thunder Zone". As-builts drawings for the Bellekeno underground workings can be seen in Figure 2-1.

Production activities were carried out in accordance with the Operation Plans submitted as per paragraph 11.1 of QML-0009, and as described in the Project Description of Water Licence Application QZ09-092 & QZ12-053.



ALEXCO

ALEXCO RESOURCE CORP
BELLKENO MINE

DEPT.	APPROVED BY	DATE	COMMENTS
SURVEY			
ENGINEERING			
GEOLOGY			
ALEXCO MANAGER			
PROCON SUPER			

TITLE: *BELLEKENO MINE*
Long Section

Drawn by: *DARIN BAKER* Scale: *1:2500*
Date: *07/28/2013* Approval: Date:
File: *C:\Users\Darin Baker\Desktop\entire mine.dxf*

2.1.2 Lucky Queen

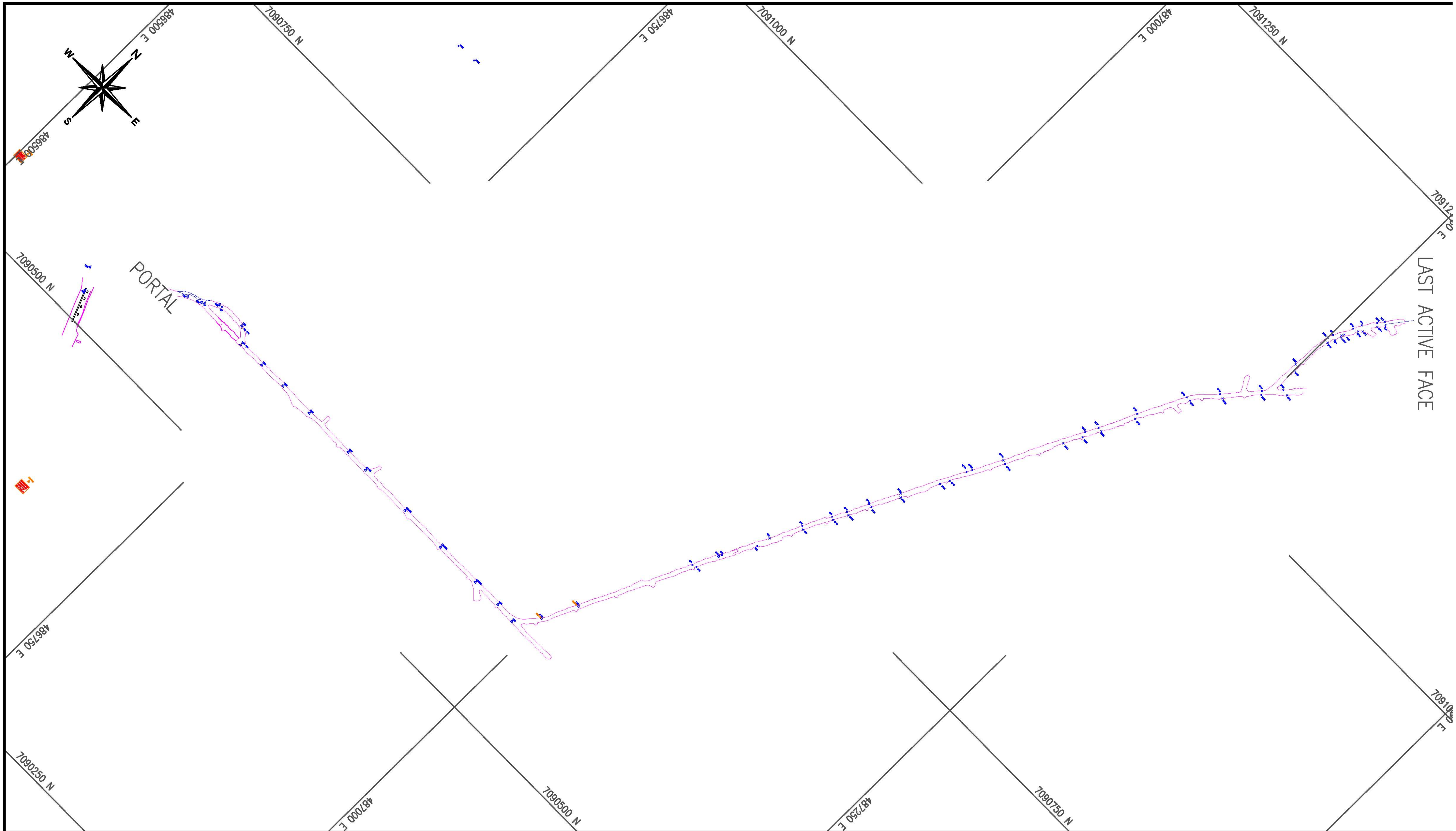
Underground rehab at Lucky Queen (LQ) continued throughout the entire year in 2012 and new CAPEX development was initiated in Q4 2012 and was suspended in 2013 to allow a re-evaluation of the project. Currently the project is on hold pending re-activation of the district mining operations.

There were no issues in regards to stability or permanent closures in 2013. Preliminary activities for the Lucky Queen Mine were approved under the current QML-0009 on November 30, 2012. As-builts for underground workings can be seen in Figure 2-2.

2.1.3 Onek 990

As discussed in the 2012 Pre-Season Summary Report submitted in March 2012, a new portal was to be prepared west of the historical Onek pit called Sign Post Portal. This development proceeded, however following continued community consultation, a new portal location, Onek 990, was found to be more suitable. The Onek 990 portal site is located near Lightning Creek.

New infrastructure for the Onek 990 portal began in August 2012 and included 2 km of road building, site preparation, portal preparation, and was 80% complete by the end of 2012. CAPEX development was initiated and continued into 2013. The Onek 990 portal pad includes a temporary office/dry, shop, compressor and generator shed, several out buildings. A lay down area on the historic Onek waste rock dump is also being used. A final detailed bridge design has been submitted, permitted and construction completed in 2013 to connect the Onek connector road into the BK Haul road. Preliminary activities for the Onek 990 Mine were approved under the current QML-0009 on November 9, 2012. There were no temporary or permanent closures or stability issues that occurred in 2013. As-builts for underground workings can be seen in Figure 2-3.



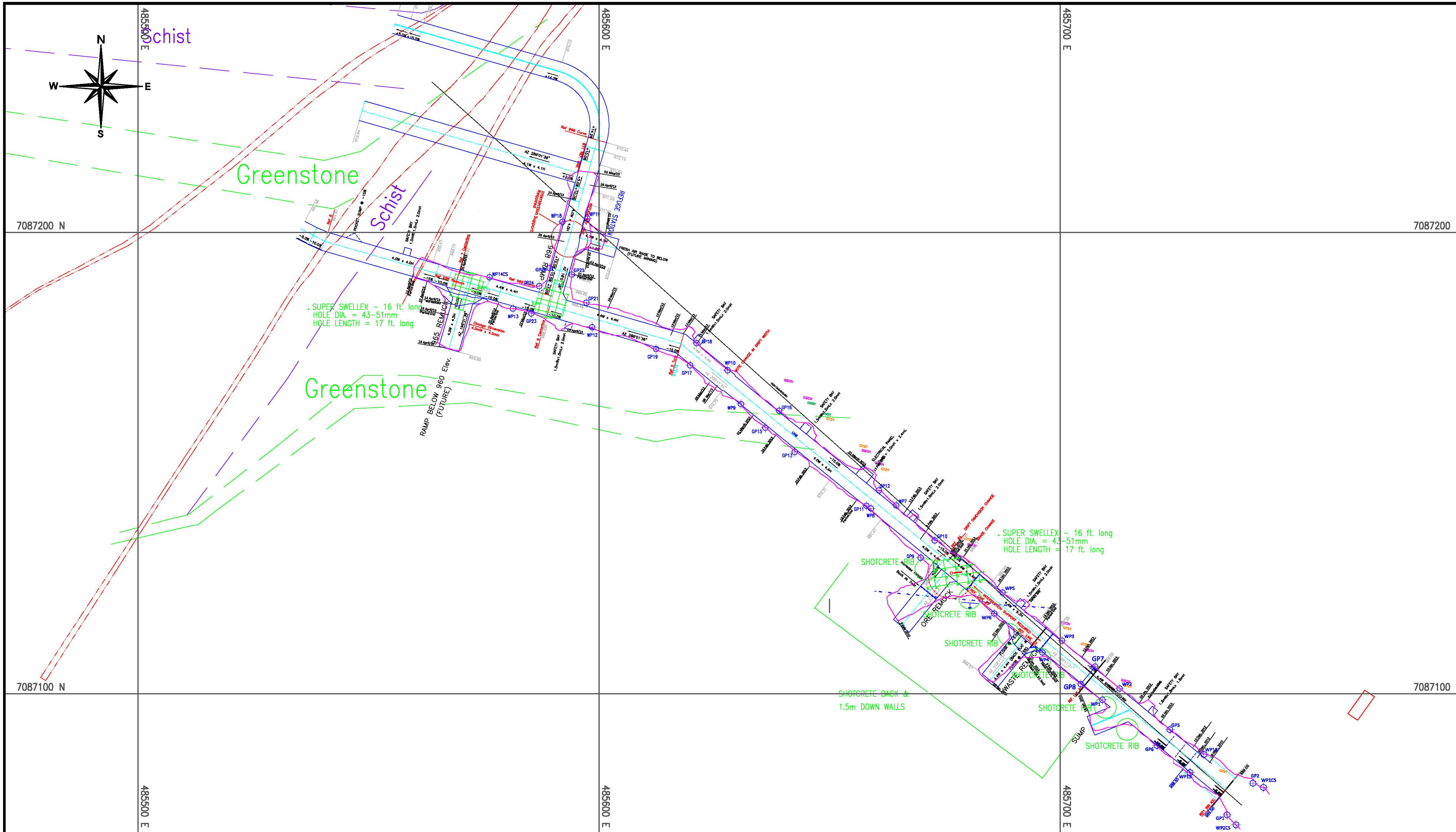
ALEXCO

ALEXCO RESOURCE CORP
BELLKENO MINE

DEPT.	APPROVED BY	DATE	COMMENTS
SURVEY			
ENGINEERING			
GEOLOGY			
ALEXCO MANAGER			
PROCON SUPER			

TITLE: **LUCK QUEEN MINE**
Asbuilt March 8, 2013

Drawn by: DARIN BAKER		Scale: 1:2500	
Date: 03/08/2013		Approval:	Date:
File: C:\Users\Darin Baker\Documents\Drawing1.dwg			



	DEPT.	APPROVED BY	DATE	COMMENTS	TITLE: ONEK ASBUILT 30 May 2013
ALEXCO RESOURCE CORP BELLEKENO MINE	SURVEY				
	ENGINEERING				
	GEOLOGY				Drawn by: DARIN BAKER — Scale: 1:750
	ALEXCO MANAGER				Date: 05/30/2013 — Approval: — Date:
ALEXCO	PROCON SUPER				File: H:\Bellekeno Underground\Development-Planning\Promine\promine draW

2.2 LIFE OF MINE AND RESERVES

Alexco does not report Mineral Reserves as this definition has certain economic parameters that must be established in order to report as Reserves. Alexco published the Updated Preliminary Economic Assessment for the Eastern Keno Hill Silver District Project – Phase 2 in November 2013 (http://www.alexcoresource.com/i/pdf/reports/Alexco_PEA_EKHSD_20131115.pdf). The mineral resource presented in this Updated PEA constitutes the current mineral resource estimate for the three deposits that are part of Alexco's Keno Hill silver district:

- Bellekeno deposit;
- Lucky Queen deposit;
- Flame & Moth deposit.

The mineral resources have been estimated in conformity with generally accepted CIM *Estimation of Mineral Resource and Mineral Reserves Best Practices Guidelines* (CIM 2003) and are reported in accordance with the Canadian Securities Administrators' National Instrument 43-101. Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the mineral resource will be converted into mineral reserve.

In the opinion of SRK, the resource evaluations reported herein are a reasonable representation of the global polymetallic mineral resources in the Bellekeno mine, Lucky Queen, and F&M deposits at the current level of sampling.

2.2.1 Bellekeno Mineral Resources

The updated Bellekeno Mineral Resource Statement presented herein (Table 2-1) represents the third mineral resource evaluation prepared for the Bellekeno deposit in accordance with the Canadian Securities Administrators' National Instrument 43-101. The mineral resource model was prepared by Alexco personnel under the supervision of a third party consulting geologist David Farrow, BSc (Hons), GDE, PrSciNat, PGeo (BC), of Geostrat Consulting Services Inc. The model considers 405 core boreholes drilled by Alexco during the period of 2006 to 2012 as well as historical drilling and chip data collection during production both historically and by Alexco. The resource estimation work was completed by Mr. Farrow, a Qualified Person as defined in National Instrument 43-101.

Table 2-1: Updated Mineral Resource Statement for the Bellekeno Deposit, September 30, 2012

Class	Tonnes	Ag (gpt)	Pb (%)	Zn (%)
Indicated*	365,000	658	5.30	5.3
Inferred*	243,000	428	4.1	5.1

* Mineral resources are not mineral reserves and have not demonstrated economic viability. All figures have been rounded to reflect the relative accuracy of the estimates.

** Reported at an NSR cut-off of C$185 (US$1 = C$1)/tonne using consensus long term metal prices (US$) and recoveries of Ag US$22.50/oz, recovery 96%; Pb US$ 0.85/lb, recovery 97%; Zn US$ 0.95/lb, recovery 88%; Ag grades capped at 5,000 gpt.

Since the date of the Bellekeno deposit resource statement, mine production totalled 81,000 tonnes at average grades of 722 gpt silver, 8.3% lead, and 4.0% zinc (from November 1, 2012 to September 1, 2013).

2.2.2 Lucky Queen Mineral Resources

Mineral resource estimates for the Lucky Queen deposit were previously prepared by SRK Consulting (Canada) Inc. (SRK) and published in an independent technical report on September 8, 2011 entitled "Technical Report on the Lucky Queen Deposit, Lucky Queen Property, Keno Hill District, Yukon", available on SEDAR.

The Mineral Resource Statement from this report is restated below.

Table 2-2: Mineral Resource Statement for the Lucky Queen Deposit, July 27, 2011

Class	Tonnes	Ag (gpt)	Au (gpt)	Pb (%)	Zn (%)
Indicated*	124,000	1,227	0.17	2.57	1.72
Inferred*	150,000	571	0.16	1.37	0.92

* Mineral resources are not mineral reserves and have not demonstrated economic viability. All figures have been rounded to reflect the relative accuracy of the estimates.

** Reported at an NSR cut-off of $185 (US$1 = C$1)/tonne using long term metal prices (US$) and recoveries developed for the nearby Bellekeno deposit (Ag US$18.50/oz, recovery 96%; Pb US$ 0.90/lb, recovery 97%; Zn US$ 0.95/lb, recovery 88%; Au US$ 1,100/oz, recovery 72%). Ag grades capped at 6,300 gpt; Pb capped at 14.8%, Zn capped at 7%, Au grades capped at 2 gpt.

2.2.3 Flame & Moth Mineral Resources

Mineral resources for the F&M deposit were previously prepared by Alexco under the supervision of Mr. Farrow and published in the technical report entitled "Updated Technical Report on the Flame & Moth Deposit, Flame & Moth Property, Keno Hill District, Yukon" (Alexco 2013) on March 15, 2013, available on SEDAR.

The Mineral Resource Statement from this report is restated below.

Table 2-3: Mineral Resource Statement for the Flame & Moth Deposit, January 30, 2013

Class	Tonnes	Ag (gpt)	Au (gpt)	Pb (%)	Zn (%)
Indicated*	1,378,000	516	0.42	1.72	5.70
Inferred*	107,000	313	0.27	0.86	4.21

* Mineral resources are not mineral reserves and have not demonstrated economic viability. All figures have been rounded to reflect the relative accuracy of the estimates.

** Reported at an NSR cut-off of $185 (US$0.96 = C$1)/tonne using consensus long term metal prices (US$) and recoveries developed for the nearby Bellekeno deposit (Ag US$24.00/oz, recovery 96%; Pb US$ 0.85/lb, recovery 97%; Zn US$ 0.95/lb, recovery 88%; Au US$ 1,400/oz, recovery 72%).For all veins, Ag grades capped at 3,000 gpt; Pb and Zn capped at 15% and 20%, respectively; Au grades not capped.

2.3 MINING METHODOLOGY

2.3.1 Bellekeno

The Bellekeno project is comprised of one primary vein, the 48 vein, a subsidiary structure, the 49 vein and at least 9 other ancillary structures present in the Southwest, 99, and East zones. Most of the historical mining (totaling approximately 400,000 t) at Bellekeno occurred on the 48 vein in the 99 zone, intermittently between the 1950's and mid 1980's. The veins have variable dip, strike, and thickness. Dips range from 60° to 80° to the east or west. The average strike direction is approximately 030 azimuth. Vein thickness varies from a few centimeters to several meters in an apparent "shoot-like" configuration.

Based on the geotechnical and physical characteristics of the veins, a mining method review was conducted and cut-and-fill mining methods have been selected as the most appropriate for Bellekeno. Cut-and-fill methods typically offer a high degree of selectivity that generally translates into high mineralization extraction and low waste dilution. Significant geotechnical study and design has been completed by SRK and a ground control management plan has been developed to address potential unstable ground conditions encountered in the vein material. Long hole mining methods were also implemented at Bellekeno as experience was gained in ground conditions and ground control methodologies and during 2013 the majority of the ore tonnes mined from Bellekeno were through long hole mining.

Backfill of mined out stopes is being accomplished through cemented rock and tailings fill. A portion of filtered tailings from the mill process were backhauled underground and used as backfill on an as-required basis. A total of 9,353 tonnes of tailings was used as backfill in 2013. The Paste Backfill plant construction, installation and commissioning was delayed due to additional underground excavation required to support the plant thus requiring additional and increased specialized ground support. Due to the difficulties encountered with the paste backfill plant, tailings were placed using both direct and cemented backfill techniques and has proven to be an effective means of backfilling tailings.

2.3.2 Lucky Queen

The Lucky Queen Mine is to be considered a conventional mechanized operation. LHD's and Trucks will be used for the movement of waste and ore to designated areas. Jumbo drills, longtom's, stoper's and jacklegs will be used in the extraction of the waste drifts and the ore. In the initial stages of mine development the footwall extraction drift complete with secondary drifts (shop, sumps, remucks and safety bays) will be driven to establish an ore pass above the 500 level drift. The extraction drift will then continue to the first intersection of the vein. All ground support in the extraction drift and secondary headings will be installed as per the ground support standards in Section 6.6 of the Mine Development and Operations Plan. During the extraction of ore, the ground conditions will be accessed and a mining method chosen. It is expected that the following three methods of mining will be considered.

- Conventional Cut and Fill – Jackleg, stopers and slushers;
- Mechanized Cut and Fill – Jumbo and LHD; and
- Longhole Stoping.

2.3.3 Onek 990

The Onek 990 Mine is to be considered a mechanized operation. Jumbo drills, bolters and jacklegs will be used in the extraction of the waste drifts and the ore. In the initial stages of mine development the hangingwall extraction drift will be driven to intersect the vein at the 970 elevation. All secondary drifts will be driven at this time (ore and waste remucks, sumps, ramp collars to sublevels 2 and 3). All ground support in the extraction drift and secondary headings will be installed as per the ground support standards in Section 6.6 of the Mine Development and Operations Plan.

LHD's and Trucks will be used for the movement of waste and ore to designated remucks. The material will then be hauled with haul trucks to designated areas on surface or to the mill. During the extraction of the vein bulk sample, the ground conditions will be accessed and a mining method chosen. It is expected that the following two methods of mining will be considered.

- Mechanized Cut and Fill – Jumbo and LHD;
- Longhole Stoping.

2.4 DEVELOPMENT

2.4.1 Bellekeno

2013 sustaining production development at the Bellekeno mine was focused in the SW and 99 zones and the Thunder Zone in the mine. In addition, exploration drifting and drilling was completed south and above of known resources and where surface drilling and underground drilling has indicated mineralization of similar tenor to the Southwest zone.

The 650, 931 Exploration Ramps continued during 2013 and the 99-555 /545 inclines continued in the central 99 zone with intent to extract 99 zone ore. Commercial production at the Bellekeno Mine and District Mill continued throughout the year and was suspended in September 2013. The average mining/milling rate in 2013 was 271 tpd.

2.4.2 Lucky Queen

Lucky Queen development was suspended in 2013 after rehabilitation of ~1,100 metres of the historic Lucky Queen adit was complete. Approximately 330m of incline development is remaining to reach the mineralization at Lucky Queen. An insulated portal plug and pipeline was constructed at Lucky Queen in September 2013 to collect clean adit drainage and direct it to an unlined settling pond. No activity at Lucky Queen is anticipated in 2014.

2.4.3 Onek 990

Onek 990 decline development was initiated in 2012 and Mine development continued in 2013 with the excavation of ~265 meters of primary decline. Underground diamond drilling was completed in 2013 to obtain geologic information and finalize mine plans. A bridge crossing over Lightning Creek was completed in 2013. The majority of all surface work at Onek necessary for mine operations is complete. No activity at Onek is anticipated in 2014.

3 CONSTRUCTION ACTIVITIES

Construction activities carried out at the Keno Hill Silver District Site involved both surface and underground. As-built drawings for the underground workings can be seen in Figures 2-1 to 2-3. The updated surface as-built drawings for 2013 include the Dry Stack Tailings Facility shown in Figure 3-1.

In accordance with our efforts to minimize the impact of the construction activities on the residents of Keno City, the majority of construction materials were delivered using the Christal Lake road to bypass Keno City.

3.1 ROAD CONSTRUCTION

Road improvements and widening took place to access the new Onek 990 portal in accordance with Occupational Health and Safety Guidelines. The new Onek Connector Road was developed from the Wernecke Road, crossing Sign Post Road, along the historic Onek waste rock storage area, to the Onek 990 Portal crossing Lightning Creek Road in 2012.

An application to amend Type B Water License MS10-029 and include a new bridge over Lightning Creek near the Onek 990 portal was approved on December 20, 2012 and supersedes MS10-029 with MS12-059. Construction design drawings for this bridge were submitted in March 2013 with construction completed in May 2013. The as-built drawing for the new bridge over Lightning Creek can be found on the Yukon Water Board's online registry Waterline.

Following completions of the Onek Access Bridge across Lightning Creek to the Bellekeno Haul Road (BKR), traffic to Onek 990 and Lucky Queens Mines will follow this route (Figure 6-6) once operations resume. The Bypass Road is approximately 2.1 km long and 6 – 9 m wide to safely accommodate passing vehicles. The road maybe restricted to one-way travel where conditions prevent construction to 9 m wide.

No major upgrades occurred on the roads to Lucky Queen, Christal Lake Road, Keno City Bypass to BKR, or the BKR haul road in 2013. Standard maintenance occurred throughout the year.

3.2 MILL SITE CONSTRUCTION

Construction of a conventional flotation mill at the historic Flame and Moth Site for processing ore and producing concentrate began in February of 2010 and was completed in December 2010. As-built drawings for this construction were submitted as part of the 2011 QML Annual Report and an update mill site as-built was submitted in the 2012 annual report.

The mill yard continues to be ditched and contoured to facilitate channeling melt water in the spring to sediment basins. Organics were consolidated and contoured to allow vegetation to take over and provide a central location for organics borrow source once reclamation begins.

3.2.1 Dry Stack Tailings Facility

The lined area of the dry stack tailings remained at from 14,148 m^2 in 2013. Additional area was cleared in 2013 and prepared for liner which will be laid in the future giving a total area of 10,982 m^2 available for additional tailings placement. See Figure 3-1 for the DSTF as-built.

Both a ground temperature cable (GTC) and a shallow monitoring well were installed in the lower bench of the Dry Stack Tailings Facility (DSTF) as part of the ongoing monitoring of the DSTF in 2012. No water was seen during these installations, indicating no free water exists within the pile. The monitoring data collected from the GTC in the DSTF in 2013 is presented in Appendix D.

3.3 Mine Site Construction

Development of the Bellekeno deposit is the first of potentially many Mines in the Keno Hill Silver District. Because the Bellekeno Mine involved the reopening of existing historical underground mine, use of existing infrastructure such as water treatment facilities, the reuse of the previously impacted historic Flame and Moth site and the Christal Lake haul road, 'new' environmental footprint is limited in scope.

No significant changes occurred at Bellekeno Mine footprint in 2013.

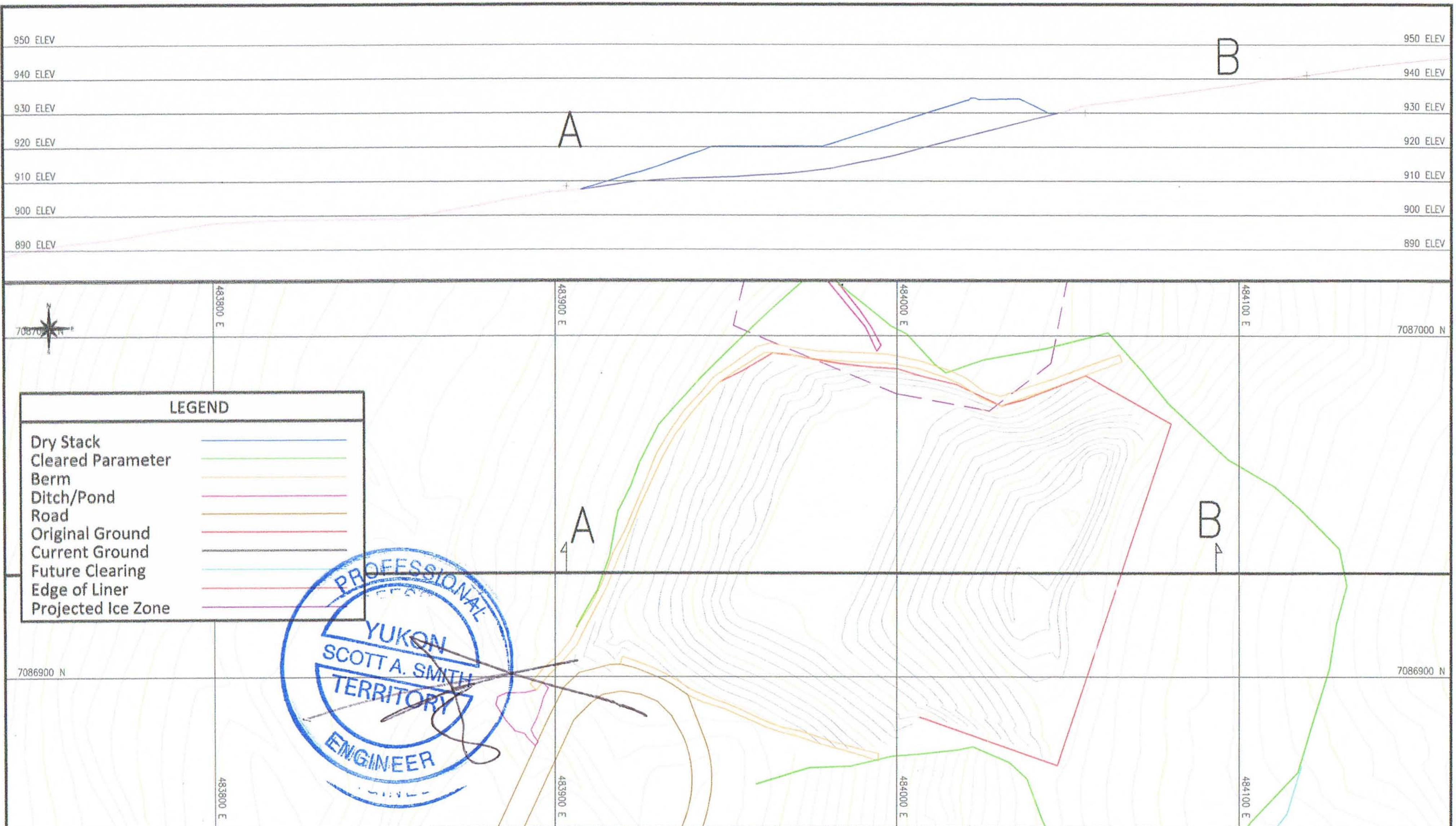
3.4 Elsa Camp Facilities

A trailer camp, kitchen facility and drillers dry are currently assembled at the old Flat Creek town site (part of Elsa) on Surface Lease 105M13-001. The Camp has a total capacity of 90 permanent beds. There are 4 houses located on Surface Lease 105M13-009 with a total of 28 rooms. On the same lease, an additional 20 rooms are available however this bunkhouse is also not occupied during the winter. These bunks were upgraded to include new framing, roof, and deck.

A Commercial Dump Permit # 81-012 is currently held from YG Environment in accordance with the Environment Act Solid Waste Regulations as well as the Public Health and Safety Act. This permit was renewed effective July 3, 2013 and will continue to be used in support of the Bellekeno Mine operation. In compliance with this permit upgrades to the location of solid waste disposal included upgrades to the electric bear fence and addition of a cattle guard to prevent animals from entering the facility.

Alexco currently holds two (2) sewage disposal system permits at Elsa issued by YG Environmental Health Services: an absorption bed permit for the Flat Creek Camp (Permit #3448) in replacement to a septic tank permit (Permit #3012) and an absorption permit for five houses (Permit #3449) in replacement of a septic tank permit (Permit #3246).

Water for camp consumption is being drawn from Flat Creek and treated through a series of filters and UV light before it is chlorinated and stored in holding tanks ready for consumption under the Yukon Environmental Health standards.



ALEXCO RESOURCE CORP
BELLKENO MINE

ALEXCO

DEPT.	APPROVED BY	DATE	COMMENTS
SURVEY			
ENGINEERING			
GEOLOGY			
ALEXCO MANAGER			
PROCON SUPER			

TITLE: Dry Stack Tailings Facility
Final As-Built - Sept 22, 2013

Drawn by: TRAVIS MURPHY
Scale: 1:1000
Date: 09/22/2013
Approval:
Date:
File:

Power for the camp is supplied from the local grid that runs through Elsa to Keno City. Several upgrades were completed in 2012, but no upgrades were completed in 2013. Upgrades included:

a) removal of the existing overhead line running from the historical pump house to the upper house complex at Elsa and replacing line with an armored tech cable.

b) Decommissioning of old transformers in the upper house complex area at Elsa and replacing with more current transformers and switchgear.

c) brushing out of both the Onek 990 and Elsa substations

d) commissioning an engineering overview of the current electrical system for the purpose of identifying areas needing upgrade in the 2013 season.

e) installing new three phase transformer in camp to remove bunkhouse a from the kitchen complex and distribute the load more evenly

f) installing new three phase transformer in the warehouse to distribute the load more effectively.

g) Commissioning an Engineering overview of the power factor at the Mill for the purpose of identifying why the power factor is low and what can be done to correct it, designed a power factor correction unit.

3.5 ANNUAL INSPECTION

In accordance with Section 12.1 to 12.3 of Quartz Mining License (QML) QML-0009, an "annual inspection of the physical stability of all engineered structures, works and installations located at the site is conducted by an engineer by August 1st of each year". In 2013 a variance was provided by Yukon Government to allow the inspection to be completed prior to September 30th and the annual inspection was completed on September 10th.

EBA Engineering Ltd. was retained to complete the 2013 annual inspection of the surface engineered earth structures located throughout the Bellekeno Mine site. The mine and associated infrastructure was inspected by Senior Mining Engineer Darin Baker and Mine Manager, Scott Smith, P.Eng (Yukon) and stamped by Scott Smith.

See Appendix B for a copy of the 2013 Annual Physical Inspection Report which includes surface inspections.

3.6 UPCOMING MAINTENANCE AND UPGRADES

Routine maintenance of Mine and Mill areas continued in 2013.

3.6.1 Mill Upgrades and Maintenance

Several projects were completed in 2013 for the Mill area to improve overall efficiency. These upgrades included the addition of a mill maintenance shop, redesign of the fine ore feeder and on-going construction of the DSTF footprint to meet design footprint.

3.6.2 Mine Upgrades and Maintenance

3.6.2.1 Bellekeno

Budgeted upgrade or maintenance work planned for the Bellekeno Mine consists of continued transitioning from dry to wet shotcrete for ground control purposes. Wet shotcrete will provide safer conditions, control ground and reduce industrial hygiene exposures at reduced costs.

The underground paste plant is being configured to batch wet shotcrete to facilitate the above. The mine will continue to use a mix of fill methods including cemented rock fill (CRF), cemented and un-cemented tails to reduce tailings on surface and reduce P-AML inventory.

Various ventilation upgrades have been completed during 2012 including driving a 2.4m x 2.4m raise from the bottom of the mine for second escape and fresh air. The mine installed a ventilation bulkhead and installed a new high pressure fan.

Leveling work was completed on the BKE shop and in Q1 2013 the BK 625 shop will be refurbished. Ongoing CAPEX development to access new areas of the BK ore body will continue

3.6.2.2 Lucky Queen

The Lucky Queen mine will primarily involve underground development and consist of main haulage and ore access development. In addition to this, a secondary escape and ventilation raise is planned.

Waste rock and PAML storage sites will also be constructed along with settling ponds.

3.6.2.3 Onek 990

Budgeted upgrades for the Onek 990 portal includes road construction, berm construction, signage and a new bridge over Lightning Creek to tie in haulage onto the BK haul road and thus minimize traffic the Keno city. Underground development will continue throughout the year and includes CAPEX mine development and production on the Onek vein. In addition a secondary ventilation/escape raise to surface will be constructed.

A PAML pad will be constructed on a previously permitted site above the Onek 990 portal. Materials laydown construction will be ongoing.

Future upgrades will include a new power drop / transformer off the Onek grid to supply the Onek mine grid power.

4 MILLING OPERATIONS

The Mill generally operated between daily rates of 250 to 400 tonnes per day during 2013 up until September 3, 2013 and an annual daily average of 271 tonnes per day.

The mill process employs conventional crushing, grinding, flotation, and dewatering processes. The primary valuable sulphides in the mill feed are recovered by conventional differential flotation with a cyanide-free zinc suppressing regime. Silver and lead minerals are recovered together to produce a silver-lead concentrate and zinc minerals with some silver value are recovered to a separate zinc concentrate.

Storage and disposal of mill tailings is done in the dry-stack tailings facility (DSTF) located adjacent to the mill or backfilled underground at the Bellekeno Mine. See Figure 3-1 for as-built drawings of the DSTF.

4.1 PRODUCTION

Mill throughput for 2013 was 66,297 tonnes of ore at an average head grade of 655 ppm silver (Ag), 7.0% lead (Pb), and 3.4% zinc (Zn). The total lead concentrate produced was 7,796 dmt (dry metric tonnes) while the total zinc concentrate was 3,450 dmt. For a listing of production values see Table 4-1.The cumulative production statistics from 2010 to 2013 for N-AML, P-AML, ore and tailings are presented in Table 4-2.

Table 4-1 Keno Hill Operations 2013 Productions Statistics

Production	Amount	Grade			Metal Quantity		
	Tonnes	Silver (g/t)	Lead (%)	Zinc (%)	Silver (gm)	Lead (t)	Zinc (t)
Bellekeno Mine Production	65,206	655	7.0%	3.4%	42,681,891	4,564	2,210
Keno Hill District Mill Throughput	66,297	703	7.1%	3.6%	46,503,145	5,083	2,598
Lead Concentrate Produced	7,796	5,408	60.1%	5.6%	42,162,777	4,683	439
Zinc Concentrate Produced	3,451	360	2.3%	45.3%	2,463,200	80	1,562
Tailing Produced (Backfill and DSTF)	54,865	56	0.6%	1.1%	3,097,765	321	597

Table 4-2 Production Statistics 2010 to 2013 (tonnes)

	N-AML brought to Surface (used for construction only)	P-AML stored on surface for eventual backfill	Ore Mined	Tailings placed in DSTF	Tailings Backfilled
2010	48,824	1647	18,594	8,061	0
2011	4,553	2,059	71,992	61,033	2,088
2012	5,158	2,059	86,354	65,205	8,420
2013	21,685	773	65,206	45,512	9,353
Total	80,020	2073	242,146	179,811	19,085
QML Authorized Maximum	**500,000**	**125,000**	**613,000**	**322,000**	**-**

5 WASTE MANAGEMENT

5.1 TAILINGS MANAGEMENT

A detailed design of the Dry-Stacked Tailings Facility (DSTF) for the Keno Hill Mine site has been completed by EBA Engineering Ltd. and issued for review in March 2011. The report details additional information regarding all aspects of the DSTF and was submitted with the 2010 QML-0009 Annual Report Re-submission in June of 2011.

In addition to the DSTF expansion Alexco retained EBA Engineering Ltd. to update the parameters in the stability model previously used for design of the DSTF. The original DSTF was designed using a combination of measured and conservatively assumed design parameters.

In September 2012 Alexco, EBA, and The First Nation of Na-Cho Nyak Dun met to perform a risk assessment for the DSTF. As a result Alexco committed to have EBA review and update the parameters of the DSTF stability model based on data being collected during construction of the facility. A report was issued summarizing the updated parameters of the stability model, the data supporting the updates, and the resulting changes to factors of safety. This report was provided in the 2012 annual report.

5.1.1 Tailings Handling

The Tailings Management Plan was designed for a portion of the final flotation tailings to be stored on surface by dry stacking and a portion to be stored underground, as cemented or paste backfill. This design allows final flotation tailings to be used as backfill to provide support for the excavated underground voids and to reduce surface environmental impact.

The Keno Hill District Mill was originally designed to produce a Zinc Cleaner tailings (somewhat higher in pyrite) and a Zinc Rougher (somewhat lower in pyrite) product. This design was to allow for adaptive management in the event high pyrite ore material was encountered during mining. If an appreciable amount of pyrite was contained in the mill ore it would be substantially removed and report to the zinc cleaner scavenger tailings stream. This material could then be separated and stored underground as backfill.

No appreciable difference of pyrite has been encountered in the two pyrite streams since the mill was commissioned and consequently the mill is producing a single tailings product.

5.1.2 Dry Stack Tailings Disposal Procedure

Tailings are placed in 300 mm lifts and compacted with a 10-tonne vibratory compactor. Tailings are compacted to at least 95% of the maximum dry density using standards effort (as per American Society for Testing and Materials [ASTM] D698). The organic soils are left in place beneath the DSTF to provide some insulation and slow the rate of potential permafrost thaw.

Construction of the DSTF will occur over a five year period, as the tailings are generated by the mill. A total of 45,512 tonnes of tailings were placed in the DSTF in 2013 at a design 11% water retention volume (~5,006 tonnes). Regular monitoring of the tailings placed on the DSTF has a moisture content of ~13%. There were 9,353 tonnes of tailings taken underground in 2013 and used as backfill. Details can be seen in Table 5-1.

Table 5-1 2012 DSTF Volume Summary

Dry Stack Tailings Facility Tailings		
	Tonnes	**11% H20 Ret. (t)**
Tailing Produced	45,512	5,006
Tailings Backfilled UG	9,353	1,029
Total Tailings to DSTF	55,826	6,035

5.1.3 Tailings Characterization

The Tailings Characterization Plan was implemented to fulfill the conditions set out in Part H, Clauses 67 and 68 of Water Licence QZ09-092 issued to Alexco Keno Hill Mining Corp. on August 19th 2010.

The plan outlines the methodology that will be followed to both comply with the requirements of these clauses as well as provides geochemical characterization of tailings generated. The results are presented in the 2013 Tailings Characterization report included in the QZ09-092 2013 annual report attached as Appendix B.

5.2 Waste Rock Management

The Waste Rock Management Plan (WRMP) outlines practices for management of waste rock to be excavated during the Bellekeno Mine Development. The plan ensures that appropriate management procedures are followed during excavation activities in order to minimize impacts of stored rock to land and water resources. Monitoring following excavation activities is intended to assess the effectiveness of the management measures, ensure that adaptive management approaches are implemented and to ensure that appropriate information is obtained by Alexco to assist in closure planning. Detailed discussion of the 2013 WRMP results can be seen in Appendix C.

5.2.1 Tonnages

Development in the Bellekeno Mine generated an estimated 21,371 tonnes of excavated material which has been sampled, classified, and verified by lab analysis in 2013. Table 3 shows a breakdown of the material which lab analysis results have been received for. The total Non-AML waste generated in all of 2013 which has been verified by lab analysis was an estimated 32,171 tonnes, while the total P-AML waste generated in all of 2013 which has been verified by lab analysis was an estimated 2,142 tonnes.

Table 5-2 Keno Hill 2013 Mine Waste Rock Statistics

Category	Tonnes	Storage Location	Tonnes
Non-AML Waste Rock (excavated)	32,171	Surface Onek	20,147
		Surface LQ	1,538
		Surface BK	0
		BK PAG PAD	0
		U/G Storage	0
		BK U/G Backfill	10,486
P-AML Waste Rock (excavated)	2,142	Surface Onek	0
		Surface LQ	611
		Surface BK	0
		BK PAG PAD	0
		U/G Storage	0
		U/G Backfill	1,532
Tailings (backfilled)	9,353	Various	9,353
Total			**34,313**

5.2.2 Storage Location

Potentially acid-generating and/or metal leaching (P-AML) not suitable for general construction purposes was stored temporarily on the lined storage area near the Bellekeno mine portal area (See Figure 1-3) or stored underground in the Bellekeno mine below previous static water level (defined as the Bellekeno 625 portal elevation). As per the QML, the maximum storage of P-AML Waste Rock at surface is 125,000 tonnes. In 2013 no additional P-AML was placed on surface, while 759 tonnes were backfilled reducing the total tonnes stored on surface in the lined temporary storage area to 1,300 tonnes, while 1,532 tonnes was stored underground. The Lucky Queen Mine misclassified 611 tonnes of P-AML and placed it on surface at the Lucky Queen N-AML WRDA>

Non-acid-generating and non-metal leaching waste rock was used for general construction purposes and temporarily stored on the BK haul road at 625, by BK road marker 5 and on the mill side of the haul road bridge. All of this material is classified as road material or general construction material. A total of 0 tonnes were stored on surface while 10,486 tonnes were underground at Bellekeno. 20,147 tonnes of N-AML waste rock from the Onek 990 Mine was used to contruct the Onek connector road, while 1,538 tonnes of N-AML waste rock was placed on surface at the Lucky Queen N-AML WRDA. For a summary of this information see Table 5-2.

Construction of the Bellekeno Non-AML Waste Rock Deposit Area was not commenced during 2013. Prior to commencement of construction of the Non-AML WRDA, Alexco will conduct additional geotechnical investigations to define conditions at the toe of the slope. The results of these investigations will be incorporated into detailed design for this facility and submitted as part of the annual report.

5.2.3 Waste Rock Monitoring and QA/QC

The samples collected in 2013 were prepped on site at the prep lab facility located at the Keno Hill District Mill. Sample pulps were then composited and sent off site to ALS Chemex for ABA and ICP-MS analysis. A total of 8 samples were sent out for analysis and a summary of the results are presented in Appendix C.

The outlined sampling schedule which was proposed in 2009 has been followed and proved useful in continuing to build a comprehensive geochemical dataset to better assess waste rock for characterization. The compositing frequency was adequate enough to confirm the general rock characteristics of Non-AML rock while verifying the accuracy of the field screening classification. The additional ABA data collected from all P-AML composites has added to the understanding of the correlation between lithology and geochemical characteristics. Results of this analysis can be seen in Appendix C.

5.2.4 Mine Wall Monitoring

Monitoring in both the excavated areas and the rock storage areas form an integral and vital component of any waste rock management program, as it determines the effectiveness of the management measures and provides valuable information for waste rock management strategies of future developments and closure measures. Mine wall testing during the Bellekeno Mine Development period provided additional confirmation of the geochemical character of the mine walls through multi-element and acid-base accounting analysis.

Mine wall testing was undertaken for underground development completed during 2013 in accordance to the Mine Wall Testing Plan submitted in 2008 under the Water Use License QZ07-078. The sampling was done in a systematic way by a team of Alexco Resource Corp. geologists. A total of 36 mine wall samples were taken and analyzed in 2013. A detailed discussion of results can be seen in Appendix C.

5.2.5 Humidity Cell and Geochemical Tests

No humidity cell testing was scheduled for 2013 in the Waste Rock Management Plan (WRMP), which was included in the Construction Site Plan submitted in November 2009.

Results of water quality monitoring for the Bellekeno East Temporary Waste Rock Storage Facility (KV-78b) were included in the 2013 WUL QZ0-092 Annual Report submitted in March 2014. Details can be seen in Appendix F of the QZ09-092 2013 Annual Report, which is available on the Yukon Water Board's online registry Waterline (www.yukonwaterboard.ca/waterline).

6 MONITORING

6.1 MONITORING AND SURVEILLANCE PLAN

Site environmental monitoring was carried out at the site in accordance with the Monitoring and Surveillance Plan. A revision to the Plan was submitted in September 2011 and approved on May 22, 2012. This updated plan included monitoring and surveillance to reflect requirements of Water License QZ09-092 and also to reflect updates to other terrestrial monitoring (e.g. dust monitoring) which have been developed.

Water quality and groundwater monitoring have been carried out in accordance with the Type A water license QZ09-092. Results of this monitoring were included within the Type A water license 2013 Annual Report. Details can be seen in Appendix F3 of the QZ09-092 2013 Annual Report, which is available on the Yukon Water Board's online registry Waterline (www.yukonwaterboard.ca/waterline). Permafrost monitoring through geotechnical programs installed at the site of the future Non-AML Waste Rock Disposal Area and the Dry Stack Storage Facility is monitored routinely by the engineers of record (EBA Engineering Consultants Ltd) in accordance with the DSTF OMS Manual, which forms part of the DSTF Construction and Operation Plan. As discussed in Section 3.2.1 of this report, an additional GTC and monitoring well were installed on the DSTF, as well as full depth tailings analysis were completed in 2012.

6.1.1 Water Quality Surveillance Network

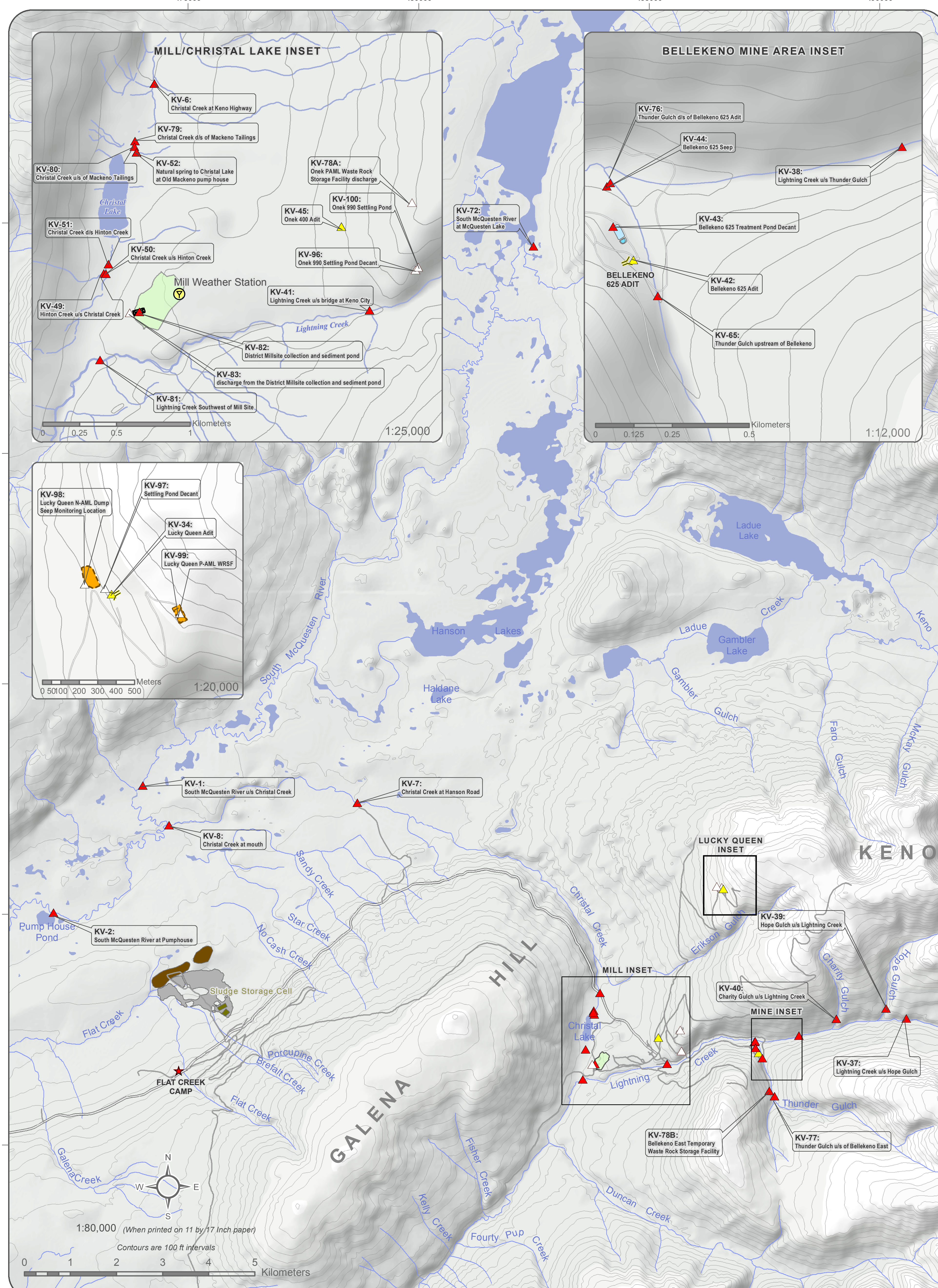
The existing water quality surveillance network for the Keno Hill Silver District Mining Operations includes surface receiving waters in the Lightning Creek and Christal Creek watersheds. Most of the monitoring stations have been sampled extensively in the past. Current water quality monitoring is required in these areas under Water Licence QZ06-074, Water Licence QZ07-078, and Water Licence QZ09-092. Water Licence QZ06-074 expired in November of 2012 and was renewed as QZ12-057, effective on January 30, 2013. Results can be seen in the QZ09-092 2013 Annual Report, which is available on the Yukon Water Board's online registry Waterline (www.yukonwaterboard.ca/waterline). QZ09-092 surface and groundwater monitoring sites can be seen in Figure 6-1, 6-2 and 6-3.

6.1.2 Groundwater Surveillance Network

A groundwater monitoring plan for the Bellekeno mine has been developed under Water Licence QZ09-092. This program outlines monitoring locations and frequency for the Keno District Mill and Dry Stack Tailings Facility, the non-AML waste rock disposal area, and Keno City.

Groundwater wells are scheduled for monthly monitoring for both water level and quality for the first year after QZ09-092 came into effect to establish baseline conditions, followed by quarterly sampling thereafter, for the duration of the project.

Results can be seen in the QZ09-092 2012 Annual Report, which is available on the Yukon Water Board's online registry Waterline (www.yukonwaterboard.ca/waterline). QZ09-092 groundwater monitoring locations can be seen in Figure 6-2 and Figure 6-3.



△	Pending Water Quality Station
▲ (yellow)	Adit Water Quality Station; Adit Discharge, Quarterly
▲ (red)	Monitored Water Quality Station
	Highway
	Secondary
	Valley Tailings Sludge
	Valley Tailings Borrow Source
	Valley Tailings
	Millsite Footprints
	To be Constructed

AKHM

ANNUAL QUARTZ MINING LICENCE REPORT, QML-0009

FIGURE 6-1

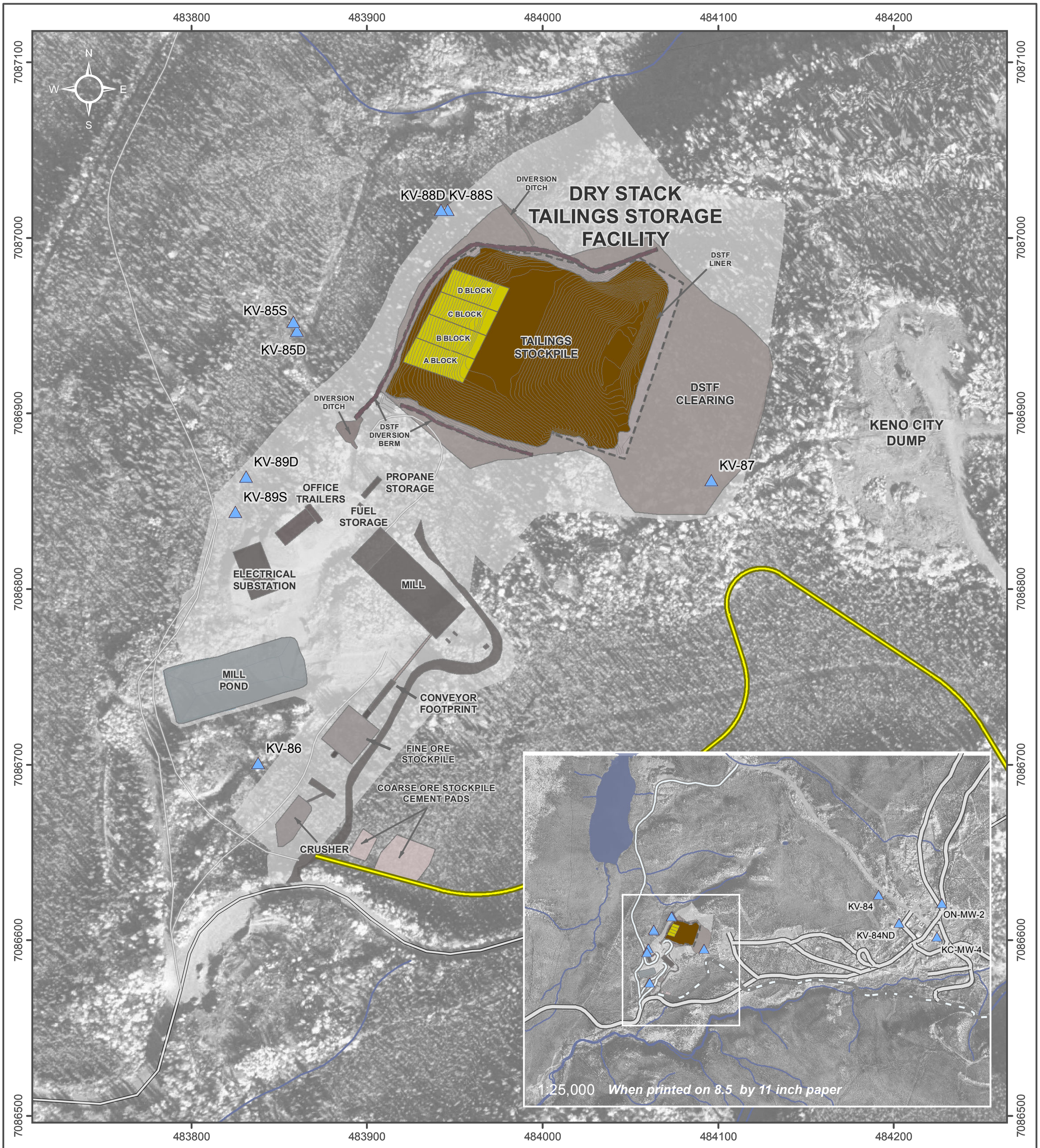
SURFACE WATER QUALITY STATION LOCATIONS

MARCH 2014

I:\ALEX-05-01\Bellekeno\GIS\mxd\Annual_Reports\2013\SW_Mon_QZ12-053_20140214.mxd (3/5/2014 12:21 PM)

National topographic Data Base (NTDB) compiled by Natural Resources Canada at a scale of 1:50,000. Reproduced under license from Her Majesty the Queen, as represented by the Minister of Natural Resources Canada. All rights reserved.
Datum: NAD 83; Projection: UTM Zone 8N

This drawing has been prepared for the use of Access Mining Consultants Ltd.'s client and may not be used, reproduced or relied upon by third parties, except as agreed by Access Mining Consultants Ltd. and its client, as required by law or for use of governmental reviewing agencies. Access Mining Consultants Ltd. accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without Access Mining Consultants Ltd.'s express written consent.



- Groundwater Monitoring Well
- DSTF Cover and Revegetation Phase I
- Duncan Creek Road
- Mill Access
- Haul Road

1:3,000 *When printed on 8.5 by 11 inch paper*

0 50 100 150 Meters

ALEXCO KENO HILL MINING CORP.

FIGURE 6-2 - QML-009 GROUNDWATER MONITORING LOCATIONS

AKHM ACCESS

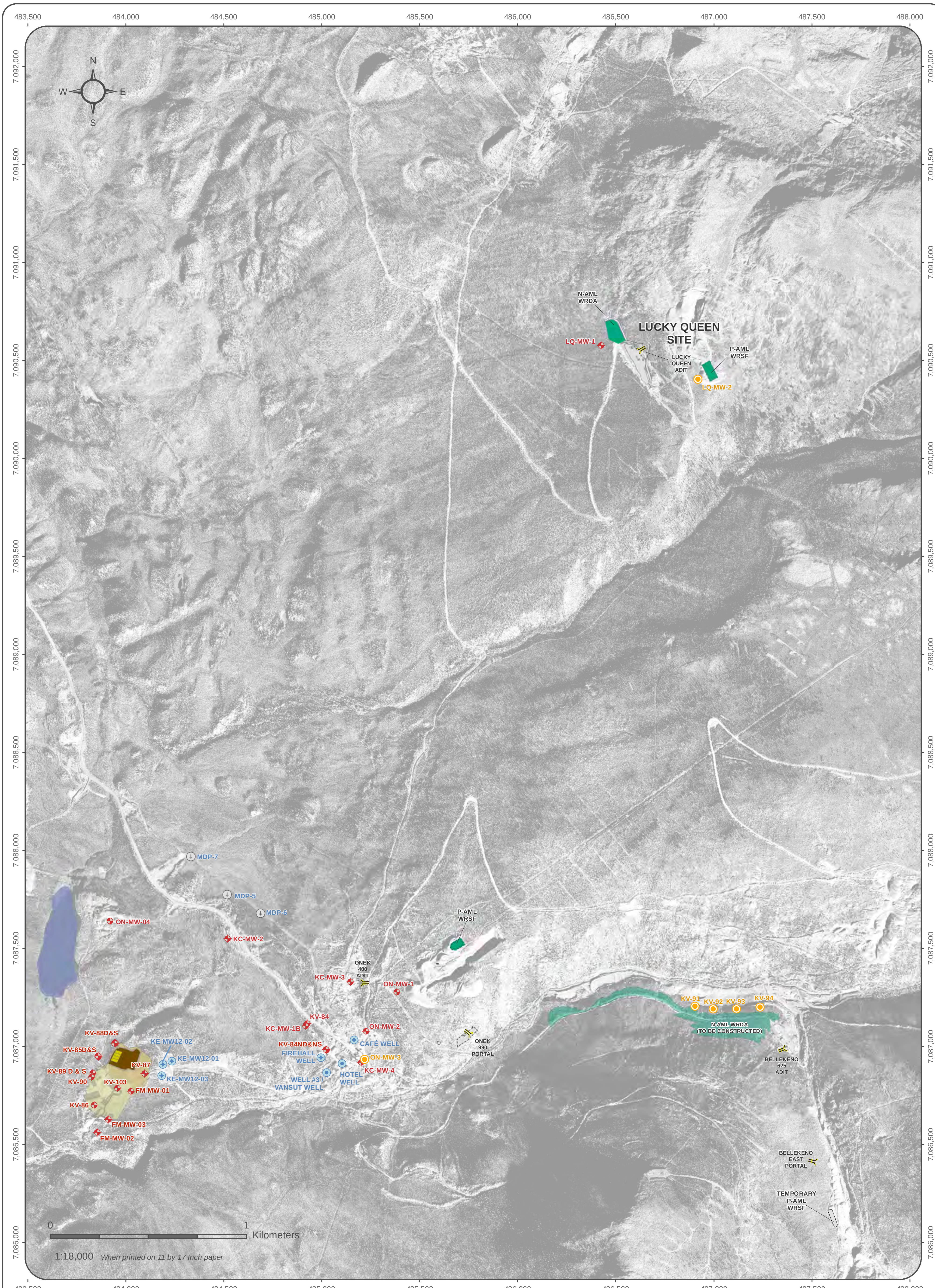
MARCH 2014

Aerial photography flight date: July 13th 2006. Ortho-rectification produced by Challenger Geomatics Ltd. Site hydrography and contours derived from 2006 aerial imagery. Mill pond survey (Y.E.S. Sept 2010), mill structures, current DSTF footprint and roads survey (ACG, December 2011). Design data obtained from EBA.

Datum: NAD 83; Projection: UTM Zone 8N

This drawing has been prepared for the use of Access Mining Consultants Ltd.'s client and may not be used, reproduced or relied upon by third parties, except as agreed by Access Mining Consultants Ltd. and its client, as required by law or for use of governmental reviewing agencies. Access Mining Consultants Ltd. accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without Access Mining Consultants Ltd.'s express written consent.

I:\Keno_Area_Mines\ALL-SITES\Closure\2014\Groundwater_MillSite_20140304.mxd
(Last edited by: jpan; 3/4/2014/16:51 PM)



- Proposed Monitoring Well
- Monitoring Well
- Decommissioned Monitoring Well
- Private Drilled Well
- Public Drilled Well
- Water Supply Well
- Manual Drive Point
- Decommissioned Manual Drive Point
- Adit
- Highway
- Local
- Proposed Features
- Existing Features
- DSTF Cover and Revegetation Phase I
- As Built, DSTF, Sept 2013
- Buildings/Structures
- DSTF 322,000 Tonnes Design
- Mill Site Footprint

Aerial photograph obtained from Geodesy Remote Sensing Inc., Calgary Alberta. Imagery acquired September 13th and 14th 2006. Site hydrography and contours derived from 2006 aerial imagery obtained from Aero Geometrics, Calgary Alberta. Datum: NAD 83; Projection: UTM Zone 8N

This drawing has been prepared for the use of Access Mining Consultants Ltd.'s client and may not be used, reproduced or relied upon by third parties, except as agreed by Access Mining Consultants Ltd. and its client, as required by law or for use of governmental reviewing agencies. Access Mining Consultants Ltd. accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without Access Mining Consultants Ltd.'s express written consent.

AKHM ACCESS

KENO HILL SILVER DISTRICT MINING OPERATIONS

FIGURE 6-3

KENO HILL SILVER DISTRICT GROUNDWATER MONITORING LOCATIONS

MARCH 2014

I:\Keno_Area_Mines\ALL-SITES\AMP\Fig4-20_GWMonitoring_ONEKLQ20140304.mxd
(Last edited by: jpan;3/4/2014/16:53 PM)

6.1.3 Permafrost Monitoring

Geotechnical programs have identified areas of permafrost within operational areas of the project. Specifically, some permafrost was encountered beneath the proposed non-AML Waste Rock Storage Area (WRSA) and in the vicinity of the proposed Dry Stack Tailings Facility (DSTF). Ground temperature and permafrost monitoring is currently in place at these locations. Details on monitoring for the DSTF are included in the DSTF OMS manual, which forms a part of the DSTF Development and Operations Plan.

Locations are monitored routinely by the engineers of record (EBA Engineering Consultants Ltd). Details on permafrost monitoring for the WRSA are included in the Mine Development and operations Plan.

Results of the 2013 permafrost monitoring can be seen in the EBA monitoring memorandums seen in Appendix A.

6.1.4 Physical Inspections

The purpose of the physical inspection is to observe and record sufficient information related to physical and water retaining structures to permit development of a course of action, repair or rehabilitation if it is required. Physical inspections are currently inspected under the Physical Inspections and Reporting Plan prepared for Water Licence QZ09-092. Results of these inspections are presented in Appendix A.

6.1.5 Meteorological Monitoring

As part of closure planning studies, a meteorological station was established on Galena Hill in summer 2007 by Alexco. The station measures air temperature, relative humidity, barometric pressure, rainfall, wind speed and direction, solar radiation, and soil temperature. As a condition of Type A Water Use Licence QZ09-092, a second metrological station and snow course was established at the Keno District Mill site. The location of the mill site weather station is shown on Figure 6-4. A Yukon Government monitored snow course station also exists in the area. An analysis of the meteorological monitoring data can be Results can be seen in the QZ12-053 2013 Annual Report, which is available on the Yukon Water Board's online registry Waterline (www.yukonwaterboard.ca/waterline).

6.1.6 Noise Impacts and Sound Monitoring

The objective of noise impact monitoring was to reduce and mitigate impacts to local residents and the environment resulting from noise produced during the development and operations of the Bellekeno Mine and Keno District Mill. To achieve this goal, AKHM identified potential noise sources and receivers in the Noise Abatement Plan, and will continue to do so during development and production as a part of monitoring. Details can be found in the Noise Abatement Plan submitted under QML-0009. An update to this plan was approved on March 19, 2013, and includes potential noise impact associated with the development of the Lucky Queen and Onek 990 Mines.

As identified in the 2011 review of the data collected from 2009 to 2011 (submitted in the 2011 QML Annual Report) no significant noise impacts (defined as exceedences of daytime or nighttime noise levels as recommended in the Decision Document) have been observed in Keno City as a result of operations. With the approval for development of the Lucky Queen and Onek 990 Mines in November 2012 and the updated Noise

Abatement Plan for 2013, noise monitoring at newly identified sites commenced in 2013. The results for the Noise monitoring program are presented in Appendix E.

6.1.7 Dust Abatement and Monitoring

In accordance with Clause 69 of the Decision Document for the assessment for the Bellekeno Mine Project (YESAB File Number 2009-0030), dustfall monitoring stations were installed at four locations near the Keno District Mill site. Bergerhoff dust monitoring gauges were selected as the appropriate instrumentation to carry out this program. At the time of installation, the Yukon had not yet developed the Ambient Air Quality Standards.

The Bergerhoff deposit dust gauge is designed to measure dust deposition, which can be reported as a weight per unit area over unit time. These results are comparable to the Ambient Air Control Objectives in the Pollution Control Objectives for the Mining, Smelting and Related Industries of BC (1979), which provides an acceptable range of 1.7 to 2.9 mg/(dm^2*d).

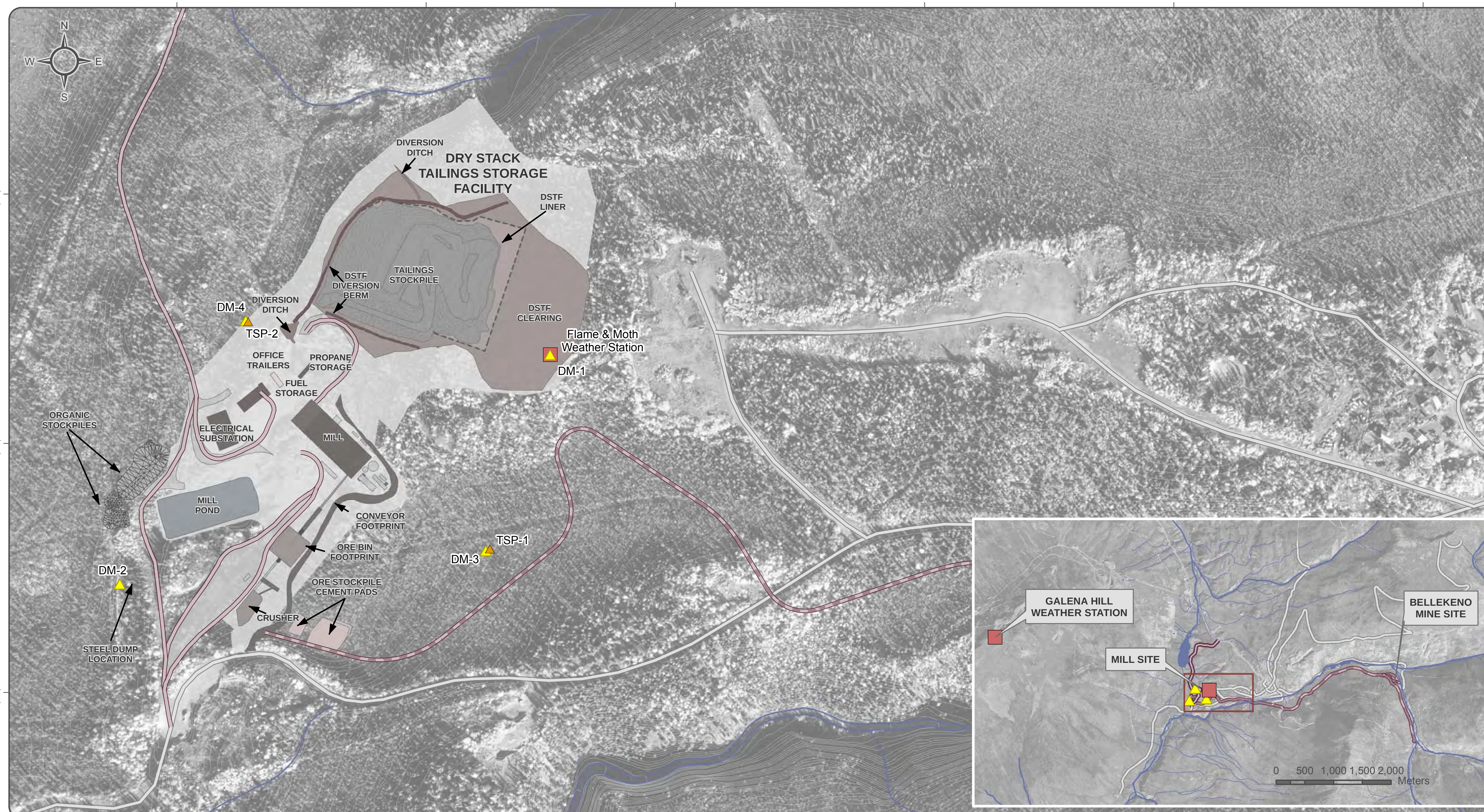
As a result of the updated Monitoring and Surveillance Plan Revision 1.1, as well as the development of the Yukon Ambient Air Quality Standards, two Total Suspended Particulate (TSP) monitoring devices were installed near the Keno District Mill site. After a thorough investigation of both continuous duty (real-time) constant flow air monitoring systems and discrete (gravimetric) samplers, the BGI OMNI sampler was chosen as the most appropriate instrument. TSP results have been compared to the Yukon Ambient Air Quality Standards [TSP = 120 $\mu g/m^3$ (24-hr average)].

In addition to TSP monitoring using the BGI OMNI samples, samples from these instruments were analyzed for total metals. The most common metals observed were aluminum, calcium, iron, lead, magnesium, manganese, sulfur, and zinc.

Though several results from the Bergerhoff method exceeded the Ambient Air Control Objectives in the Pollution Control Objectives for the Mining, Smelting and Related Industries of BC, all of the TSP results were well below the Yukon Ambient Air Quality Standards, which is the accepted standard.

The complete 2013 monitoring results can be seen in Appendix F. Dust control measures including dust suppression of haul roads, mill site, and DSTF continue on an as-needed basis throughout the year.

Mill site layout with locations of both the old Bergerhoff dust monitoring gauges and TSP monitoring instruments currently in place are shown on Figure 6-4.



Aerial photography flight date: July 13th 2006. Ortho-rectification produced by Challenger Geomatics Ltd. Data obtained from EBA: "As built" spatial data: Mill pond (Y.E.S.), Mill structure, and current DSTF footprints, Roads (In House survey December 11th 2011). Design spatial data: Conveyance and water collection, diversion ditches and berm.

Datum: NAD 83; Projection: UTM Zone 8N

This drawing has been prepared for the use of Access Mining Consultants Ltd.'s client and may not be used, reproduced or relied upon by third parties, except as agreed by Access Mining Consultants Ltd. and its client, as required by law or for use of governmental reviewing agencies. Access Mining Consultants Ltd. accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without Access Mining Consultants Ltd.'s express written consent.

Main Map: 1:3,000 Inset Map: 1:65,000

(when printed on 11 x17 inch paper)

0 50 100 150 200 Meters

- Total Suspended Particulates Monitor
- Dust Monitor Station
- Dry Stack Tailings
- Design PU
- AsBuilt; As Built
- Mill Access Road
- Haul Road
- Local Road

AKHM

ACCESS

ALEXCO KENO HILL MINING CORP.

DUST MONITORING AND WEATHER STATION LOCATIONS

Drawn By JP	MARCH 2013	Verified by VB

I:\ALEX-05-01\Bellekeno\GIS\mxd\Annual_Reports\2012\Dust_Monitoring_Stns_20130311.mxd
(*Last edited by: jpan;3/11/2013/14:25 PM*)

6.1.8 Waste Rock Monitoring

All waste rock management facilities are subject to monitoring for physical and geochemical stability (acid rock drainage or metal leaching). A complete Waste Rock Management Plan was attached to the Construction Site Plan Revision 1 and includes detailed descriptions of waste rock monitoring and mine wall testing. This plan was submitted as part of the QML-0009 2010 Annual Report submitted in June 2011. This plan was revised and approved in 2013 to include the Lucky Queen and Onek 990 Mines.

This monitoring is discussed in Section 5.0 of this report, and detailed results can be seen in the WRMP 2013 Report attached in Appendix C.

6.1.9 Environmental Effects Monitoring

AHKM prepared the first study design for the Environmental Effects Monitoring (EEM) program required under the federal Metal Mining Effluent Regulations (MMER) and submitted in September 2011. The first round of EEM program was completed in 2012 with the EEM interpretive report for Bellekeno completed and submitted in March 2013. Sub-lethal toxicity testing of effluent from the BK625 treatment pond decant was conducted during 2012 and no significant adverse effects were noted during these tests. The results for the first cycle of EEM were presented in the 2012 annual report. The next EEM cycle study design will be completed in 2014.

6.1.10 Wildlife Monitoring Plan

The Keno Hill Silver District, including Elsa, the Silver Trail Highway, District Mill, Bellekeno, Lucky Queen, and Onek 990 Mine sites, and all associated haul roads are frequented by natural wildlife in the area. This wildlife includes fox, bear, moose, wolverine, rabbit, lynx, and a number of other species of animal and birds. Wildlife encounters are recorded in a log located in the Elsa Admin Office. The most common sightings involved moose, fox, as well as both black and grizzly bears in 2013. Other less common sightings involved lynx, and wolves.

Any encounters between vehicles and wildlife are reported to both the Safety and Environmental departments for documentation and if required, incident investigation. 2013 saw no encounters between AKHM vehicles and wildlife.

6.1.11 Traffic Management

2013 Traffic Routine and Volume

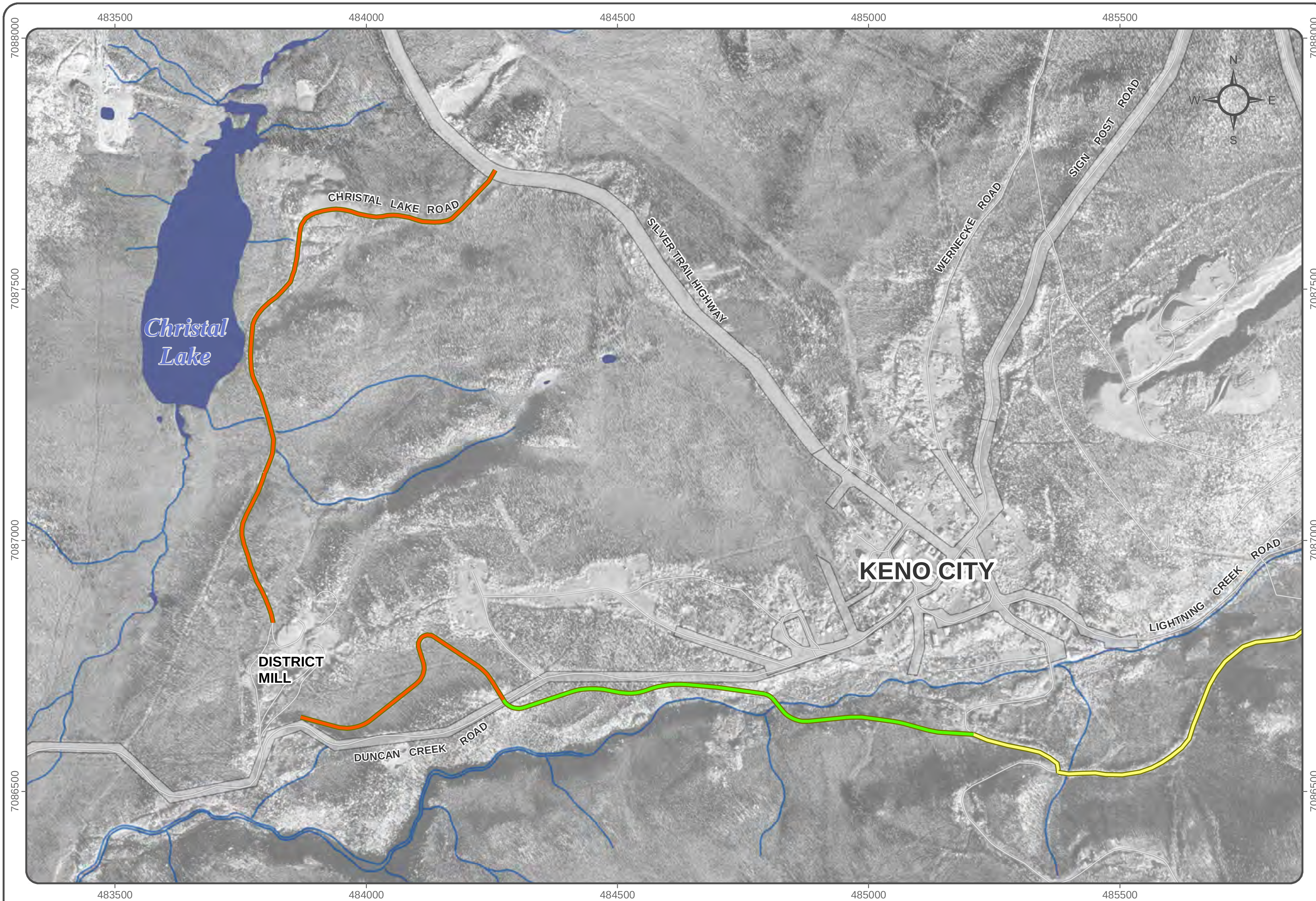
The BKR haul road crosses two public roads in the Keno City area, both Duncan Creek road and the access to the Sourdough Trail. Mine traffic has been redirected around Keno City to ensure that direct ore haulage traffic is routed around the community, effectively minimizing impact on the local community. This road consists of two portions, the Bellekeno Bypass North, which ensures all mill traffic and concentrate haul will bypass Keno City via Chrystal Lake Road, and the Bellekeno Bypass South which connects the Sourdough Trail on the south side of Lightning Creek to the Duncan Creek Road across Lightning Creek. Figure 6-5 shows the routing of traffic around the community along the Bypass Roads.

With the developments of the Lucky Queen and Onek 990 Mines, the Onek Connector Road has been developed from the Wernecke Road, crossing Sign Post Road, along the historic Onek waste rock storage area, to the Onek

990 Portal, crossing Lightning Creek Road and the new Onek Access Bridge across Lightning Creek to the Bellekeno Haul Road (Figure 6-6). The road maybe restricted to one-way travel where conditions prevent construction to 9 m wide. Until the completion of the new Onek Access Bridge in May 2013, some light vehicle traffic has been directed through Keno City. This traffic was discontinued with the construction of the new Onek Bridge. Estimated traffic volumes during development can be seen in Table 6-1 below. It is expected that occasional traffic will continue to flow through Keno City but the use of the bypass roads will continue to be a priority and policy.

Table 6-1 Estimated Traffic through Keno City during Development – Lucky Queen and Onek 990 Mines

Vehicle Type	Average Traffic Volume (roundtrips/week)
Lucky Queen	
Light Truck	45
Water truck	2
Sewage truck	2
Semi-trailer loads (mining equipment, building supplies, construction equipment, etc.)	3
Grader	1
Onek 99	
Light Truck	50
Water truck	1
Sewage truck	1
Semi-trailer loads (mining equipment, building supplies, construction equipment, etc.)	3
Grader	1
Dump truck (hauling P-AML waste rock to Onek WRSF)	5
Total	**114**



Aerial photograph obtained from Geodesy Remote Sensing Inc., Calgary Alberta. Imagery acquired September 13th and 14th 2006.Site hydrography derived from 2006 aerial imagery obtained from Aero Geometrics, Calgary Alberta

Datum: NAD 83; Map Projection: UTM Zone 8N

This drawing has been prepared for the use of Access Mining Consultants Ltd.'s client and may not be used, reproduced or relied upon by third parties, except as agreed by Access Mining Consultants Ltd. and its client, as required by law or for use of governmental reviewing agencies. AccessMining Consultants Ltd. accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without Access Mining Consultants Ltd.'s express written consent.

1:10,000 *When printed on 81/2 by 11 inch paper*

0 100 200 300 Meters

- Bellekeno Project Bypass Road North
- Bellekeno Project Bypass Road South
- Bellekeno Haul Road

AKHM

ACCESS

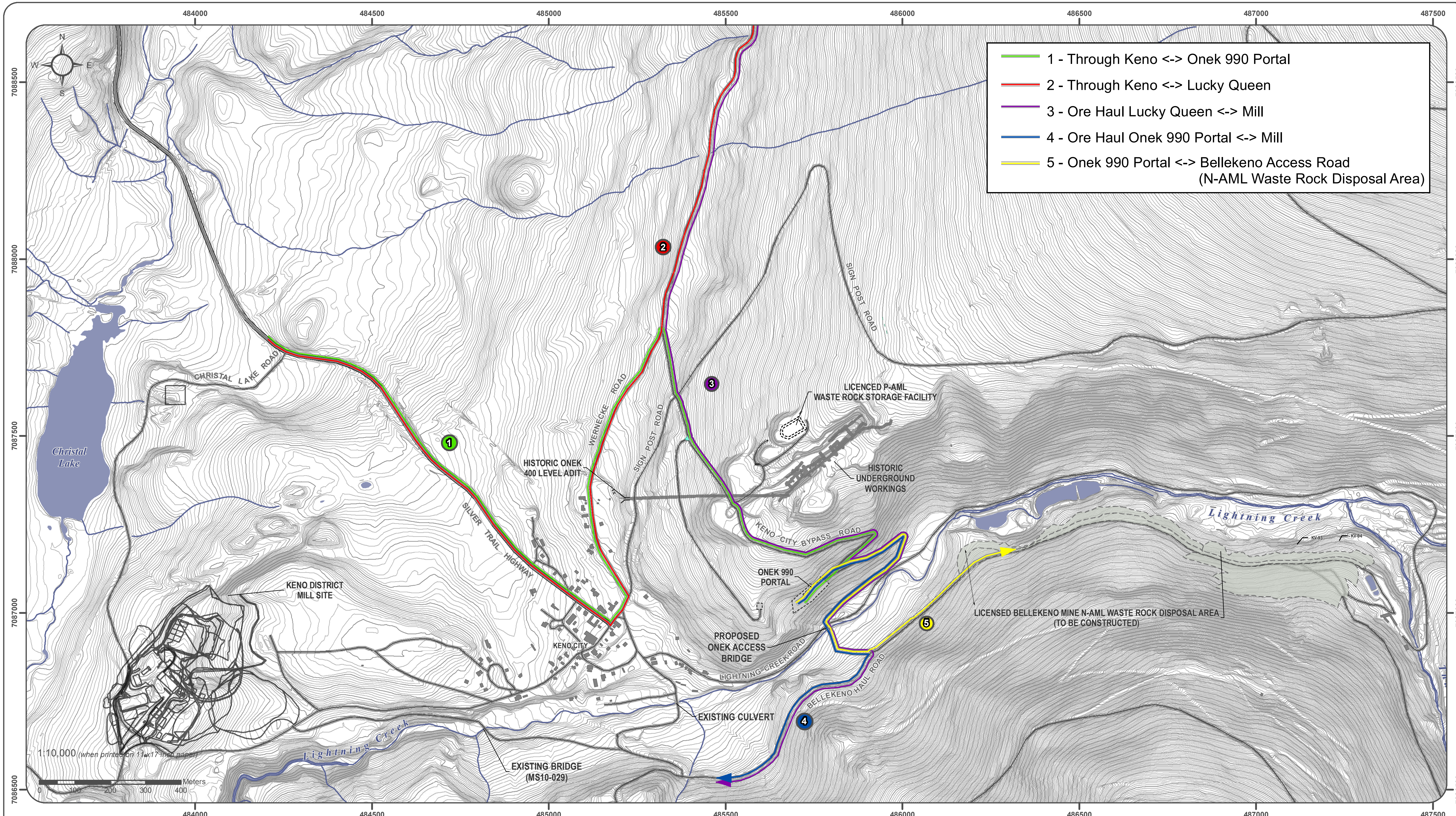
ALEXCO KENO HILL MINING CORP.

FIGURE 6-5

BELLEKENO PROJECT BYPASS ROAD

MARCH 2013

I:\Keno_Area_Mines\ONEK\Maps\2_Permitting\QML\BellekenoProjectBypassRoad_20121031.mxd
(Last edited by: jpan;3/25/2013/15:58 PM)



Aerial photograph obtained from Geodesy Remote Sensing Inc., Calgary Alberta. Imagery acquired September 13th and 14th 2006.

Site contours and hydrography derived from 2006 aerial imagery obtained from Aero Geometrics, Calgary Alberta.

Datum: NAD 83; Projection: UTM Zone 8N

This drawing has been prepared for the use of Access Mining Consultants Ltd.'s client and may not be used, reproduced or relied upon by third parties, except as agreed by Access Mining Consultants Ltd. and its client, as required by law or for use of governmental reviewing agencies. Access Mining Consultants Ltd. accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without Access Mining Consultants Ltd.'s express written consent.

Proposed Road
Highway
Secondary
Existing Features
Building/Structure
Contour (5 m interval)
Contour (1 m interval)

AKHM

ACCESS

ALEXCO KENO HILL MINING CORP.

FIGURE 6-6

LUCKY QUEEN, ONEK 990 AND BELLEKENO ACCESS ROUTES

MARCH 2014

I:\Keno_Area_Mines\LQ\Maps\1_Overview_Maps\Project_Overview\TrafficManagement_20140305.mxd
(Last edited by: jpan;3/5/2014/09:52 AM)

6.2 Adaptive Management Plan

Pursuant to Clause 90 and Clause 91 of QZ09-092, Alexco developed a Bellekeno Adaptive Management Plan, which was submitted to Yukon Water Board in April, 2011. This plan was based on the framework established by the District Wide Adaptive Management Plan, but was customized for the specific activities and developments of the Bellekeno Undertaking. The Adaptive Management Plan was updated in 2013 to include the Onek 990 and Lucky Queen Mines. No adaptive management triggers or activities were undertaken during 2013.

Reporting for the AMP including a summary of any adaptive management triggers and actions was prepared for the WUL QZ09-092 2013 Annual Report. The QZ09-092 2012 Annual Report is available on the Yukon Water Board's online registry Waterline (www.yukonwaterboard.ca/waterline).

7 Unauthorized Discharge

7.1 Reportable Spills

No reportable spill occurred in 2013.

7.1.1 Non-Reportable Spills

There were no non-reportable spills recorded at the Site in 2013 according to the reportable spill quantities defined in Schedule A of the Yukon Spill Regulations.

7.2 Permit Exceedences

There were no Water Licence exceedences during the course of 2013 relating to mine discharge.

8 CARE AND MAINTENANCE AND RECLAMATION

The care and maintenance activities at the Keno Hill District are the primary objective of Water Use License QZ06-074, which was renewed for 5 years and issued as QZ12-057 effective January 30, 2013. The purpose of this license is to obtain water, divert water, store water and to deposit waste for the purpose of care and maintenance activities for the Keno Hill Mines Property.

Alexco Resource Canada Corporation was issued Water Use Licence QZ07-078 on October 3, 2008, for the purpose to obtain water, store water, and to deposit a waste for the purpose of advanced exploration and preliminary development activities at the Bellekeno Mine on the Keno Hill Property. The Bellekeno project has since moved into production (under QZ09-092) and in 2011, Alexco applied to amend QZ07-078 to remove clauses pertinent to the mine production Licence. Alexco Keno Hill Mining Corp. (AKHM) was issued Water Use Licence QZ10-060 on November 16, 2011 for the amended purpose: to store water and to deposit a waste for the purpose of maintaining the Onek P-AML Waste Rock Storage Facility on the Keno Hill Property.

Information and analyses pertaining to the Bellekeno Mine, Lucky Queen Mine, Onek 990 Mine and District Mill areas have been fully developed through WUL QZ12-053.

8.1 CARE AND MAINTENANCE ACTIVITIES

Prevention of environmental degradation within the Keno Hill Silver District is accomplished largely by the daily operation of lime-addition water treatment systems existing at Galkeno 900, Galkeno 300, Silver King 100, and Bellekeno 625 adits. The Valley Tailings Facility is also treated on an as-required basis during spring and early summer. Care and Maintenance activities and performance monitoring (i.e. water quality monitoring) is undertaken by Elsa Reclamation and Development Company Ltd. (ERDC), using on-site laboratory facilities for daily and weekly water quality analysis. Monitoring of surface and groundwater sites as well as physical conditions is completed as per WL monitoring schedules.

A detailed discussion of these results and other Care and Maintenance activities can be found in 2013 Annual Water License report submitted to the Yukon Water Board as per Water Use License QZ06-074 (QZ12-057 effective January 30, 2013) in February 2014.

8.2 RECLAMATION ACTIVITIES

Progressive reclamation of the Dry Stack Tailings Facility (DSTF) was initiated during the summer of 2012 as presented in the Reclamation and Closure Plan to prevent potential dusting and erosion of exposed tailings slopes. Final slope and bench elevations were reached on the west toe of the DSTF, allowing final reclamation to begin.

The progressive reclamation included four areas (block A, B, C, & D) on the DSTF which were covered with granular/organic material and seeded to test various cover trials. The cover material was local material that had been cleared and stockpiled during the initial construction of the Keno District Mill. The seed material (Keno District Dry Land Seed Mix) was selected using a blend of suitable species seeded at the Brewery Creek and Minto Mine sites also located in the Yukon. Additional slopes were contoured in 2013 for preparation of progressive reclamation to be completed in 2014 including covering portions of the DSTF and seeding the cover.

APPENDIX A

2013 ANNUAL PHYSICAL INSPECTION

A TETRA TECH COMPANY

December 9, 2013

ISSUED FOR USE
EBA FILE: W14103290
Via Email: kwoloshyn@alexcoresource.com

Alexco Resource Corp.
3 – 151 Industrial Road
Whitehorse, YT Y1A 2V3

Attention: Kai Woloshyn – Environmental Manager

Subject: 2013 Annual Inspection – Surface Engineered Earth Structures
Bellekeno Mine, Keno City, YT

1.0 INTRODUCTION

1.1 General

Alexco Resource Corp. (Alexco) retained EBA Engineering Consultants Ltd. operating as EBA, A Tetra Tech Company (EBA) to complete the 2013 annual inspection of the surface engineered earth structures at the Bellekeno Mine near Keno City, Yukon. Authorization for this work was provided by purchase order (PO #15222) on August 23, 2013. The following structures were identified as requiring inspection:

- Potentially acid generating (PAG) waste storage facility
- Bellekeno 625 water treatment ponds
- Bellekeno waste rock pile
- Lightning Creek Bridge abutments (Onek Road)
- Lightning Creek Bridge abutments (Bellekeno Road)
- Mill water storage pond
- Dry stacked tailings facility (DSTF)

The location of each of the above structures is shown on Figure 1.

1.2 Scope of Services

EBA's scope of services for the 2013 annual inspection of surface engineered earth structures is as follows:

- Complete a visual inspection of the surface engineered earth structures at the Bellekeno Mine prior to September 30, 2013.
- Prepare an inspection report containing the results of the inspection, summary of the stability, integrity, and status of all inspected structures, and any recommendations for remedial actions.

EBA Engineering Consultants Ltd. operating as EBA, A Tetra Tech Company
61 Wasson Place
Whitehorse, YT Y1A 0H7 CANADA
p. 867.668.3068 f. 867.668.4349

2.0 INSPECTION SUMMARY AND RECOMMENDATIONS

The 2013 annual inspection of the surface engineered earth structures at the Bellekeno Mine was completed by Mr. Justin Pigage, P.Eng. on September 10, 2013. The following sections summarize inspection results and provide recommended remedial actions for each structure. Photographs taken during the site inspections are attached to this report.

2.1 PAG Waste Storage Facility

The PAG waste storage facility is located immediately south of the Bellekeno portal, as shown on Figure 1. The perimeter berms of the facility appeared intact with no visible signs of instability (Photo 1). Waste in the facility is being stored in accordance with the design (Photo 2).

The north and west anchor trenches are incomplete and should be excavated to properly anchor the liner. Currently piles of loose material anchor the liner in place (Photo 3).

The liner has been placed throughout the facility but the protective geotextile and geonet materials have only been placed in the north half of the facility. Some of the waste rock currently being stored in the facility extends beyond the limits of the protective geotextile and geonet (Photo 4). Sharp angular waste material in direct contact with the liner increases the likelihood of damage and punching failures. The protective geotextile and geonet should be installed over the remainder of the exposed liner.

2.2 Bellekeno 625 Water Treatment Ponds

The Bellekeno 625 water treatment ponds are located northeast of the Bellekeno portal, as shown on Figure 1. The ponds and surrounding structures (vehicle barriers, walkways, and piping) appeared stable at the time of inspection (Photo 5). The facility consists of two water treatment ponds and was operating at the time of the inspection. The water level in the primary pond was at the spillway invert with a freeboard of approximately 0.5 m below the crest of the perimeter berm (Photo 6). The water level in the secondary pond was approximately 1.5 m below the crest of the perimeter berm and 1.0 m below the emergency spillway invert (Photo 7).

At the time of the inspection water was being discharged from the secondary pond downslope of the facility. The partially buried discharge line appeared stable and intact (Photo 8). Erosion protection in the form of rip-rap should be placed immediately below the discharge point to protect the natural slope (Photo 9).

2.3 Bellekeno Waste Rock Pile

The Bellekeno waste rock pile is located beside the Bellekeno Road north of the Bellekeno portal, as shown on Figure 1. The waste rock pile has decreased in overall size from previous inspections because of ongoing construction activities around the property (Photos 10 and 11). The pile and side slopes appeared stable at the time of the inspection (Photo 12). No remedial action is recommended for the Bellekeno waste rock pile.

2.4 Lightning Creek Bridge Abutments (Onek Road)

The Onek Road Lightning Creek Bridge is located east of Keno City, as shown on Figure 1. The bridge was recently constructed and was not in service at the time of the inspection. It is a single span steel structure approximately 6 m in length (Photo 13) founded on compacted earth fill and adjustable wooden timber abutments (Photo 14). The abutments appeared stable at the time of the inspection.

The earth fill abutments are guarded from erosion by rip-rap placed after construction. The rip-rap placed protecting both bridge abutments appears satisfactory (Photo 15). No remedial action is recommended for the Lightning Creek Bridge on the Onek Road.

2.5 Lightning Creek Bridge Abutments (Bellekeno Road)

The Bellekeno Road Lightning Creek Bridge is located southwest of Keno City, as shown on Figure 1. The bridge was in service at the time of the inspection. It is a single span steel structure approximately 9 m in length (Photo 16) founded on earth filled timber cribbing abutments (Photo 17). The abutments appeared stable at the time of inspection.

The earth fill abutments are guarded from erosion by rip-rap placed after construction. The rip-rap protection for both abutments appears satisfactory (Photo 18). No remedial action is recommended for the Lightning Creek Bridge on the Bellekeno Road.

2.6 Mill Water Storage Pond

The mill water storage pond is located at the Keno Hill District Mill Site approximately 1 km west of Keno City, as shown on Figure 1. The pond was operating at the time of the inspection with a water level approximately 2 m below the perimeter berm crest (Photo 19). The perimeter berm appeared stable at the time of inspection and no loose seems, excessive tension or bulging was observed in the liner (Photo 20).

Some minor erosion was noted during the inspection along the exterior berm in the south and west portion of the pond (Photo 21). This area should be monitored closely for signs of increased erosion and armoured with rip-rap or vegetation if erosion continues.

In response to previous safety recommendations, ropes have been installed in several locations around the perimeter of the pond to help personnel climb out of the pond should they fall in (Photo 22).

2.7 Dry Stacked Tailings Facility

The dry stacked tailings facility (DSTF) is located at the Keno Hill District Mill Site approximately 1 km west of Keno City, as shown on Figure 1. Construction and operation of the DSTF was ongoing at the time of the inspection with work being focussed on contouring the sideslopes (Photo 23).

Construction of the lower tailings bench is complete to the design dimensions and elevations. Progressive reclamation of the facility is underway with revegetation of the western face of the lower bench (Photo 24).

The foundation elements of the DSTF (gravel drainage blanket, geosynthetic clay liner, geonet, and geotextile) placed to date appeared properly installed and intact at the time of the inspection. The perimeter berms and surface water collection structures appeared stable and functional (Photo 25).

Some minor tension cracking was observed near the top of the placed tailings on the north slope of the DSTF (Photo 26). This is likely due to the natural drying of placed tailings and should not impact the performance of the facility.

Ongoing routine DSTF instrumentation monitoring and compaction testing (Photo 27) indicates there is no lateral movement of the frozen foundation soils and that compaction of the placed tailings to date is adequate. In general, construction and performance of the DSTF has been consistent with the design to date. No remedial action is recommended for the DSTF.

3.0 CONCLUSION

The structures inspected pose no significant risk to the environment or human health and safety. The remedial actions recommended in the previous sections should be completed as soon as possible. The following Table 1 summarizes the recommended remedial actions for each structure inspected:

Table 1: Summary of Remedial Recommendations

Structure	Remedial Recommendations
PAG Waste Storage Facility	• Complete anchor trench for liner on north and west sides of facility. • Complete placement of protective geonet and geotextile over liner in southern half of facility.
Bellekeno 625 Water Treatment Ponds	• Armour discharge location with rip-rap to reduce erosion.
Bellekeno Waste Rock Pile	• No remedial action recommended.
Lightning Creek Bridge Abutments (Onek Road)	• No remedial action recommended.
Lightning Creek Bridge Abutments (Bellekeno Road)	• No remedial action recommended.
Mill Water Storage Pond	• Monitor south and west exterior perimeter berms for erosion and armour if necessary.
Dry Stacked Tailings Facility	• No remedial action recommended.

4.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Alexco Resource Corp. and their agents. EBA Engineering Consultants Ltd. operating as EBA, A Tetra Tech Company, does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Alexco Resource Corp., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in EBA's Services Agreement. EBA's General Conditions are provided in Appendix A of this report.

5.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
EBA Engineering Consultants Ltd.

PROFESSIONAL YUKON JUSTIN PIGAGE TERRITORY ENGINEER
Dec. 9/13

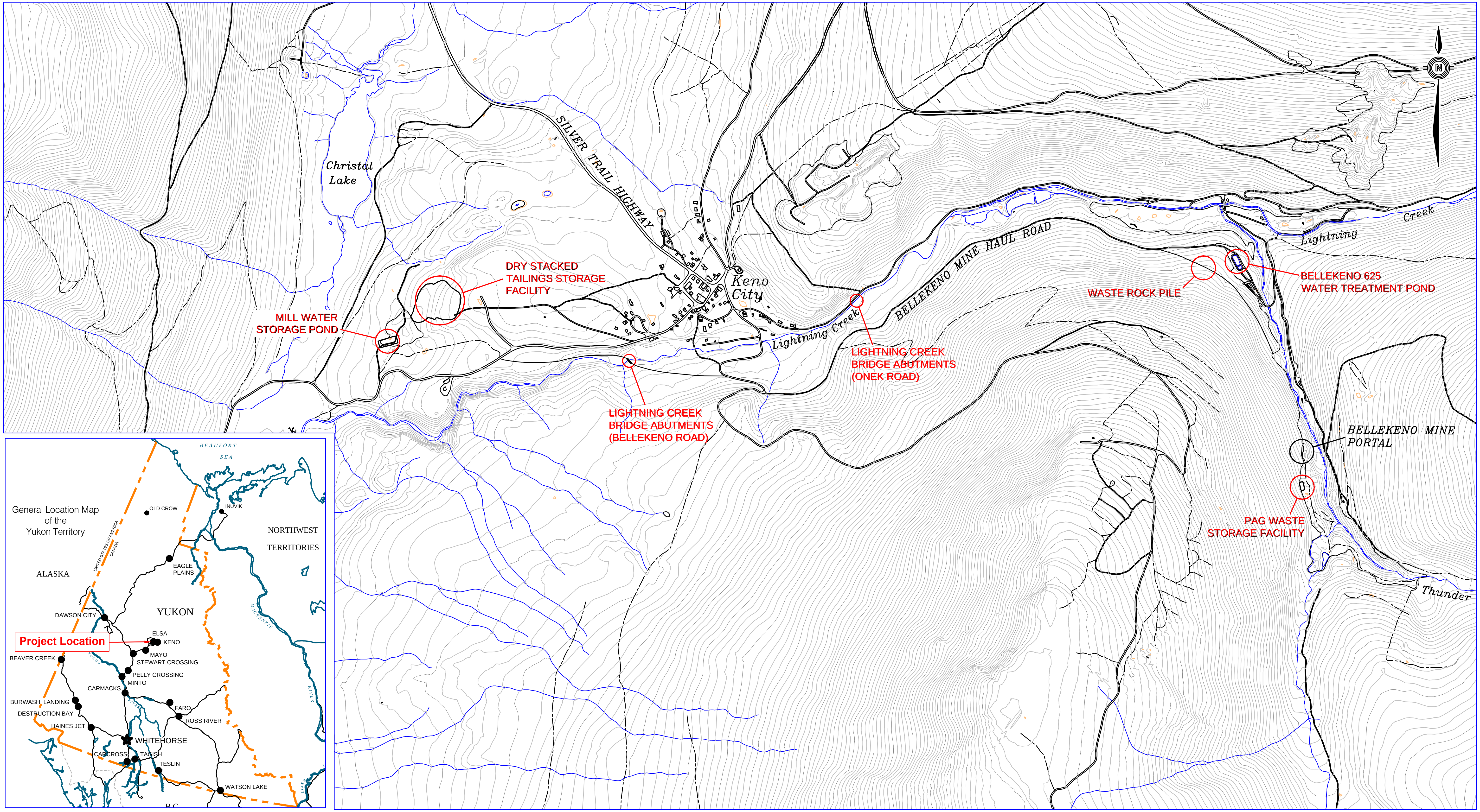
PROFESSIONAL YUKON J. RICHARD TRIMBLE TERRITORY ENGINEER
Dec 9/13

Justin Pigage, P.Eng.
Geotechnical Engineer, Arctic Region
Direct Line: 867.668.9213
jpigage@eba.ca

J. Richard Trimble, P.Eng., FEC
Principal Consultant, Arctic Region
Direct Line: 867.668.9216
rtrimble@eba.ca

PERMIT TO PRACTICE
EBA ENGINEERING CONSULTANTS LTD.
SIGNATURE
Date Dec 9/13
PERMIT NUMBER PP003
Association of Professional
Engineers of Yukon

FIGURES



NOTES
CONTOUR INFORMATION IS BASED ON DRAWING PROVIDED BY ALEXCO RESOURCE INC.

0 500
Scale: 1: 15 000 (metres)

CLIENT
ALEXCO

eba
A TETRA TECH COMPANY

2013 ANNUAL INSPECTION
BELLEKENO MINE SITE - KENO CITY, YUKON

SITE PLAN SHOWING STRUCTURE LOCATIONS

PROJECT NO.	DWN	CKD	REV
W14103290-01	CB	JTP	0

OFFICE	DATE
EBA-WHSE	December 3, 2013

Figure 1

Q:\Whitehorse\Data\0201drawings\Keno\W14103290-01 2013 Annual Inspection\W14103290-01 Fig.1_R0.dwg [FIGURE 1] December 03, 2013 - 3:07:18 pm (BY: BUCHAN, CAMERON)

PHOTOGRAPHS

Photo 1: **PAG Waste Storage Facility**
Perimeter berm
Facing south – September 10, 2013

Photo 2: **PAG Waste Storage Facility**
Material stored in facility
Facing north – September 10, 2013

Photo 3: **PAG Waste Storage Facility**
Liner not properly anchored around north and west perimeter
Facing north – September 10, 2013

Photo 4: **PAG Waste Storage Facility**
Angular waste material in direct contact with liner
Facing west – September 10, 2013

Photo 5: **Bellekeno 625 Water Treatment Ponds**
Photograph showing condition of facility
Facing north – September 10, 2013

Photo 6: **Bellekeno 625 Water Treatment Ponds**
Approximately 0.5 m freeboard in pond one
Facing west – September 10, 2013

Photo 7: **Bellekeno 625 Water Treatment Ponds**
Approximately 1.5 m freeboard in pond two
Facing north – September 10, 2013

Photo 8: **Bellekeno 625 Water Treatment Ponds**
Partially buried discharge line
Facing west – September 10, 2013

Photo 9: **Bellekeno 625 Water Treatment Ponds**
Discharge point requiring rip-rap armouring for erosion protection
Facing south – September 10, 2013

Photo 10: **Bellekeno Waste Rock Pile**
Overview of waste rock pile
Facing west – September 10, 2013

Photo 11: **Bellekeno Waste Rock Pile**
Overview of waste rock pile
Facing south – September 10, 2013

Photo 12: **Bellekeno Waste Rock Pile**
Stable pile sideslopes
Facing west – September 10, 2013

Photo 13: **Lightning Creek Bridge Abutments (Onek Road)**
Lightning Creek Bridge on the Onek Road
Facing north – September 10, 2013

Photo 14: **Lightning Creek Bridge Abutments (Onek Road)**
Compacted earth fill and wooden timber bridge abutments
Facing east – September 10, 2013

Photo 15: **Lightning Creek Bridge Abutments (Onek Road)**
Rip-rap armouring providing erosion protection for bridge abutments
Facing north – September 10, 2013

Photo 16: **Lightning Creek Bridge Abutments (Bellekeno Road)**
Lightning Creek Bridge on the Bellekeno Road
Facing west – September 10, 2013

Photo 17: **Lightning Creek Bridge Abutments (Bellekeno Road)**
Earth filled timber cribbing bridge abutments
Facing east – September 10, 2013

Photo 18: **Lightning Creek Bridge Abutments (Bellekeno Road)**
Rip-rap armouring providing erosion protection for bridge abutments
Facing south – September 10, 2013

Photo 19: **Mill Water Storage Pond**
Approximately 2.0 m of freeboard in mill water storage pond
Facing west – September 10, 2013

Photo 20: **Mill Water Storage Pond**
Stable perimeter berm
Facing east – September 10, 2013

Photo 21: **Mill Water Storage Pond**
Minor erosion observed on exterior of perimeter berm on south and west sides
Facing west – September 10, 2013

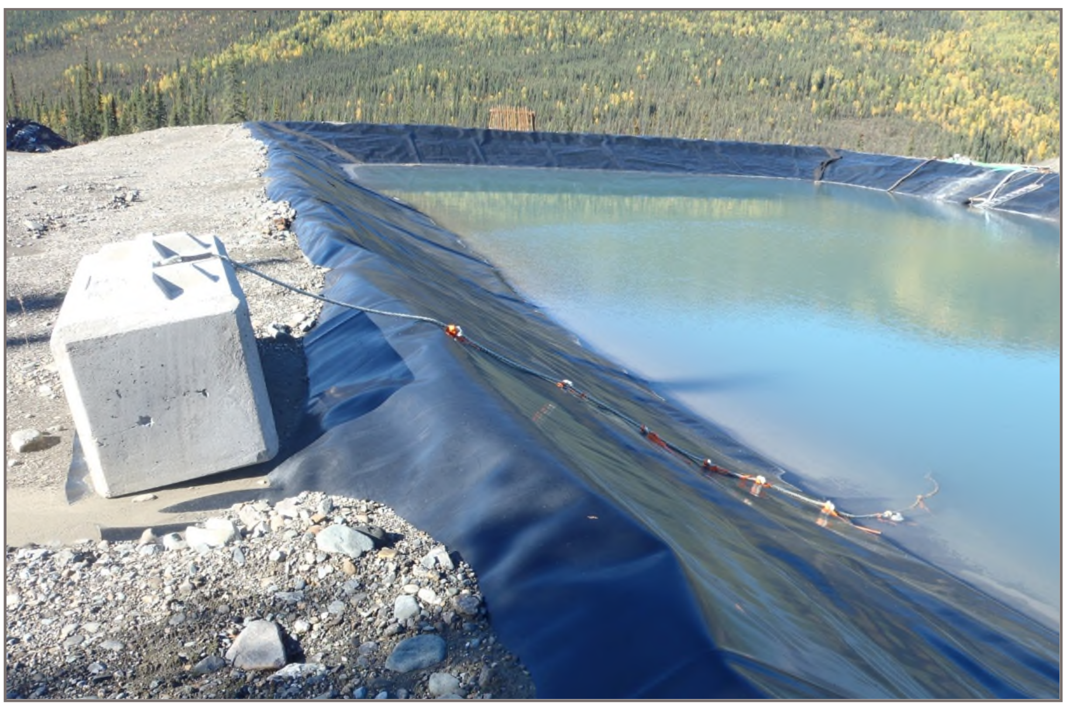


Photo 22: **Mill Water Storage Pond**
Safety rope for exiting pond
Facing west – September 10, 2013

Photo 23: **Dry Stacked Tailings Facility**
Contouring of facility to design grades
Facing west – September 10, 2013

Photo 24: **Dry Stacked Tailings Facility**
Vegetation on western slope of lower tailings bench
Facing north – September 10, 2013

Photo 25: **Dry Stacked Tailings Facility**
Perimeter berm and surface water collection system
Facing north – September 10, 2013

Photo 26: **Dry Stacked Tailings Facility**
Minor tension cracking on north side of facility
Facing east – September 10, 2013

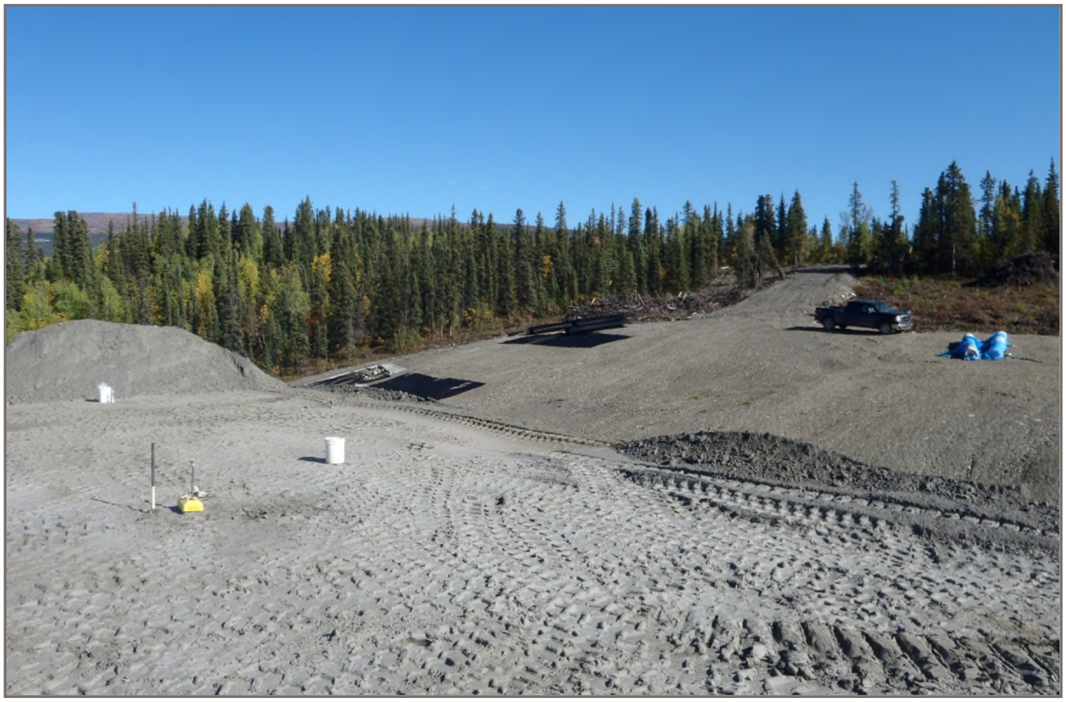


Photo 27: **Dry Stacked Tailings Facility**
Compaction testing at the dry stacked tailings facility
Facing north – September 10, 2013

APPENDIX A

EBA'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEOTECHNICAL REPORT

This report incorporates and is subject to these "General Conditions".

1.0 USE OF REPORT AND OWNERSHIP

This geotechnical report pertains to a specific site, a specific development and a specific scope of work. It is not applicable to any other sites nor should it be relied upon for types of development other than that to which it refers. Any variation from the site or development would necessitate a supplementary geotechnical assessment.

This report and the recommendations contained in it are intended for the sole use of EBA's Client. EBA does not accept any responsibility for the accuracy of any of the data, the analyses or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA's Client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. EBA's instruments of professional service will be used only and exactly as submitted by EBA.

Electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

3.0 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, EBA has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

4.0 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. EBA does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

5.0 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

6.0 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. EBA does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

7.0 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

8.0 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

9.0 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques are known.

10.0 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

11.0 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

12.0 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

13.0 SAMPLES

EBA will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client’s expense upon written request, otherwise samples will be discarded.

14.0 INFORMATION PROVIDED TO EBA BY OTHERS

During the performance of the work and the preparation of the report, EBA may rely on information provided by persons other than the Client. While EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

APPENDIX B

QZ09-092 2013 TAILINGS CHARACTERIZATION PLAN REPORTING

Memorandum

To: Alexco Keno Hill Mining Corp.

From: Andrew Gault

CC: Kai Woloshyn

Date: February 27, 2014

Re: QZ12-053 Tailings Characterization Plan 2013 Reporting

1 Introduction

The Tailings Characterization Plan (The TC Plan) for the Bellekeno Mine was submitted on December 31, 2010 as a requirement under Water Licence QZ09-092. The TC Plan was revised and submitted on January 27, 2014 as part of the requirement for amended Water Licence QZ12-053. The TC Plan provides a method by which the geochemical and physical characterization of tailings generated by the Mill can be evaluated.

The site assay lab prepares both monthly and quarterly composites for various analyses based on daily tailings production rates. Operations at the Bellekeno mine and district mill were suspended on September 3, 2013, so tailings characterization data for 2013 are only available up to and including August 2013.

2 X-Ray Diffraction Analysis

Quantitative Reitveld-X-ray Diffraction (XRD) analysis was conducted on mill tailings composites collected for the first two quarters of 2013 by the University of British Columbia Department of Earth and Ocean Science to determine mineralogy of the mill throughput. The quarterly mill composite was reduced to the optimal grain-size range for analysis and step-scan X-ray powder-diffraction data were collected. The X-ray diffractogram was analyzed against the International Centre for Diffraction Database PDF-4.

The results of the two 2013 quarterly mill composites are shown in Table 2-1. These amounts represent the relative amount of crystalline phases by weight normalized to 100%.

Table 2-1 Results of XRD quantitative phase analysis for quarterly final mill tailings composites (wt. %), 2013.

Minerals	FMT Comp 2013	FMT Comp 2013	Average
	1st Quarter	2nd Quarter	
	Jan/Feb/Mar	Apr/May/June	
Quartz	63.1	59.8	61.5
Siderite	27.1	26.4	26.8
Calcite	1.9	3.4	2.7
Muscovite	4.5	4.7	4.6
K-Feldspar	-	2.5	2.5
Sphalerite	1.0	1.4	1.2
Pyrite	2.2	1.8	2
Galena	0.2	0.1	0.2
Total	100	100	100

The most abundant mineral by weight in the 2013 tailings composites was quartz at an average of 61.5 wt. %, followed by siderite (average 26.8 wt. %). Muscovite and calcite comprised an average of 4.6 wt. % and 2.7 wt. %, respectively. Sulphide minerals accounted for an average of 3.4 wt. % of the tailings, with the relative abundance of each being pyrite > sphalerite >> galena.

Compared to the 2012 data, the 2013 tailings composites had a slightly higher average proportion of quartz (61.5 wt. in 2013 % *cf.* 55.1 wt % in 2012) and lower amount of siderite (26.8 wt. % in 2013 *cf.* 30.6 wt. % in 2012). The average calcite abundance was comparable between 2012 and 2013, but the mean total sulphide minerals content of the 2013 tailings was lower (3.4 wt. in 2013 % *cf.* 5.8 wt % in 2012). In 2012, the average sphalerite concentration (2.5 wt. %) was double that in 2013 (1.2 wt. %). The average pyrite content was similar between the 2012 and 2013 tailings composites, while the average galena level was lower in 2013 (0.2 wt. % in 2013 *cf.* 0.9 wt. % in 2012), although quantitative measurements below 1% mineral abundance are challenging by XRD.

3 ACID BASE ACCOUNTING

Acid base accounting (ABA) analyses were conducted on a monthly composite of the tailings produced by the mill. ABA testing was performed by ALS Environmental in Burnaby, BC. 2013 ABA data are provided in Table 3-1.

Table 3-1 ABA data collected for 2013 mill tailings composite samples

	Maximum Potential Acidity	Fizz Rating	Net Neutralization Potential	Neutralization Potential	pH	NPR (NP:MPA)	Total Sulphur	Total Sulphate (Carbonate Leach)	HCl-Leachable Sulphate	Sulphide Sulphur (Calculated)	Inorganic Carbon (C)	Inorganic Carbon (C as CO2)
Unit	Kg $CaCO_3$/t	Unit	Kg $CaCO_3$/t	Kg $CaCO_3$/t	Unit	Unit	%	%	%	%	%	%
Jan-13	34.1	3	38	72	8.2	2.11	1.09	0.03	0.05	1.06	3	11
Feb-13	45.3	3	15	60	8.2	1.32	1.45	<0.01	0.02	1.45	1.91	7
Mar-13	48.4	3	26	74	8.2	1.53	1.55	0.04	<0.01	1.51	3.56	13
Apr-13	45	2	-5	40	8.2	0.89	1.44	0.05	0.05	1.39	2.74	10
May-13	55.3	3	44	99	8.1	1.79	1.77	0.04	0.02	1.73	3.25	11.9
Jun-13	35.9	3	49	85	8.1	2.37	1.15	0.06	0.09	1.09	1.2	4.4
Jul-13	28.1	2	15	43	8.1	1.53	0.9	0.05	0.05	0.85	2.56	9.4
Aug-13	75.6	2	-31	45	8.1	0.6	2.42	0.04	0.03	2.38	3.22	11.8
Average [1]	46.0	3	19	65	8.2	1.52	1.47	0.04	0.04	1.43	2.68	9.8

[1] Where a sample returned a value that was below the method detection limit, half the detection limit was used in calculating the average

The total sulphur concentration ranged between 0.90 and 2.42%, with an average of 1.47% in 2013. The maximum sulphur content was observed in the August 2013 composite, which was the final sample produced before the mill operations were suspended. Total sulphur concentrations in the 2013 composite samples were generally lower than those measured in previous years (Figure 3-1). Sulphide sulphur was the dominant form of sulphur in the tailings, accounting for 95 – 100% of the total sulphur. The maximum potential acidity (MPA) of the tailings composites ranged from 28.1 to 75.6 kg $CaCO_3$/tonne.

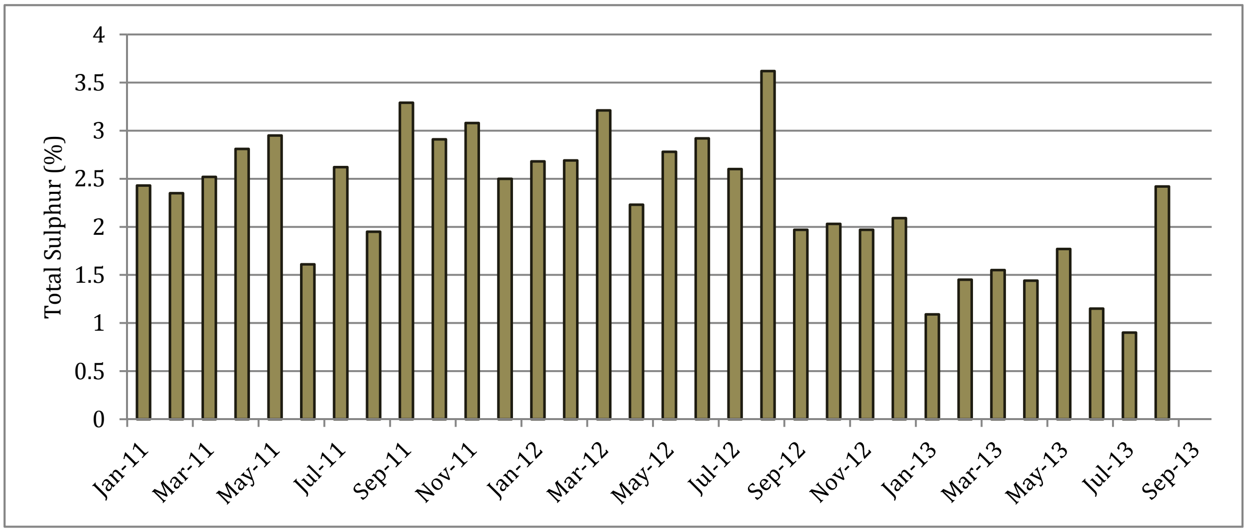


Figure 3-1 Total sulphur content of Mill tailings composites.

The results of mineralogical testing of the tailings composite using X-Ray Diffraction (XRD) has shown that Bellekeno tailings contain significant siderite (26 to 35 wt. %). As a result of this determination, the ABA package was switched in July 2011 from standard ABA to a siderite-corrected ABA analytical package to remove any potential neutralization potential (NP) contributions from the siderite. All 2013 NP was calculated using the siderite correction. The NP in 2013 ranged from 40 to 99 kg $CaCO_3$/tonne. Overall, lower NP values were observed for the 2013 tailings composites than in 2012 (Figure 3-2). A decreasing overall trend in NP values is observed, with annual median siderite-corrected NP values for the tailings composites in 2011, 2012, and 2013 of 125, 87, and 65 kg $CaCO_3$/tonne, respectively.

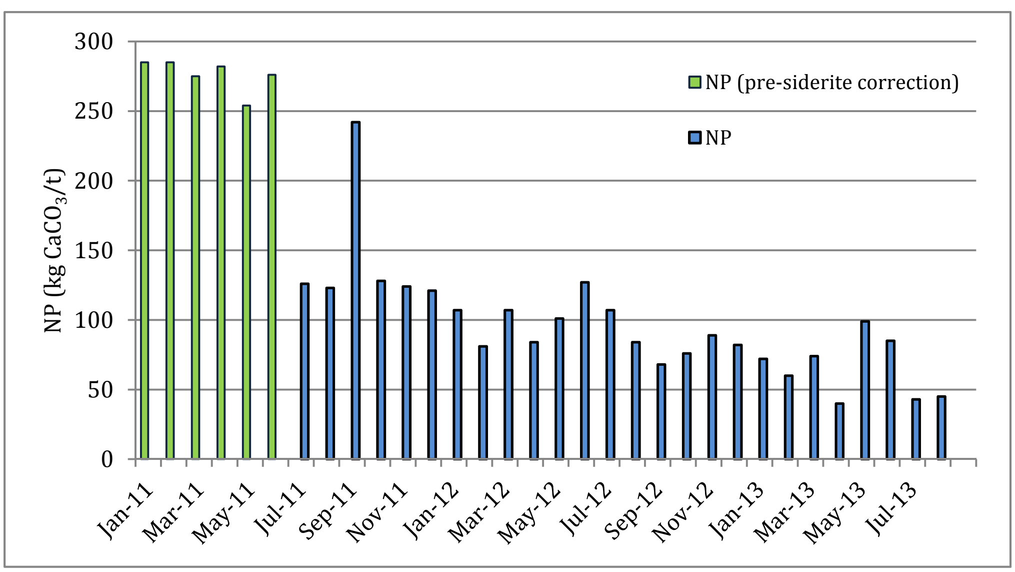


Figure 3-2 Neutralization potential (NP) of Mill tailings composites

The neutralization potential ratio (NPR = NP:MPA ratio) of the tailings composites in 2013 ranged from 0.60 to 2.37, with an average of 1.52. The 2013 NPR values are broadly higher than those from 2012, likely due to the lower sulphide content of the 2013 tailings composite samples. Net neutralization potential (NNP), the difference between NP and MPA, of the tailings composites ranged between -31 and 49 kg $CaCO_3$/tonne, with two values below zero in 2013 (Figure 3-4). The median NNP in 2013 was 19 kg $CaCO_3$/tonne, which is slightly higher than that observed in 2012 (14 kg $CaCO_3$/tonne), but lower than in 2011 (44 kg $CaCO_3$/tonne siderite-corrected).

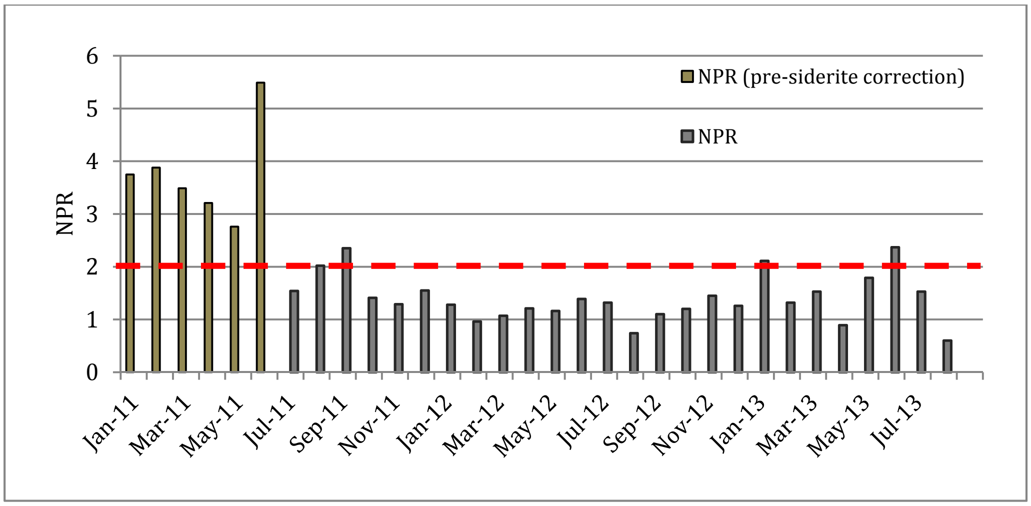


Figure 3-3 Neutralization potential ratio (NPR = NP/MPA) of Mill tailings composites. Red dashed line indicates NPR = 2, above which MEND (2009) indicate the sample is unlikely to be acid generating.

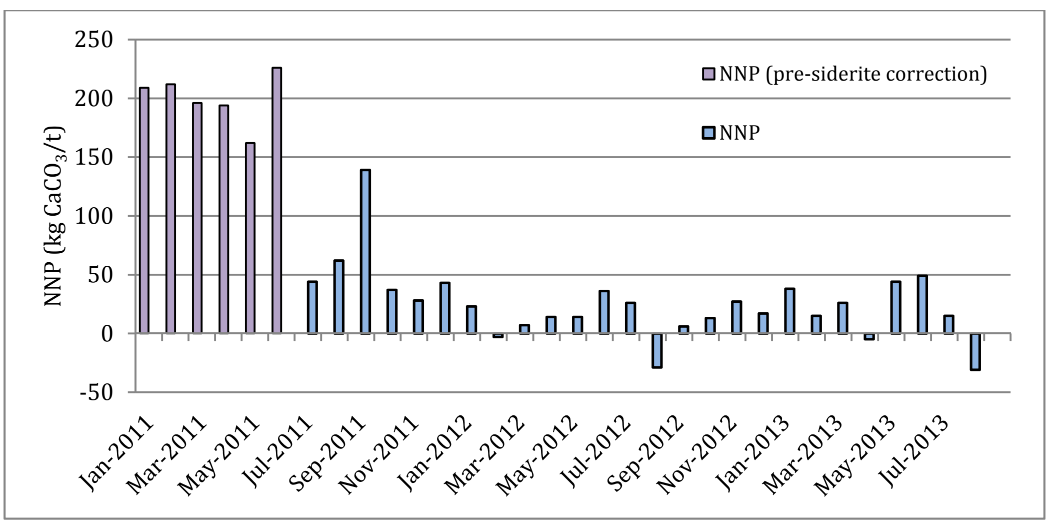


Figure 3-4 Net neutralization potential (NNP = NP-MPA) of Mill tailings composites.

4 Shake Flask Extraction

Shake flask extraction (SFE) was conducted on a monthly composite of the tailings produced by the mill. SFE testing was performed by ALS Environmental in Burnaby, BC. 2013 SFE data is provided in Table 3-1.

Table 4-1 SFE data, 2013

	Arsenic, leachable	Cadmium, leachable	Copper, leachable	Lead, leachable	Nickel, leachable	Silver, leachable	Zinc, leachable
Unit	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**%**
WUL-EQS [1]	0.1	0.01	0.1	0.2	0.5	0.01	0.5
Jan-12	0.0089	0.005	0.0098	0.0856	0.00101	0.00296	0.049
Feb-12	0.0117	0.00181	0.0095	0.034	0.0007	0.00215	0.023
Mar-12	0.0065	0.112	0.0079	0.0389	0.0007	0.000085	0.029
Apr-12	0.0117	0.00437	0.0084	0.097	<0.001	0.00693	0.035
May-12	0.0054	0.00167	0.0078	0.0189	0.00073	0.00196	0.021
Jun-12	0.01	0.00495	0.006	0.0974	0.0012	0.000889	0.054
Jul-12	0.0081	0.00498	0.0072	0.0886	0.001	0.00095	0.057
Aug-12	0.0047	0.00271	0.0072	0.0371	0.0008	0.0013	0.046
Average [2]	0.0084	0.0172	0.0080	0.0622	0.0008	0.0022	0.039

[1] Denotes effluent quality standard mandated by water use licence QZ09-92

[2] Where a sample returned a value that was below the method detection limit, half the detection limit was used in calculating the average

The range of SFE leachable concentrations obtained from the monthly 2013 tailings composites were: 0.0047 to 0.012 mg/L for arsenic (average of 0.0084 mg/L); 0.0017 to 0.11 mg/L for cadmium (average of 0.017 mg/L); 0.0060 to 0.0098 mg/L for copper (average of 0.0080 mg/L); 0.019 to 0.097 mg/L for lead (average of 0.062 mg/L); <0.001 to 0.0012 mg/L for nickel (average of 0.0008 mg/L); 0.000085 to 0.0069 mg/L for silver (average of 0.0022 mg/L); and 0.021 to 0.057 mg/L zinc (average of 0.039 mg/L). All SFE monthly leachable concentrations of the licenced elements were below their respective effluent quality standards (EQL), with the exception of the March 2013 composite for cadmium (0.112 mg/L), which marginally exceeded its EQL (0.1 mg/L). SFE leachable metal(loid) concentrations in the mill tailings composite samples are displayed in Figure 4-1 to Figure 4-4. There is little discernable trend in leachable concentrations of most metals over the timescale that these analyses have been performed, although arsenic, copper and silver appear to be generally higher from Jan 2012 onwards compared to the 2011 data.

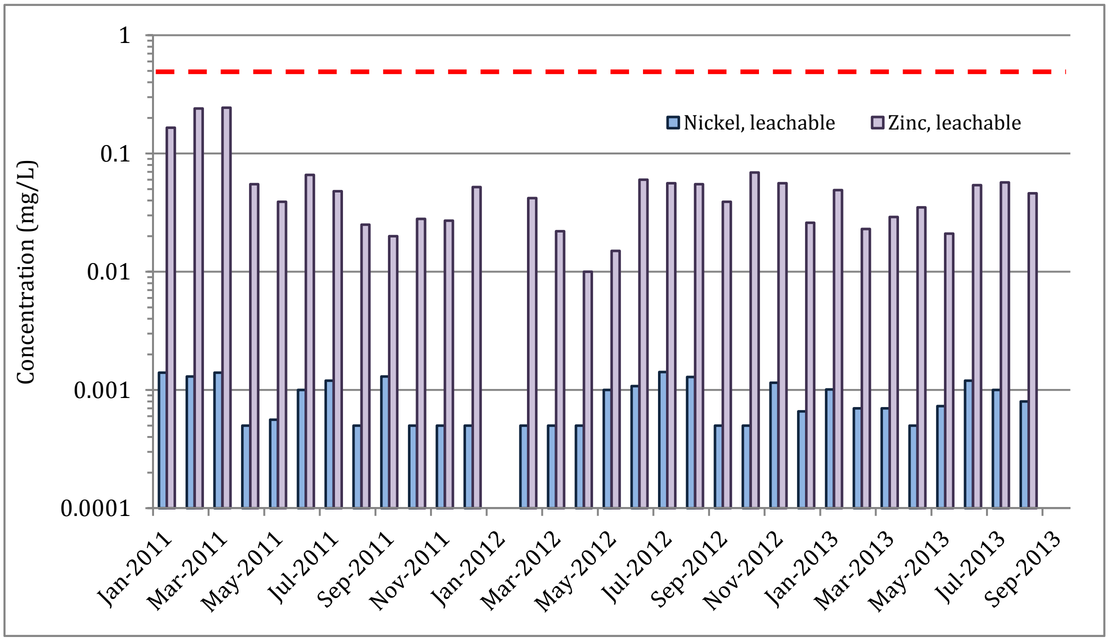


Figure 4-1 Nickel and zinc concentrations leached during shake flask extraction of Mill tailings composites. Red dashed line indicates the QZ09-92 effluent quality standard for nickel and zinc.

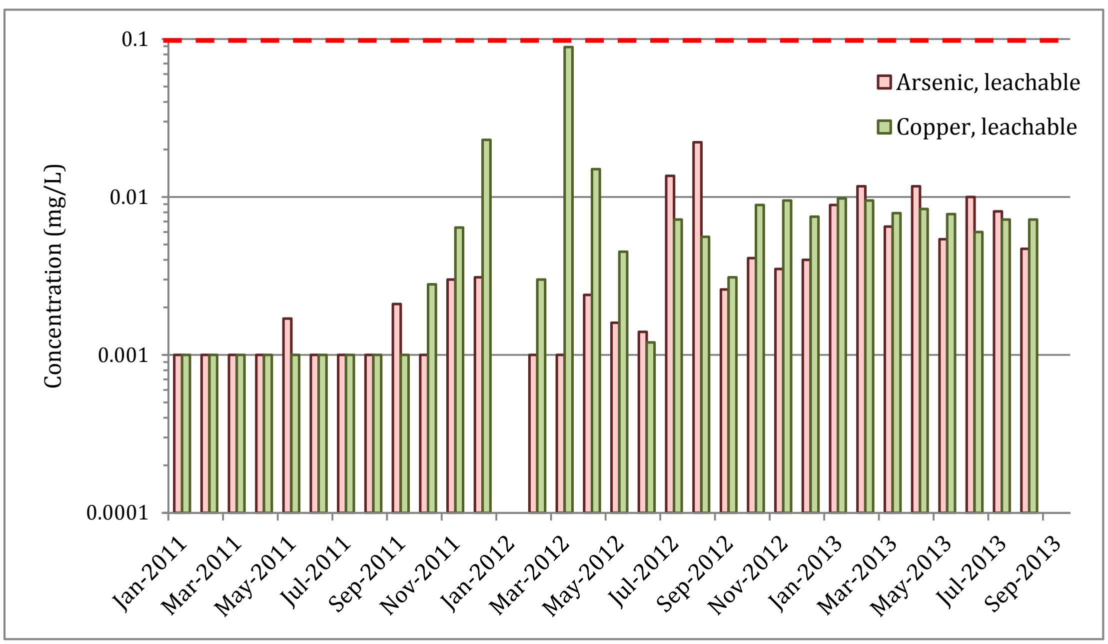


Figure 4-2 Arsenic and copper concentrations leached during shake flask extraction of Mill tailings composites. Red dashed line indicates the QZ09-92 effluent quality standard for arsenic and copper.

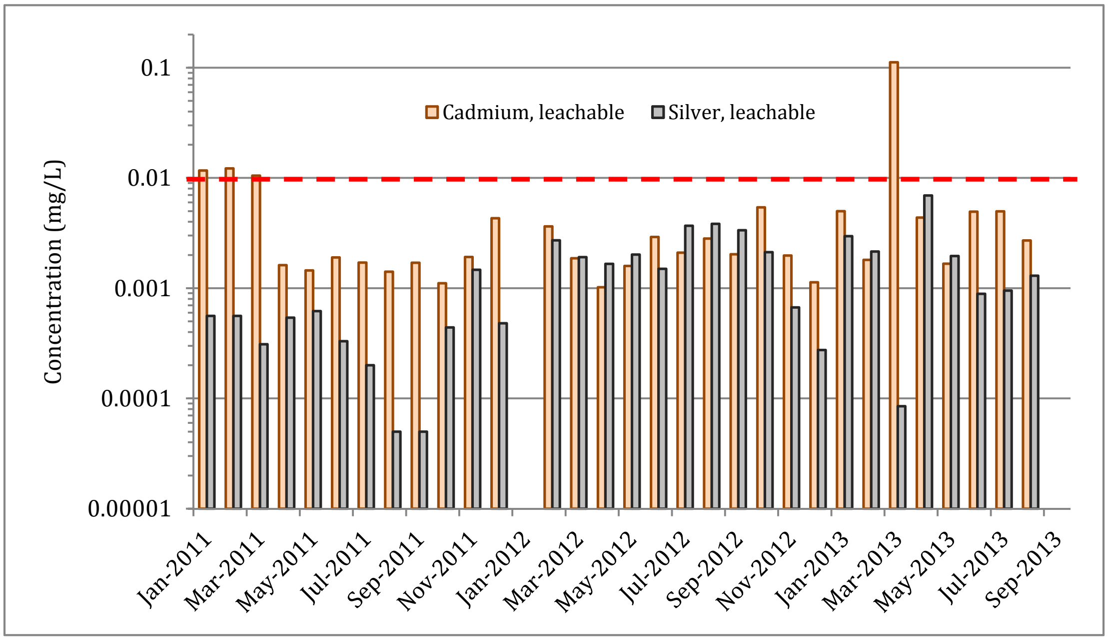


Figure 4-3 Cadmium and silver concentrations leached during shake flask extraction of Mill tailings composites. Red dashed line indicates the QZ09-92 effluent quality standard for cadmium and silver.

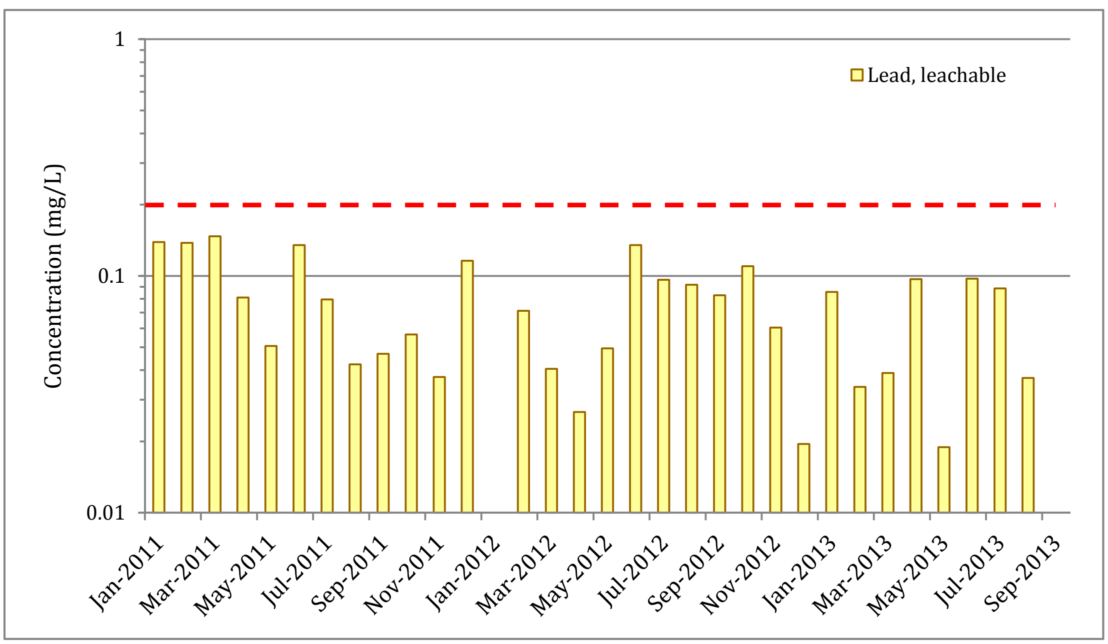


Figure 4-4 Lead concentrations leached during shake flask extraction of Mill tailings composites. Red dashed line indicates the QZ09-92 effluent quality standard for lead.

5 INITIAL PORE WATER COMPOSITION

Two samples of water from the filter press were collected in 2013 and submitted to ALS Environmental, in Burnaby, BC for testing. These samples reflect the chemical composition of residual process related water contained within in the tailings that are transported to the dry stack tailings facility (DSTF) or backfilled underground. These samples provide information on the initial pore water chemical composition of the DSTF. It should be noted that the water that is sampled is reused in the milling process.

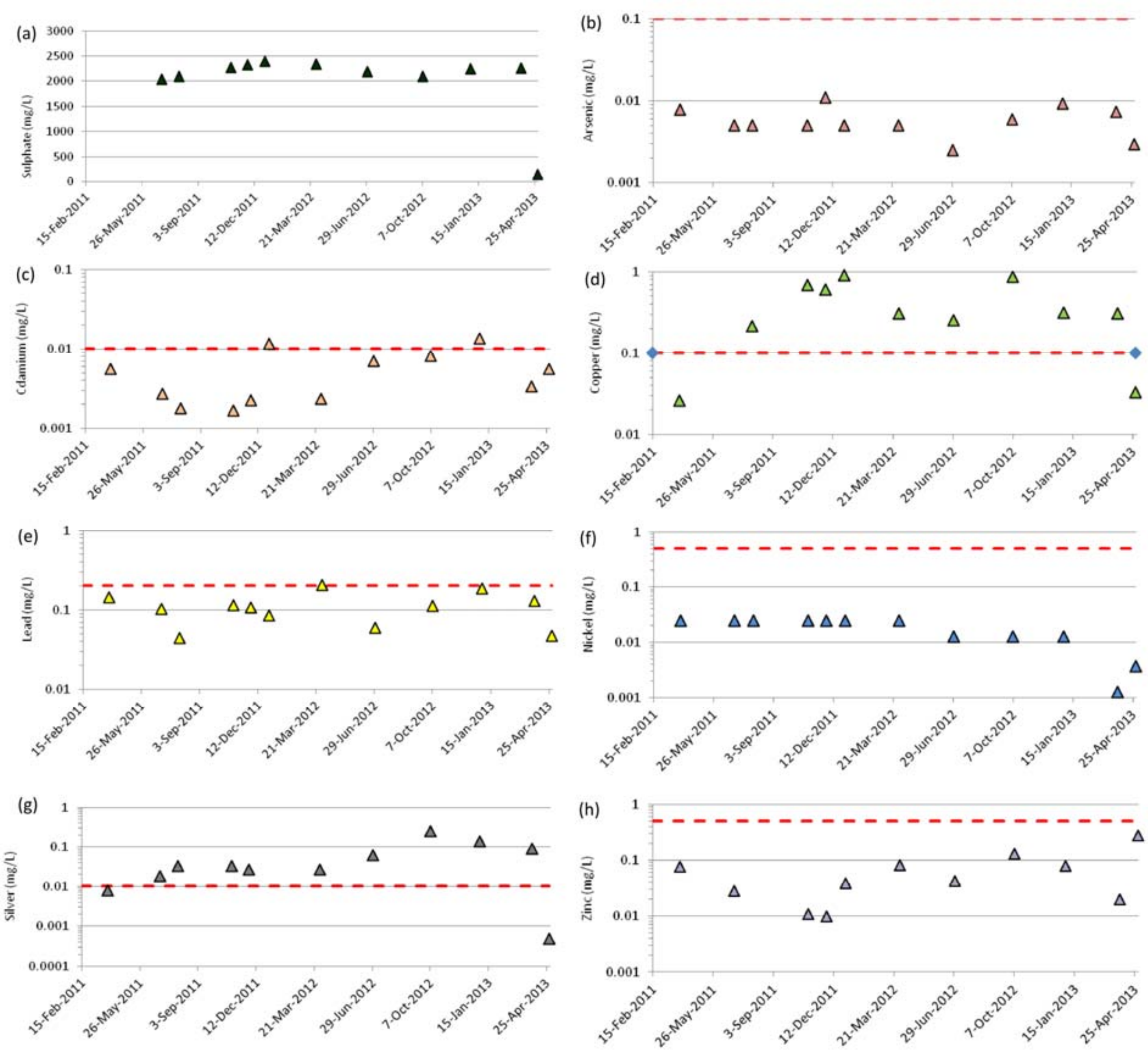


Figure 5-1 Concentrations of (a) sulphate, (b) arsenic, (c) cadmium, (d) copper, (e) lead, (f) nickel, (g) silver, and (h) zinc in filter press water. Red dashed line indicates the QZ09-92 effluent quality standard for each metal(loid).

Sulphate and metal(loid) concentrations measured in 2013 were broadly within the concentration range observed in the past two years of sampling (Figure 5-1), with the exception of the April 2013 sulphate data point (147 mg/L), which was an order of magnitude lower. The April 2013 filter press water sample also had anomalously low copper, nickel, and silver concentrations compared with historic ranges (Figure 5-1). Copper and silver were the only regulated metals that regularly showed filter press water concentrations in excess of the effluent quality standard (Figure 5-1). There is tentative evidence for an upward trend in silver concentrations in filter press water over the two years of monitoring data.

6 HUMIDITY CELL

6.1 SOURCE MATERIAL

The humidity cell consists of weighted composite tailings generated from the first 6 months (January to June 2011) of operation of the District Mill running Bellekeno Mine ore. The management and subsequent testing of the humidity cells were conducted by ALS Environmental in Burnaby, BC. ABA testing was conducted on the monthly mill tailings composites. The results of ABA testing for the first 6 months of tailings are reported in Table 6-1. It is important to note that the method of determining NP from January to June 2011 did not take into account the presence of siderite and are not properly corrected. Therefore the NP and related NNP and NPR are reported artificially high.

Table 6-1 ABA testing results for the first six months of mill tailings composites through the mill

	Proportion of composite	Maximum Potential Acidity (MPA)	Net Neutralizing Potential (NNP)	Neutralizing Potential (NP)	pH	NPR NP: MPA	T – S	T – SO_4^-	Leachable SO_4^-	S as S^{2-} (Leco)	Inorganic C as C	Inorganic C as CO_2
Description	**%**	**Kg CaCO3/t**	**Kg CaCO3/t**	**Kg CaCO3/t**	**Unit**	**Unit**	**%**	**%**	**%**	**%**	**%**	**%**
Jan-11	16	75.9	209	285	8	3.75	2.43	0.06	0.03	2.33	3.85	14.1
Feb-11	14	73.4	212	285	8	3.88	2.35	0.07	0.02	2.3	3.82	14
Mar-11	19	78.8	196	275	8.1	3.49	2.52	0.07	0.03	2.43	3.9	14.3
Apr-11	18	87.8	194	282	8.2	3.21	2.81	0.06	0.01	2.75	4.17	15.3
May-11	17	92.2	162	254	8.2	2.76	2.95	0.03	<0.01	2.91	3.82	14
Jun-11	16	50.3	226	276	8	5.49	1.61	0.03	0.03	1.581 [1]	3.76	13.8

[1] Sulphur as sulphide for June 2011 was calculated and not determined by Leco analysis.

The six monthly composites were used to create quarterly composite samples on which a quantitative phase analysis by X-ray diffraction was conducted to determine the mineralogy of mill throughput. These amounts represent the relative amounts of crystalline phases normalized to 100%. The results of the first two quarterly results are reported in Table 6-2.

Table 6-2 Results of XRD quantitative phase analysis of first and second quarter 2011 final mill tailings composites (wt. %)

Mineral	First Quarter 2011 (Jan/Feb/Mar) (%)	Second Quarter 2011 (Apr/May/June) (%)
Quartz	53.1	49.5
Siderite	32	35.2
Muscovite	5	4.6
Calcite	2.2	3.1
Sphalerite	2.3	2.8
Pyrite	2.2	1.9
Plagioclase	1.1	1.2
Ankerite – Dolomite	0.9	0.8
Arsenopyrite	0.8	0.6
Galena	0.3	0.2
Total	100	100

Quartz is the most abundant mineral in the mill throughput tailings comprising about half of the composites by weight. Siderite is the second most abundant mineral comprising about a third of the composites by weight. Muscovite comprises roughly 5% of mineralization. Calcite is 2.65% of mineralization by weight, while dolomite, which contributes to NP, and ankerite, which does not contribute to NP, are a combined 0.85% of mineralization by weight on average. Sulphides sphalerite, pyrite, arsenopyrite and galena are a combined 5.5% by weight.

6.2 Humidity Cell Results

The humidity cell was initiated on August 10, 2011 and the results up to week 124 (January 1, 2014) are discussed here.

6.2.1 pH

Leachate pH has remained between 7.7 and 8.1 throughout the duration of the humidity cell (Figure 6-1). A slow upward trend in pH is discernable in the past year of operation.

6.2.2 Alkalinity and Acidity

An initial spike was observed in total alkalinity increasing from 43.0 mg $CaCO_3$/L in the initial leachate (Week 0) to 78.3 mg $CaCO_3$/L in Week 7 (Figure 6-2). Alkalinity remained relatively high (71 to 78 mg $CaCO_3$/L) until Week 17. Moving forward from Week 17, alkalinity has varied between 47.4 mg $CaCO_3$/L (Week 45) to 66.3 mg $CaCO_3$/L (Week 22). Alkalinity remained relatively stable between 50 and 60 mg $CaCO_3$/L until Week 83, when a gradual upward trend can be perceived, in line with the slight rise in pH observed over this interval. Acidity peaks were observed between Week 33 and Week 48 reaching a maximum of 15 mg $CaCO_3$/L in Week 36 (Figure 6-2). However, outside those weeks, acidity has been fairly consistent ranging between 1.3 and 11 mg $CaCO_3$/L, with the exception of a spike at Week 107 of 14.4 mg $CaCO_3$/L.

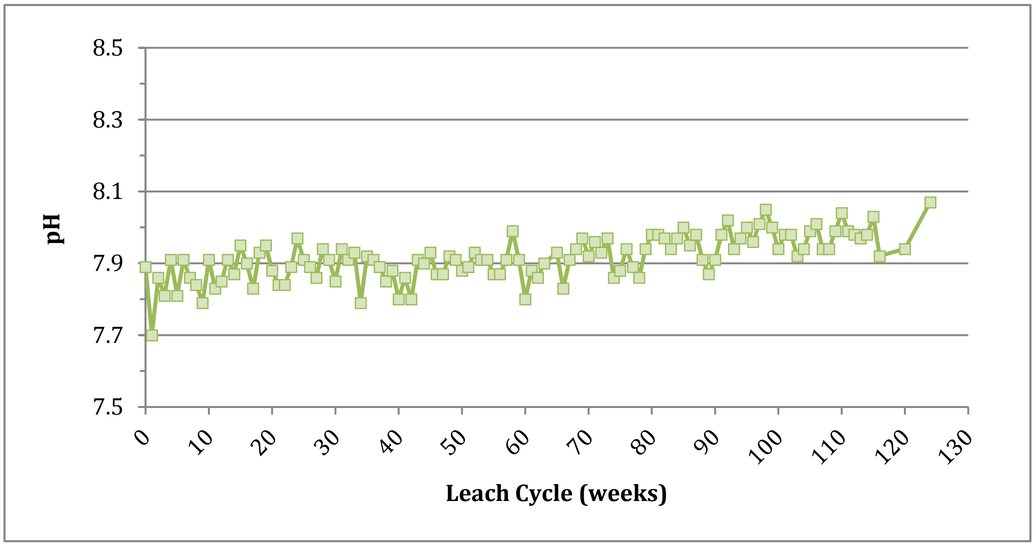


Figure 6-1 Change in humidity cell pH as a function of leach cycle

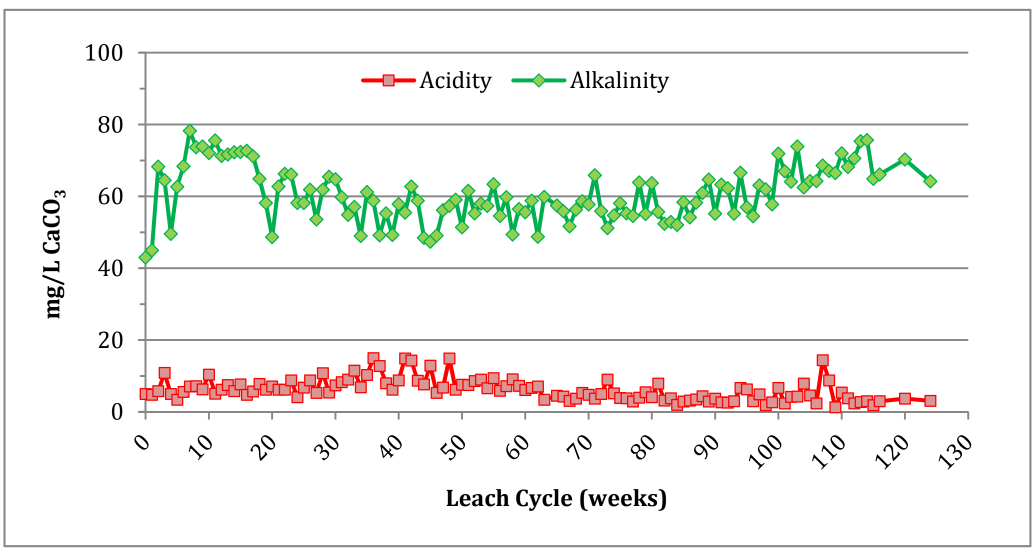


Figure 6-2 Change in humidity cell acidity and alkalinity levels as a function of leach cycle

6.2.3 Sulphate

Sulphate was highest at the beginning of the humidity cell testing with a maximum concentration of 1150 mg/L at Week 0 as soluble secondary sulphate salts that likely accumulated during storage of the sample were washed out. The dissolved sulphate concentration then decreased rapidly to 158 mg/L by Week 7 (Figure 6-3). Sulphate increased slightly to 206 mg/L in Week 20 and since then has gradually trended downwards and remained below 50 mg/L since Week 69.

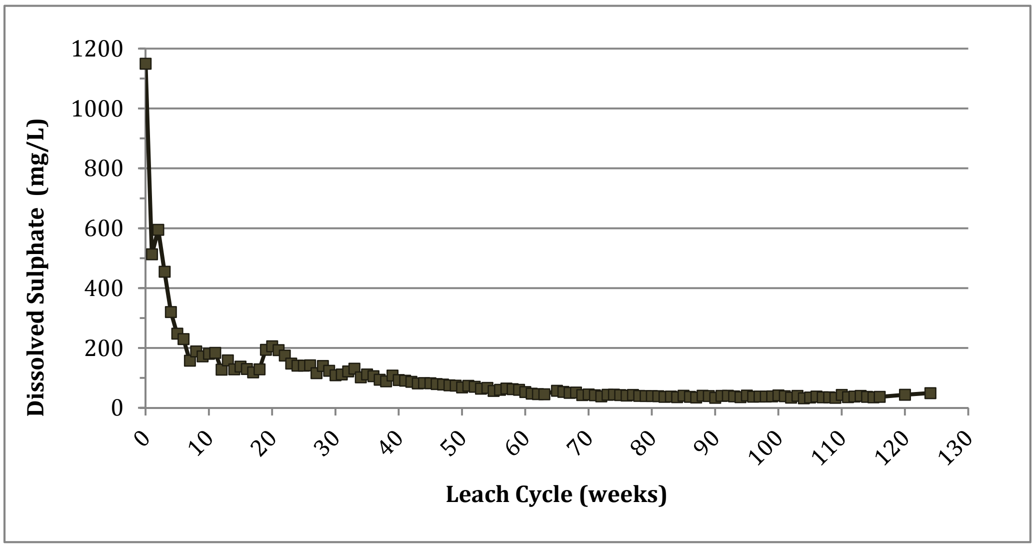


Figure 6-3 Change in humidity cell dissolved sulphate concentration as a function of leach cycle

6.2.4 Zinc

Dissolved zinc in the humidity cell leachate increased from 0.5 mg/L in Week 0 of humidity cell testing to a maximum of 4.3 mg/L at Week 35 (Figure 6-4). The zinc concentration oscillated between 2.6 and 4.3 mg/L between Weeks 20 and 60. It then declined, remaining between 0.7 and 1.9 mg/L between Weeks 89 and 120. The lowest dissolved zinc concentration recorded to date (0.4 mg/L) was observed for the most recent sampling at Week 124. All values are well above the CCME guideline (0.03 mg/L) and all but the Week 124 sample (0.4 mg/L) exceed the EQS (0.5 mg/L). All of the data were also well below the pore water zinc concentration (20.3 mg/L) predicted from the initial metallurgical testing program.

6.2.5 Cadmium

Dissolved cadmium exhibited a similar trend to dissolved zinc, increasing from 0.026 mg/L in Week 0 to 0.053 mg/L in Week 23 (Figure 6-5). The leachate cadmium concentration then fluctuated between 0.048 mg/L and 0.064 mg/L for Weeks 24 to 60, before decreasing gradually. Between Weeks 81 and 120, the dissolved cadmium concentration remained between 0.023 mg/L and 0.046 mg/L, with the most recent sampling event in Week 124 returning the lowest cadmium concentration observed to date of 0.019 mg/L. Dissolved cadmium has been consistently above the CCME guideline (0.00015 mg/L for 90 mg/L hardness) and the EQS (0.01 mg/L), but well below the pore water cadmium concentration predicted from the initial metallurgical testing program (0.12 mg/L).

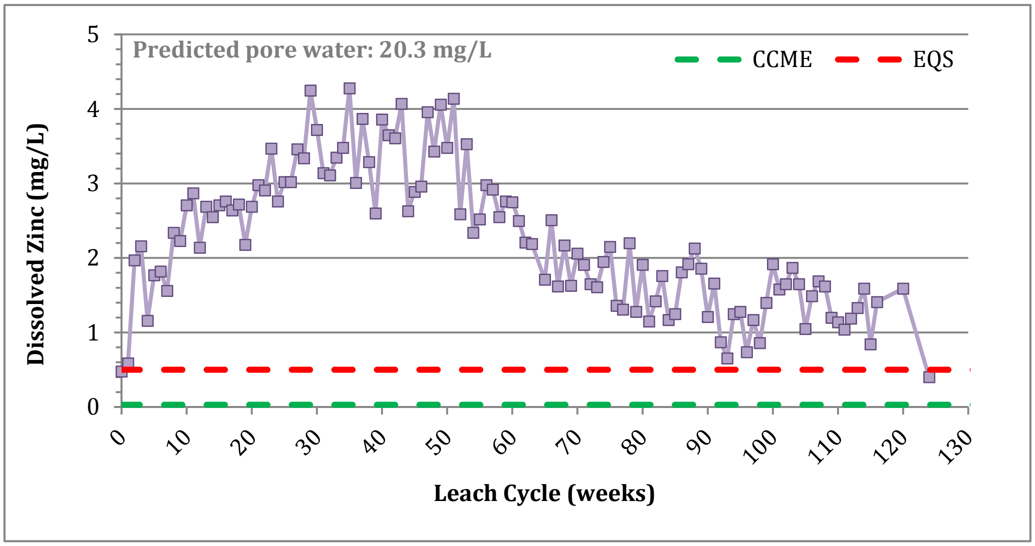


Figure 6-4 Change in humidity cell dissolved zinc concentration as a function of leach cycle

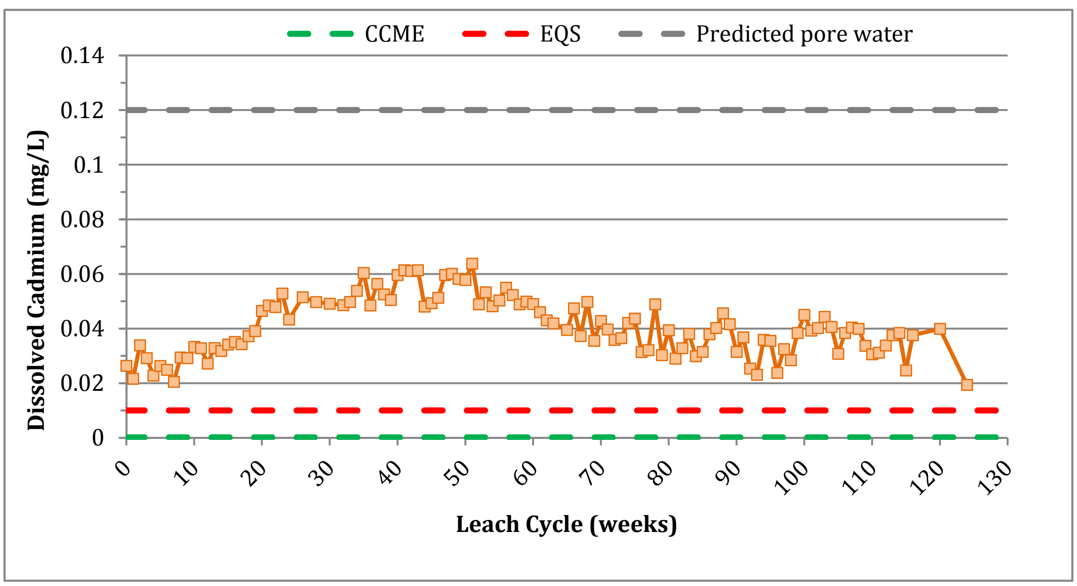


Figure 6-5 Change in humidity cell dissolved cadmium concentration as a function of leach cycle

6.2.6 Lead

Dissolved lead concentrations in the humidity cell leachate were highest at the beginning of testing with a maximum of 0.2 mg/L in Week 0, but decreased quickly to remain below 0.1 mg/L from Week 10 onwards (Figure 6-6). The dissolved lead has continued to decline slowly, reaching the lowest concentration recorded (0.04 mg/L) at the latest sampling in Week 124. All dissolved lead values were higher than the CCME guideline (0.0028 mg/L for 90 mg/L hardness), but lower than the EQS (0.2 mg/L) and the pore water concentration predicted by metallurgical testing (0.45 mg/L).

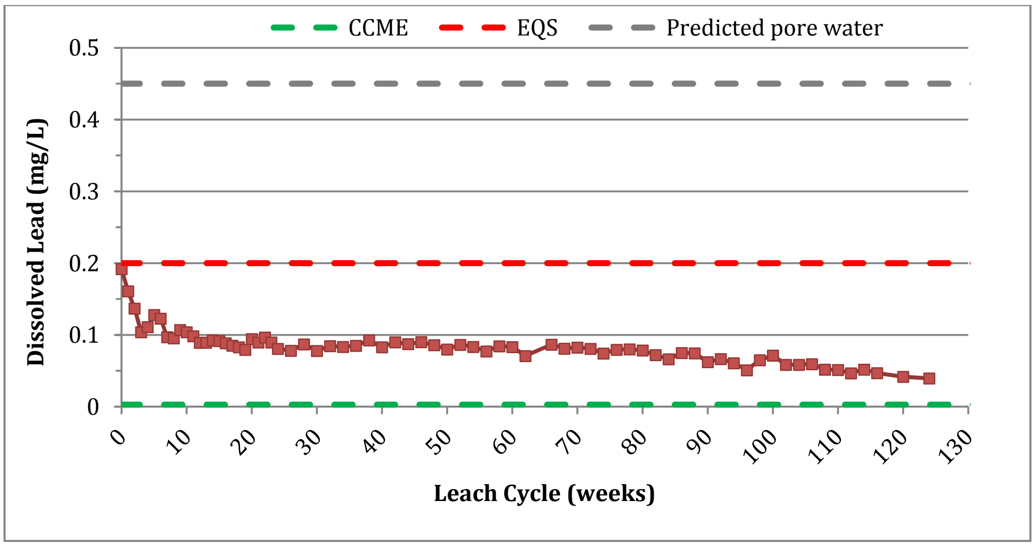


Figure 6-6 Change in humidity cell dissolved lead concentration as a function of leach cycle

6.2.7 Arsenic

The maximum dissolved arsenic concentration was observed in Week 2 (0.0025 mg/L), which was followed by consistently low arsenic concentrations averaging 0.0008 mg/L between Weeks 5 and 22 (Figure 6-7). Since then, the dissolved arsenic concentration has fluctuated between 0.0009 and 0.0020 mg/L for the remainder of the humidity cell testing conducted to date. All dissolved arsenic concentrations were well below the CCME guideline of 0.005 mg/L and the EQS of 0.1 mg/L. Metallurgical testing predicted pore water arsenic concentrations <0.2 mg/L. Dissolved arsenic concentrations in the humidity cell leachate have been two orders of magnitude below this predicted upper bound.

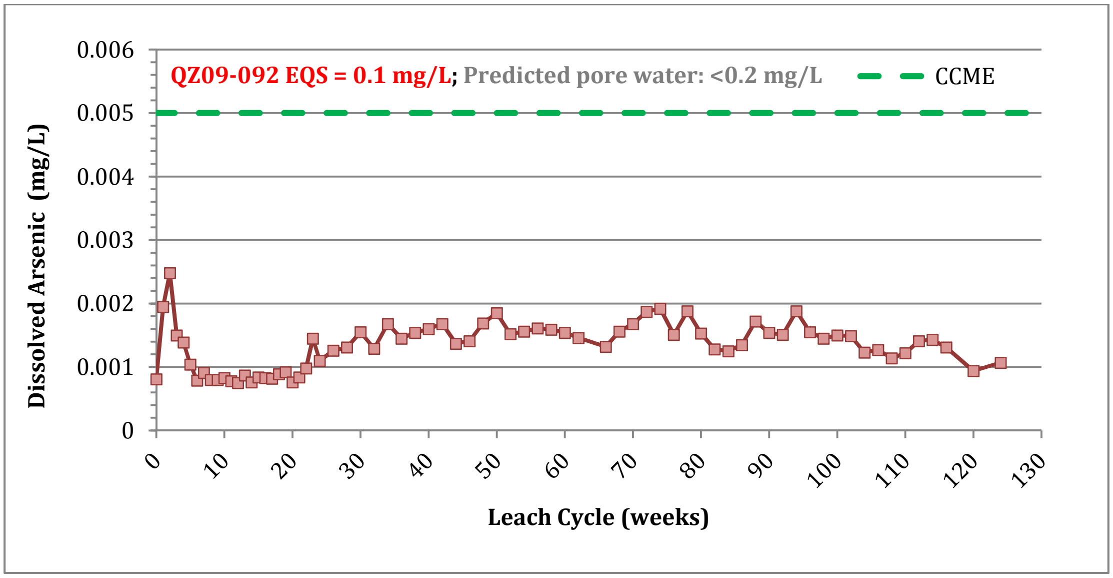


Figure 6-7 Change in humidity cell dissolved arsenic concentration as a function of leach cycle

6.2.8 Nickel

Dissolved nickel concentrations have been relatively low throughout the humidity cell testing (Figure 6-8). Concentrations increased slowly from Week 23 (0.0015 mg/L) to Week 67 (0.0050 mg/L). The leachate nickel concentration then oscillated between 0.0032 mg/L and 0.0063 mg/L for Weeks 61 to 97. The dissolved nickel concentration then moved higher, varying between 0.0064 mg/L and 0.0085 mg/L between Weeks 99 and 119, before falling to 0.0030 mg/L for the most recent sampling point at Week 124. Throughout the humidity cell testing, the dissolved nickel concentrations have been well below the CCME guideline of 0.088 mg/L (for 90 mg/L hardness) and the EQS of 0.5 mg/L.

6.2.9 Copper

The maximum dissolved copper concentration of 0.0049 mg/L was observed in Week 0 of humidity cell testing (Figure 6-9). Week 1 through Week 13 reported dissolved copper concentrations below the detection limit (<0.0005 mg/L in Weeks 1, 2 and 13 and <0.00025 in Weeks 3 through 12). Concentrations were equal to the detection limit in Week 19 and 20 followed by an increasing trend through to Week 68 with peaks of 0.0046 mg/L in Week 48 and 0.0045 in Week 68. Since then, the dissolved copper concentration has decreased to 0.00088 mg/L by Week 124. Dissolved copper has been well below the EQS (0.1 mg/L) and pore water concentration predicted by initial metallurgical testing (0.64 mg/L) throughout humidity cell testing. The leachate copper concentrations was above the CCME threshold (0.0022 mg/L at 90 mg/L hardness) between Weeks 32 and 88 and again at Week 100, but since Week 102 it has remained below CCME.

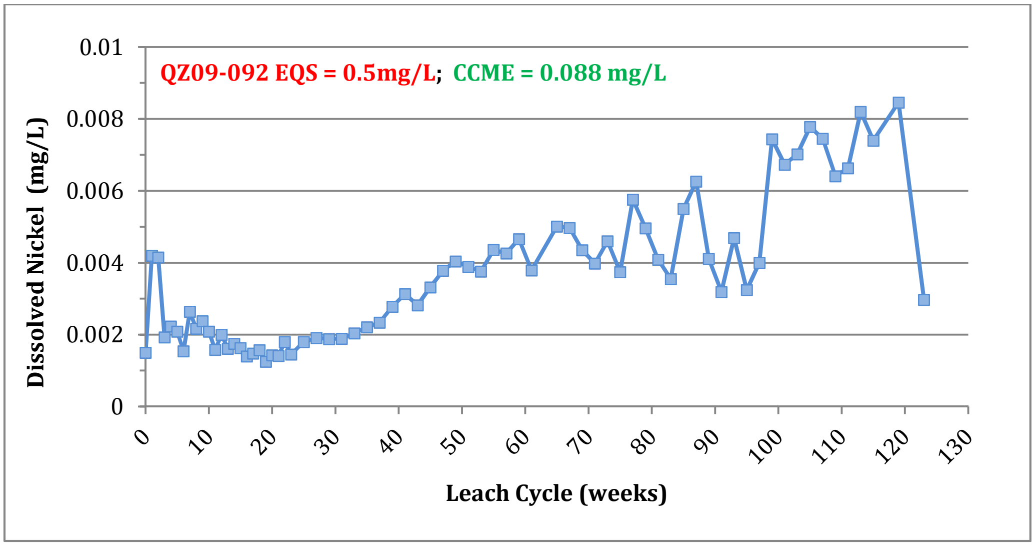


Figure 6-8 Change in humidity cell dissolved nickel concentration as a function of leach cycle

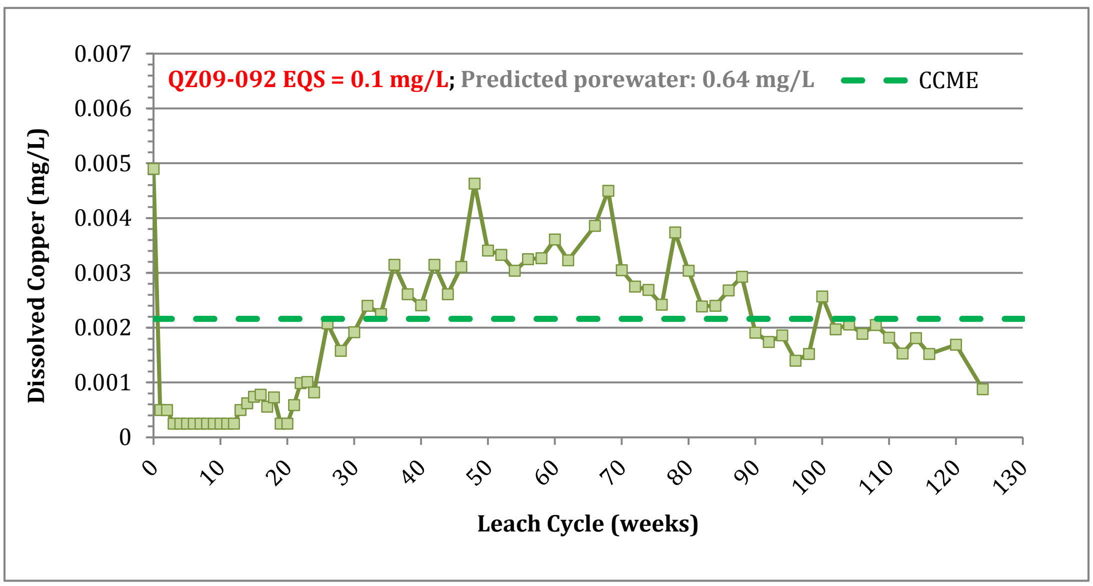


Figure 6-9 Change in humidity cell dissolved copper concentration as a function of leach cycle

6.2.10 Silver

The initial rinse at Week 0 (0.0080 mg/L) and Week 1 (0.00059 mg/L) yielded dissolved silver concentrations that were above the CCME threshold (0.0001 mg/L), but below the EQS (0.01 mg/L). For the remainder of the humidity cell operation, all the dissolved silver concentrations have been below the limit of detection (<0.00001 mg/L) and beneath the CCME and EQS limits.

6.2.11 Leachate Metal Correlations

The dissolved zinc and cadmium concentrations appear to track each other throughout the humidity cell testing. This is confirmed by the strong positive correlation between zinc and cadmium (R^2=0.72; Figure 6-10), suggesting that cadmium and zinc share similar mineralogical hosts, predominantly sphalerite, in which cadmium can substitute for zinc.

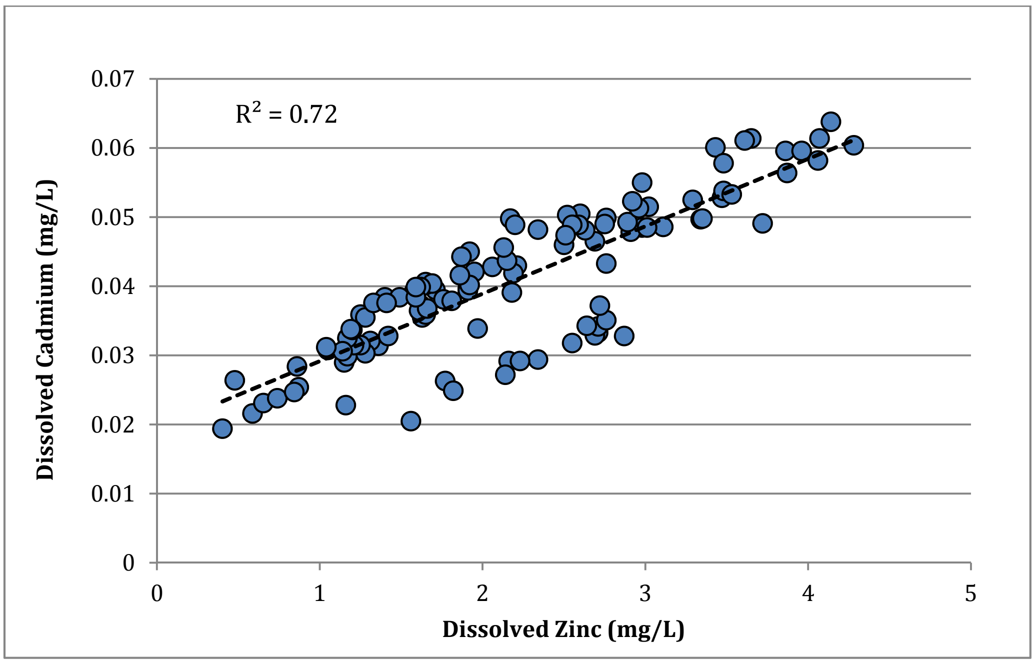


Figure 6-10 Relationship between dissolved cadmium and zinc in humidity cell leachate

6.3 PHYSICAL CHARACTERIZATION

Physical characterization tests for the tailings were completed by EBA Engineering Ltd., which have been included in the DSTF inspection reports as a separate Appendix to the annual report.

APPENDIX C

2013 WASTE ROCK MANAGEMENT PLAN REPORT

2013 Waste Rock Management Plan Annual Report

QZ12-053 and QML-0009

March 2014

TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

1 WASTE ROCK MANAGEMENT ACTIVITIES

1.1 INTRODUCTION

Proposed waste rock management practices were outlined in the Project Proposal submitted to Yukon Environmental and Socio-Economic Assessment Board (YESAB) on February 6, 2008 in Section 2.5.1, the Waste Rock Management Plan (Appendix D) of the Project Proposal and in the Waste Rock Metals and Acid Base Accounting Testing Plan submitted to Yukon Water Board and Government of Yukon, Mining Land Use Department, under clauses 31 to 35 of Water Licence QZ12-053. These guidelines have been successfully put into practice in managing waste rock from the Bellekeno, Onek 990 and Lucky Queen deposits within the Keno Hill Mining District. The waste rock management plan (WRMP) and subsequent components, including the Waste Rock Testing Plan (required by QZ07-078) augments those presented in the original Project Proposal and Water Use License QZ07-078 by reviewing the effectiveness of the current plan.

This Waste Rock Testing Plan Summary will fulfill the following objectives:

- Review the method and effectiveness in which waste rock is sampled and classified using field screening criteria;
- Review all waste rock management data collected to date from the Bellekeno, Onek 990 and Lucky Queen development and operations; and
- Review the sampling schedule for both ICP and ABA analyses based on a per tonnage basis.

1.2 DEVELOPMENT SUMMARY

1.2.1 Bellekeno Underground Development 2013

Underground development at Bellekeno continued throughout January to August of 2013, focusing mainly in the lower Thunder Zone of the mine and notable development in the upper 99 Zone above the Southwest 650 Level. The majority of development consisted of production mining of the Bellekeno ore body. Waste rock was also generated during stope re-access, as breasting down existing access provided elevation to mine subsequent cuts. There were no temporary or permanent closures or stability issues that occurred in 2013 in mine development. Figure 1 shows an isometric view looking down to the North East direction of all new development for 2013 in red.

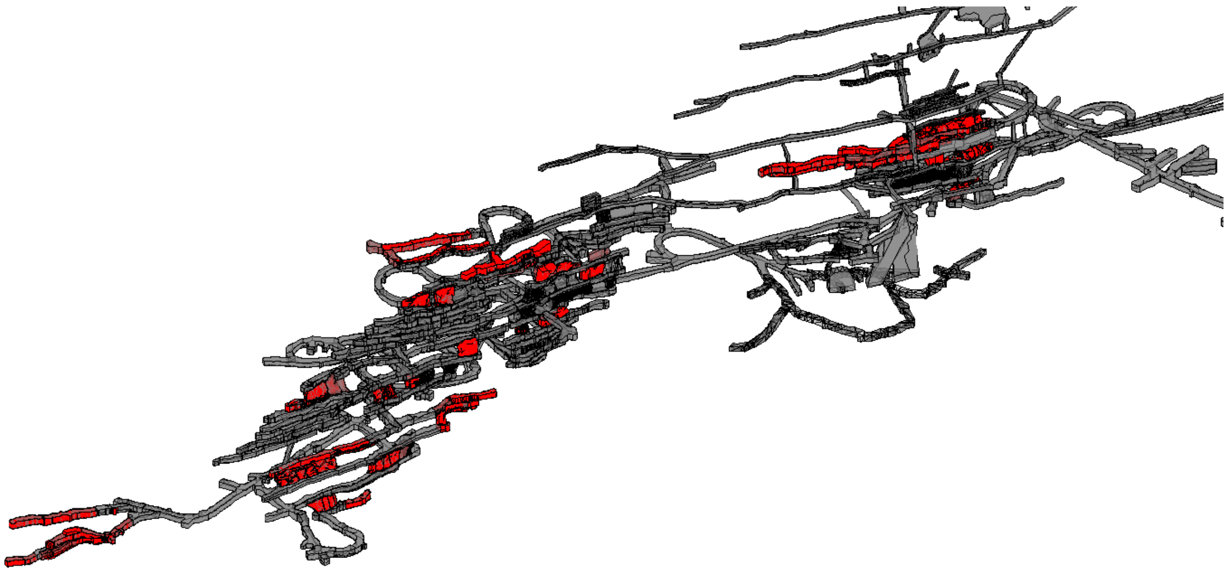


Figure 1. Isometric View showing new 2013 development in the Bellekeno Mine

Face sampling was conducted as outlined in Section 2.5.1 of the Project Proposal submitted to YESAB February 6, 2008 where possible. All face sampling was conducted by trained site geologists and sample preparation was done on site by a lab technician at the Keno District Mill assay laboratory. The laboratory is located at the Keno District Mill site. A total of 8 samples were analyzed using 44 element ICP-OES, with 3 of these samples having an additional suite of ABA analysis.

The ARD/ML sampling program in 2013 was generally effective and reasonably accurate at identifying P-AML rock. Some field misclassification of material, both incorrectly as N-AML or as P-AML occurred during 2013, particularly at Lucky Queen, but these data provide useful information which can be used to improve future accuracy. The field classification is based on essentially two independent variables, the $CaCO_3$ vs. pyrite ratio as a proxy for acid base accounting and the quantity of various sulphides such as sphalerite and galena for metal leaching potential predictability. Geochemical results received from the 2013 sampling program have more consistent Pb and Zn levels to what was observed in the field compared to sampling in 2011 and 2012. This is most likely due to improved procedures to limit contamination throughout the various procedural steps in the acquisition and preparation process. It should be noted that all waste generated in 2013, regardless of classification, was used as underground backfill and no material was brought to surface for storage.

1.2.2 Onek 990 Underground Development 2013

Onek 990 decline development was initiated in 2012 and development continued in 2013 with the excavation of ~265 meters of primary decline. The decline was used to access and develop underground drill stations located at the 960 and 970 levels. Underground diamond drilling was completed in 2013 from these stations to obtain geologic information and finalize mine plans. The Figure 2 shows the as-built drawings of the Onek 990 portal and underground development.

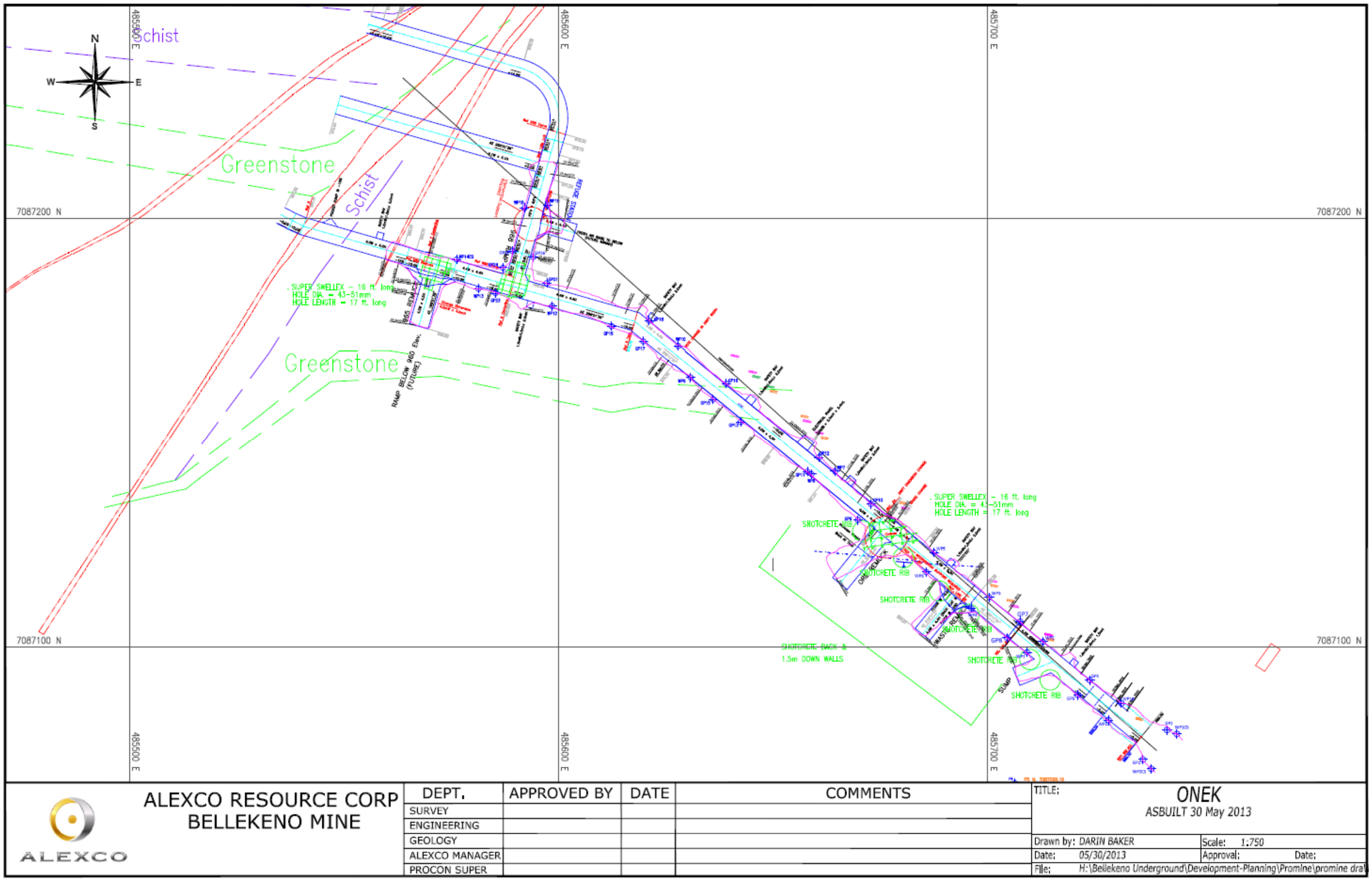


Figure 2. Plan View of Onek 990 Underground Development As-Built

1.2.3 Lucky Queen Underground Development 2013

Underground development and rock excavation that had been initiated in Q4 2012 in order to facilitate access to the Lucky Queen resource from the Lucky Queen 500 portal was suspended in early 2013 to allow a re-evaluation of the project. As such, very little underground development or rock excavation occurred at Lucky Queen during 2013. What little development and excavation that did occur was mostly from the LQ 1330 Ramp and LQ TX#2 headings. Currently the project is on hold pending re-activation of the district mining operations. Currently the project is on hold pending re-activation of the district mining operations.

There were no issues in regards to stability or permanent closures. Preliminary activities for the Lucky Queen Mine were approved under the current QML-0009 on November 30, 2012. As-builts for underground workings connecting the Lucky Queen Portal can be seen in Figure 3.

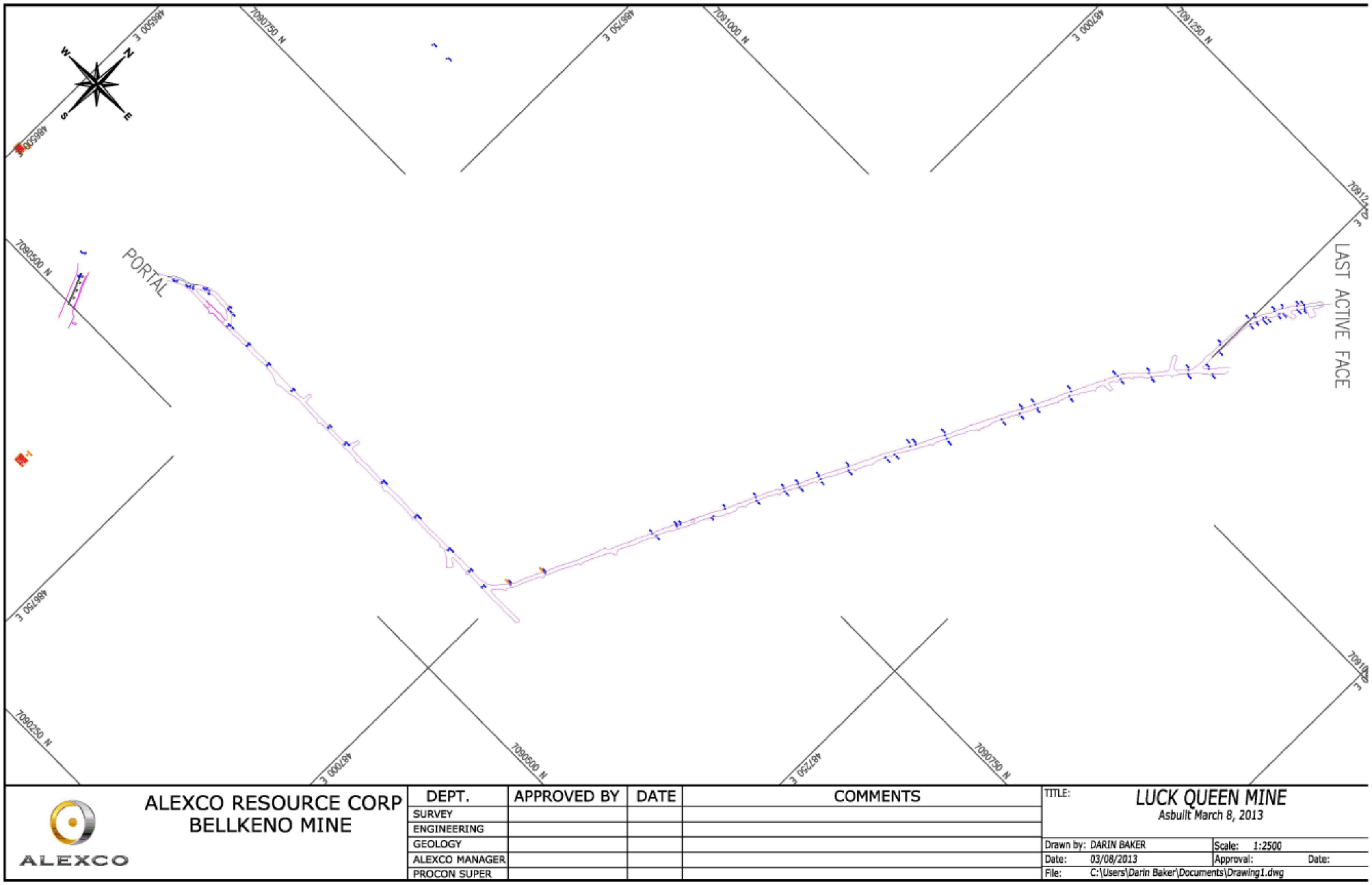


Figure 3. Plan View of Lucky Queen 500 Underground Development As-Built

2 Results

Raw WRMP geochemical verification testing results which include ABA and ICP metals data are included for Bellekeno, Onek 990, and Lucky Queen as Appendix A, Appendix B, and Appendix C, respectively. Results for mine wall testing are included as Appendix D. The following subsections summarize key results from these data and integrate the 2013 results with historical data from Bellekeno since the inception of Alexco's advanced underground development and mining in the district.

2.1 $CaCO_3$ Prediction

Carbonate estimation at the field level has been facilitated by the relationship between NP and fizz rating shown in Figure 4. The Keno Hill district waste rock management operations data between 2008-2013 show that samples with a fizz rating of 1 contain between approximately 10 and 40 kg $CaCO_3$/t, samples with a fizz rating of 2 contain between approximately 10 and 90 kg $CaCO_3$/t, and samples with a fizz rating of 3 contain between approximately 50 and 175 kg $CaCO_3$/t. The only sample with a fizz rating of 4 contained a NP of nearly 200 kg $CaCO_3$/t.

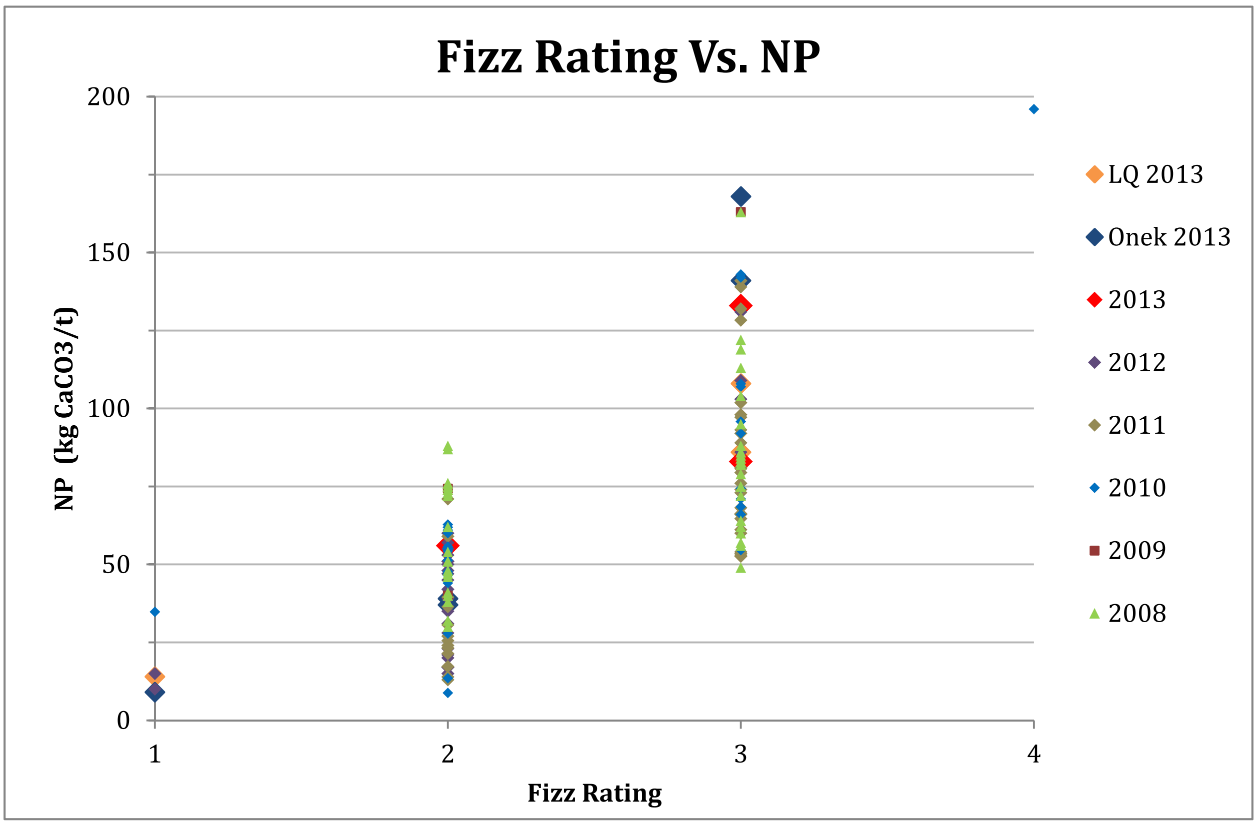


Figure 4. Distribution of Neutralization Potential in relation to Fizz Rating by Year and Deposit

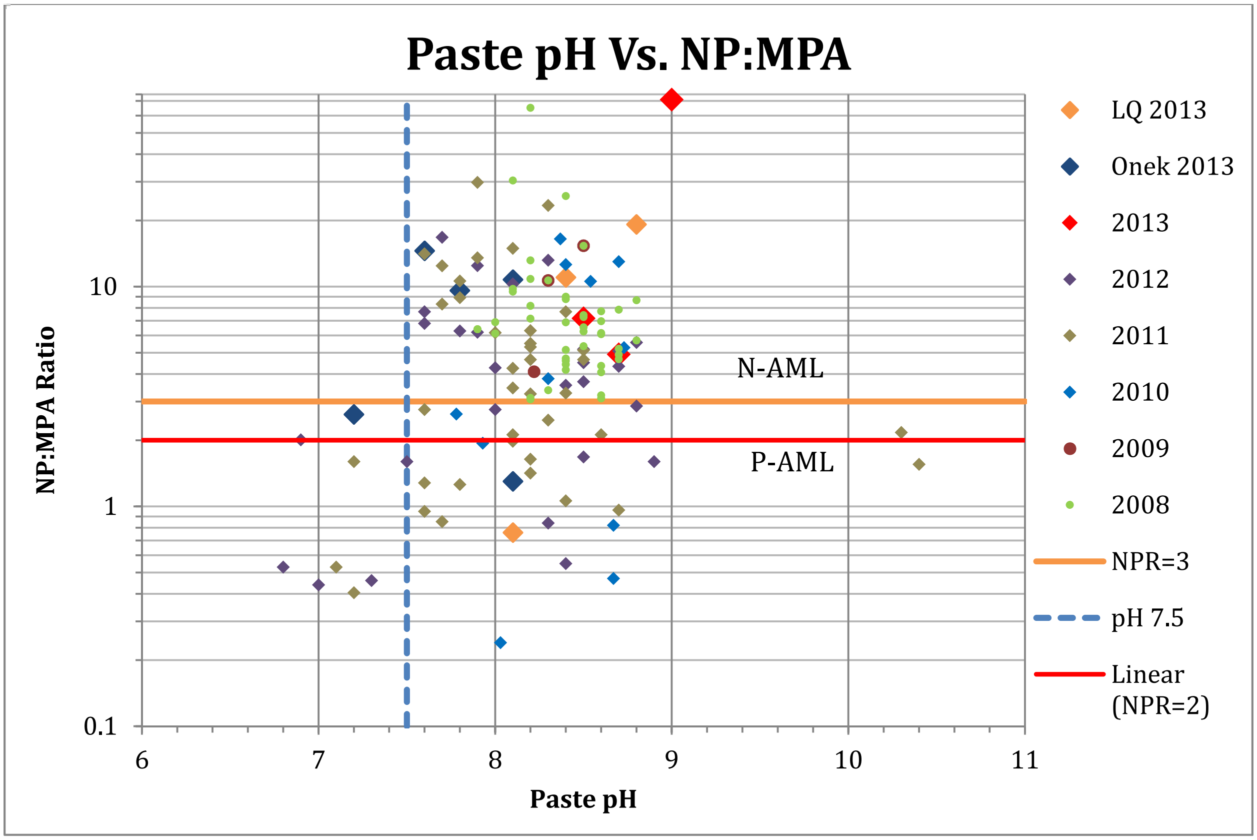


Figure 5. Distribution of Paste pH to NP:MPA ratio (2008-2013)

The paste pH data from 2013 as shown in Figure 5 has no values < 6. The distribution of paste pH values in P-AML material is between a pH of 6.5 - 9.0, with the exception of two samples taken in 2011 which show a pH above 10.

A compilation of all data collected to date shows that fizz rating criteria is of limited use in predicting NP:MPA. This result is expected because the majority or rock excavated as part of Keno district development to date has occurred within fresh, sulphidic, unoxidized rock in which some quantity of buffering carbonate exists, which results in elevated paste pH measurements even in samples which contain sufficient AP to result in low NP:MPAs.

However, the data from Bellekeno to date Figure 5 do show that paste pH values below 7.5 predict some samples with NP:MPA <3. It is suspected that these likely represent oxidized samples or samples with very little carbonate.

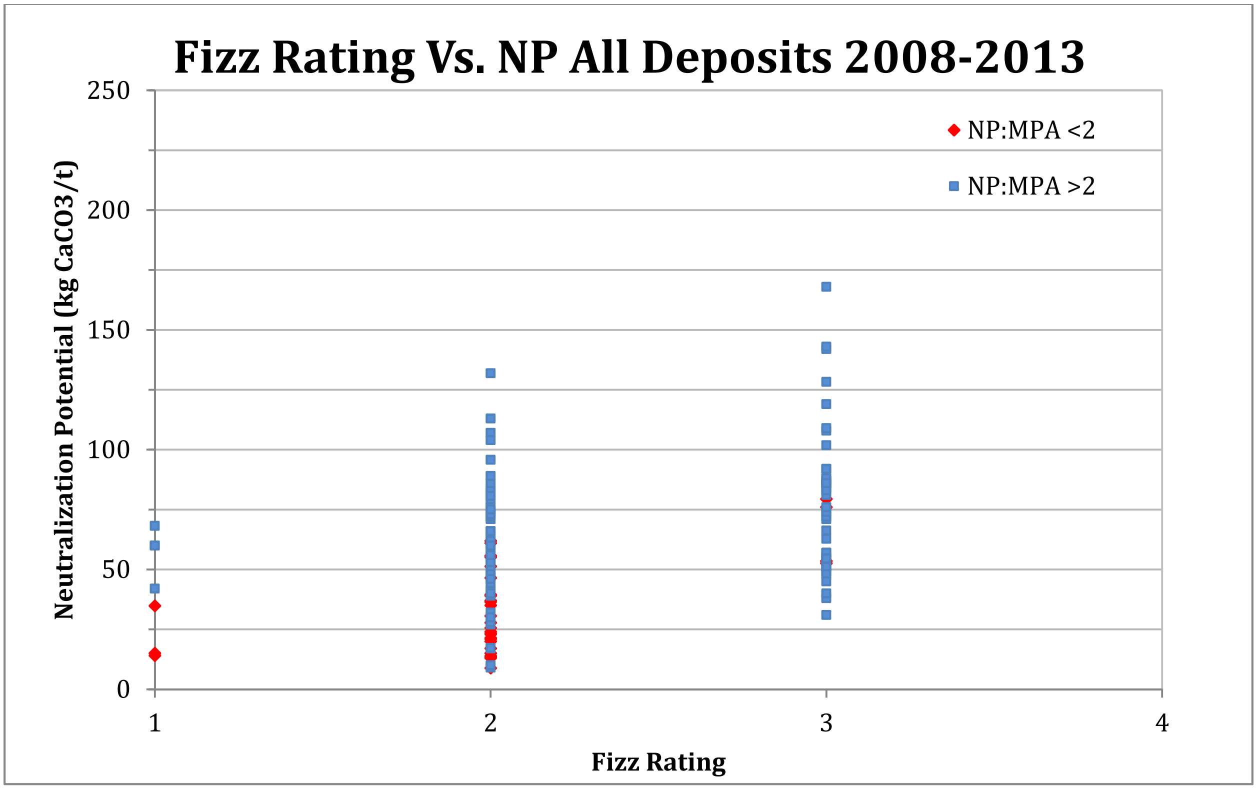


Figure 6. Fizz Rating Vs. NP – All Deposits (2008-2013)

A review of all data collected to date Figure 5 also shows a relationship between NP and Fizz Rating. The data also show that very few samples with a fizz rating of 3 or higher have NP:MPA below 3, the majority of samples with a fizz rating of 2 have NP:MPA > 2, and approximately half the samples with a fizz rating of 1 have NP:MPA below 2.

2.2 Pyrite Prediction

The dominant form of sulphide encountered in the 2013 Bellekeno development was pyrite, with the exception of development in the ore accesses which also contained significant amounts of galena and sphalerite due to the proximity of the mineralized 48 Vein. Lead and zinc was a minor contributor of sulphides present for most samples taken. Sulphur values obtained from ICP analysis were plotted against a calculated value of Sulphur in the form of Pyrite (Figure 7). This calculation is based on Sulphur being present only in three forms; Pyrite, Galena, or Sphalerite. Using the Pb and Zn assays, the molar ratio of Sulphur for each of their respective minerals was subtracted from the total sulphur leaving the remaining Sulphur to represent the amount present in the form of Pyrite. Figure 8 shows that in the majority of samples, Pb and Zn sulphides represent a minor portion of the total sulphides averaging 3% of the total sulphide component, but on an individual basis can comprise up to 5% of the total sulphide present.

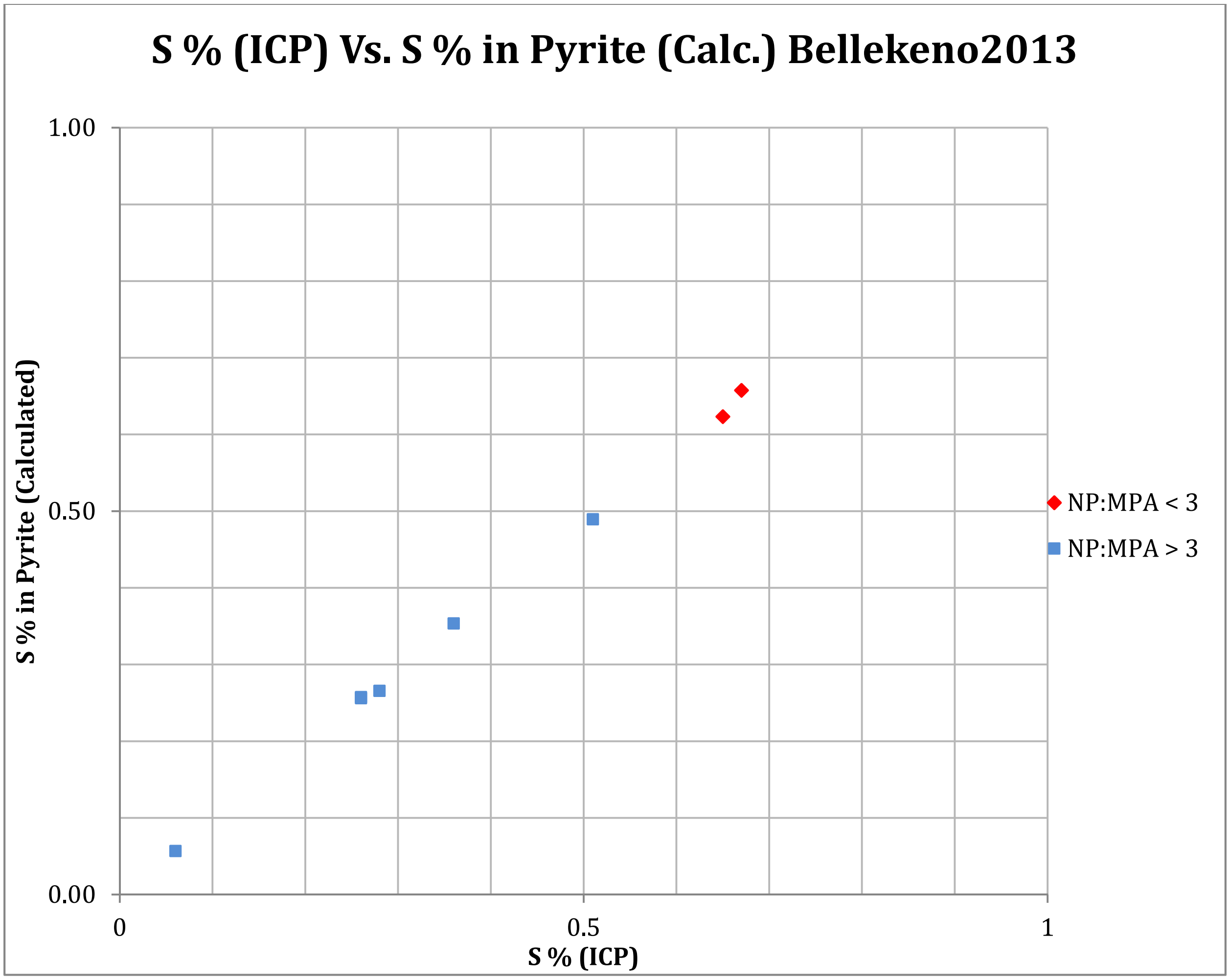


Figure 7 Correlation between S% (ICP) and ICP Geochemical Screening

ICP Geochemical screening for Pb and Zn showed zero samples with potential for metal leaching (values >5000ppm). Figure 8 shows both Pb and Zn values for all samples. All samples from Bellekeno and Onek during 2013 were designated in the field as P-AML were done so on the basis of pyrite content and not from Pb and Zn levels. All samples from Lucky Queen were designated as P-AML from the field call due to uncertainty regarding the contained quantity of pyrite, not from the presence of Pb or Zn mineralization.

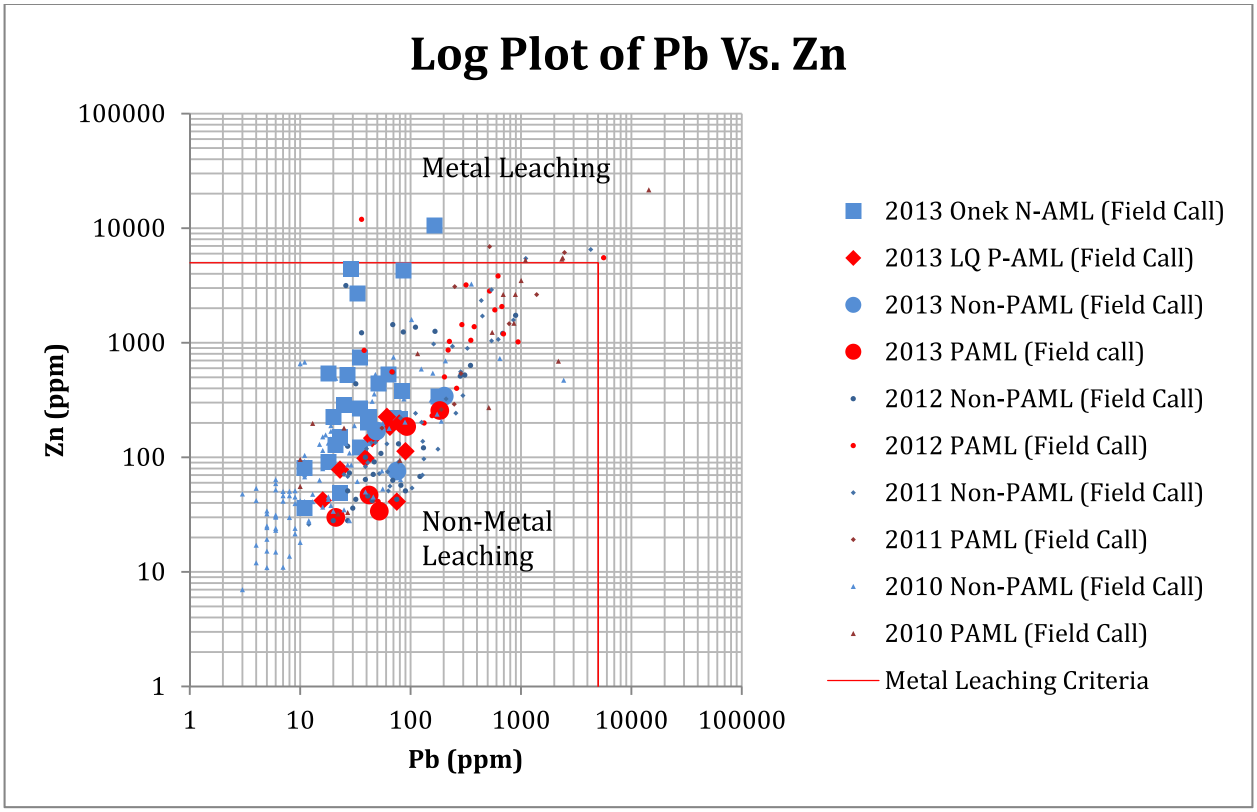


Figure 8. Log Plot of Pb Vs. Zn - All Data 2010-2013

Figure 8 shows that almost all samples collected as part of waste rock management in the Keno Hill mining district between 2010 and 2013 contained less than 5000 Pb and Zn.

Table 1. Pb and Zn Distribution of Samples – Bellekeno 2011-2013

2013 Pb ppm			2013 Zn ppm		
Bin(ppm)	*Frequency*	% of Samples	*Bin(ppm)*	*Frequency*	% of Samples
100	6	75%	100	4	50%
500	2	25%	500	4	50%
1000	0	0%	1000	0	0%
5000	0	0%	5000	0	0%
5000+	0	0%	5000+	0	0%
2012 Pb ppm			2012 Zn ppm		
Bin(ppm)	*Frequency*	% of Samples	*Bin(ppm)*	*Frequency*	% of Samples
100	29	52.73%	100	18	32.73%
500	17	30.91%	500	8	14.55%
1000	8	14.55%	1000	8	14.55%
5000	0	0.00%	5000	19	34.55%
5000+	1	1.82%	5000+	2	3.64%
2011 Pb ppm			2011 Zn ppm		
Bin(ppm)	*Frequency*	% of Samples	*Bin(ppm)*	*Frequency*	% of Samples
100	16	34.78%	100	13	28.26%
500	20	43.48%	500	15	32.61%
1000	6	13.04%	1000	5	10.87%
5000	4	8.70%	5000	9	19.57%
5000+	0	0.00%	5000+	4	8.70%

As shown in Table 1, a shift in the main modal distribution of both Lead and Zinc at Bellekeno from the 100-500ppm bin to the 0-100ppm bin suggested a decrease in contamination issues in 2012 compared with 2011. In 2012 a bimodal distribution of Zinc was present and the increase in samples between 1000-5000 ppm and was attributed to the increased proportion of development directly adjacent to the vein in the form of re-accesses. In 2013, Bellekeno a marked shift in the limited number of samples towards the lowest two bins suggests further decrease in contamination issues or development in areas more distal to Pb and Zn mineralization.

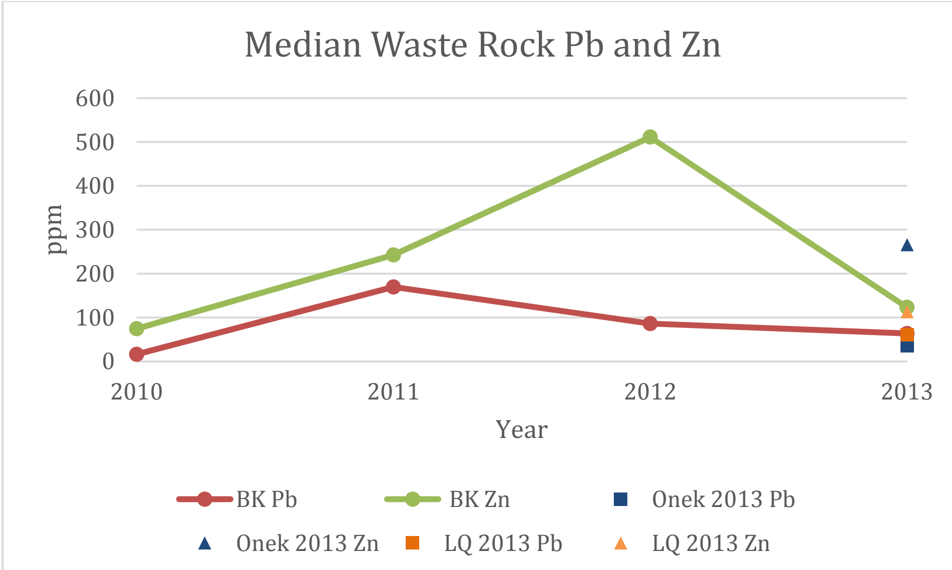


Figure 9. Waste Rock ICP contained Pb and Zn Trends, All Deposits, 2010-2013

Figure 9 shows median Pb and Zn values between 2010 and 2013 for all three deposits. For Bellekeno, Figure 9 shows an increasing trend for both parameters between 2010 and 2011 and a decoupling between 2011 and 2012 with Zn increasing and Pb decreasing. Both parameters decrease in 2013 to levels slightly above those seen in 2010. Lucky Queen median Pb and Zn are very similar to Bellekeno 2013 values, and Onek 990 shows higher Zn and lower Pb, as predicted during pre-development geochemical characterization.

2.3 ACID BASE ACCOUNTING

Using the Modified ABA analysis with siderite correction, 3 samples were analyzed during 2013. All 3 ABA samples returned NP:MPA ratios above 3.

Figure 10 shows a log plot of all of the ABA data to date from the three district development projects. The data shows the four quadrants of potentially acid generating material. All NP:MPA values between 0 and 1 represent material with a net acid producing potential, with the exception of Sulphur values <0.25% which are assumed to be too low to sustain acidic pH values over time. The lower left quadrant contains samples with Sulphur values of between 0.25% and 1.5%. The lower right quadrant contains samples with Sulphur values >1.5%. All samples taken to date indicate that Sulphur values >1.5% have a net acid producing potential with the exception of one sample from 2011. The upper two quadrants contain samples with an NP:MPA ratio between 1 and 2, and represent samples with a net neutralizing potential where the effective neutralization potential may not be adequate to sustain a drainage pH of 6.0 or higher over time. The upper left quadrant represents samples with a Sulphur level between 0.25% and 1.5%. There are 2 samples represented by the sample population with S>1.5% and a NP:MPA ratio >1. All samples that fall outside of these four quadrants represent NP:MPA values >2 and are unlikely to produce net acidity over time.

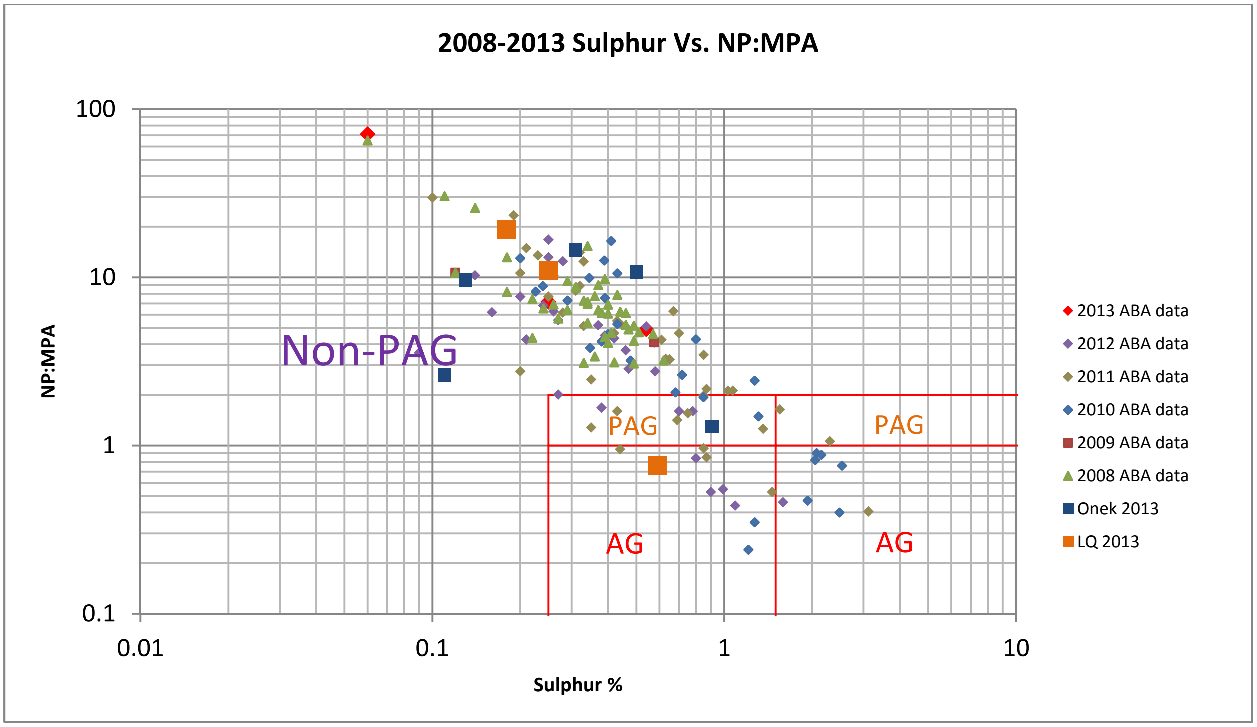


Figure 10 Log Plot of Sulphur% Vs. NP:MPA for all ABA data collected to date

Data collected from Bellekeno in 2013 were all non-PAG but fell along the historical trend.

Sulphur% (ICP) shows a very good correlation to Sulphur% (Leco) with a coefficient of determination of 0.9566 (Figure 11, Table 2). Given the close correlation between the two methods of measuring Sulphur, especially at levels less than 1% (typical of waste rock), using S% (ICP) as a proxy for Leco Sulphide would be a reasonable estimate of the Sulphur in a waste rock sample given that it is not visibly oxidized.

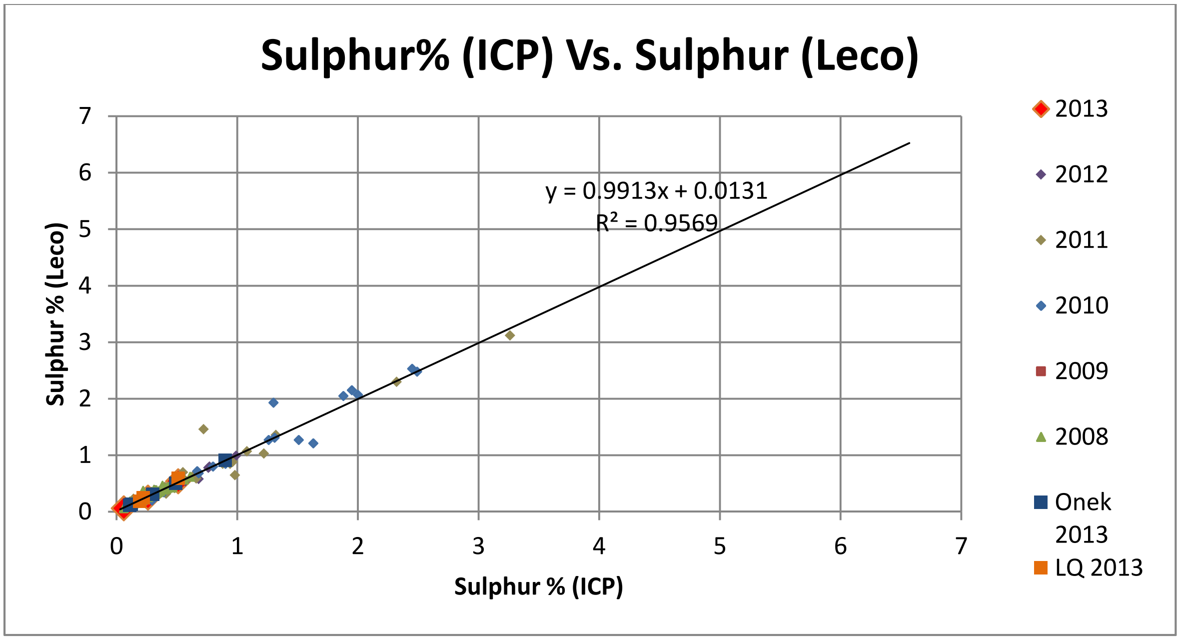


Figure 11. Sulphur% (ICP) Vs. Sulphur% (Leco)

Table 2. S% (ICP) – S% Sulphide (Leco) Correlation

S% (ICP - S% (LECO)		
YEAR	Correlation Coefficient	# of Samples
2008	0.970	45
2009	1.000	2
2010	0.975	29
2011	0.970	38
2012	0.992	19
2013	0.992	8
Average	*0.983*	*141*
All Data	*0.957*	*141*

Correlation between Calcium (ICP) and the Neutralization Potential show a consistent trend year to year. The coefficient of determination between Ca% (ICP) and NP for all data between 2008 and 2013 was 0.852. See Table 3 for the individual breakdown of each year. There appears to be a minimum NP value for any given amount of calcium present which can be used to predict a conservative statistical NP value based off of Ca% (ICP) in the future where ABA analysis is not available or cost prohibitive. This is useful in conjunction with S% (ICP) in making ABA predictions using existing exploration assay drill core data. A second order polynomial function was derived to describe the minimum NP as a function of %Ca observed and is given as Equation 1.

Equation 1. Minimum Neutralization Potential from Ca% (ICP)

$$NP_{Calc.}=-1.375(Ca\%^2)+28.38(Ca\%)$$

As was determined by Altura (2008), the use of this formula should be limited to sedimentary units and exclude greenstone units, which were shown to contain non-carbonate calcium minerals such as calcic amphiboles which results in predicting artificially high NP values. 15 of the 136 samples collected fall slightly below the proposed NPCalc, but this relationship should be considered a useful lower boundary of contained NP as a function of %Ca.

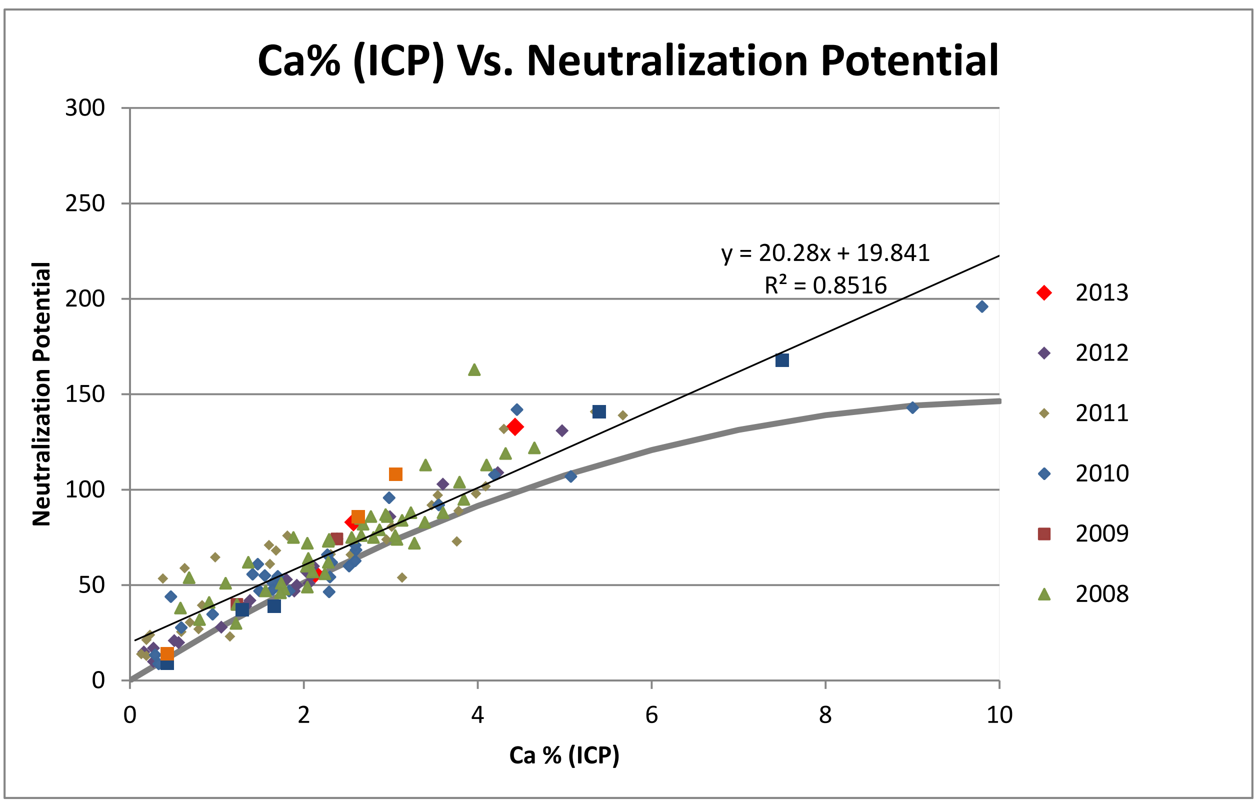


Figure 12. Ca% vs. Neutralization Potential

Table 3. Ca% (ICP) - Neutralization Potential Correlation

Ca% - NP Correlation		
YEAR	Correlation Coefficient	# of Samples
2008	0.882	45
2009	1.000	2
2010	0.938	29
2011	0.917	33
2012	0.916	19
2013	0.931	8
Average	0.931	*136*
All Data	*0.881*	*136*

2.4 Waste Rock Management Summary

2.4.1 Bellekeno

Underground development in the Bellekeno Mine in 2013 resulted in blasting an estimated 12,018 tonnes of rock, all of which remained underground as backfill (Table 4). Because all development rock during 2013 remained underground, only a subset of 4,111 tonnes was sampled, classified, and verified by lab analysis. Table 5 shows a breakdown of the 4,111 tonnes of material and its classification. The total N-AML waste generated in all of 2013 which has been verified by lab analysis was an estimated 4,111 tonnes, while the total verified P-AML waste generated in all of 2013 was an estimated zero tonnes.

Table 4. 2013 Bellekeno Waste Rock Handling Summary

Rock Classification	Tonnes	Percent
Total N-AML Waste Rock (Broken)	10,486	87.25%
Total N-AML Waste Rock (Excavated to Surface)	-	0.00%
Total N-AML Waste Rock (U/G Backfill)	10,486	87.25%
Total P-AML Waste Rock (Broken)	1,532	12.75%
Total P-AML Waste Rock (Excavated to Surface)	-	0.00%
Total P-AML Waste Rock (U/G Backfill)	1,532	12.75%
Total Waste Rock (Broken)	**12,018**	100.00%
Total Waste Rock (Excavated to Surface)	**-**	0.00%
Total Waste Rock (U/G Backfill)	**12,018**	100.00%

Table 5. 2013 Bellekeno Waste Rock Characterization Summary

Rock Classification	Tonnes	Percent
Total N-AML Waste Rock (Field Classified)	2,798	68.06%
Total N-AML Waste Rock (Lab Verified)	2,798	68.06%
Total P-AML Waste Rock (Field Classified)	1,313	31.94%
Total P-AML Waste Rock (Lab Verified)	-	0.00%
Total P-AML Waste Rock (Mis-classified as N-AML)	-	0.00%
Total N-AML Waste Rock (Mis-classified as P-AML)	1,313	31.94%
Total Verified N-AML Waste Rock	***4,111***	*100.00%*
Total Verified P-AML Waste Rock	***-***	*0.00%*
Total Development Rock Characterized	**4,111**	100.00%

An estimated 1,313 tonnes of material was misclassified in the field screening process as P-AML but lab results determined this material to be N-AML. All waste rock from 2013 remained underground as backfill. (Table 6).

Table 6. 2013 Bellekeno Waste Rock Storage Locations

Category	Tonnes	Storage Location	Tonnes
Non-AML Waste Rock (excavated)	10,486	Surface	-
		BK PAG PAD	-
		U/G Storage	-
		U/G Backfill	10,486
P-AML Waste Rock (excavated)	1,532	Surface	-
		BK PAG PAD	-
		U/G Storage	-
		U/G Backfill	1,532
Total	12,018		**12,018**

2.4.2 Onek 990

Underground development from the Onek 990 portal in 2013 resulted in blasting an estimated 20,147 tonnes of rock, all of which was used for construction of the Onek connector road (

Table 9). Table 8 shows a breakdown of the 4,111 tonnes of material and its classification. The total N-AML waste generated from Onek in all of 2013 which has been verified by lab analysis was an estimated 20,147 tonnes, while the total verified P-AML waste generated in all of 2013 was an estimated 0 tonnes.

Table 7. 2013 Onek 990 Waste Rock Handling Summary

Rock Classification	Tonnes	Percent
Total N-AML Waste Rock (Broken)	20,147	100%
Total N-AML Waste Rock (Excavated to Surface)	20,147	100%
Total N-AML Waste Rock (U/G Backfill)	-	0.00%
Total P-AML Waste Rock (Broken)	-	0%
Total P-AML Waste Rock (Excavated to Surface)	-	0%
Total P-AML Waste Rock (U/G Backfill)	-	0.00%
Total Waste Rock (Broken)	**20,147**	100.00%
Total Waste Rock (Excavated to Surface)	**20,147**	100.00%
Total Waste Rock (U/G Backfill)	**-**	0.00%

Table 8. 2013 Onek 990 Waste Rock Characterization Summary

Rock Classification	Tonnes	Percent
Total N-AML Waste Rock (Field Classified)	20,147	100.00%
Total N-AML Waste Rock (Lab Verified)	20,147	100.00%
Total P-AML Waste Rock (Field Classified)	-	0.00%
Total P-AML Waste Rock (Lab Verified)	-	0.00%
Total P-AML Waste Rock (Mis-classified as N-AML)	-	0.00%
Total N-AML Waste Rock (Mis-classified as P-AML)	-	0.00%
Total Verified N-AML Waste Rock	***20,147***	100.00%
Total Verified P-AML Waste Rock	***-***	0.00%
Total Development Rock Characterized	**20,147**	100.00%

Table 9. 2013 Onek 990 Waste Rock Storage Locations

Category	Tonnes	Storage Location	Tonnes
Non-AML Waste Rock (excavated)	20,147	Onek Connector Road Construction	20,147
P-AML Waste Rock (excavated)	0	Onek Connector Road Construction	0
Total	20,147		**20,147**

2.4.3 Lucky Queen

Underground rehab and minor development accessed the Lucky Queen 500 portal in 2013 resulted in blasting and excavation of an estimated 2,149 tonnes of rock, all of which was end dumped at the existing Lucky Queen 500 waste rock dump (Table 10). Table 11 shows a breakdown of the material and its classification. The total N-AML waste generated from Lucky Queen in all of 2013 which has been verified by lab analysis was an estimated 1,538 tonnes, while the total verified P-AML waste generated in all of 2013 was an estimated 611 tonnes.

Table 10. 2013 Lucky Queen Waste Rock Handling Summary

Rock Classification	Tonnes	Percent
Total N-AML Waste Rock (Broken)	1,538	71.57%
Total N-AML Waste Rock (Excavated to Surface)	1,538	71.57%
Total N-AML Waste Rock (U/G Backfill)	-	0.00%
Total P-AML Waste Rock (Broken)	611	28.43%
Total P-AML Waste Rock (Excavated to Surface)	611	28.43%
Total P-AML Waste Rock (U/G Backfill)	-	0.00%
Total Waste Rock (Broken)	**2,149**	100%
Total Waste Rock (Excavated to Surface)	**2,149**	100%
Total Waste Rock (U/G Backfill)	**-**	0.00%

Table 11. 2013 Lucky Queen Waste Rock Characterization Summary

Rock Classification	Tonnes	Percent
Total N-AML Waste Rock (Field Classified)	-	0.00%
Total N-AML Waste Rock (Lab Verified)	1,538	71.57%
Total P-AML Waste Rock (Field Classified)	2,149	100.00%
Total P-AML Waste Rock (Lab Verified)	611	28.43%
Total P-AML Waste Rock (Mis-classified as N-AML)	-	0.00%
Total N-AML Waste Rock (Mis-classified as P-AML)	1,538	71.57%
Total Verified N-AML Waste Rock	***1,538***	71.57%
Total Verified P-AML Waste Rock	***611***	28.43%
Total Development Rock Characterized	**2,149**	100.00%

Site geology staff had difficulty estimating the contained pyrite in waste rock generated at Lucky Queen, and as a result, temporarily assumed that all waste rock was P-AML. Laboratory geochemical verification demonstrated that only 28% of this material (3 of 9 composites) was actually P-AML These 3 rounds were designated as P-AML based on their NP:MPA ratios of less than 3. Sample E816066 from Heading LQ TX#2 R1-3 represented 242.3 tonnes of material and had a calculated NP:MPA ratio of 1.71 and a measured NP:MPA of 0.76. Sample E816065 from heading LQ1330 Sump R1-3 represented 288.8 tonnes and had a calculated NP:MPA of 0.85. Sample E872846 from heading LQ TZ#2 R1 Lith represented 79.92 tonnes and had a calculated NPR of 0.55. Paste pH measurements were available only for sample E816066 and showed that at pH 8.1, the sample was net neutralizing at time of measurement. After determination that the majority of the excavated material at Lucky Queen was strongly net neutralizing and contained low levels of metals, with less than 250 ppm Zn and less than 100 ppm Pb in all samples, the P-AML material was mixed and included in the end dump. This material is unlikely to result in net acid drainage. The fate of all Lucky Queen waste rock is summarized in Table 12.

Table 12. 2013 Lucky Queen Waste Rock Storage Locations

Category	Tonnes	Storage Location	Tonnes
Non-AML Waste Rock (excavated)	1,538	Lucky Queen 500 External Dump	1,538
P-AML Waste Rock (excavated)	611	Lucky Queen 500 External Dump	611
Total	**2,149**		**2,149**

3 Discussion

The Waste Rock Management Plan has been successfully implemented throughout 2013 at three deposits within the Keno Hill District. With the addition of data collected from 2008-2013, a substantial amount of geochemical data has been compiled. This will help guide site geologists in the future in determining the characteristics of rock to be excavated in the future and also in predicting amounts of P-AML material to be encountered in planned development. The Bellekeno data set from 2013 as a continuation of the trend observed in 2012 shows a shift in the modal distribution of Pb and Zn back to what would be expected for samples representing material from both development through sedimentary rocks with very low Pb/Zn levels outside of the area of influence around the vein and also access development directly adjacent to the vein. Improvements in the sample handling and preparation procedures are attributed to the reduction in contamination.

While some sources of minor contamination are difficult to avoid, others have been addressed and mitigated. Sample preparation has improved with more thorough cleanings and batch preparing waste rock samples to avoid contamination from high grade production samples. Another source of contamination which was identified and addressed was cross contamination which was occurring in the drying oven. Changing sample bags from polyethylene to cloth also reduced the air born contamination as the previously used polyethylene bags had to be open to allow the sample to dry and the opening and closing of the drying oven door stirred up dust from concentrate samples which were also drying in the oven.

Waste rock disposal on surface has been decreasing year over year as demand for backfill increases and capital development decreases. In 2013 all development waste was kept underground and used as backfill along with significant quantities of tailings.

Development of the portal access to the Onek 990 deposit from the Onek 990 portal facilitated underground drilling and resource definition and resulted in generation of 20,147 tonnes of waste rock, all of which was excavated and used as road construction material. This material was verified to be 100% N-AML and is unlikely to result in net acid generation.

Minor underground development and rehab accessed from the Lucky Queen 500 portal in early 2013 resulted in generation of 2,149 tonnes of waste rock, all of which was excavated, and after geochemical verification, placed on the existing surface dump at the LQ 500 portal. This excavation contains approximately 28% material which showed NP:MPA ratios of less than 2, but is mixed within material with significant net neutralizing potential and is considered unlikely to result in net acid generation especially given the limited tonnage.

4 RECOMMENDATIONS

With the compilation of 6 years of underground geochemical data and underground exposure throughout all of the varying lithologies known in the Bellekeno mine, a 3D block model estimating the NP:MPA and Pb/Zn should be constructed and used to better refine zones of P-AML before encountering it in development.

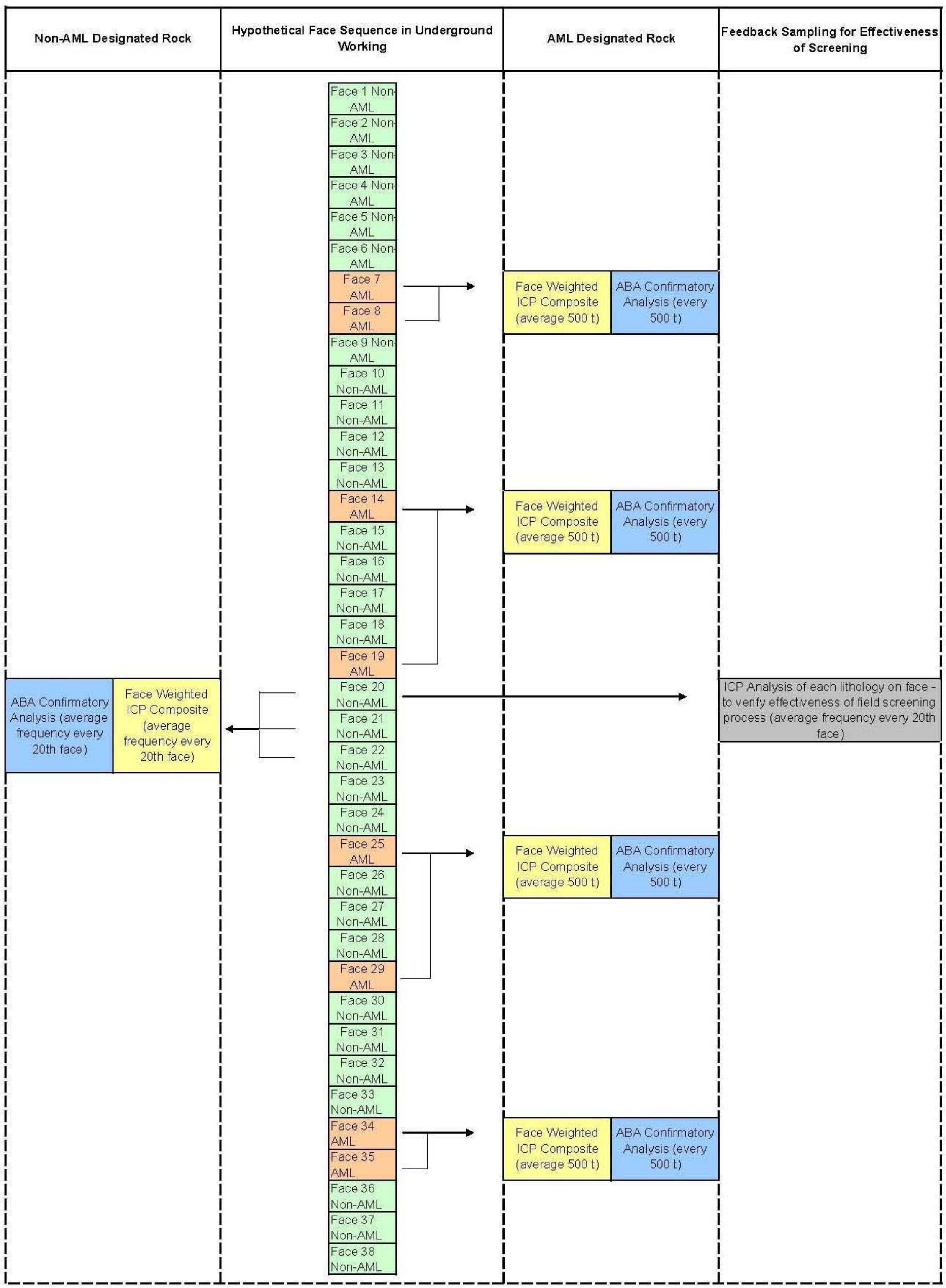
The Waste Rock Management Plan within Water License QZ07-078 (amendment QZ12-053) does not address the level of characterization needed for waste rock which is to be used as underground backfill. As P-AML material is preferentially used as backfill material to limit the potential liability of surface storage, the Waste Rock Management Plan should be modified to include underground backfill as a storage location for both Non-AML rock and P-AML rock and whether or not material being used as backfill needs to be classified as it will be handled the same regardless of its classification.

The sample density and schedule should be revised to focus on sampling only material hauled to surface. It is recommended that the Bellekeno Waste Rock Sampling Schedule be reviewed and a new sampling plan focusing on areas which the possibility of encountering P-AML material is moderate to high.

A summary of operational data at Bellekeno show that paste pH can in some cases predict NP:MPA. However, the criterion of pH 6 within the WRMP is not useful as no samples collected during operation have been below pH 6. Instead, a criterion of pH 7.5 successfully predicted NP:MPA ratios below 2. Modification of this field screening P-AML indicator criterion from pH 6 to pH 7.5 is recommended.

Fizz rating data from operations data 2008-2013 show that samples with a fizz rating of 3 or higher almost always have a NPR of 2 or greater, and the majority of samples with a fizz rating of two also have an NPR of 2 or greater. This demonstrates that fizz rating is a useful indicator of NP and also has some utility as a predictor of NPR and that the metric should continue to be used during field screening determination.

Table 13. Current Underground Development Waste Rock Hypothetical Sampling Schedule



APPENDIX A

2013 BELLEKENO WASTE ROCK VERIFICATION ASSAYS

Appendix A

2013 Bellekno Waste Rock Testing Data

Cert. #	Heading	Tonnes	SAMPLE	Classification	Classification	Year	Fiz_Rate	Acid Potential	nnp	NP	Paste pH	NP_MPA	S (total)	Ag
			DESCRIPTIO	Field	Geochem			kgCaCO3/t	kg CaCO3/t	kgCaCO3/t	pH	%	%	ppm
WH13157937	TZMR R1-4	394.31	E816056	PAML	N-AML	2013	2	7.8	48	56	8.5	7.17	0.25	0.5
WH13157937	TZMR R5-10	881.15	E816057	N-AML	N-AML	2013								0.9
WH13157937	TZMR R11-16	879.41	E816058	N-AML	N-AML	2013								0.6
WH13157937	TZMR 17-23	1037.38	E816059	N-AML	N-AML	2013								1.3
WH13157937	TZMR R24-26	429.23	E816060	PAML	N-AML	2013	3	16.9	66	83	8.7	4.92	0.54	1.4
WH13157937	TZMR R27-28	262.44	E816061	PAML	N-AML	2013	3	1.9	131	133	9	70.93	0.06	<0.5
WH13157937	TZMR R2 Lith	86.18	E817658	PAML	N-AML	2013								0.5
WH13157937	TZMR R24 Lith	140.84	E817744	PAML	N-AML	2013								1.1

Cert. #	Heading	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	K
		%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	%
WH13157937	TZMR R1-4	0.58	5	130	<0.5	<2	2.13	<0.5	2	202	5	0.69	<10	0.16
WH13157937	TZMR R5-10	0.98	5	210	<0.5	<2	2.6	0.7	3	195	6	0.92	<10	0.25
WH13157937	TZMR R11-16	2.19	7	1130	0.6	<2	1.49	1.3	5	216	7	1.37	10	0.58
WH13157937	TZMR 17-23	1.87	7	460	0.5	<2	1.59	2.7	4	219	9	1.38	<10	0.59
WH13157937	TZMR R24-26	1.14	8	230	<0.5	<2	2.57	2.2	4	232	4	2.99	<10	0.36
WH13157937	TZMR R27-28	0.29	<5	60	<0.5	<2	4.43	0.6	2	183	2	0.49	<10	0.08
WH13157937	TZMR R2 Lith	0.69	7	110	<0.5	2	2.52	<0.5	1	180	5	0.59	<10	0.16
WH13157937	TZMR R24 Lith	0.63	<5	170	<0.5	<2	5.94	1.8	1	174	5	0.71	<10	0.21

Appendix A

2013 Bellekno Waste Rock Testing Data

Cert. #	Heading	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
		ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
WH13157937	TZMR R1-4	10	0.16	308	3	0.02	7	390	42	0.26	<5	1	49	<20
WH13157937	TZMR R5-10	10	0.24	332	4	0.03	8	410	75	0.36	<5	2	70	<20
WH13157937	TZMR R11-16	10	0.29	528	5	0.05	17	390	49	0.67	<5	4	69	<20
WH13157937	TZMR 17-23	10	0.28	930	3	0.07	16	660	202	0.65	<5	3	72	<20
WH13157937	TZMR R24-26	10	0.2	8780	4	0.05	11	340	184	0.51	<5	2	60	<20
WH13157937	TZMR R27-28	10	0.11	425	1	0.01	2	130	52	0.06	<5	1	61	<20
WH13157937	TZMR R2 Lith	10	0.17	117	3	0.03	8	470	21	0.26	<5	1	65	<20
WH13157937	TZMR R24 Lith	10	0.16	1155	2	0.02	11	330	92	0.28	<5	1	86	<20

Cert. #	Heading	Ti	Tl	U	V	W	Zn	AP (S ICP correlation)	NP (Ca correlation	(ICP Correlation)	S% in Pb	S% in Zn	Sulphide in PbZn	PbZn Corrected S%
		%	ppm	ppm	ppm	ppm	ppm							
WH13157937	TZMR R1-4	0.06	<10	<10	15	<10	47	8.125	65.4413	8.054314	0.00	0.00	0.00	0.26
WH13157937	TZMR R5-10	0.09	<10	<10	24	<10	76	11.25	76.256	6.778311	0.00	0.01	0.01	0.35
WH13157937	TZMR R11-16	0.14	<10	<10	44	<10	170	20.9375	50.7149	2.422204	0.00	0.01	0.01	0.66
WH13157937	TZMR 17-23	0.14	<10	<10	39	<10	343	20.3125	53.0159	2.610014	0.00	0.02	0.03	0.62
WH13157937	TZMR R24-26	0.08	<10	<10	28	<10	257	15.9375	75.5657	4.741377	0.00	0.02	0.02	0.49
WH13157937	TZMR R27-28	0.05	<10	<10	7	<10	34	1.875	118.3643	63.12763	0.00	0.00	0.00	0.06
WH13157937	TZMR R2 Lith	0.07	<10	<10	13	<10	30	8.125	74.4152	9.158794	0.00	0.00	0.00	0.26
WH13157937	TZMR R24 Lith	0.05	<10	<10	16	<10	186	8.75	153.1094	17.49822	0.00	0.01	0.01	0.27

Cert. #	Heading	Pb/Zn corrected MPA	PbZn corrected NP:MPA
WH13157937	TZMR R1-4	8.00	8.18
WH13157937	TZMR R5-10	11.05	6.90
WH13157937	TZMR R11-16	20.55	2.47
WH13157937	TZMR 17-23	19.48	2.72
WH13157937	TZMR R24-26	15.30	4.94
WH13157937	TZMR R27-28	1.78	66.62
WH13157937	TZMR R2 Lith	8.05	9.24
WH13157937	TZMR R24 Lith	8.30	18.44

APPENDIX B

2013 ONEK 990 WASTE ROCK VERIFICATION ASSAYS

Appendix B
2013 Onek Waste Rock Testing Data

Heading	Tonnes	SAMPLE	Field Classification	Geochem Classification	Year	Fiz_Rate	Acid Potential	nnp	NP	Paste pH	NP_MPA	S (total)	Ag
ONEK 965 RM R1-5	862.3	E816068	N-AML	N-AML	2013								0.6
ONEK Incline R1-5	1075	E816069	N-AML	N-AML	2013								<0.5
ONEK MAIN R1-3	1045	E816071	N-AML	N-AML	2013								<0.5
ONEK MAIN R13-17	935	E816072	N-AML	N-AML	2013								0.6
ONEK MAIN R18-21	1012	E816073	N-AML	N-AML	2013								<0.5
ONEK MAIN R26-29	989	E816075	N-AML	N-AML	2013								0.7
ONEK MAIN R30-34	992.7	E816076	N-AML	N-AML	2013								1.1
ONEK MAIN R35-39	972.2	E816077	N-AML	N-AML	2013								<0.5
ONEK MAIN R40-44	951.3	E816078	N-AML	N-AML	2013	3	9.7	131	141	7.6	14.55	0.31	<0.5
ONEK MAIN R45-50	1002	E816079	N-AML	N-AML	2013								<0.5
ONEK MAIN R51-56	957	E816080	N-AML	N-AML	2013								<0.5
ONEK MAIN R57-61	975.8	E816081	N-AML	N-AML	2013								<0.5
ONEK MAIN R62-65	826.8	E816082	N-AML	N-AML	2013	3	15.6	152	168	8.1	10.75	0.5	<0.5
ONEK MAIN R66-69	915.7	E816083	N-AML	N-AML	2013								<0.5
ONEK ORE RM R1-2	884.2	E816085	N-AML	N-AML	2013								0.6
ONEK ORE RM R3-4	606.6	E816086	N-AML	N-AML	2013	2	4.1	35	39	7.8	9.6	0.13	<0.5
ONEK W RM R1-4	1079	E816087	N-AML	N-AML	2013								0.8
ONEK Incline R9 Lith	175.1	E807062	N-AML	N-AML	2013								1.1
ONEK MAIN R24 Lith	229.4	E807827	N-AML	N-AML	2013								<0.5
ONEK MAIN R41 Lith	219.7	E807817	N-AML	N-AML	2013								1
ONEK ORE RM R4 Lith	335.8	E807074	N-AML	N-AML	2013								0.7
ONEK Incline R6-12	1085	E816070	N-AML	N-AML	2013	2	28.4	9	37	8.1	1.3	0.91	3.6
ONEK MAIN R22-25	919.4	E816074	N-AML	N-AML	2013	1	3.4	6	9	7.2	2.62	0.11	2.2
ONEK MAIN R70-73	863	E816084	N-AML	N-AML	2013								2
ONEK MAIN R62 Lith	238.3	E807017	N-AML	N-AML	2013								0.8

Appendix B

2013 Onek Waste Rock Testing Data

Heading	Tonnes	Al	Ca	Pb	S	Zn	Calculated AP (S ICP correlation)	Calculated NP (Ca correlation	NP:MPA (ICP Correlation)	S% in Pb	S% in Zn	Sulphide in PbZn
ONEK 965 RM R1-5	862.3	6.46	2.43	86	0.18	4280	4.8	72.3	14.97	0.001333	0.294892	0.3
ONEK Incline R1-5	1075	2.97	3.6	33	0.17	2690	4.5	99.3	22	0.000512	0.185341	0.19
ONEK MAIN R1-3	1045	1.21	2.46	21	0.19	128	5.2	73	14.18	0.000326	0.008819	0.01
ONEK MAIN R13-17	935	1.71	0.42	23	0.03	49	0	26.1	545.9	0.000357	0.003376	0
ONEK MAIN R18-21	1012	5.51	1.27	18	0.08	91	1.6	45.7	27.8	0.000279	0.00627	0.01
ONEK MAIN R26-29	989	1.3	0.19	35	0.06	122	1	20.8	20.71	0.000543	0.008406	0.01
ONEK MAIN R30-34	992.7	1.77	0.24	178	0.11	340	2.6	22	8.45	0.002759	0.023426	0.03
ONEK MAIN R35-39	972.2	1.92	2.2	11	0.07	81	1.3	67.1	50.67	0.000171	0.005581	0.01
ONEK MAIN R40-44	951.3	4.72	5.4	42	0.3	225	8.7	140.7	16.25	0.000651	0.015503	0.02
ONEK MAIN R45-50	1002	2.65	3.62	41	0.18	201	4.8	99.7	20.64	0.000636	0.013849	0.01
ONEK MAIN R51-56	957	6.83	7.78	35	0.18	266	4.8	195.4	40.45	0.000543	0.018327	0.02
ONEK MAIN R57-61	975.8	6.13	4.44	35	0.28	742	8	118.6	14.79	0.000543	0.051124	0.05
ONEK MAIN R62-65	826.8	7.35	7.5	27	0.49	526	14.7	189	12.84	0.000419	0.036241	0.04
ONEK MAIN R66-69	915.7	2.23	1.97	29	0.14	4390	3.6	61.8	17.37	0.00045	0.302471	0.3
ONEK ORE RM R1-2	884.2	5.22	0.76	23	0.16	150	4.2	33.9	8.09	0.000357	0.010335	0.01
ONEK ORE RM R3-4	606.6	4.6	1.66	20	0.12	225	2.9	54.6	18.72	0.00031	0.015503	0.02
ONEK W RM R1-4	1079	3.22	1.14	51	0.07	439	1.3	42.7	32.24	0.000791	0.030247	0.03
ONEK Incline R9 Lith	175.1	5.87	2.14	70	1.08	220	33.5	65.7	1.96	0.001085	0.015158	0.02
ONEK MAIN R24 Lith	229.4	1.62	0.1	11	0.03	36	0	18.7	391.86	0.000171	0.00248	0
ONEK MAIN R41 Lith	219.7	6.83	7.61	84	0.21	379	5.8	191.5	33.09	0.001302	0.026113	0.03
ONEK ORE RM R4 Lith	335.8	5.75	1.75	25	0.05	287	0.7	56.7	82.7	0.000388	0.019774	0.02
ONEK Incline R6-12	1085	6.33	1.29	63	0.9	529	27.8	46.1	1.66	0.000977	0.036448	0.04
ONEK MAIN R22-25	919.4	2.83	0.43	80	0.11	215	2.6	26.3	10.13	0.00124	0.014814	0.02
ONEK MAIN R70-73	863	3.08	0.37	165	0.23	10600	6.4	24.9	3.88	0.002558	0.73034	0.73
ONEK MAIN R62 Lith	238.3	6.44	9.57	18	1.77	542	55.5	236.6	4.26	0.000279	0.037344	0.04

APPENDIX C

2013 LUCKY QUEEN WASTE ROCK VERIFICATION ASSAYS

Appendix C

2013 Lucky Queen Waste Rock Testing Data

Cert. #	Heading	Tonnes	SAMPLE	Field Classification	Geochem Classification	Year	Fiz_Rate	Acid Potential	nnp	NP	Paste pH	NP_MPA	S (total)
WH13157937	LQ1330 Ramp R12-15	334.9	E816062	PAML	N-AML	2013	3	7.8	78	86	8.4	11.01	0.25
WH13157937	LQ1330 Ramp R16-19	430.1	E816063	PAML	N-AML	2013							
WH13157937	LQ1330 Ramp R20-22	326.4	E816064	PAML	N-AML	2013	3	5.6	102	108	8.8	19.2	0.18
WH13157937	LQ 1330 Ramp R12 Lith	90.91	E876000	PAML	N-AML	2013							
WH13157937	LQ 1330 Ramp R22 Lith	105.3	E872837	PAML	N-AML	2013							
WH13157937	LQ1330 Sump R1-3	288.8	E816065	PAML	PAML	2013							
WH13157937	LQ TX#2 R1-3	242.3	E816066	PAML	PAML	2013	1	18.4	-4	14	8.1	0.76	0.59
WH13157937	LQ TX#2 R4-6	250.4	E816067	PAML	N-AML	2013							
WH13157937	LQ TZ#2 R1 Lith	79.92	E872846	PAML	PAML	2013							

Appendix C

2013 Lucky Queen Waste Rock Testing Data

Cert. #	Heading	Ag	Al	Ca	Pb	S	Zn	Calculated AP (S ICP correlatio	Calculated NP (Ca correlatio	NP:MPA (ICP Correlatio	S% in Pb	S% in Zn	Sulphide in PbZn
WH13157937	LQ1330 Ramp R12-15	0.6	0.88	2.63	65	0.22	185	6.1	76.9	12.6	0.001008	0.012747	0.01
WH13157937	LQ1330 Ramp R16-19	1.1	1.52	3.85	79	0.41	197	12.2	105	8.63	0.001225	0.013573	0.01
WH13157937	LQ1330 Ramp R20-22	<0.5	0.7	3.06	39	0.19	98	5.2	86.8	16.86	0.000605	0.006752	0.01
WH13157937	LQ 1330 Ramp R12 Lith	0.8	0.97	0.98	75	0.32	41	9.3	39	4.19	0.001163	0.002825	0
WH13157937	LQ 1330 Ramp R22 Lith	<0.5	1.29	0.9	16	0.29	42	8.3	37.1	4.45	0.000248	0.002894	0
WH13157937	LQ1330 Sump R1-3	1	2.9	1.41	90	1.83	113	57.4	48.9	0.85	0.001395	0.007786	0.01
WH13157937	LQ TX#2 R1-3	0.8	0.38	0.43	45	0.51	147	15.4	26.3	1.71	0.000698	0.010128	0.01
WH13157937	LQ TX#2 R4-6	1	1.23	0.73	23	0.38	78	11.2	33.2	2.96	0.000357	0.005374	0.01
WH13157937	LQ TZ#2 R1 Lith	1.3	0.31	0.06	61	1.04	226	32.3	17.8	0.55	0.000946	0.015571	0.02

APPENDIX D

2013 BELLEKENO MINE WALL TESTING PLAN DATA

Appendix D
2013 Bellekno Mine Wall Testing Plan Data

Cert. #	Heading	SAMPLE	Classification	Classification	Year	Fiz_Rate	Acid Potential	nnp	NP	Paste pH	NP_MPA	S (total)	Sulfate
		DESCRIPTION	Field	Geochem			kgCaCO3/t	kg CaCO3/t	kgCaCO3/t	pH	%	%	%
WH11047581	MWTP SW CEN INC	E605378		N-AML	2013	2	13.1	77	90	8.2	6.86	0.42	<0.01
WH11047581	MWTP SW CEN INC	E605379		N-AML	2013								
WH11047581	MWTP SW CEN INC	E605380		N-AML	2013								
WH11047581	MWTP SW CEN INC	E605381		N-AML	2013								
WH11047581	MWTP SW CEN INC	E605391		N-AML	2013	2	9.4	64	73	8.2	7.79	0.3	0.01
WH11047581	MWTP SW CEN INC	E605392	PAG	P-AML	2013								
WH11047581	MWTP SW CEN INC	E605393		N-AML	2013								
WH11047581	MWTP SW CEN INC	E605394		N-AML	2013								
WH11047581	MWTP SW CEN INC	E605395		N-AML	2013	2	18.1	63	81	8.1	4.47	0.58	0.02
WH11047581	MWTP SW CEN INC	E605398		N-AML	2013								
WH11047581	MWTP SW CEN INC	E605399		N-AML	2013								
WH11047581	MWTP SW CEN INC	E605400		N-AML	2013								
WH11047581	MWTP SW CEN INC	E605403		N-AML	2013	2	8.1	23	31	8.8	3.82	0.26	<0.01
WH11047581	MWTP SW CEN INC	E605404		N-AML	2013								
WH11047581	MWTP SW CEN INC	E605417		N-AML	2013								
WH11047581	MWTP 720ACC	E605418		N-AML	2013								
WH11047581	MWTP 720ACC	E605419		N-AML	2013	2	12.2	76	88	8.4	7.22	0.39	<0.01
WH11047581	MWTP 840C2Acc	E605420		P-AML	2013								
WH11047581	MWTP SW CEN DEC	E605430		N-AML	2013								
WH11047581	MWTP SW CEN DEC	E605431		N-AML	2013								
WH11047581	MWTP SW CEN DEC	E605432		N-AML	2013	2	14.1	47	61	8.3	4.34	0.45	<0.01
WH11047581	MWTP SW CEN DEC	E605433		N-AML	2013								
WH11047581	MWTP SW CEN DEC	E605434		N-AML	2013								
WH11047581	MWTP SW CEN DEC	E605435		N-AML	2013								
WH11047581	MWTP SW CEN DEC	E605446		N-AML	2013	3	14.7	312	327	8	22.26	0.47	<0.01
WH11047581	MWTP 780 ACC	E605447		N-AML	2013								
WH11047581	MWTP 780 RMK	E605448		N-AML	2013								
WH11047581	MWTP SW CEN DEC	E605449	PAG	N-AML	2013								
WH11047581	MWTP SW CEN DEC	E605450	AG	P-AML	2013	1	10.3	-2	8	8.1	0.78	0.33	<0.01
WH11047581	MWTP SW CEN DEC	E605455		N-AML	2013								
WH11047581	MWTP SW CEN DEC	E605456		N-AML	2013								
WH11047581	MWTP SW CEN DEC	E605457		N-AML	2013								
WH11047581	MWTP SW CEN DEC	E605458	PAG	P-AML	2013	2	30.3	12	42	8.2	1.39	0.97	<0.01
WH11047581	MWTP 820 Vent Acc	E605459		N-AML	2013								
WH11047581	MWTP 820 RMK	E605460		N-AML	2013								
WH11047581	MWTP 840C2 X-cut	E605461	PAG/ML	P-AML	2013								

Cert. #	Heading	SAMPLE DESCRIPTION	Sulfide	C	CO2	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co
			%	%	%	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm
WH11047581	MWTP SW CEN INC	E605378	0.42	1.13	4.1	0.6	0.91	6	200	<0.5	<2	3.31	<0.5	2
WH11047581	MWTP SW CEN INC	E605379				1.6	0.48	<5	120	<0.5	<2	1.47	1.7	1
WH11047581	MWTP SW CEN INC	E605380				1.1	1.61	8	290	0.5	3	2.11	<0.5	3
WH11047581	MWTP SW CEN INC	E605381				<0.5	1.92	<5	330	0.5	<2	2.7	0.7	4
WH11047581	MWTP SW CEN INC	E605391	0.29	0.93	3.4	0.5	0.88	7	160	<0.5	<2	2.69	0.8	3
WH11047581	MWTP SW CEN INC	E605392				1.5	7.72	17	540	2.2	<2	1.1	1.3	15
WH11047581	MWTP SW CEN INC	E605393				1.3	0.82	6	130	<0.5	<2	5.29	0.9	2
WH11047581	MWTP SW CEN INC	E605394				18.1	0.98	<5	180	<0.5	<2	8.15	2	1
WH11047581	MWTP SW CEN INC	E605395	0.56	1	3.7	<0.5	1.47	<5	220	<0.5	<2	3.14	0.5	3
WH11047581	MWTP SW CEN INC	E605398				0.6	2.15	13	330	0.7	<2	4.27	0.8	4
WH11047581	MWTP SW CEN INC	E605399				<0.5	0.74	<5	110	<0.5	<2	3.93	<0.5	1
WH11047581	MWTP SW CEN INC	E605400				0.5	1.63	11	240	0.5	<2	2.97	<0.5	3
WH11047581	MWTP SW CEN INC	E605403	0.26	0.39	1.4	1.5	0.91	5	150	<0.5	<2	1.03	0.9	2
WH11047581	MWTP SW CEN INC	E605404				<0.5	0.89	<5	140	<0.5	<2	2.59	0.5	2
WH11047581	MWTP SW CEN INC	E605417				0.9	1.3	24	270	<0.5	<2	2.01	0.6	3
WH11047581	MWTP 720ACC	E605418				1	1.94	<5	270	0.5	<2	1.12	2.5	4
WH11047581	MWTP 720ACC	E605419	0.39	1.21	4.4	<0.5	1.76	<5	450	<0.5	<2	2.93	0.5	5
WH11047581	MWTP 840C2Acc	E605420				3.9	5.15	23	920	1.3	<2	1.7	3.5	10
WH11047581	MWTP SW CEN DEC	E605430				0.7	0.76	<5	180	<0.5	<2	2.54	<0.5	3
WH11047581	MWTP SW CEN DEC	E605431				<0.5	0.48	<5	110	<0.5	2	2.41	<0.5	3
WH11047581	MWTP SW CEN DEC	E605432	0.45	0.68	2.5	<0.5	1.58	5	310	0.6	<2	2.07	<0.5	3
WH11047581	MWTP SW CEN DEC	E605433				1.9	0.47	5	120	<0.5	<2	3.41	<0.5	2
WH11047581	MWTP SW CEN DEC	E605434				<0.5	0.43	<5	120	<0.5	<2	2.91	<0.5	2
WH11047581	MWTP SW CEN DEC	E605435				0.7	0.51	<5	140	<0.5	<2	3.33	<0.5	2
WH11047581	MWTP SW CEN DEC	E605446	0.47	3.91	14.3	0.6	1.22	<5	280	<0.5	<2	12.65	<0.5	2
WH11047581	MWTP 780 ACC	E605447				<0.5	0.96	<5	210	<0.5	<2	3.3	<0.5	2
WH11047581	MWTP 780 RMK	E605448				<0.5	0.38	<5	90	<0.5	<2	0.79	<0.5	1
WH11047581	MWTP SW CEN DEC	E605449				1.1	1.3	<5	240	<0.5	<2	0.72	0.5	3
WH11047581	MWTP SW CEN DEC	E605450	0.33	0.1	0.4	0.9	1.13	<5	210	<0.5	<2	0.38	<0.5	2
WH11047581	MWTP SW CEN DEC	E605455				<0.5	1.35	<5	260	<0.5	<2	1.6	<0.5	4
WH11047581	MWTP SW CEN DEC	E605456				<0.5	0.75	<5	180	<0.5	2	5.67	<0.5	2
WH11047581	MWTP SW CEN DEC	E605457				0.6	0.56	<5	100	<0.5	<2	1.96	0.5	2
WH11047581	MWTP SW CEN DEC	E605458	0.97	0.53	1.9	0.9	2.16	7	300	0.6	<2	1.51	0.5	4
WH11047581	MWTP 820 Vent Acc	E605459				1.4	0.6	<5	120	<0.5	<2	2.49	1	2
WH11047581	MWTP 820 RMK	E605460				<0.5	0.68	<5	130	<0.5	<2	1.87	<0.5	2
WH11047581	MWTP 840C2 X-cut	E605461				4.8	0.33	94	30	<0.5	3	0.27	59.2	2

Cert. #	Heading	SAMPLE	Cr	Cu	Fe	Ga	K	La	Mg	Mn	Mo	Na	Ni	P
		DESCRIPTION	ppm	ppm	%	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm
WH11047581	MWTP SW CEN INC	E605378	256	8	0.77	<10	0.19	10	0.27	98	13	0.03	17	540
WH11047581	MWTP SW CEN INC	E605379	353	5	0.49	<10	0.1	10	0.04	109	13	0.01	18	200
WH11047581	MWTP SW CEN INC	E605380	340	7	1.06	<10	0.29	10	0.17	74	12	0.04	23	310
WH11047581	MWTP SW CEN INC	E605381	251	9	1.27	10	0.37	10	0.34	163	8	0.07	18	430
WH11047581	MWTP SW CEN INC	E605391	251	7	0.81	<10	0.18	10	0.16	191	9	0.03	13	280
WH11047581	MWTP SW CEN INC	E605392	202	49	4.51	20	2.11	30	0.73	243	10	0.21	62	340
WH11047581	MWTP SW CEN INC	E605393	208	4	0.57	<10	0.14	10	0.12	96	7	0.04	14	280
WH11047581	MWTP SW CEN INC	E605394	181	8	0.64	<10	0.14	10	0.16	124	5	0.05	11	290
WH11047581	MWTP SW CEN INC	E605395	245	5	0.97	<10	0.36	10	0.18	91	9	0.05	23	770
WH11047581	MWTP SW CEN INC	E605398	289	7	1.13	<10	0.47	10	0.16	89	10	0.11	25	470
WH11047581	MWTP SW CEN INC	E605399	262	3	0.64	<10	0.17	10	0.14	92	9	0.03	10	380
WH11047581	MWTP SW CEN INC	E605400	234	5	0.89	<10	0.38	10	0.17	88	8	0.06	20	340
WH11047581	MWTP SW CEN INC	E605403	317	6	0.74	<10	0.21	10	0.16	85	13	0.04	33	300
WH11047581	MWTP SW CEN INC	E605404	271	8	0.83	<10	0.22	10	0.27	92	10	0.03	15	280
WH11047581	MWTP SW CEN INC	E605417	317	4	0.89	<10	0.36	10	0.25	160	12	0.04	16	270
WH11047581	MWTP 720ACC	E605418	350	8	1.09	10	0.44	10	0.19	111	13	0.05	22	400
WH11047581	MWTP 720ACC	E605419	261	7	1.81	<10	0.35	10	0.44	669	9	0.04	18	340
WH11047581	MWTP 840C2Acc	E605420	269	46	2.54	10	1.54	20	0.51	586	22	0.11	45	410
WH11047581	MWTP SW CEN DEC	E605430	252	6	0.68	<10	0.19	10	0.21	116	10	0.02	16	460
WH11047581	MWTP SW CEN DEC	E605431	225	2	0.64	<10	0.1	10	0.19	91	9	0.01	13	390
WH11047581	MWTP SW CEN DEC	E605432	253	7	1.02	<10	0.27	10	0.29	98	9	0.04	19	410
WH11047581	MWTP SW CEN DEC	E605433	221	3	0.58	<10	0.09	<10	0.15	98	9	0.01	14	430
WH11047581	MWTP SW CEN DEC	E605434	235	3	0.57	<10	0.09	<10	0.13	79	9	0.01	12	400
WH11047581	MWTP SW CEN DEC	E605435	224	4	0.6	<10	0.1	10	0.14	120	9	0.01	13	440
WH11047581	MWTP SW CEN DEC	E605446	170	7	0.81	<10	0.23	10	0.33	85	7	0.03	14	510
WH11047581	MWTP 780 ACC	E605447	278	6	0.82	<10	0.18	10	0.25	98	11	0.02	17	410
WH11047581	MWTP 780 RMK	E605448	333	3	0.49	<10	0.06	<10	0.05	51	13	0.01	15	150
WH11047581	MWTP SW CEN DEC	E605449	327	9	0.86	<10	0.18	10	0.1	60	13	0.04	24	300
WH11047581	MWTP SW CEN DEC	E605450	340	6	0.68	<10	0.24	10	0.06	49	14	0.03	24	230
WH11047581	MWTP SW CEN DEC	E605455	300	13	0.94	<10	0.2	10	0.13	57	12	0.04	25	270
WH11047581	MWTP SW CEN DEC	E605456	196	7	0.55	<10	0.16	10	0.12	79	8	0.02	13	300
WH11047581	MWTP SW CEN DEC	E605457	248	4	0.44	<10	0.15	10	0.06	79	10	0.01	14	220
WH11047581	MWTP SW CEN DEC	E605458	245	11	1.5	<10	0.3	10	0.38	109	9	0.06	20	380
WH11047581	MWTP 820 Vent Acc	E605459	284	7	0.56	<10	0.08	10	0.09	123	11	0.03	13	300
WH11047581	MWTP 820 RMK	E605460	248	6	0.47	<10	0.08	10	0.08	58	10	0.02	12	360
WH11047581	MWTP 840C2 X-cut	E605461	278	30	4.41	<10	0.12	10	0.11	13650	10	0.01	12	230

Cert. #	Heading	SAMPLE	Pb	S	Sb	Sc	Sr	Ta	Th	Ti	Tl	U	V	W
		DESCRIPTION	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
WH11047581	MWTP SW CEN INC	E605378	29	0.42	<5	2	61		<20	0.07	<10	<10	25	<10
WH11047581	MWTP SW CEN INC	E605379	144	0.24	<5	1	23		<20	0.05	<10	<10	11	<10
WH11047581	MWTP SW CEN INC	E605380	121	0.76	<5	3	73		<20	0.1	<10	<10	33	<10
WH11047581	MWTP SW CEN INC	E605381	35	0.69	<5	4	126		<20	0.11	<10	<10	40	<10
WH11047581	MWTP SW CEN INC	E605391	59	0.31	<5	2	92		<20	0.05	<10	<10	20	<10
WH11047581	MWTP SW CEN INC	E605392	111	2.64	<5	16	237		<20	0.34	<10	<10	183	<10
WH11047581	MWTP SW CEN INC	E605393	115	0.33	<5	2	114		<20	0.07	<10	<10	17	<10
WH11047581	MWTP SW CEN INC	E605394	2680	0.46	18	2	172		<20	0.07	<10	<10	19	<10
WH11047581	MWTP SW CEN INC	E605395	31	0.58	<5	3	121		<20	0.1	<10	<10	28	<10
WH11047581	MWTP SW CEN INC	E605398	36	0.87	<5	4	223		<20	0.13	<10	<10	41	<10
WH11047581	MWTP SW CEN INC	E605399	33	0.3	<5	1	125		<20	0.06	<10	<10	13	<10
WH11047581	MWTP SW CEN INC	E605400	29	0.51	<5	3	193		<20	0.1	<10	<10	31	<10
WH11047581	MWTP SW CEN INC	E605403	122	0.23	<5	2	34		<20	0.09	<10	<10	20	<10
WH11047581	MWTP SW CEN INC	E605404	28	0.34	<5	2	65		<20	0.07	<10	<10	18	<10
WH11047581	MWTP SW CEN INC	E605417	60	0.37	<5	2	61		<20	0.09	<10	<10	25	<10
WH11047581	MWTP 720ACC	E605418	81	0.41	<5	3	65		<20	0.14	<10	<10	40	<10
WH11047581	MWTP 720ACC	E605419	36	0.38	<5	4	112		<20	0.1	<10	<10	37	<10
WH11047581	MWTP 840C2Acc	E605420	446	1.23	<5	10	129		<20	0.26	<10	<10	120	<10
WH11047581	MWTP SW CEN DEC	E605430	50	0.29	<5	2	50		<20	0.06	<10	<10	20	<10
WH11047581	MWTP SW CEN DEC	E605431	19	0.26	<5	1	41		<20	0.05	<10	<10	13	<10
WH11047581	MWTP SW CEN DEC	E605432	16	0.44	<5	3	79		<20	0.12	<10	<10	37	<10
WH11047581	MWTP SW CEN DEC	E605433	256	0.26	<5	1	68		<20	0.05	<10	<10	13	<10
WH11047581	MWTP SW CEN DEC	E605434	26	0.26	<5	1	53		<20	0.05	<10	<10	13	<10
WH11047581	MWTP SW CEN DEC	E605435	75	0.3	<5	1	60		<20	0.05	<10	<10	15	<10
WH11047581	MWTP SW CEN DEC	E605446	21	0.47	<5	3	229		<20	0.09	<10	<10	28	<10
WH11047581	MWTP 780 ACC	E605447	19	0.4	<5	2	86		<20	0.09	<10	<10	25	<10
WH11047581	MWTP 780 RMK	E605448	34	0.2	<5	1	19		<20	0.04	<10	<10	9	<10
WH11047581	MWTP SW CEN DEC	E605449	47	0.51	<5	2	39		<20	0.1	<10	<10	28	<10
WH11047581	MWTP SW CEN DEC	E605450	30	0.34	<5	2	26		<20	0.08	<10	<10	22	<10
WH11047581	MWTP SW CEN DEC	E605455	13	0.68	<5	2	56		<20	0.1	<10	<10	29	<10
WH11047581	MWTP SW CEN DEC	E605456	16	0.37	<5	2	83		<20	0.04	<10	10	15	<10
WH11047581	MWTP SW CEN DEC	E605457	27	0.21	<5	1	31		<20	0.04	<10	<10	10	<10
WH11047581	MWTP SW CEN DEC	E605458	23	0.93	<5	5	65		<20	0.13	<10	<10	41	<10
WH11047581	MWTP 820 Vent Acc	E605459	41	0.26	<5	1	47		<20	0.05	<10	<10	12	<10
WH11047581	MWTP 820 RMK	E605460	14	0.21	<5	1	43		<20	0.06	<10	<10	14	<10
WH11047581	MWTP 840C2 X-cut	E605461	441	0.6	<5	1	4		<20	0.03	<10	<10	8	<10

Cert. #	Heading	SAMPLE	Zn	Calculated AP (S ICP correlation)	Calculated NP (Ca correlation	NP:MPA (ICP Correlation)	S% in Pb	S% in Zn	Sulphide in PbZn
		DESCRIPTION	ppm						
WH11047581	MWTP SW CEN INC	E605378	44	12.48	92.59	7.42	0.00045	0.00303	0.00348
WH11047581	MWTP SW CEN INC	E605379	138	6.74	50.25	7.45	0.00223	0.00951	0.01174
WH11047581	MWTP SW CEN INC	E605380	50	23.33	64.98	2.79	0.00188	0.00345	0.00532
WH11047581	MWTP SW CEN INC	E605381	73	21.10	78.56	3.72	0.00054	0.00503	0.00557
WH11047581	MWTP SW CEN INC	E605391	74	8.98	78.33	8.73	0.00091	0.00510	0.00601
WH11047581	MWTP SW CEN INC	E605392	211	83.28	41.74	0.50	0.00172	0.01454	0.01626
WH11047581	MWTP SW CEN INC	E605393	76	9.61	138.15	14.37	0.00178	0.00524	0.00702
WH11047581	MWTP SW CEN INC	E605394	165	13.76	203.96	14.82	0.04154	0.01137	0.05291
WH11047581	MWTP SW CEN INC	E605395	35	17.59	88.68	5.04	0.00048	0.00241	0.00289
WH11047581	MWTP SW CEN INC	E605398	82	26.84	114.68	4.27	0.00056	0.00565	0.00621
WH11047581	MWTP SW CEN INC	E605399	32	8.66	106.86	12.34	0.00051	0.00220	0.00272
WH11047581	MWTP SW CEN INC	E605400	45	15.36	84.77	5.52	0.00045	0.00310	0.00355
WH11047581	MWTP SW CEN INC	E605403	76	6.43	40.13	6.25	0.00189	0.00524	0.00713
WH11047581	MWTP SW CEN INC	E605404	66	9.93	76.03	7.65	0.00043	0.00455	0.00498
WH11047581	MWTP SW CEN INC	E605417	75	10.89	62.68	5.76	0.00093	0.00517	0.00610
WH11047581	MWTP 720ACC	E605418	232	12.17	42.20	3.47	0.00126	0.01598	0.01724
WH11047581	MWTP 720ACC	E605419	76	11.21	83.85	7.48	0.00056	0.00524	0.00579
WH11047581	MWTP 840C2Acc	E605420	357	38.32	55.55	1.45	0.00691	0.02460	0.03151
WH11047581	MWTP SW CEN DEC	E605430	65	8.34	74.88	8.98	0.00078	0.00448	0.00525
WH11047581	MWTP SW CEN DEC	E605431	32	7.38	71.88	9.74	0.00029	0.00220	0.00250
WH11047581	MWTP SW CEN DEC	E605432	53	13.12	64.06	4.88	0.00025	0.00365	0.00390
WH11047581	MWTP SW CEN DEC	E605433	47	7.38	94.89	12.85	0.00397	0.00324	0.00721
WH11047581	MWTP SW CEN DEC	E605434	33	7.38	83.39	11.30	0.00040	0.00227	0.00268
WH11047581	MWTP SW CEN DEC	E605435	57	8.66	93.05	10.75	0.00116	0.00393	0.00509
WH11047581	MWTP SW CEN DEC	E605446	53	14.08	307.51	21.84	0.00033	0.00365	0.00398
WH11047581	MWTP 780 ACC	E605447	30	11.85	92.36	7.80	0.00029	0.00207	0.00236
WH11047581	MWTP 780 RMK	E605448	22	5.47	34.61	6.33	0.00053	0.00152	0.00204
WH11047581	MWTP SW CEN DEC	E605449	55	15.36	33.00	2.15	0.00073	0.00379	0.00452
WH11047581	MWTP SW CEN DEC	E605450	30	9.93	25.17	2.53	0.00047	0.00207	0.00253
WH11047581	MWTP SW CEN DEC	E605455	50	20.78	53.25	2.56	0.00020	0.00345	0.00365
WH11047581	MWTP SW CEN DEC	E605456	43	10.89	146.90	13.49	0.00025	0.00296	0.00321
WH11047581	MWTP SW CEN DEC	E605457	46	5.79	61.53	10.63	0.00042	0.00317	0.00359
WH11047581	MWTP SW CEN DEC	E605458	66	28.75	51.18	1.78	0.00036	0.00455	0.00490
WH11047581	MWTP 820 Vent Acc	E605459	96	7.38	73.72	9.99	0.00064	0.00661	0.00725
WH11047581	MWTP 820 RMK	E605460	37	5.79	59.46	10.27	0.00022	0.00255	0.00277
WH11047581	MWTP 840C2 X-cut	E605461	5050	18.23	22.64	1.24	0.00684	0.34795	0.35478

APPENDIX D

DSTF MONITORING MEMOS, EBA

EBA Engineering Consultants Ltd. operating as EBA, A Tetra Tech Company
Calcite Business Centre, Unit 6, 151 Industrial Road
Whitehorse, YT Y1A 2V3 CANADA
p. 867.668.3068 f. 867.668.4349

TECHNICAL MEMO

ISSUED FOR USE

TO:	Katherine Penney	**DATE:**	February 27, 2013
C:	Vanessa Benwood	**MEMO NO.:**	014
FROM:	Ian MacIntyre, EIT / Richard Trimble, P.Eng.	**EBA FILE:**	W14103124-01

SUBJECT: DSTF Instrumentation and Construction Monitoring
Keno Hill District Mill Site

1.0 INTRODUCTION

Alexco Resource Corp (Alexco) retained EBA, A Tetra Tech Company (EBA) to observe construction and operation activities associated with the Dry Stacked Tailings Facility (DSTF) at the Keno Hill District Mill Site. Activities related to the DSTF are to be carried out in accordance with the following documents:

- Operation, Maintenance, and Surveillance Manual, Dry Stack Tailings Facility, Keno Hill District Mill, YT
- Quarter 1 Tailings Placement Provisions, Keno Hill District Mill Site, Yukon
- Runoff Diversion Structure Specs, Dry Stacked Tailings Facility, Keno Hill District Mill, YT
- Detailed Design, Dry Stacked Tailings Facility, Keno Hill District Mill Site, Yukon

This memo summarizes the on-going monitoring of the DSTF completed by EBA on February 7, 8, and 9, 2013.

2.0 WORK COMPLETED

EBA has been collecting ground temperature cable (GTC) readings since November 2009 and slope indicator (SI) readings since September 2010 at the DSTF. During the February 2013 site visit, EBA collected GTC readings from boreholes BH15, BH17, BH18, BH23, BH31, BH32, and BH40; and SI readings from boreholes BH28, BH30, and BH36. Current GTC and slope indicator readings are attached to this memo.

Only a partial set of SI readings were collected from BH28 during the site visit. BH28 was previously damaged and the SI readings below 11 m are not reliable. Therefore, only SI readings above 11 m are included in the attached displacement plots.

In addition to compaction testing with a nuclear densometer, densities were determined using the volumetric sand cone method. These tests were completed on a test pad of tailings material approximately 0.3 m thick, 3 m wide, and 4 m long. The test pad was composed of fresh tailings placed on the existing DSTF and compacted before the tailings were allowed to freeze. Moisture contents recorded by the nuclear densometer have been consistently low (in the range of 4 – 8 %), compared to the average moisture content calculated through laboratory testing (approximately 15 – 16 %). The volumetric method allows

EBA to determine a moisture content correction factor that can be applied to the nuclear densometer readings.

3.0 DISCUSSION

Ongoing GTC and slope indicator readings provide a baseline for the site and monitor any changes during DSTF construction and operation. To date, no readings requiring additional review have been recorded. However, since October 2011 EBA has attempted to gather reliable readings from the damaged SI pipe in BH28. After analyzing this data, EBA recommends that the SI in BH28 be replaced. The replacement can be completed at Alexco's convenience, such as the next time a drill rig is onsite for a geotechnical investigation.

EBA has used the results of the volumetric (sand cone) density testing to determine a moisture content correction for suspect moistures returned by our nuclear densometers during compaction testing. EBA will continue to conduct volumetric density testing during subsequent site visits to strengthen this moisture content correction factor.

EBA completed six compaction tests on exposed tailings during the site visit. All six compaction tests failed to meet the compaction requirements stated in the Operation, Maintenance, and Surveillance Manual and as required by the Detailed Design, Dry Stacked Tailings Facility, Keno Hill District Mill, YT. The compaction records are attached to this memo. The deficient compaction results are likely due to tailings freezing before adequate compaction is achieved. As per the recommendations contained in Preliminary Engineering Design and Management Plan, the frozen tailings should be hauled to a location within the DSTF (at least 30 m from any edge) and placed in a loose state. These frozen tailings should not be covered until they have thawed and are properly compacted.

4.0 CLOSURE

The next site visit is scheduled for April 2013; dates will be confirmed with Alexco site personnel.

We trust this memo meets your present requirements. Should you have any questions or comments, please contact us.

COMPACTION DENSITY TEST SUMMARY REPORT

ASTM Designation D2922 & D3017

Project: Dry Stacked Tailings Facility
Keno Hill Mine District
Project No.: W14103124-01
Client: Alexco Resource Corporation
Attention:
Contractor: Alexco Resource Corporation

Test Apparatus: Nuclear **Troxler No:** 38813
Specified Compaction: 95 % Std. Proctor Max. Dry Density
Specified Moisture (MC):
Temperature Air: -10 °C **Soil:** °C
Date Tested: See below **By:** IM
Construction Period:

Soil Description: Tailings (2080@13%)
Material Usage/Zone:

Date yyyy/mm/dd	Test No. / Probe (mm)	Location:	Elevation (m)	Dry Density (kg/m³)	MC %	Max. Dry Density	Opt. MC %	Comp % SPD
2013/02/08	**127** / 250	N 7086907 E 484032	936	1769	7.5	2080	13	**<90**
	128 / 250	N 7086918 E 484037	936	1498	6.4	2080	13	**<90**
	129 / 250	N 7086927 E 484043	937	1569	6.8	2080	13	**<90**
	130 / 250	N 7086927 E 484032	937	1660	8.0	2080	13	**<90**
	131 / 250	N 7086903 E 484035	935	1521	9.0	2080	13	**<90**
	132 / 250	N 7086913 E 484040	935	1612	7.7	2080	13	**<90**

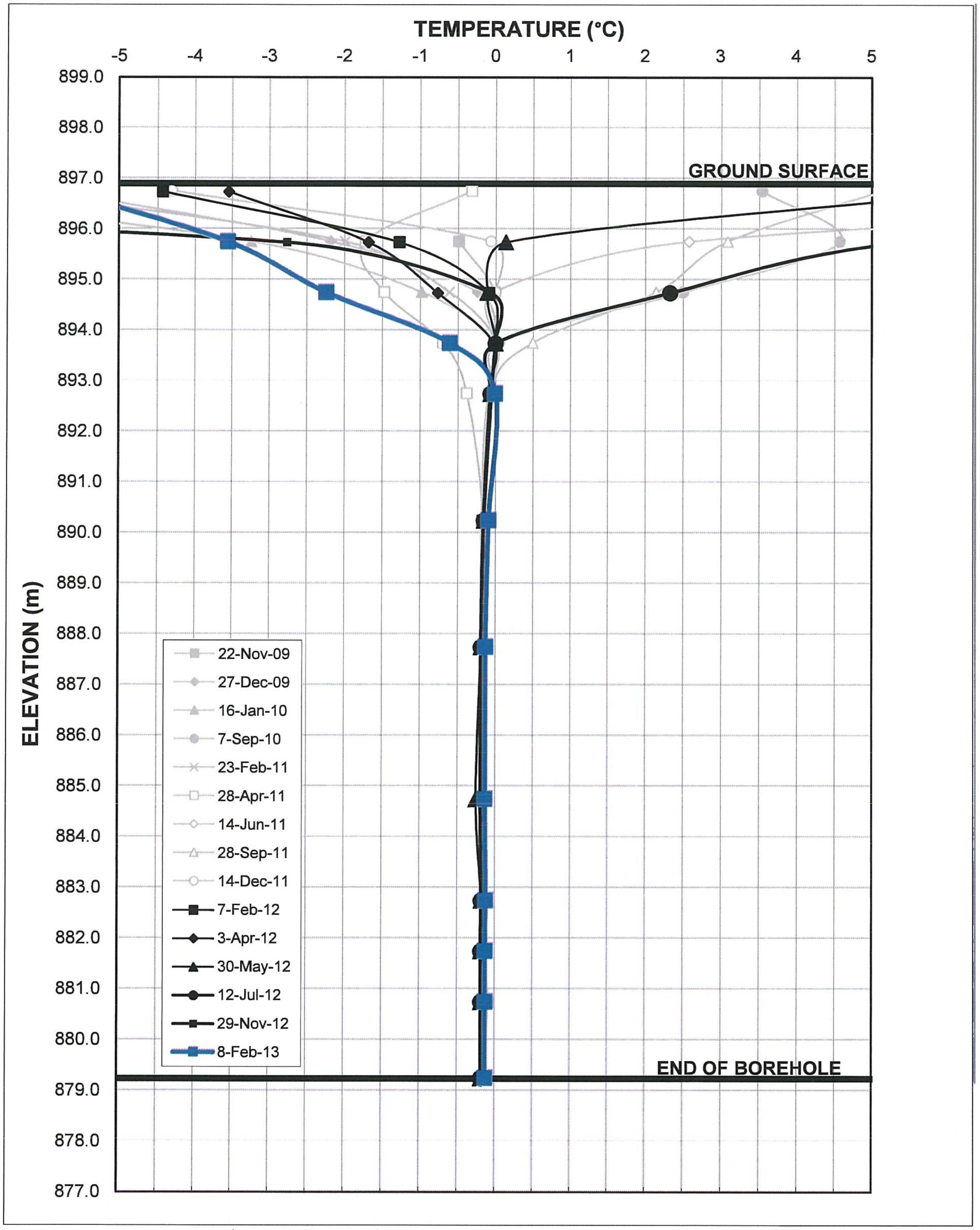
Remarks:

Copies:

Reviewed By: [signature]

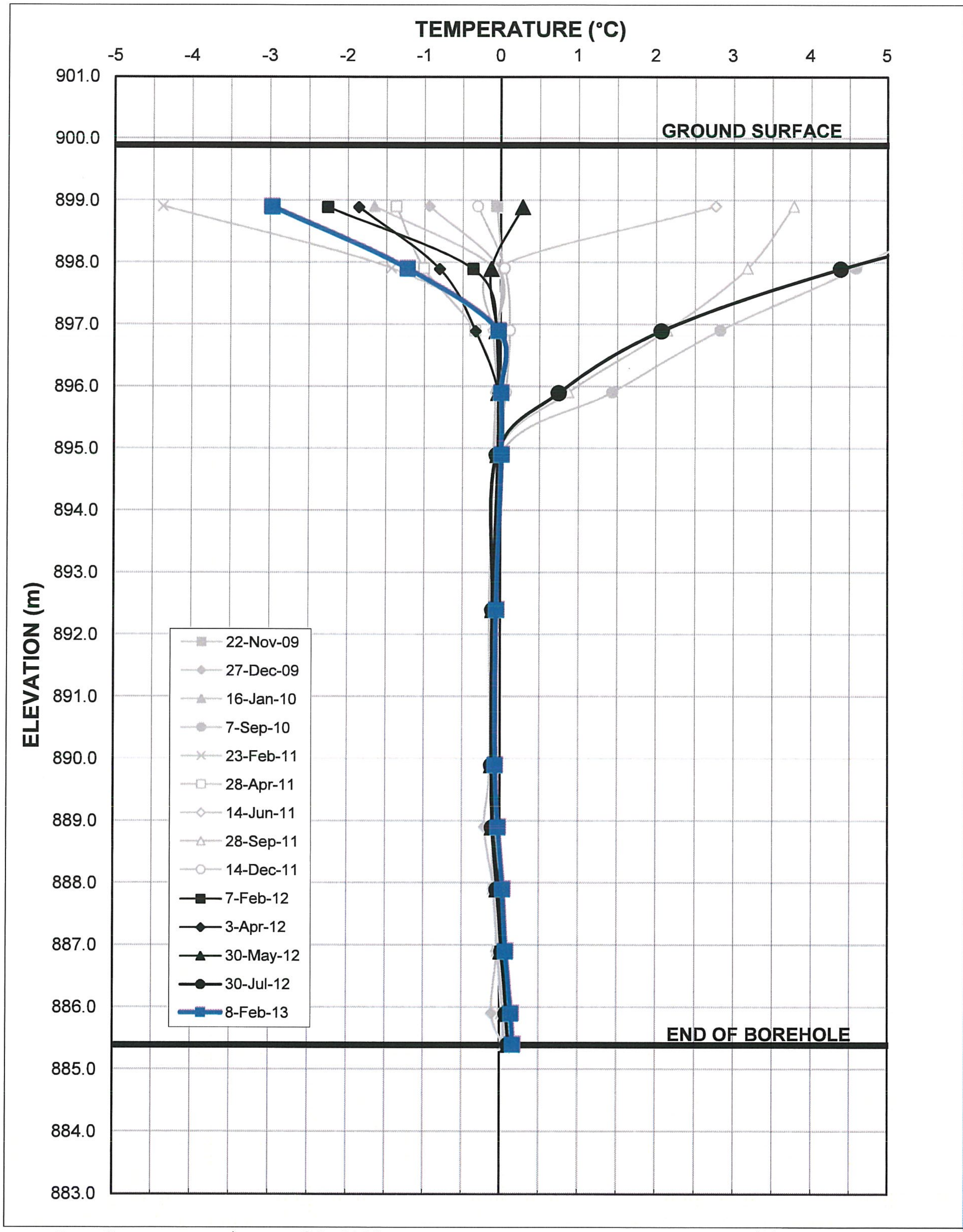
Data presented hereon is for the sole use of the stipulated client. EBA is not responsible, nor can be held liable, for use made of this report by any other party, with or without the knowledge of EBA. The testing services reported herein have been performed by an EBA technician to recognized industry standards, unless otherwise noted. No other warranty is made. These data do not include or represent any interpretation or opinion of specification compliance or material suitability. Should engineering interpretation be required, EBA will provide it upon written request.

eba
A TETRA TECH COMPANY

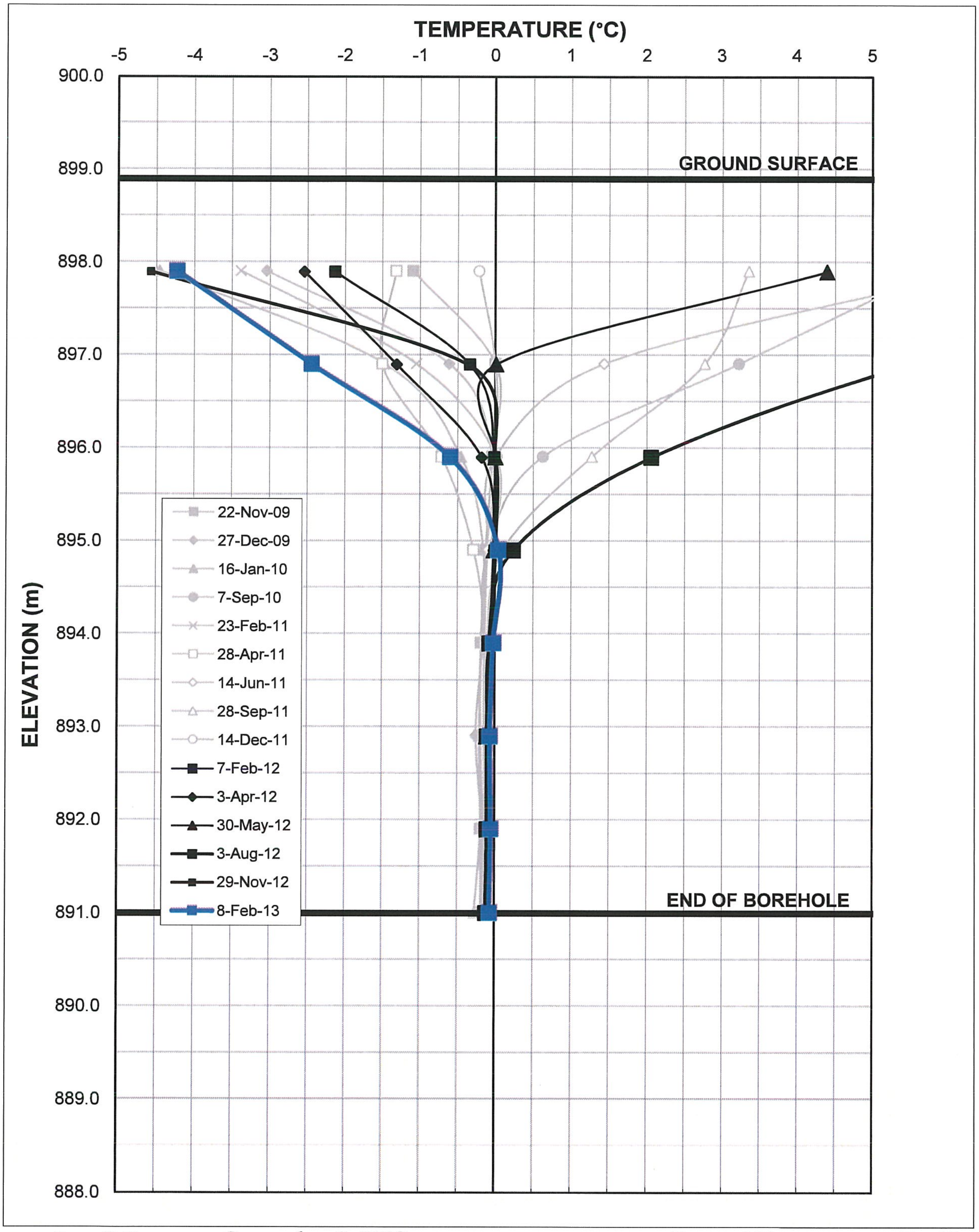


Install Date	August 30, 2009
Last Updated	February 8, 2013
Cable No:	2207

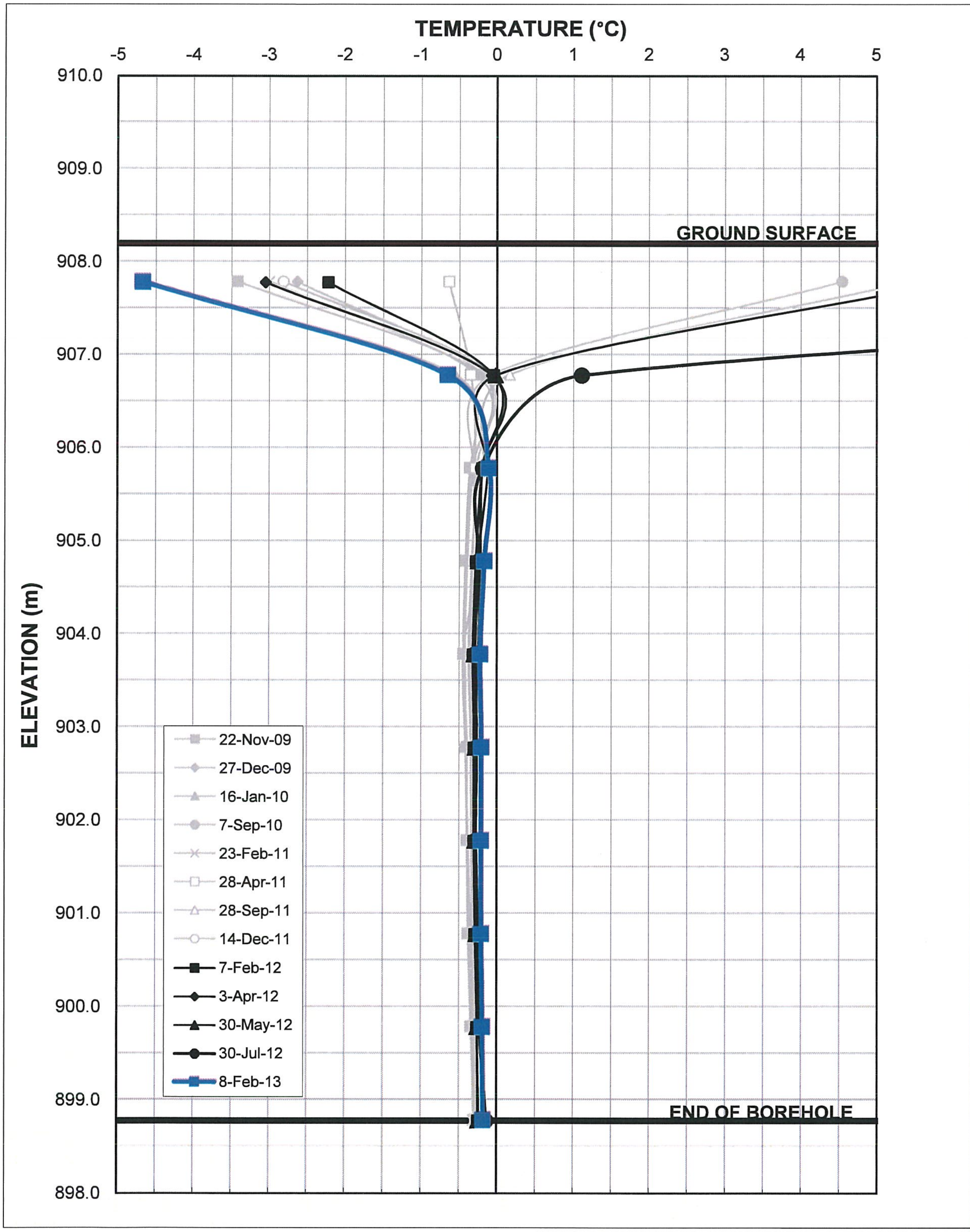
Ground Temperature Profile
Keno Hill District Mill Site Borehole BH15
Figure T1



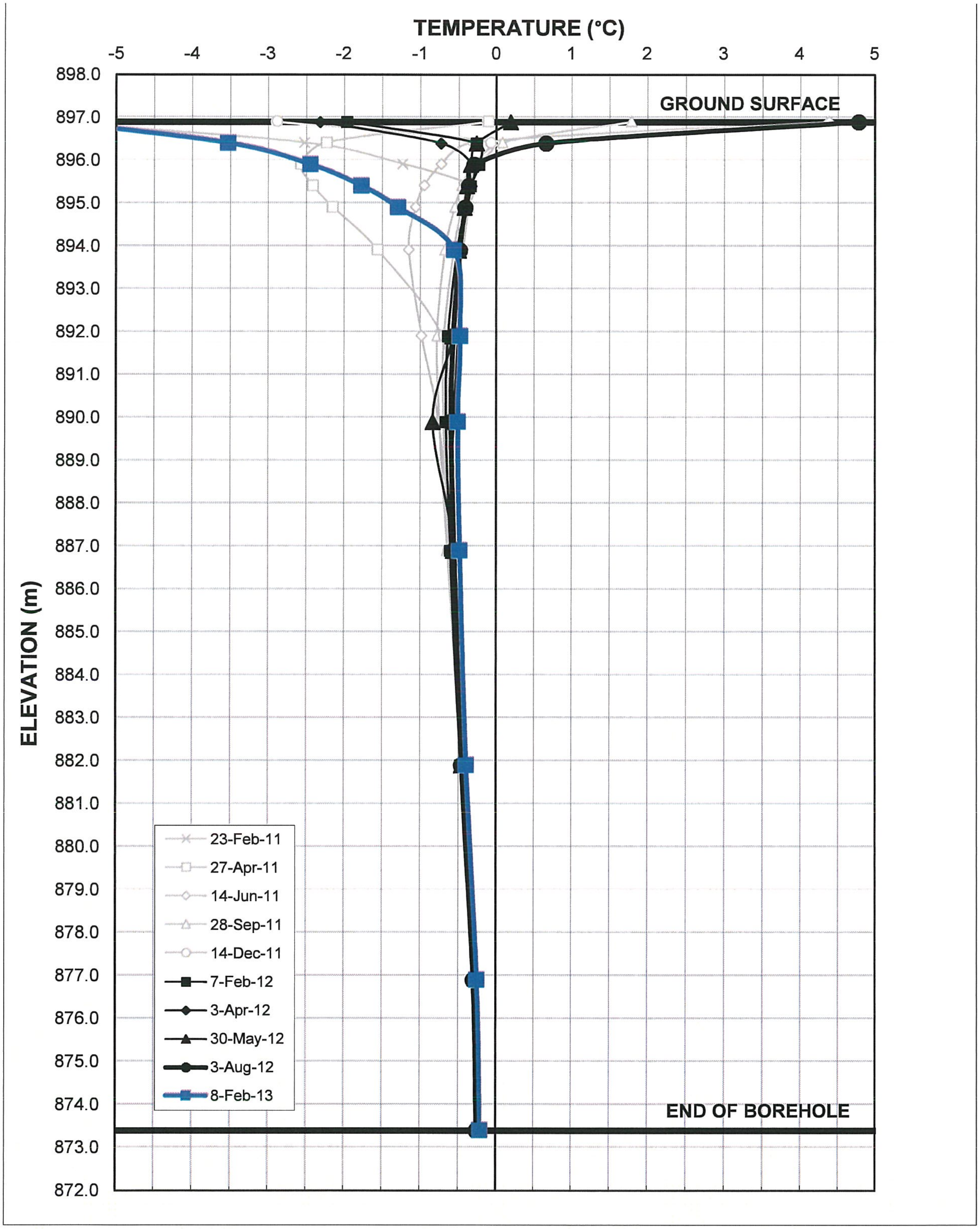
Install Date	August 30, 2009	**Ground Temperature Profile**
Last Updated	February 8, 2013	**Keno Hill District Mill Site Borehole BH17**
Cable No:	2208	**Figure T2**



Install Date	September 2, 2009	**Ground Temperature Profile**
Last Updated	February 8, 2013	**Keno Hill District Mill Site Borehole BH18**
Cable No:	2209	**Figure T3**

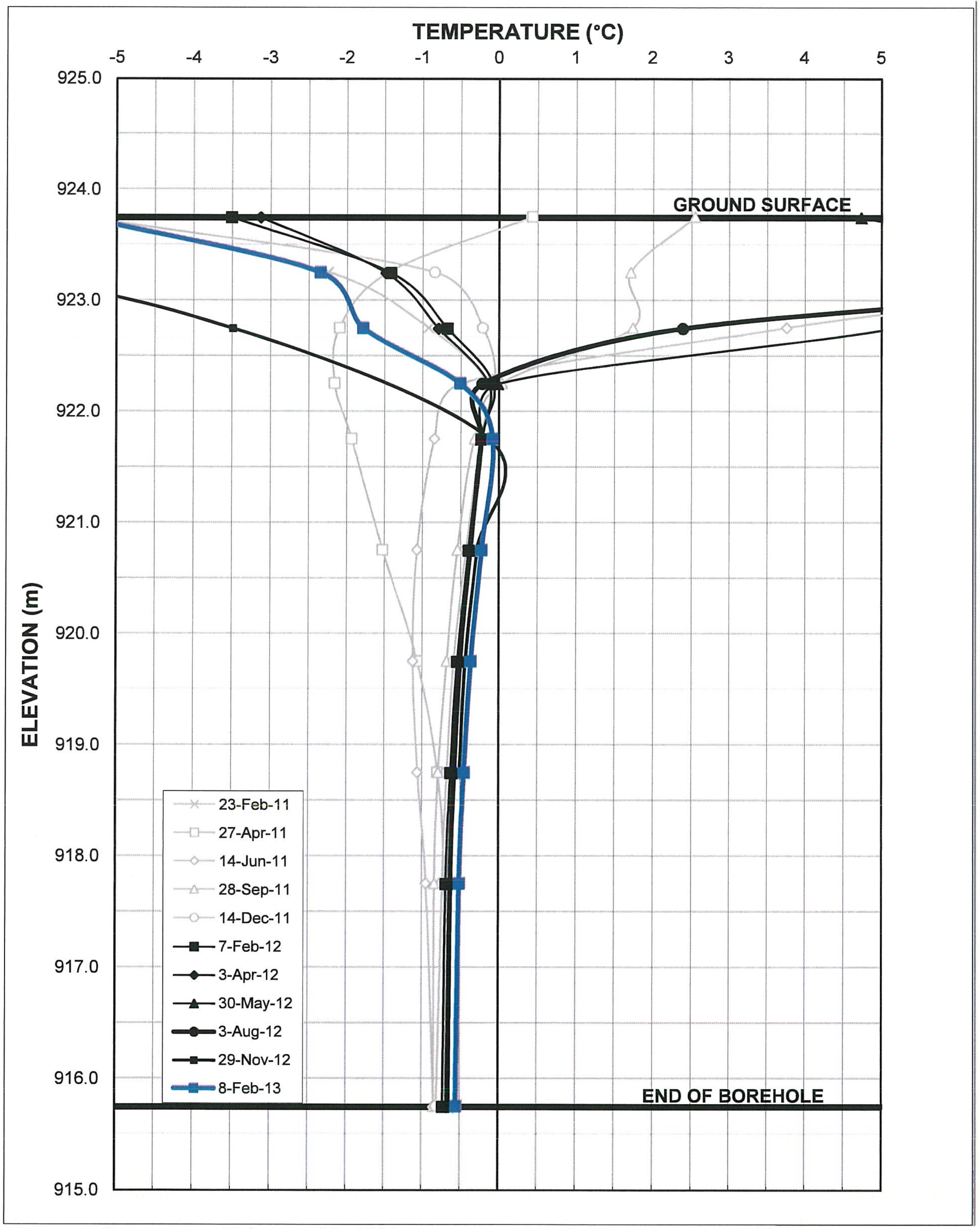


Install Date	September 29, 2009		**Ground Temperature Profile**
Last Updated	February 8, 2013		**Keno Hill District Mill Site Borehole BH23**
Cable No:	2210		**Figure T4**

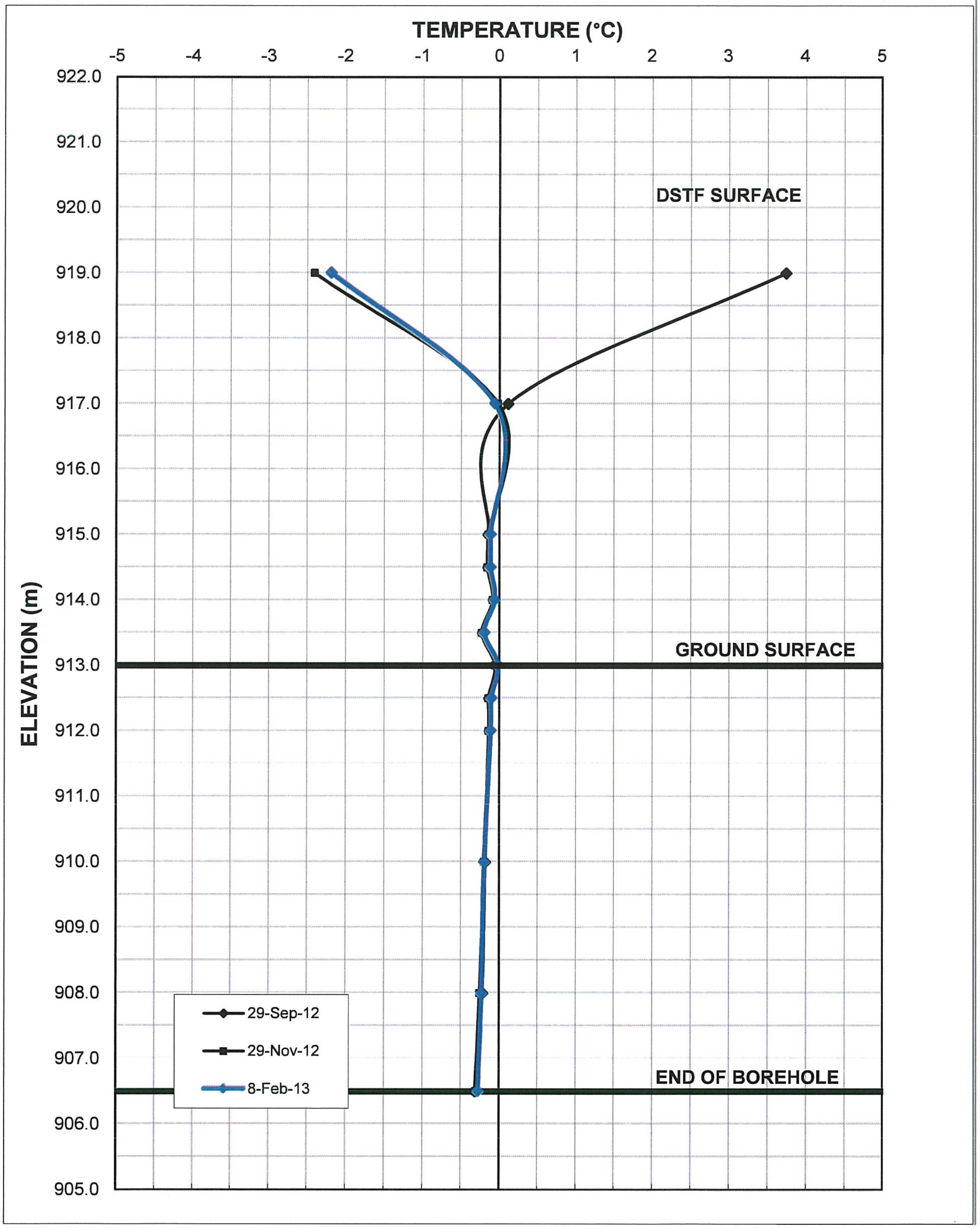


Install Date February 22, 2011
Last Updated February 8, 2013
Cable No: 2263

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH31
Figure T5



Install Date	February 22, 2011		**Ground Temperature Profile**
Last Updated	February 8, 2013		**Keno Hill District Mill Site Borehole BH32**
Cable No:	2264		**Figure T6**



Install Date	August 2, 2012	**Ground Temperature Profile**
Last Updated	February 8, 2013	**Keno Hill District Mill Site Borehole BH40**
Cable No:		**Figure T7**

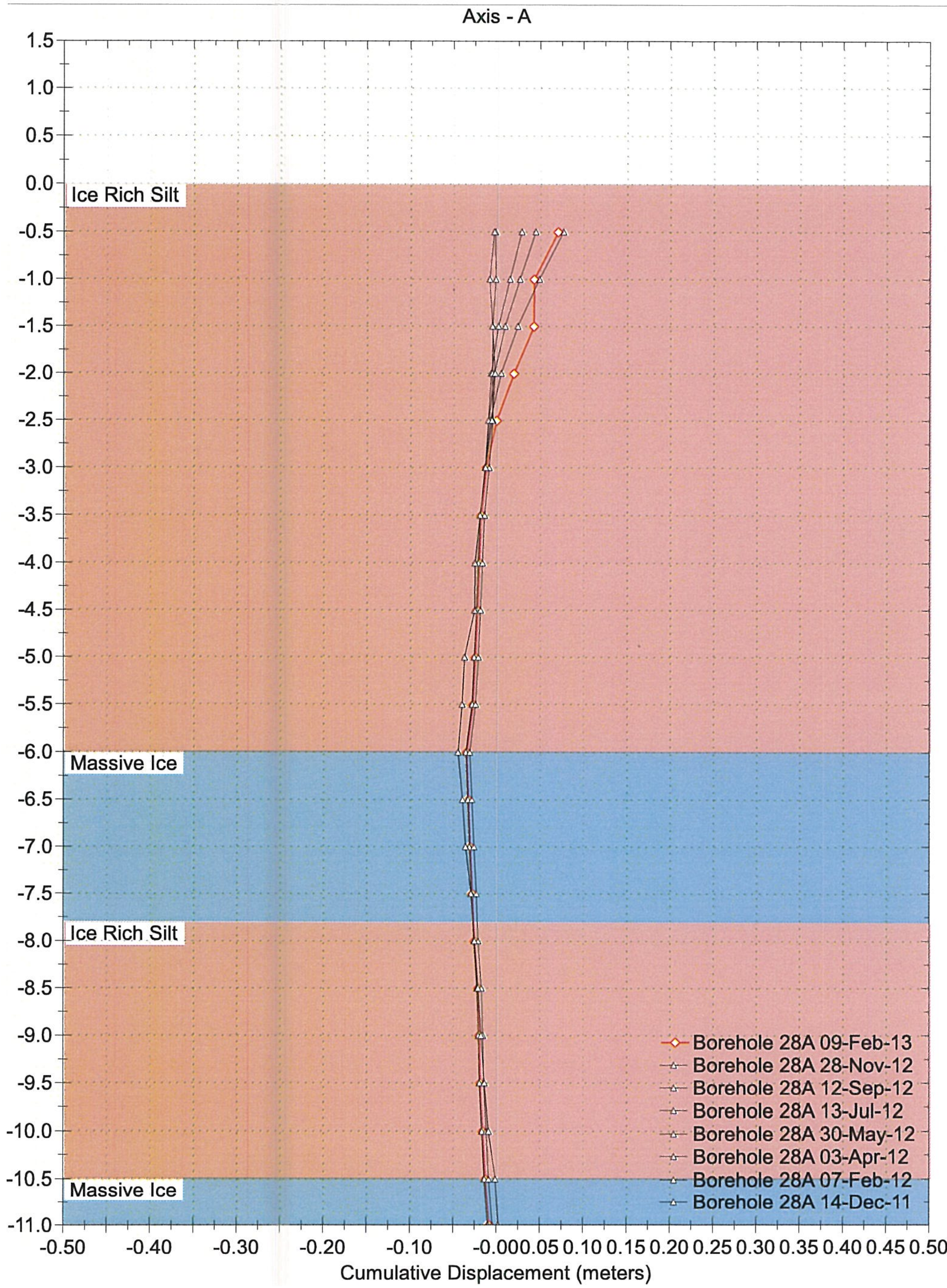
RST Instruments Ltd.

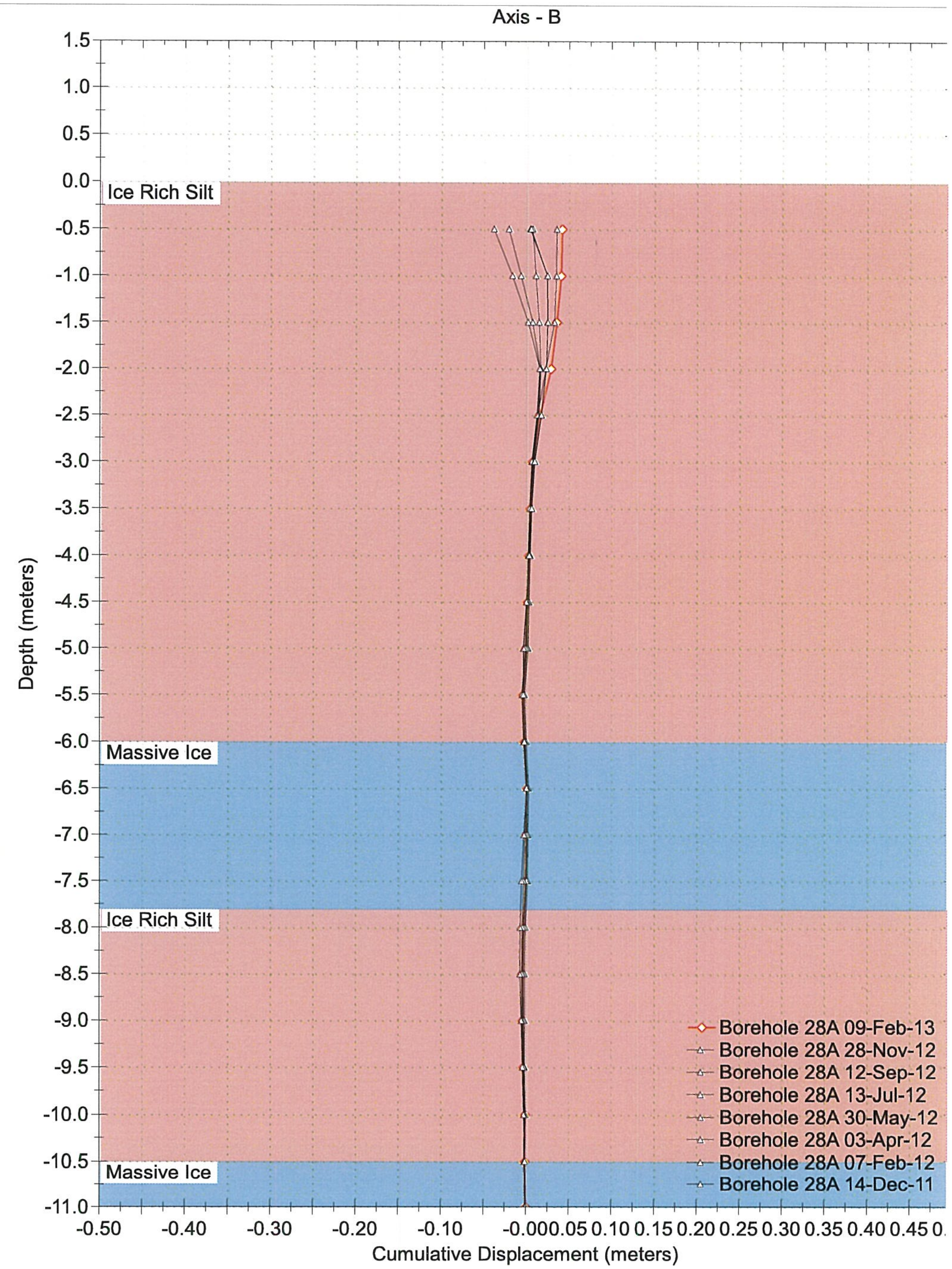
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.43.

Borehole : Borehole 28A
Project : Keno Hill District Mill
Location :
Northing :
Easting :
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 11.0 meters
A+ Groove Azimuth :
Base Reading : 2011 Oct 07 14:56
Applied Azimuth : 0.0 degrees





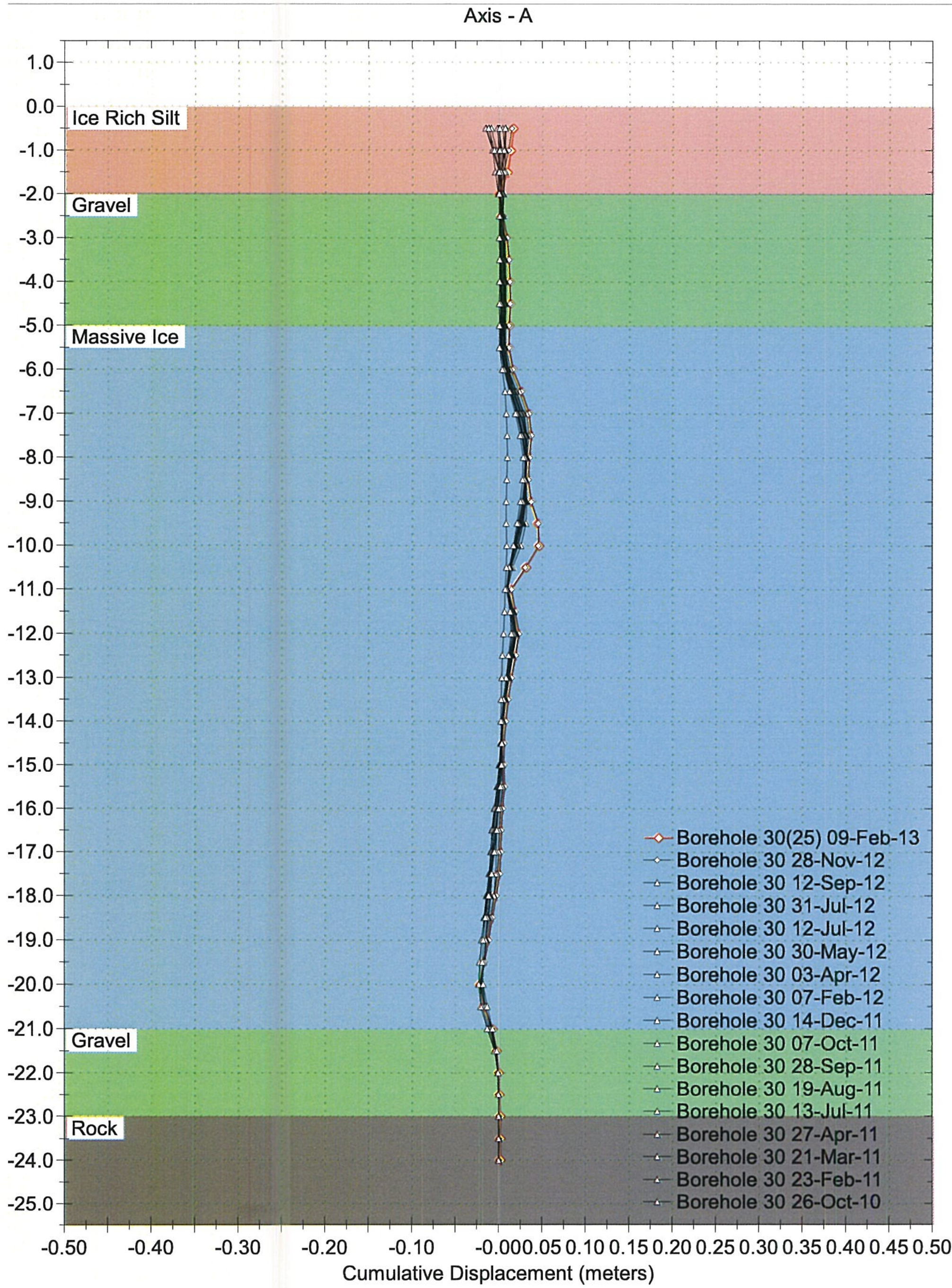
ST Instruments Ltd.

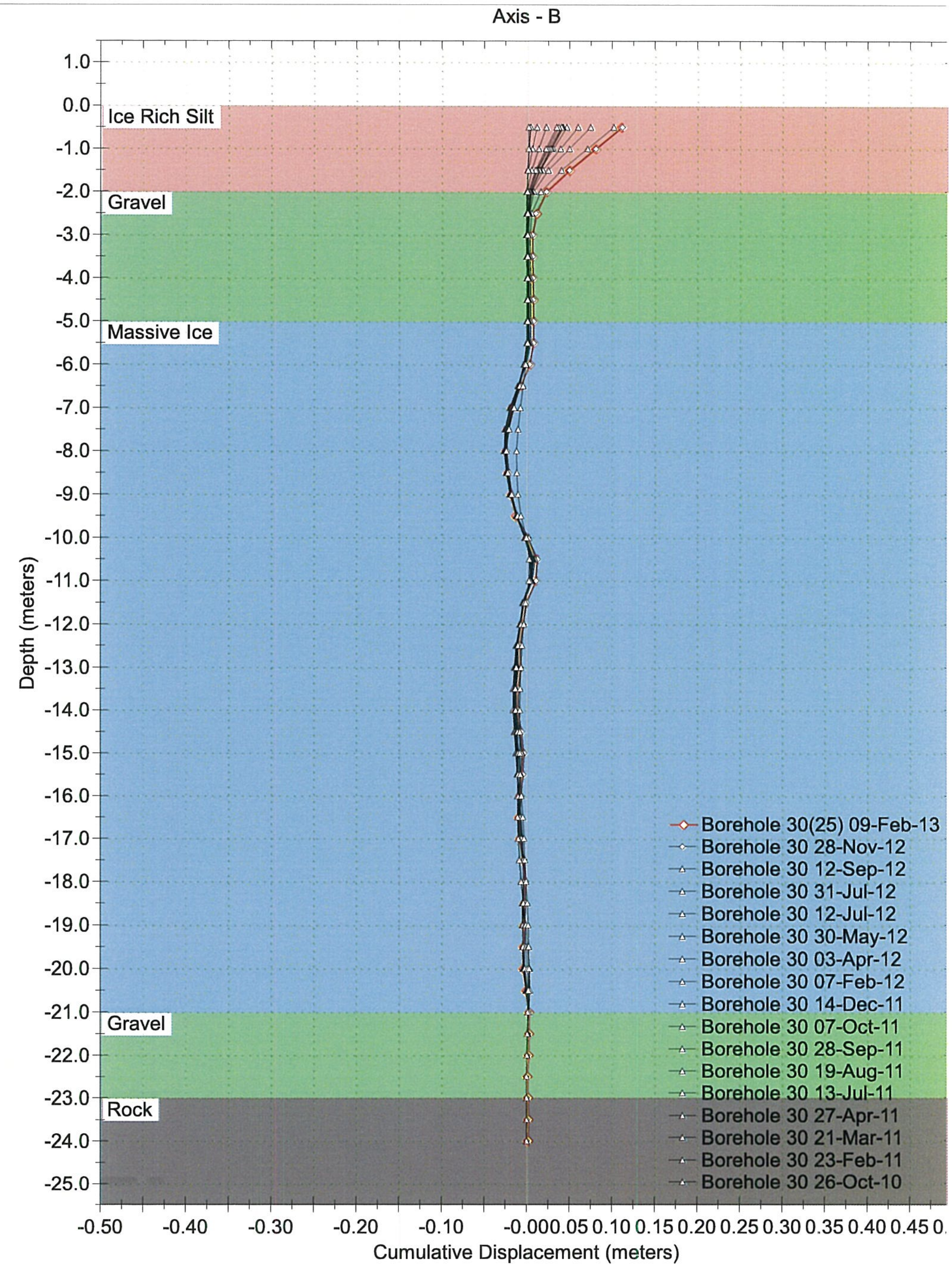
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.43.

orehole : Borehole 30
roject : Keno Hill District Mill
ocation : DSTF
orthing : 7087032
asting : 483969
ollar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 24.0 meter
A+ Groove Azimuth :
Base Reading : 2010 Sep 12 08:5
Applied Azimuth : 0.0 degrees





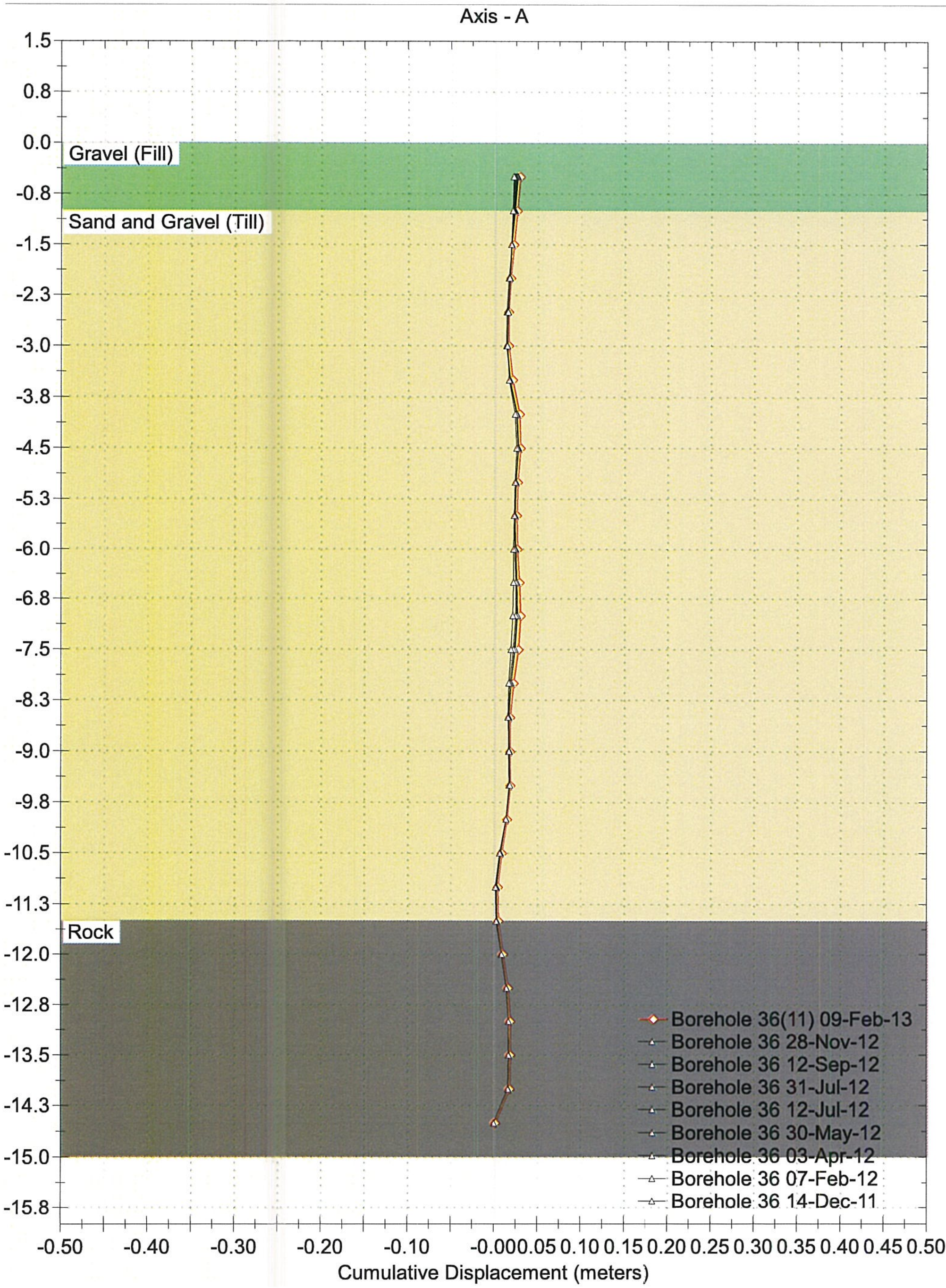
ST Instruments Ltd.

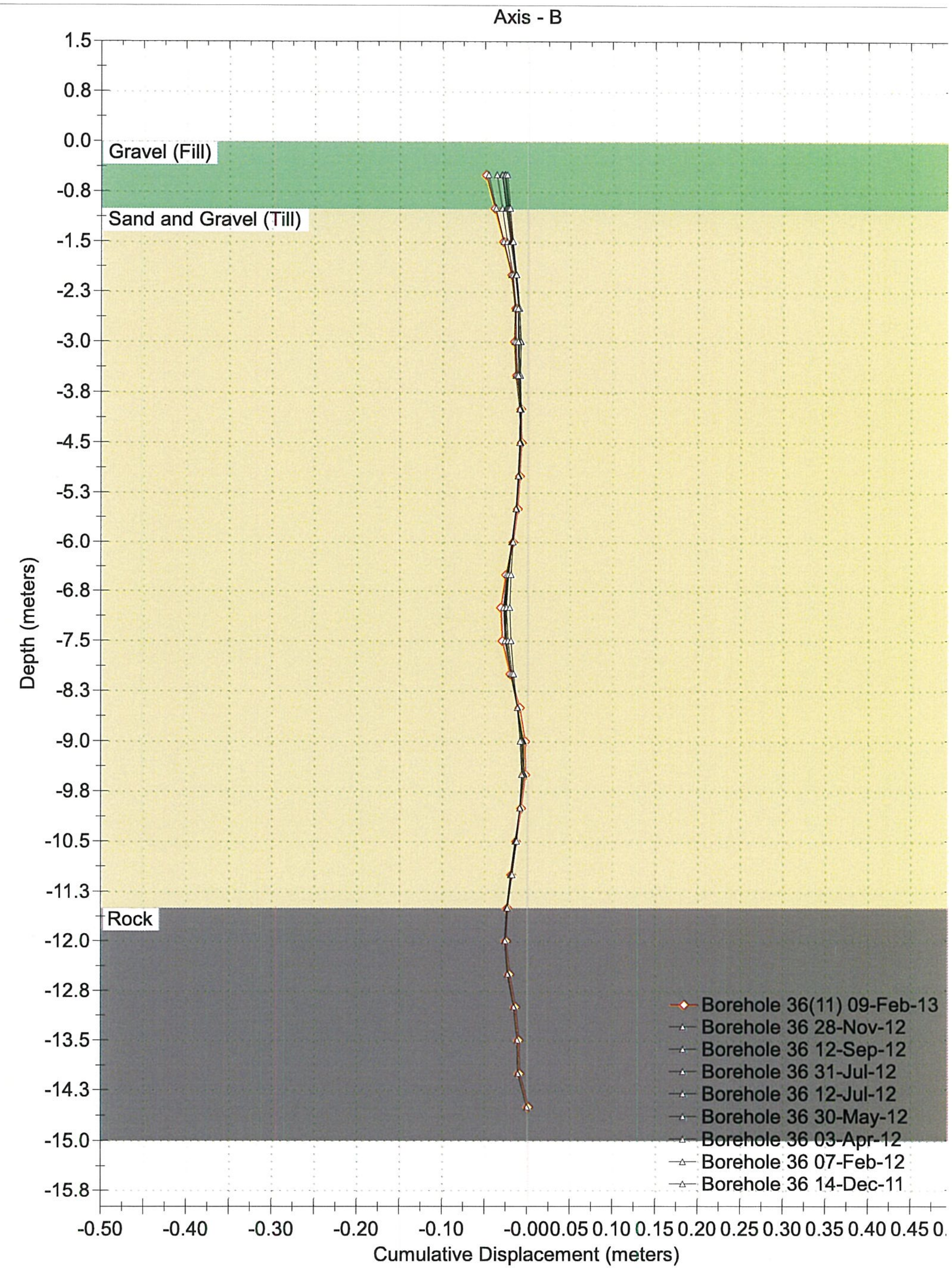
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.43.

orehole : Borehole 36
roject : Keno Hill District Mill
ocation :
orthing :
asting :
ollar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 14.0 meters
A+ Groove Azimuth :
Base Reading : 2011 Oct 07 14:04
Applied Azimuth : 0.0 degrees





EBA Engineering Consultants Ltd. operating as EBA, A Tetra Tech Company
Calcite Business Centre, Unit 6, 151 Industrial Road
Whitehorse, YT Y1A 2V3 CANADA
p. 867.668.3068 f. 867.668.4349

TECHNICAL MEMO

ISSUED FOR USE

TO:	Katherine Penney	**DATE:**	April 24, 2013
C:	Vanessa Benwood / Darrin Morrell	**MEMO NO.:**	015
FROM:	Ian MacIntyre, EIT	**EBA FILE:**	W14103144-01

SUBJECT: DSTF Instrumentation and Construction Monitoring
Keno Hill District Mill Site

1.0 INTRODUCTION

Alexco Resource Corp (Alexco) retained EBA, A Tetra Tech Company (EBA) to observe construction and operation activities associated with the Dry Stacked Tailings Facility (DSTF) at the Keno Hill District Mill Site. Activities related to the DSTF are to be carried out in accordance with the following documents:

- Operation, Maintenance, and Surveillance Manual, Dry Stack Tailings Facility, Keno Hill District Mill, YT
- Quarter 1 Tailings Placement Provisions, Keno Hill District Mill Site, Yukon
- Runoff Diversion Structure Specs, Dry Stacked Tailings Facility, Keno Hill District Mill, YT
- Detailed Design, Dry Stacked Tailings Facility, Keno Hill District Mill Site, Yukon

This memo summarizes the on-going monitoring of the DSTF completed by EBA on April 2 and 3, 2013.

2.0 WORK COMPLETED

EBA completed compaction testing while on site, however due to the placement of loose tailings material over the majority of the exposed DSTF, only 3 tests were completed. The compaction results including the UTM coordinates and elevations (NAD83 datum) of each test are attached to this memo. Test locations were recording with a handheld GPS accurate to within 5 m horizontally and unknown accuracy vertically. Sample driving, a complimentary density testing method, was also attempted but discontinued due to the tailings being frozen.

EBA has been collecting ground temperature cable (GTC) readings since November 2009 and slope indicator (SI) readings since September 2010 at the DSTF. During the April 2013 site visit, EBA collected GTC readings from boreholes BH15, BH17, BH18, BH23, BH31, BH32, and BH40; and SI readings from boreholes BH28, BH30, and BH36. Current GTC and slope indicator readings are attached to this memo.

As with the previous inspection, only a partial set of SI readings were collected from BH28 during the site visit. BH28 was previously damaged and the SI readings below 11 m are not reliable. Therefore, only SI readings above 11 m are included in the attached displacement plots.

3.0 DISCUSSION

EBA completed three compaction tests on exposed tailings during the site visit. All compaction tests failed to meet the compaction requirements stated in the Operation, Maintenance, and Surveillance Manual and as required by the Detailed Design, Dry Stacked Tailings Facility, Keno Hill District Mill, YT. The compaction records are attached to this memo. The deficient compaction results are likely due to tailings freezing before adequate compaction is achieved. As per the recommendations contained in Preliminary Engineering Design and Management Plan, the frozen tailings should be hauled to a location within the DSTF (at least 30 m from any edge) and placed in a loose state. These frozen tailings should not be covered until they have thawed and are properly compacted.

Ongoing GTC and slope indicator readings provide a baseline for the site and monitor any changes during DSTF construction and operation. To date, no readings requiring additional review have been recorded. However as stated in the previous inspection memo dated February 27 2013, EBA continues to recommend that the damaged slope indicator in BH28 be replaced when possible.

4.0 CLOSURE

The next site visit is scheduled for May 2013; dates will be confirmed with Alexco site personnel.

We trust this memo meets your present requirements. Should you have any questions or comments, please contact us.

COMPACTION DENSITY TEST SUMMARY REPORT

ASTM Designation D2922 & D3017

Project: Dry Stacked Tailings Facility
Keno Hill Mine District
Project No.: W14103144-01
Client: Alexco Resource Corporation
Attention:
Contractor: Alexco Resource Corporation

Test Apparatus: Nuclear **Troxler No:** 38813/63324
Specified Compaction: 95 % Std. Proctor Max. Dry Density
Specified Moisture (MC):
Temperature **Air:** -10 °C **Soil:** °C
Date Tested: See below **By:** IM
Construction Period:

Soil Description: Tailings (2080@13%)

Material Usage/Zone:

Date yyyy/mm/dd	Test No. / Probe (mm)	Location:	Elevation (m)	Dry Density (kg/m³)	MC %	Max. Dry Density	Opt. MC %	Comp % SPD
2013/02/08	**127** / 250	N 7086907 E 484032	936	1769	7.5	2080	13	**<90**
	128 / 250	N 7086918 E 484037	936	1498	6.4	2080	13	**<90**
	129 / 250	N 7086927 E 484043	937	1569	6.8	2080	13	**<90**
	130 / 250	N 7086927 E 484032	937	1660	8.0	2080	13	**<90**
	131 / 250	N 7086903 E 484035	935	1521	9.0	2080	13	**<90**
	132 / 250	N 7086913 E 484040	935	1612	7.7	2080	13	**<90**
2013/04/02	**133** / 300	N 7086944 E 0484013	938	1926	8.2	2080	13	**92.6**
	134 / 250	N 7086948 E 0484010	937	1925	7.8	2080	13	**92.5**
	135 / 200	N 7086946 E 0484007	937	1909	7.7	2080	13	**91.8**

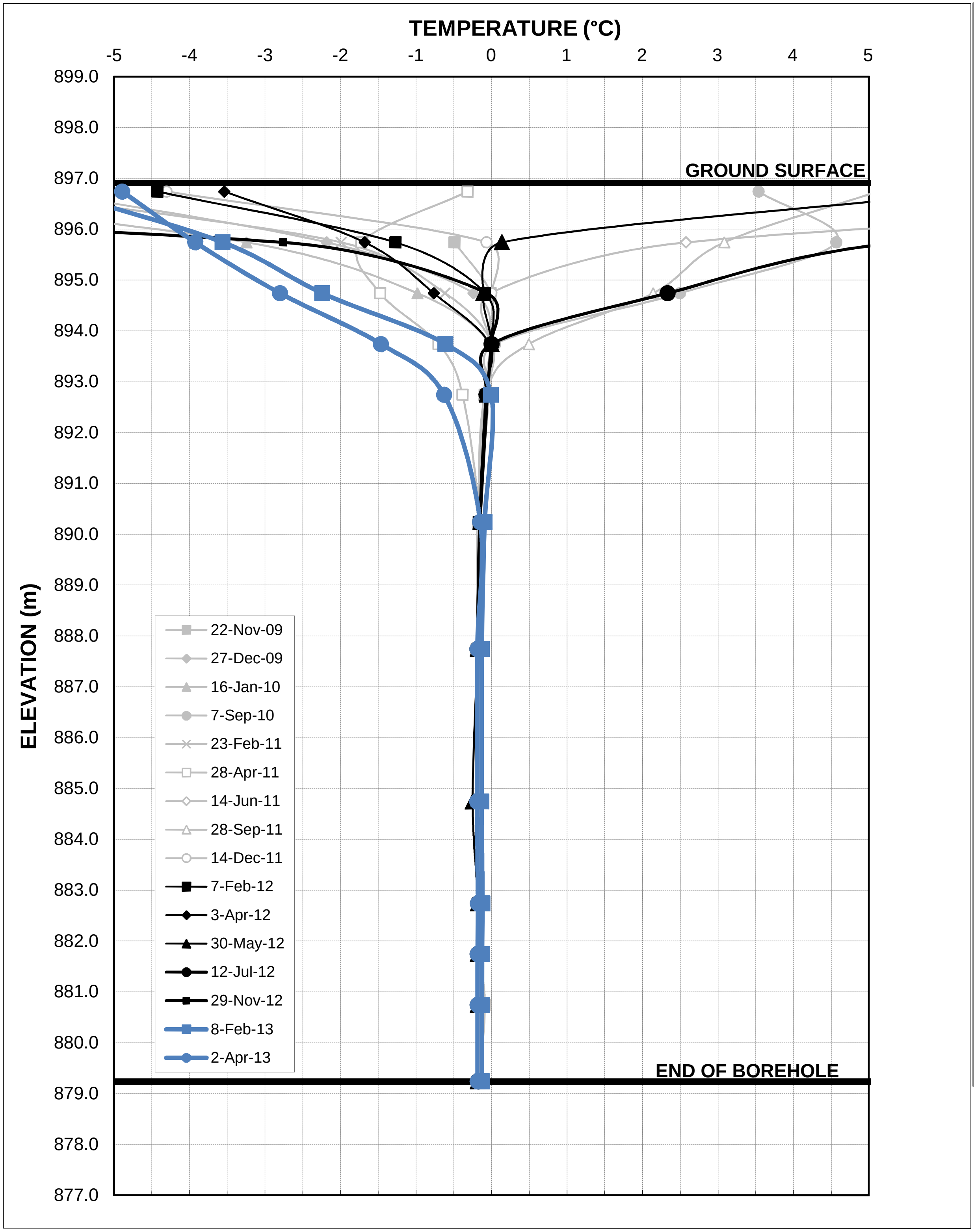
Remarks:

Copies:

Reviewed By: [signature] P.Eng.

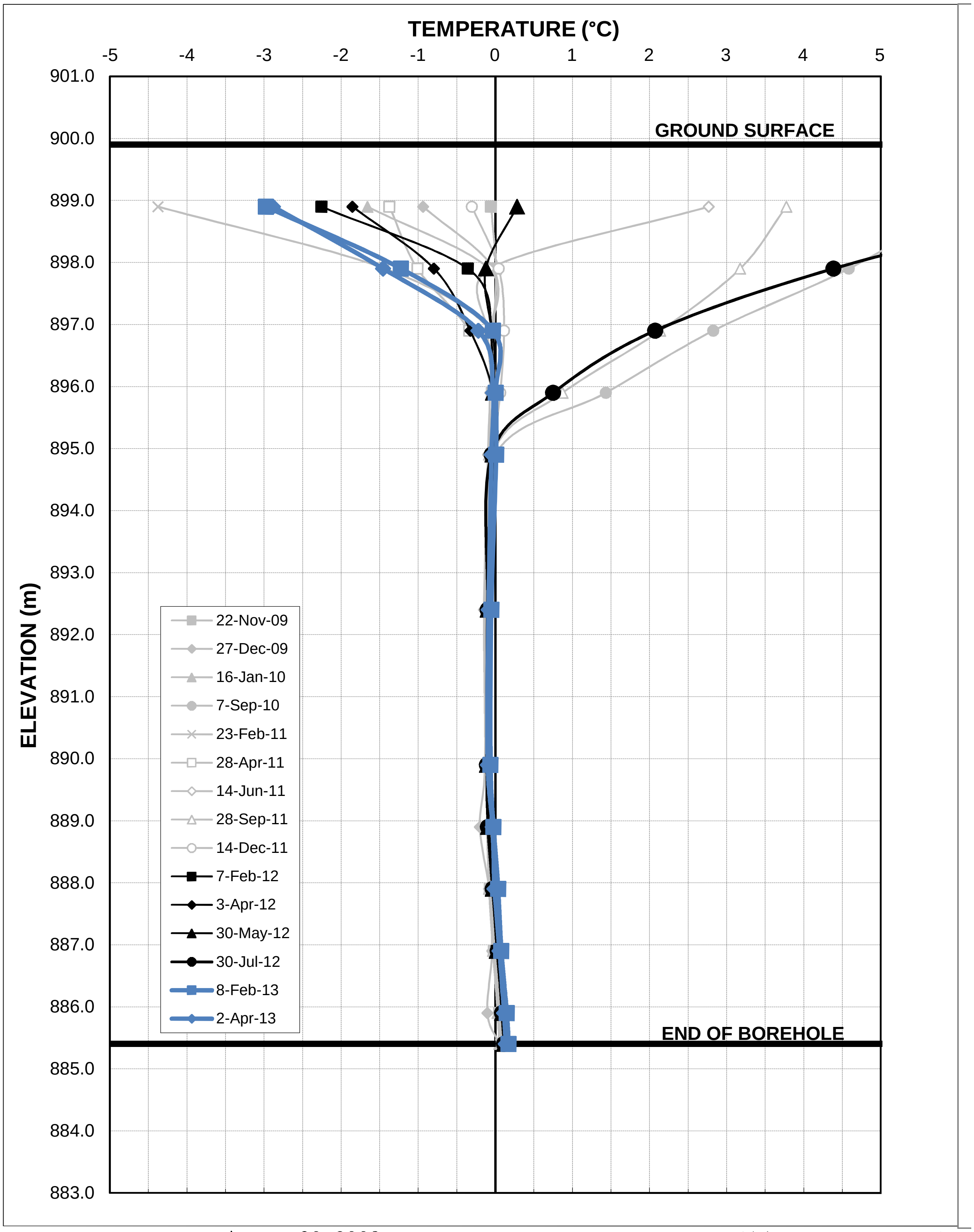
Data presented hereon is for the sole use of the stipulated client. EBA is not responsible, nor can be held liable, for use made of this report by any other party, with or without the knowledge of EBA. The testing services reported herein have been performed by an EBA technician to recognized industry standards, unless otherwise noted. No other warranty is made. These data do not include or represent any interpretation or opinion of specification compliance or material suitability. Should engineering interpretation be required, EBA will provide it upon written request.

eba A TETRA TECH COMPANY

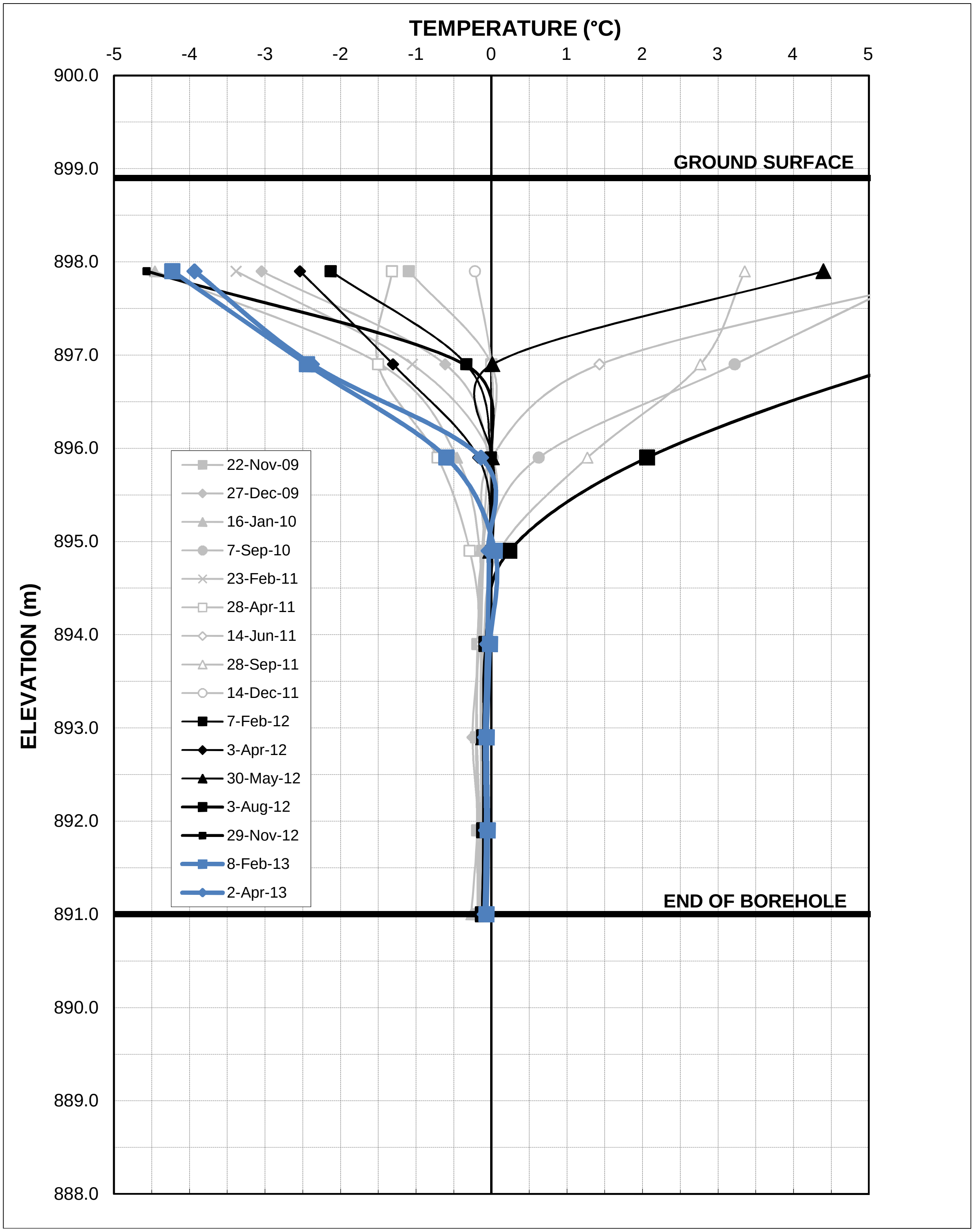


Install Date	August 30, 2009
Last Updated	April 2, 2013
Cable No:	2207

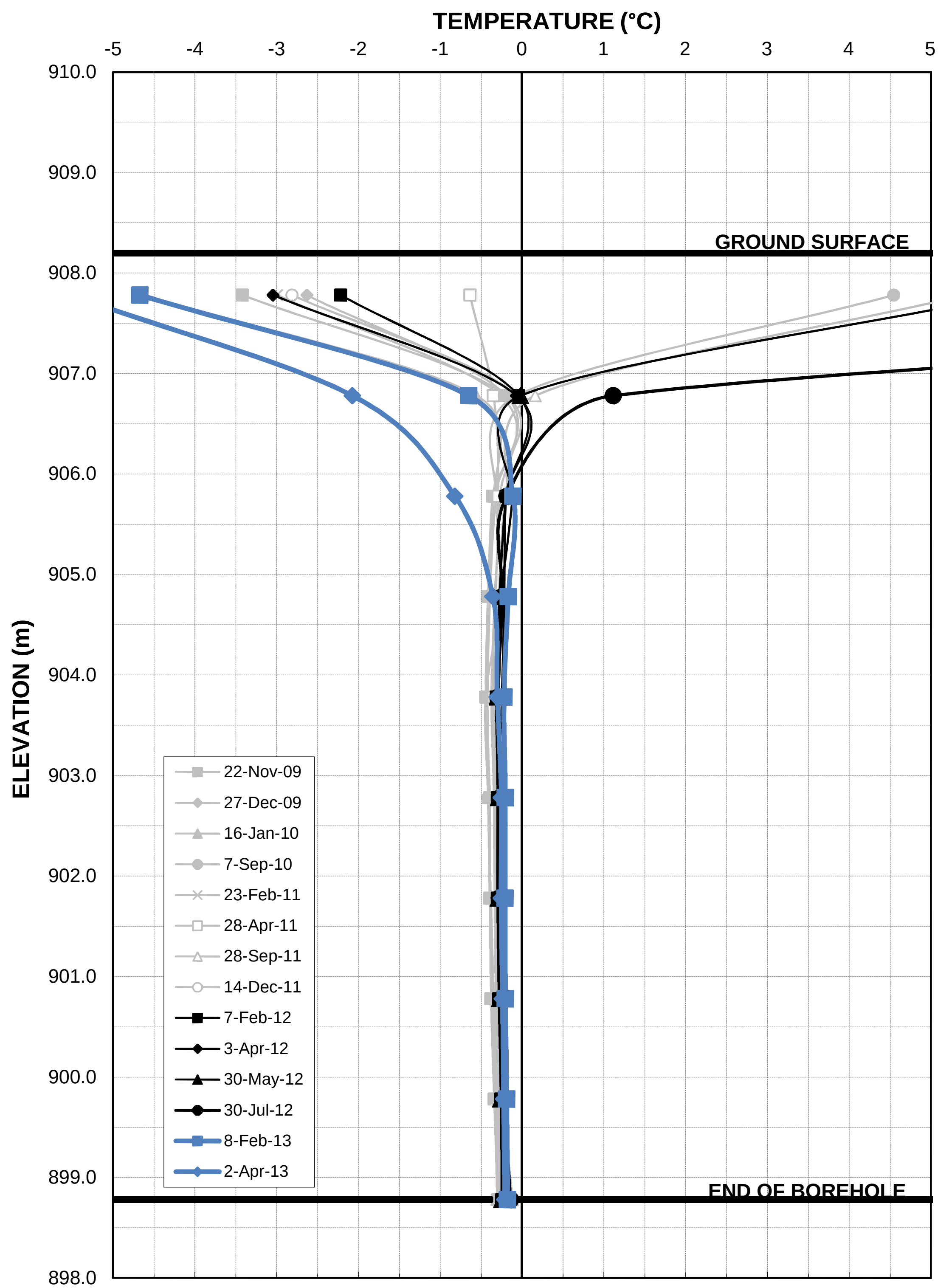
Ground Temperature Profile
Keno Hill District Mill Site Borehole BH15
Figure T1



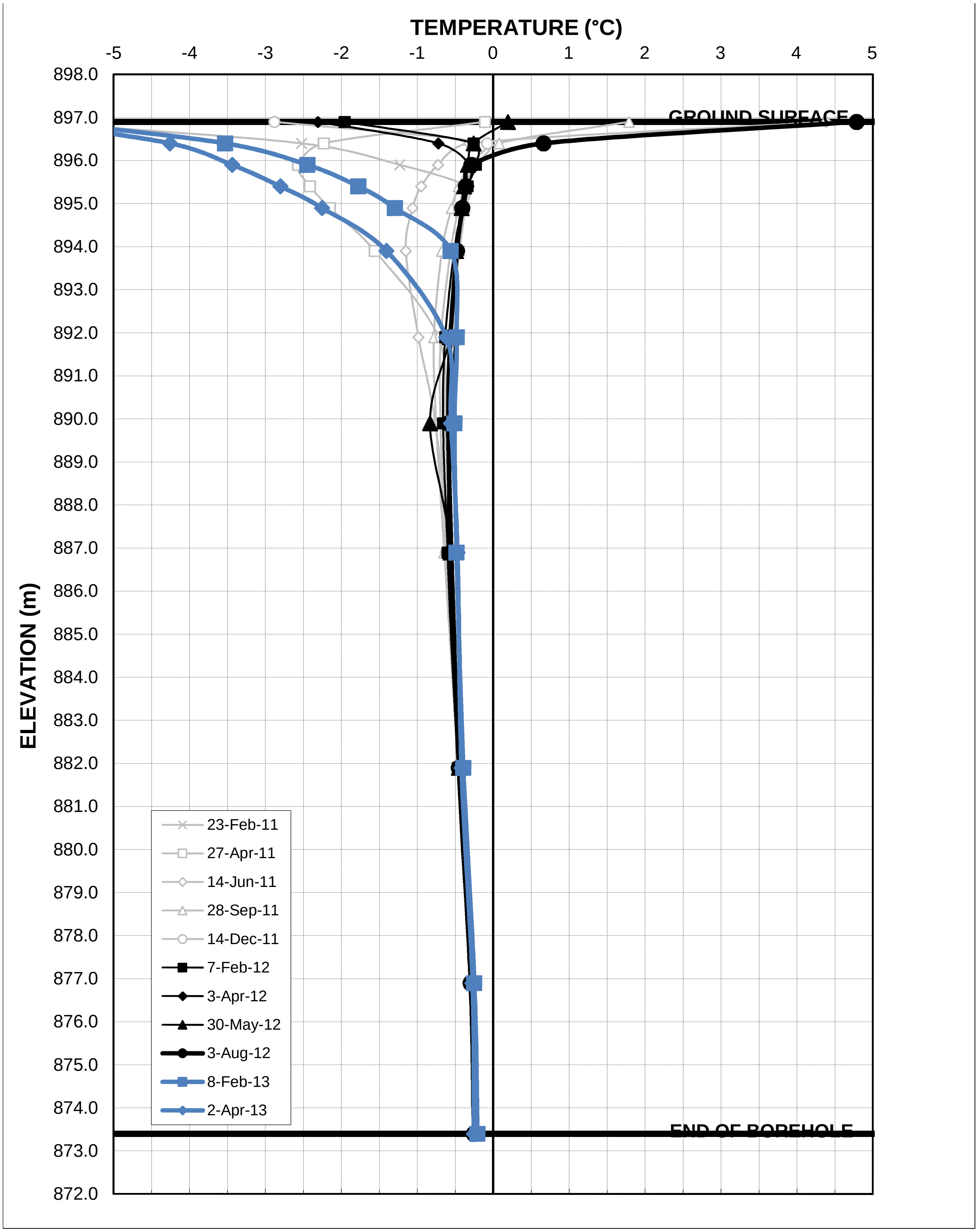
Install Date	August 30, 2009	**Ground Temperature Profile**
Last Updated	April 2, 2013	**Keno Hill District Mill Site Borehole BH17**
Cable No:	2208	**Figure T2**



Install Date	September 2, 2009	**Ground Temperature Profile**
Last Updated	April 2, 2013	**Keno Hill District Mill Site Borehole BH18**
Cable No:	2209	**Figure T3**

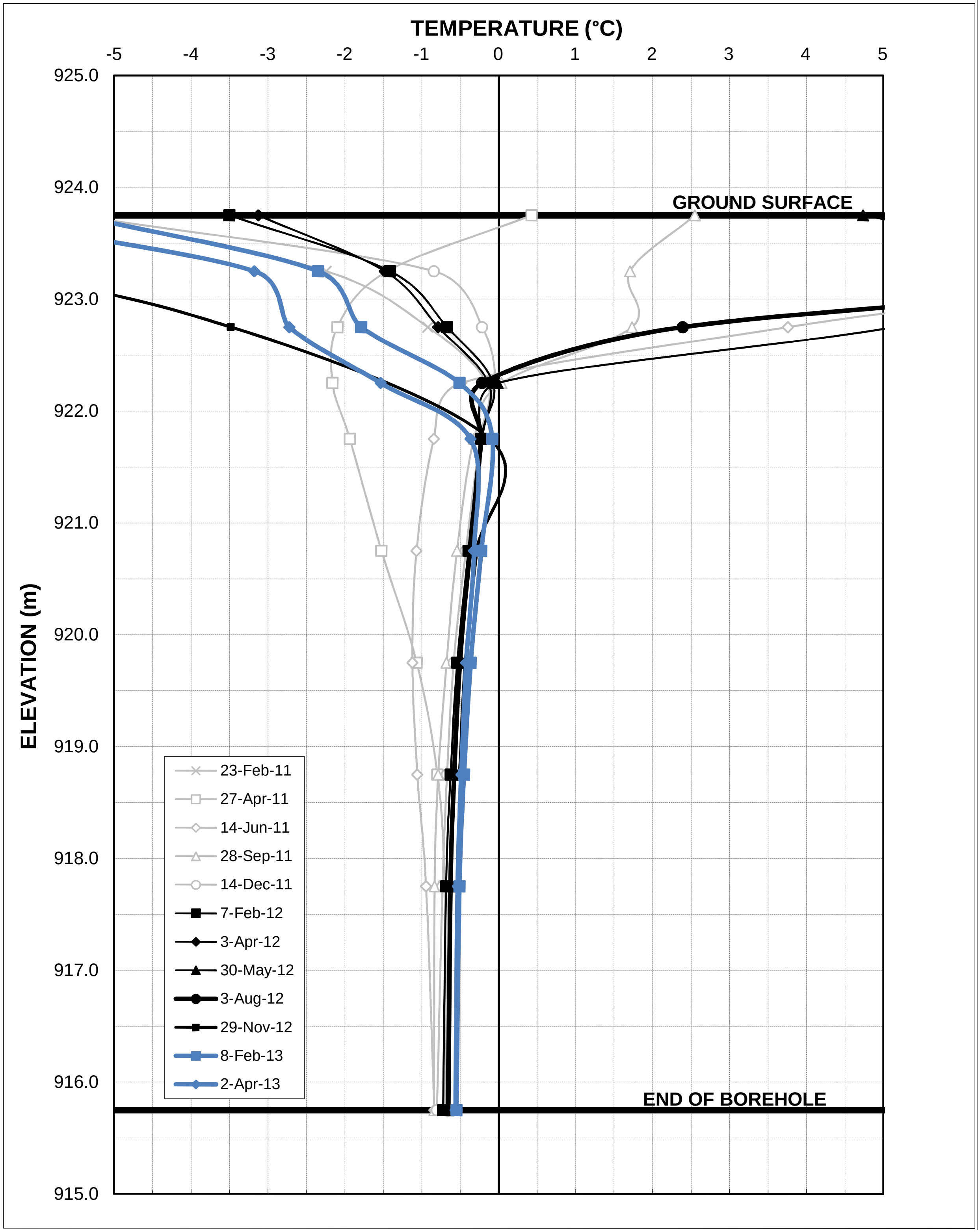


Install Date	September 29, 2009	**Ground Temperature Profile**
Last Updated	April 2, 2013	**Keno Hill District Mill Site Borehole BH23**
Cable No:	2210	**Figure T4**

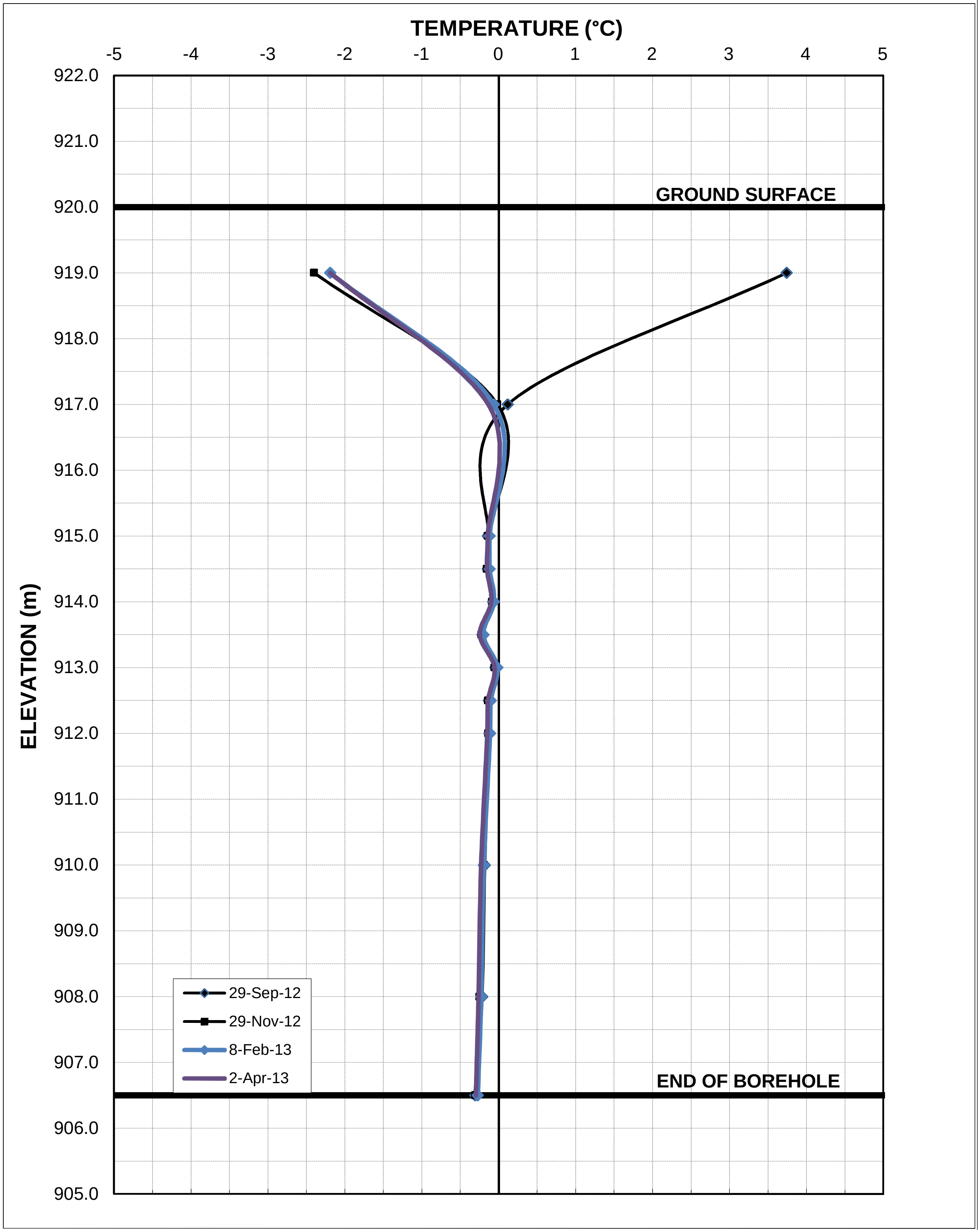


Install Date	February 22, 2011
Last Updated	April 2, 2013
Cable No:	2263

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH31
Figure T5



Install Date	February 22, 2011		**Ground Temperature Profile**
Last Updated	April 2, 2013		**Keno Hill District Mill Site Borehole BH32**
Cable No:	2264		**Figure T6**



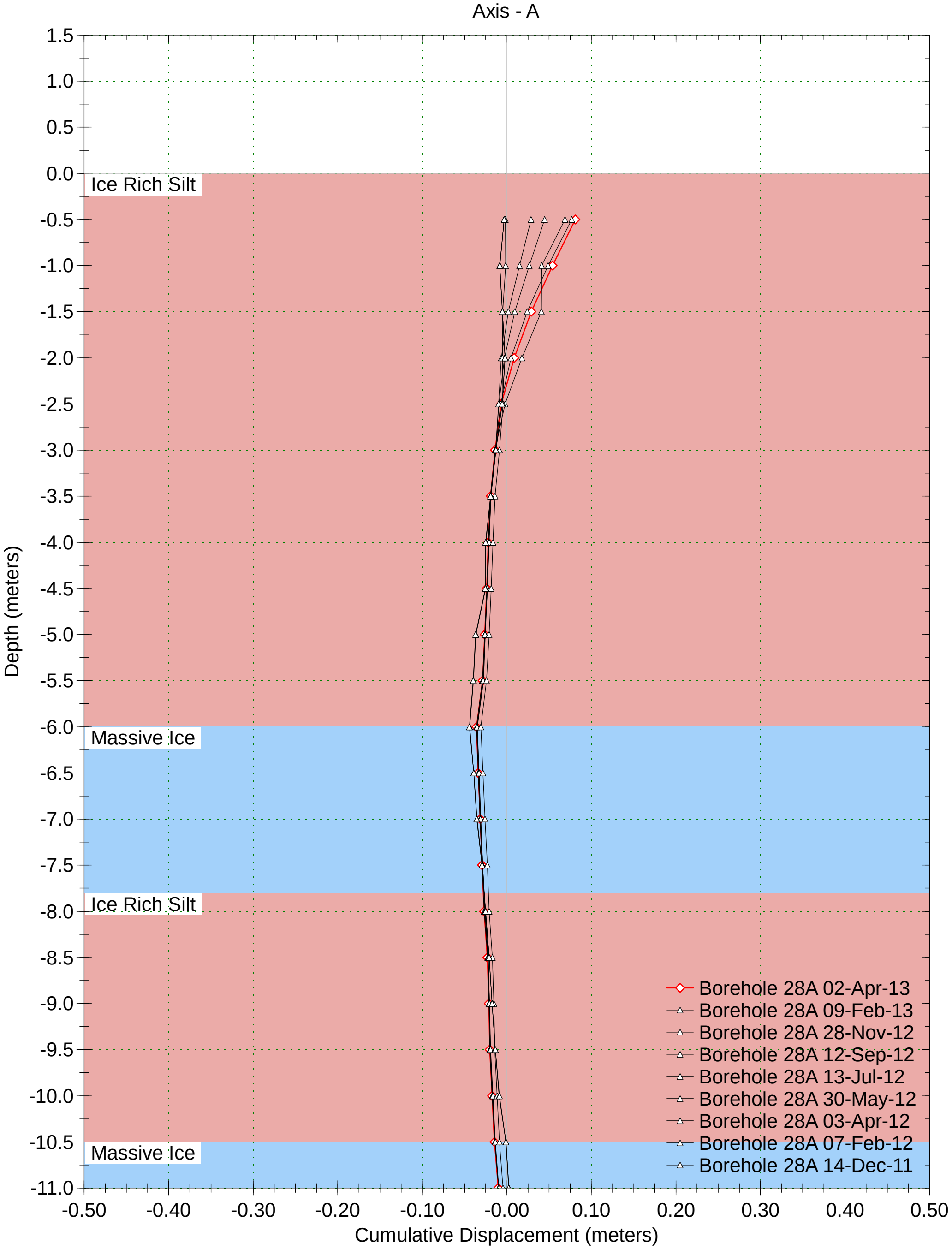
Install Date	August 2, 2012
Last Updated	April 2, 2013
Cable No:	

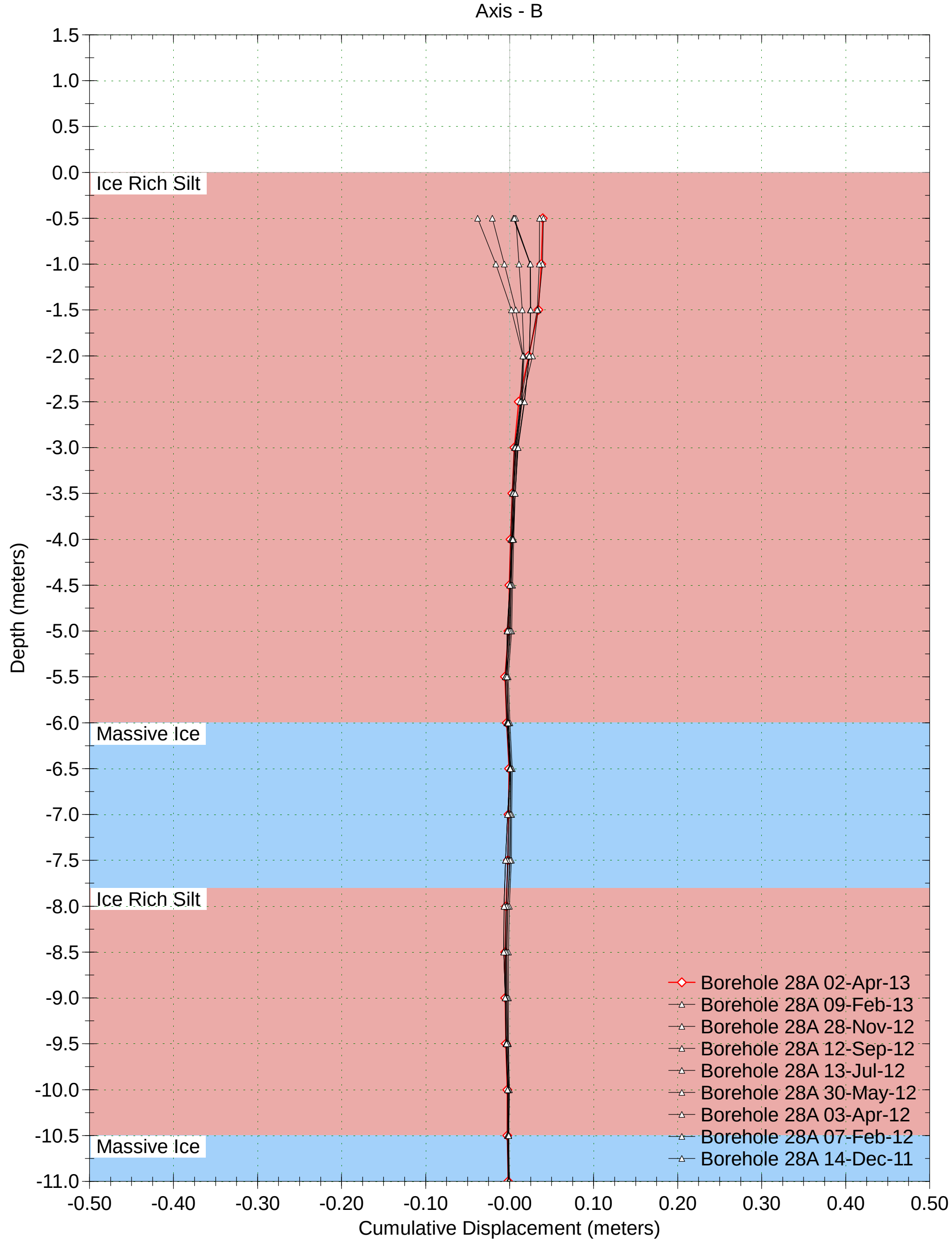
Ground Temperature Profile
Keno Hill District Mill Site Borehole BH40
Figure T7

RST Instruments Ltd. CUMULATIVE DISPLACEMENT Inclinalysis v. 2.43.1

Borehole : Borehole 28A
Project : Keno Hill District Mill
Location :
Northing :
Easting :
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 11.0 meters
A+ Groove Azimuth :
Base Reading : 2011 Oct 07 14:56
Applied Azimuth : 0.0 degrees





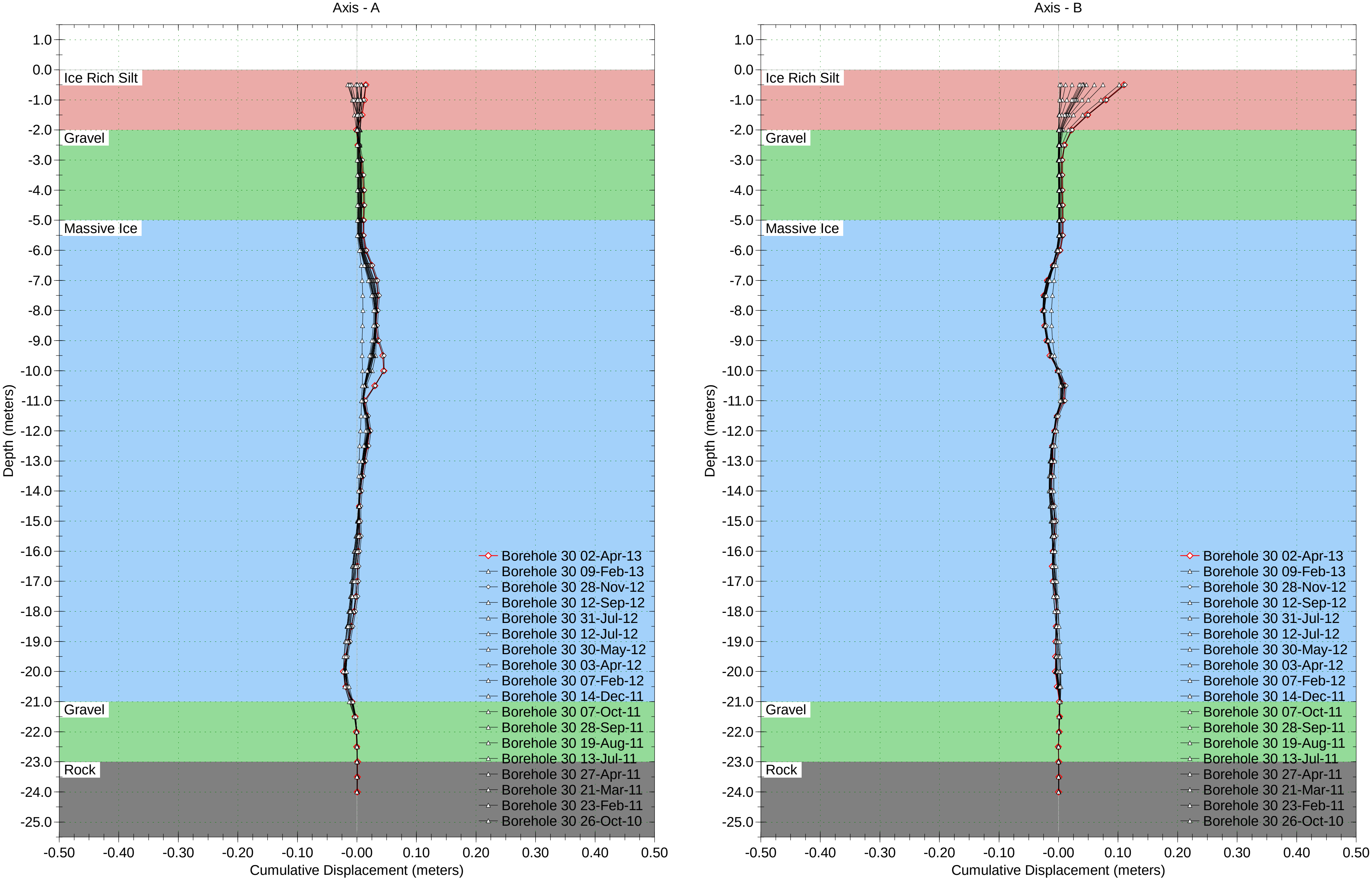
RST Instruments Ltd.

CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.43.1

Borehole : Borehole 30
Project : Keno Hill District Mill
Location : DSTF
Northing : 7087032
Easting : 483969
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 24.0 meters
A+ Groove Azimuth :
Base Reading : 2010 Sep 12 08:57
Applied Azimuth : 0.0 degrees



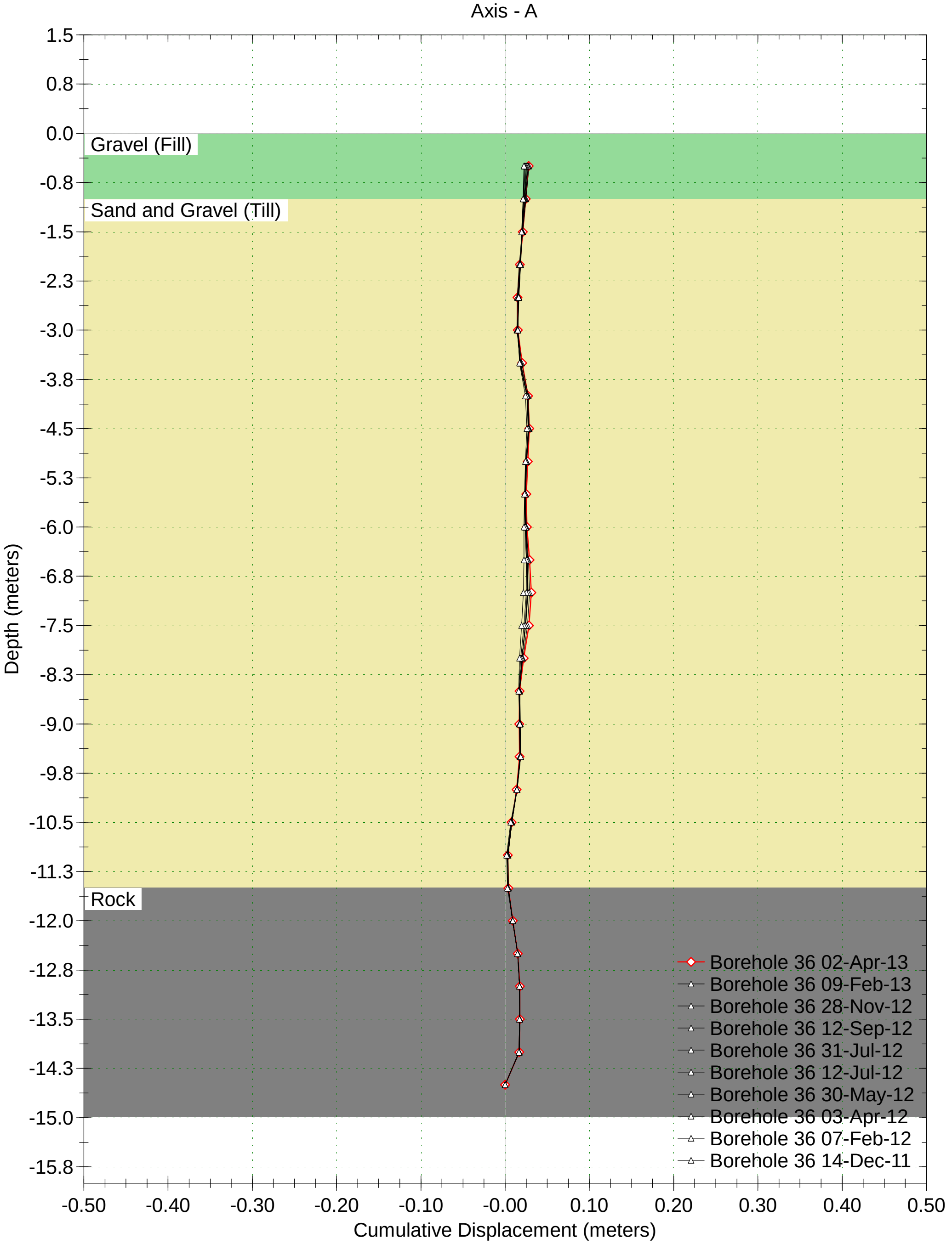
RST Instruments Ltd.

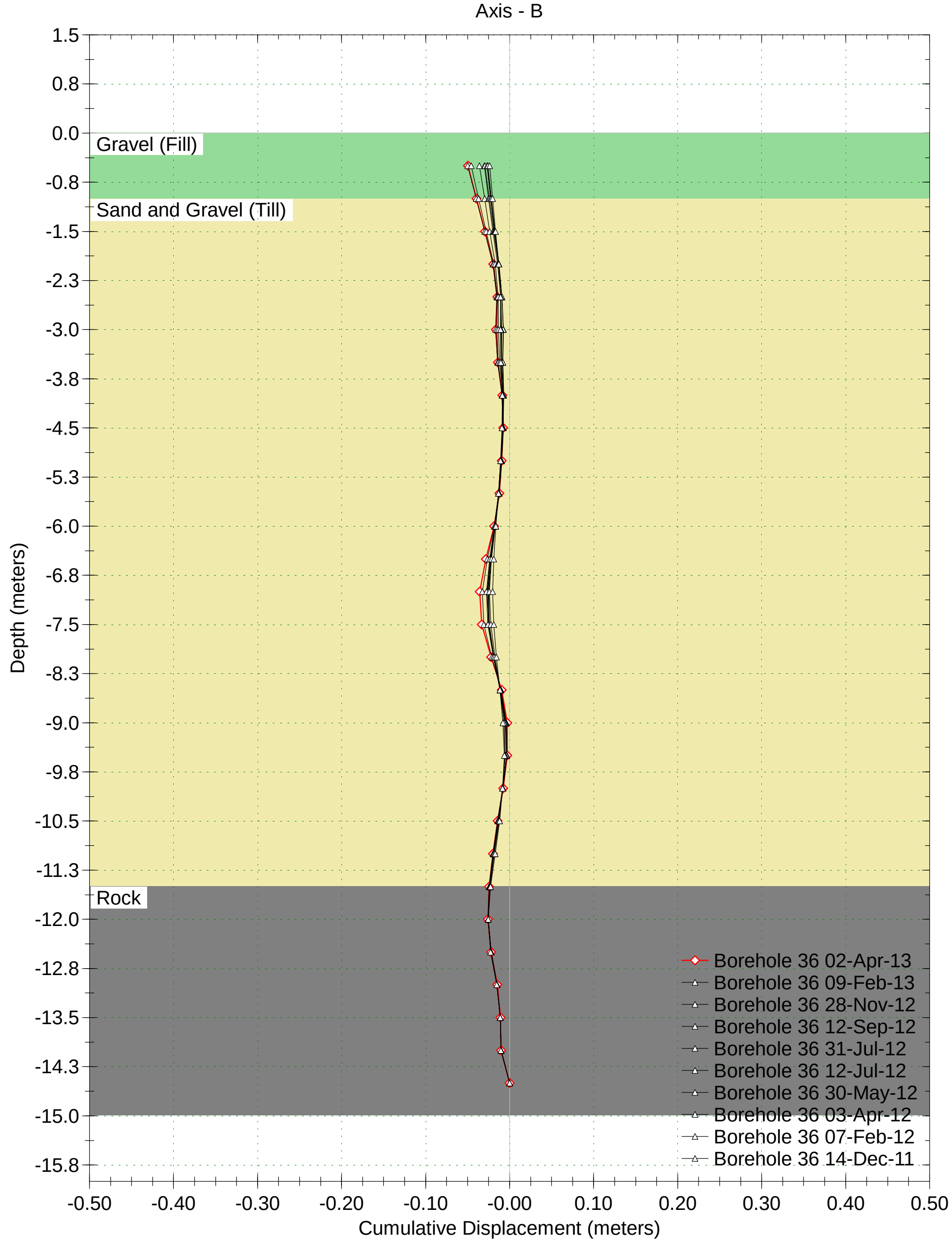
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.43.1

Borehole : Borehole 36
Project : Keno Hill District Mill
Location :
Northing :
Easting :
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 14.0 meters
A+ Groove Azimuth :
Base Reading : 2011 Oct 07 14:04
Applied Azimuth : 0.0 degrees





EBA Engineering Consultants Ltd. operating as EBA, A Tetra Tech Company
Calcite Business Centre, Unit 6, 151 Industrial Road
Whitehorse, YT Y1A 2V3 CANADA
p. 867.668.3068 f. 867.668.4349

TECHNICAL MEMO

ISSUED FOR USE

TO:	Katherine Penney	**DATE:**	June 17, 2013
C:	Vanessa Benwood / Darrin Morrell	**MEMO NO.:**	016
FROM:	Ian MacIntyre, EIT	**EBA FILE:**	W14103144-01

SUBJECT: DSTF Instrumentation and Construction Monitoring
Keno Hill District Mill Site

1.0 INTRODUCTION

Alexco Resource Corp (Alexco) retained EBA, A Tetra Tech Company (EBA) to observe construction and operation activities associated with the Dry Stacked Tailings Facility (DSTF) at the Keno Hill District Mill Site. Activities related to the DSTF are to be carried out in accordance with the following documents:

- Operation, Maintenance, and Surveillance Manual, Dry Stack Tailings Facility, Keno Hill District Mill, YT
- Quarter 1 Tailings Placement Provisions, Keno Hill District Mill Site, Yukon
- Runoff Diversion Structure Specifications, Dry Stacked Tailings Facility, Keno Hill District Mill, YT
- Detailed Design, Dry Stacked Tailings Facility, Keno Hill District Mill Site, Yukon

This memo summarizes the on-going monitoring of the DSTF completed by EBA on May 23 and 24, 2013.

2.0 WORK COMPLETED

EBA conducted eight compaction tests on the upper bench of the DSTF during the May, 2013 visit. The compaction results including the UTM coordinates and elevations (NAD83 datum) of each test are attached to this memo. Test locations were recorded with a handheld GPS receiver accurate to within 5 m horizontally, and unknown accuracy vertically. During this trip to site EBA also used the Drive-Cylinder density testing method (ASTM D2937 – 10) with the intent of continuing to determine a correlation between nuclear methods and non-nuclear methods.

EBA has been collecting ground temperature cable (GTC) readings since November 2009 and slope indicator (SI) readings since September 2010 at the DSTF. During the May 2013 site visit, EBA collected GTC readings from boreholes BH15, BH17, BH18, BH23, BH31, BH32, and BH40; and SI readings from boreholes BH36. Current GTC and slope indicator readings are attached to this memo.

Readings were not taken on the SI in BH28 because it has been damaged. In BH 30 ice was encountered at a depth of 1.5 m and therefore readings were not able to be taken. Please refer to the discussion below for recommendations on remedial actions.

EBA also completed water level readings from the piezometer located in BH39.

3.0 DISCUSSION

EBA completed eight compaction tests on exposed tailings during the site visit. All compaction tests met or exceeded the compaction requirements stated in the Operation, Maintenance, and Surveillance Manual and as required by the Detailed Design, Dry Stacked Tailings Facility, Keno Hill District Mill, YT. The compaction records are attached to this memo.

An unacceptable amount of standing water was observed on the lower bench of the DSTF. This is likely due to snow melt and the existence of a berm around the bench preventing surface drainage. While temporary drainage measures have been put in place to trench this water off of the DSTF surface, it was also recommended on site that more effort be put into removing the remaining standing water. Care must be taken next winter to ensure that snowmelt water does not pool on the top of the DSTF.

Water level readings in the DSTF from BH39 indicated presence of water at 4.2 m from surface. It is likely that this presence of water can be attributed to the existence of free standing water on the DSTF. EBA will continue to monitor the water level in the DSTF for any changes.

Ongoing GTC and slope indicator readings provide a baseline for the site and monitor any changes during DSTF construction and operation. To date, no readings requiring additional review have been recorded. However as stated in the previous inspection memo dated February 27 2013, EBA continues to recommend that the damaged slope indicator in BH28 be replaced when possible. In addition, BH30 was filled with ice at a depth of 1.5 m, and therefore EBA recommends that this ice be steamed and removed before the next site visit. It is critical that the steamer operators are careful not to overheat the SI pipe and potentially melt the slots on the inside of the pipe. If readings are still not possible or the pipe is damaged other options may have to be investigated.

4.0 CLOSURE

The next site visit is scheduled for June 2013; dates will be confirmed with Alexco site personnel.

We trust this memo meets your present requirements. Should you have any questions or comments, please contact us.

COMPACTION DENSITY TEST SUMMARY REPORT

ASTM Designation D2922 & D3017

Project: Dry Stacked Tailings Facility
Keno Hill Mine District
Project No.: W14103144-01
Client: Alexco Resource Corporation
Attention:
Contractor: Alexco Resource Corporation

Test Apparatus: Nuclear **Troxler No:** 38813
Specified Compaction: 95 % Std. Proctor Max. Dry Density
Specified Moisture (MC):
Temperature **Air:** 10 °C **Soil:** °C
Date Tested: See below **By:** IM
Construction Period:

Soil Description: Tailings (2080@13%)

Material Usage/Zone:

Date yyyy/mm/dd	Test No. / Probe (mm)	Location:	Elevation (m)	Dry Density (kg/m³)	MC %	Max. Dry Density	Opt. MC %	Comp % SPD
2013/05/23	**136** / 250	N 7086932 E 484040	936	2059	12.6	2080	13	**99.0**
	137 / 250	N 7086930 E 484031	936	2045	12.6	2080	13	**98.3**
	138 / 250	N 7086930 E 484025	936	2083	12.6	2080	13	**100.1**
	139 / 250	N 7086945 E 484015	936	2145	12.6	2080	13	**103.1**
	140 / 250	N 7086911 E 484027	936	2074	12.6	2080	13	**99.7**
	141 / 250	N 7086918 E 484043	936	2132	12.6	2080	13	**102.5**
	142 / 300	N 7086952 E 0484052	936	2098	12.6	2080	13	**100.9**
	143 / 250	N 7086931 E 0484047	936	2096	12.6	2080	13	**100.8**

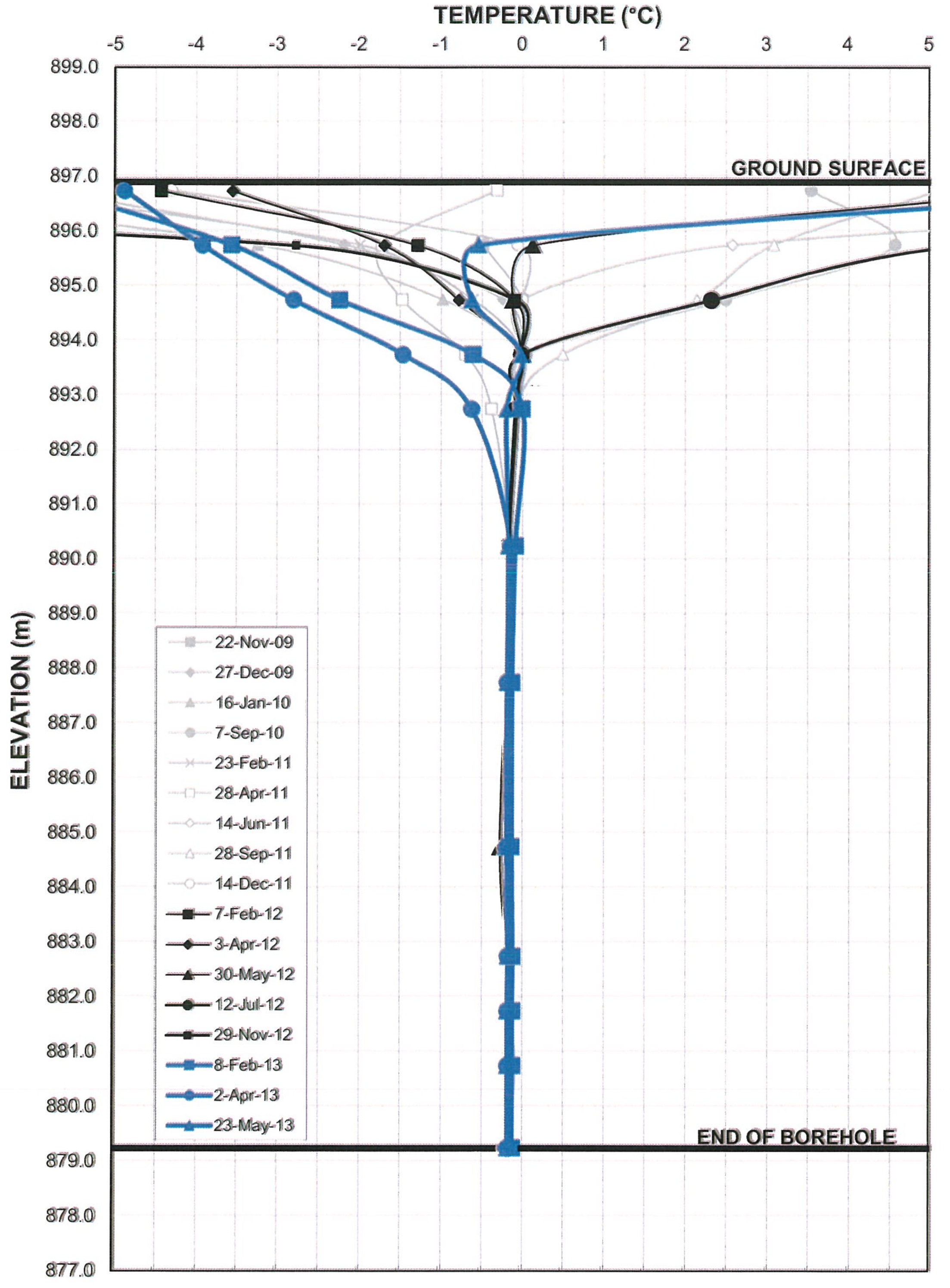
Remarks: Moisture contents have been corrected using insitu moistures as sampled on site.

Copies:

Reviewed By: [signature]

Data presented hereon is for the sole use of the stipulated client. EBA is not responsible, nor can be held liable, for use made of this report by any other party, with or without the knowledge of EBA. The testing services reported herein have been performed by an EBA technician to recognized industry standards, unless otherwise noted. No other warranty is made. These data do not include or represent any interpretation or opinion of specification compliance or material suitability. Should engineering interpretation be required, EBA will provide it upon written request.

eba
A TETRA TECH COMPANY

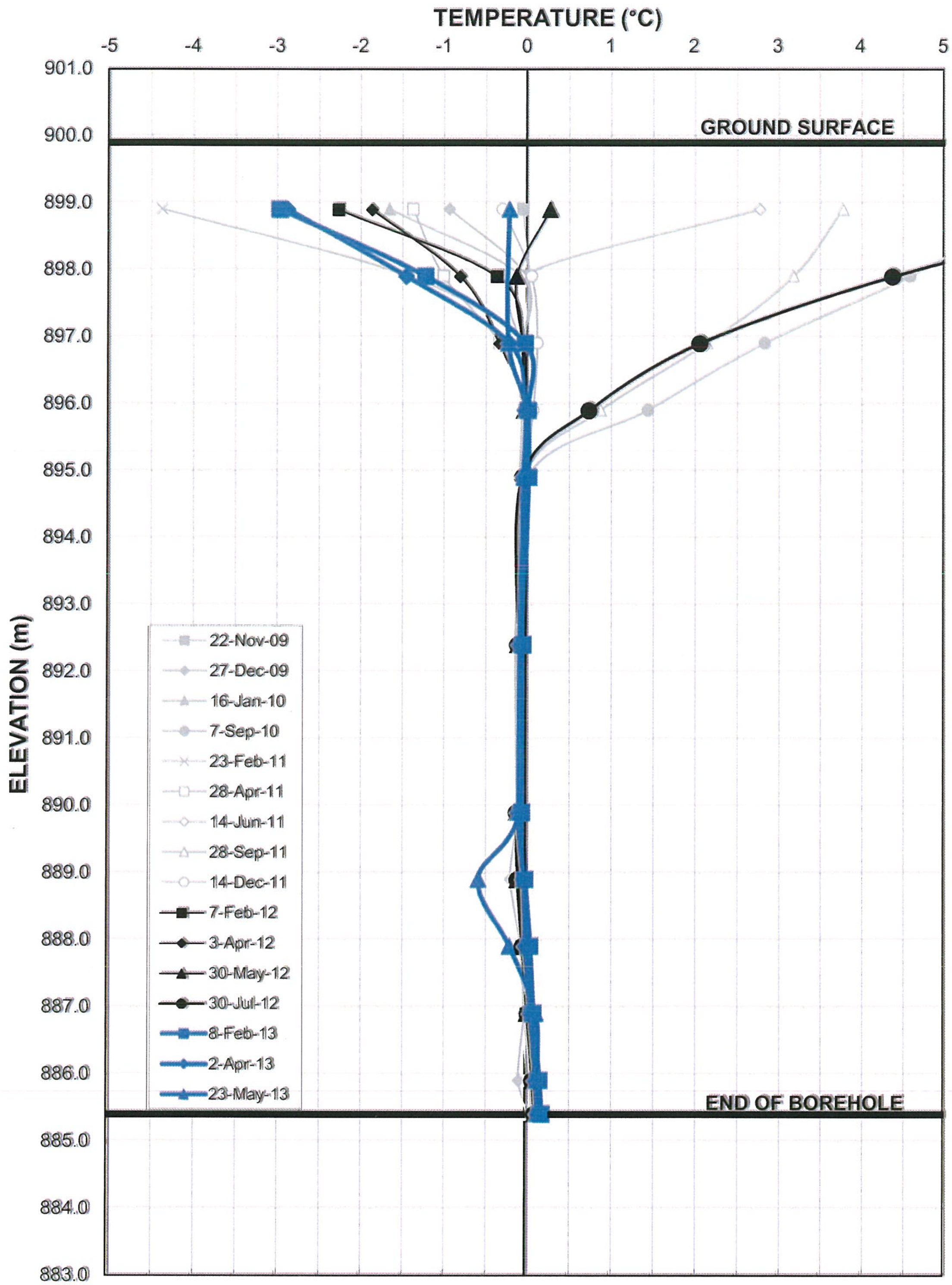


Install Date August 30, 2009
Last Updated May 23, 2013
Cable No: 2207

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH15
Figure T1

CLIENT: NND EBA LAND PROTECTION CORPORATION	DSTF MONITORING 2013 KENO HILL DISTRICT, YUKON GROUND TEMPERATURE PROFILE BH15			
eba A TETRA TECH COMPANY	PROJECT NO. W14103144-01	DWN CB	CKD IM	REV 0
	OFFICE EBA-WHSE	DATE June 14, 2013		Figure 1

Q:\Whitehorse\Data\0201drawings\Keno\W14103144-01 NELPCo. Alexco DSTF Monitoring 2013\W14103144-01 Fig.1_R0.dwg [FIGURE 1] June 14, 2013 - 3:20:46 pm (BY: BUCHAN, CAMERON)



Install Date	August 30, 2009
Last Updated	May 23, 2013
Cable No:	2208

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH17
Figure T2

CLIENT

NND EBA LAND PROTECTION CORPORATION

GROUND TEMPERATURE PROFILE
BH17

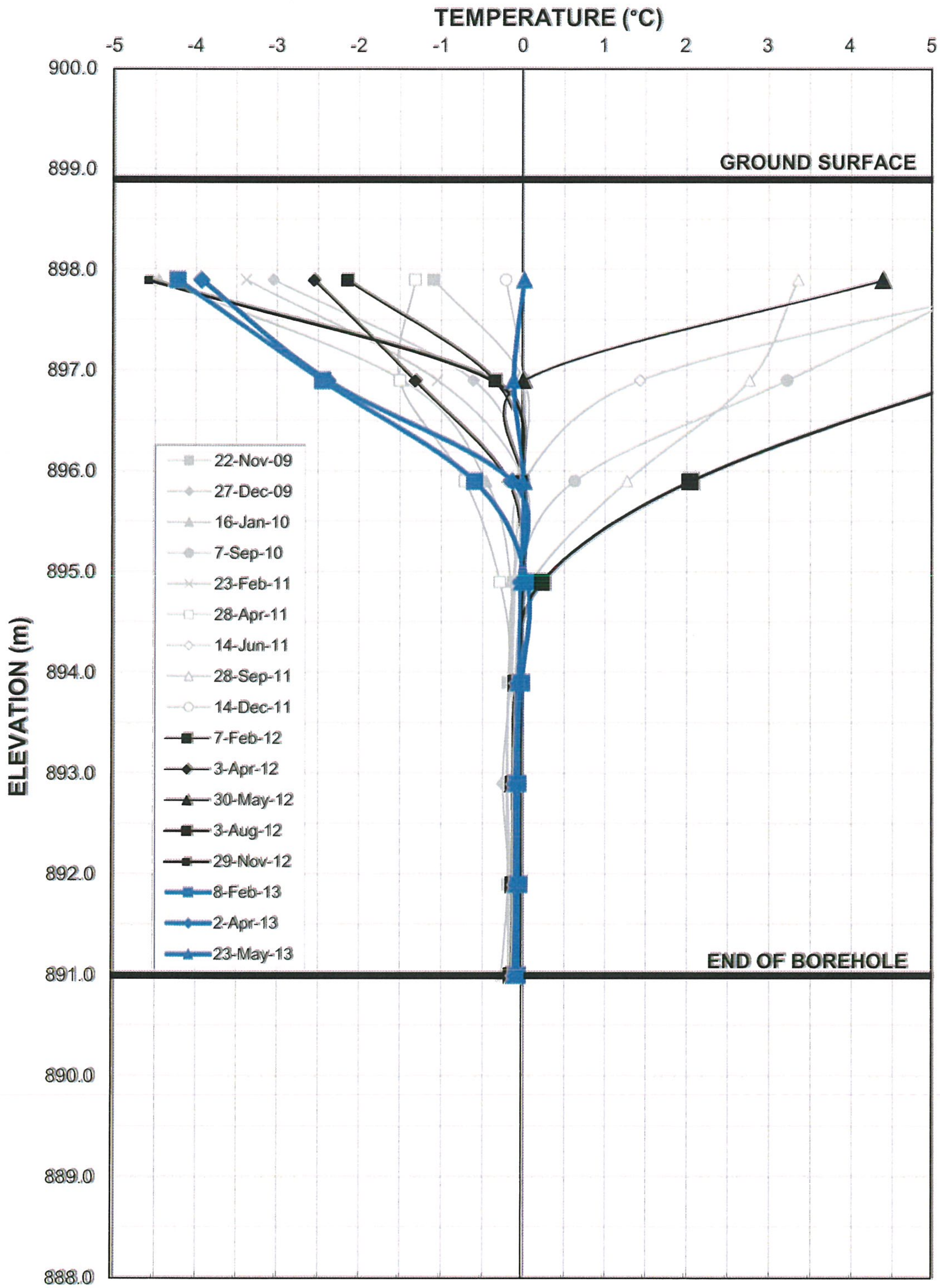
PROJECT NO.	DWN	CKD	REV
W14103144-01	CB	IM	0

OFFICE	DATE
EBA-WHSE	June 14, 2013

A TETRA TECH COMPANY

Figure 2

Q:\Whitehorse\Data\0201drawings\Keno\W14103144-01 NELPCo. Alexco DSTF Monitoring 2013\W14103144-01 Fig.1_R0.dwg [FIGURE 2] June 14, 2013 - 3:21:17 pm (BY: BUCHAN, CAMERON)



Install Date	September 2, 2009	Ground Temperature Profile
Last Updated	May 23, 2013	Keno Hill District Mill Site Borehole BH18
Cable No:	2209	Figure T3

Q:\Whitehorse\Data\0201drawings\Keno\W14103144-01 NELPCo. Alexco DSTF Monitoring 2013\W14103144-01 Fig.1_R0.dwg [FIGURE 3] June 14, 2013 - 3:21:51 pm (BY: BUCHAN, CAMERON)

CLIENT

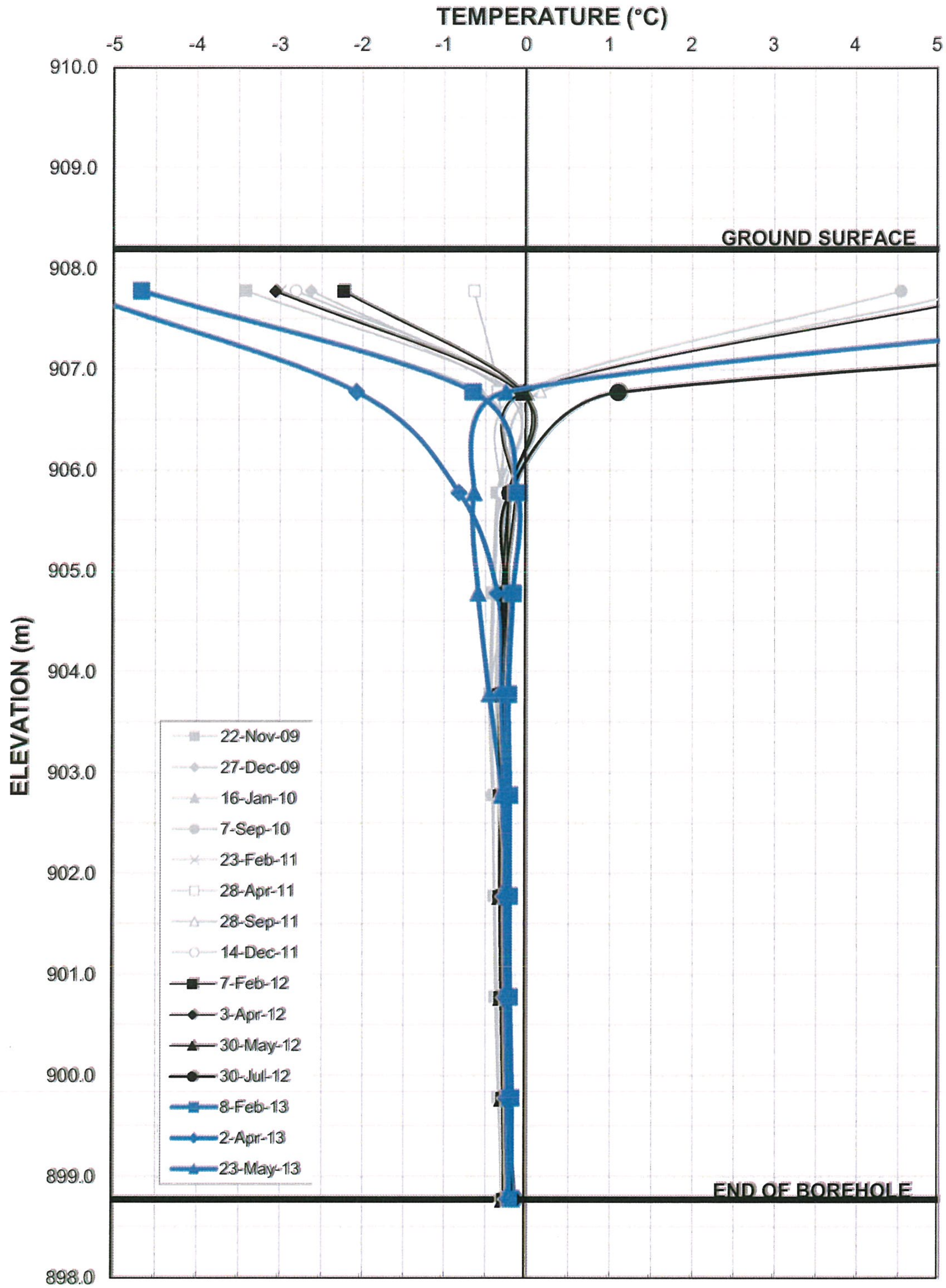
NND EBA LAND PROTECTION CORPORATION

GROUND TEMPERATURE PROFILE BH18

eba A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14103144-01	CB	IM	0
OFFICE	DATE		
EBA-WHSE	June 14, 2013		

Figure 3



Install Date	September 29, 2009		Ground Temperature Profile
Last Updated	May 23, 2013		Keno Hill District Mill Site Borehole BH23
Cable No:	2210		Figure T4

Q:\Whitehorse\Data\0201drawings\Keno\W14103144-01 NELPCo. Alexco DSTF Monitoring 2013\W14103144-01 Fig.1_R0.dwg [FIGURE 4] June 14, 2013 - 3:22:32 pm (BY: BUCHAN, CAMERON)

CLIENT

NND EBA LAND PROTECTION CORPORATION

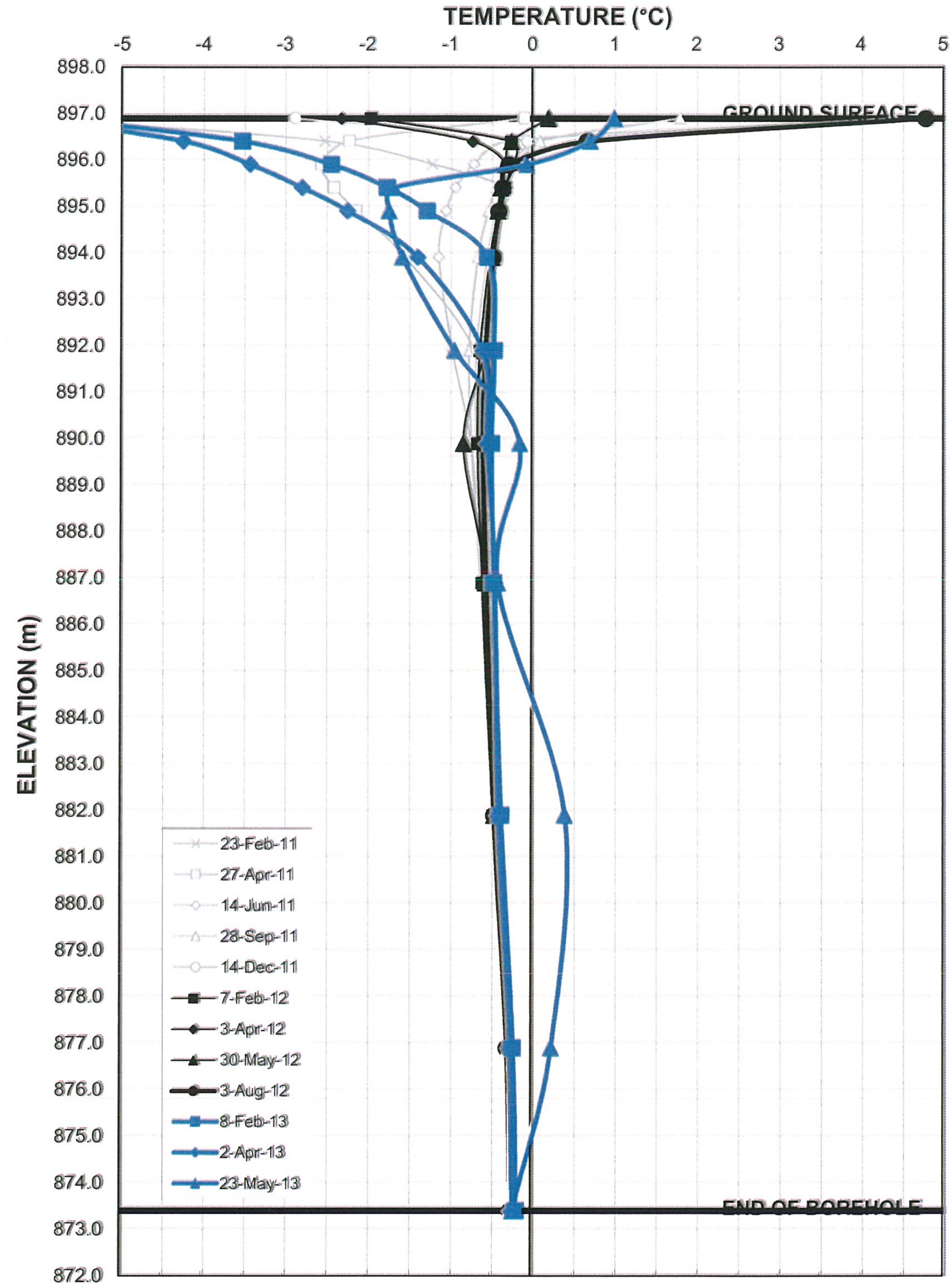
DSTF MONITORING 2013
KENO HILL DISTRICT, YUKON

GROUND TEMPERATURE PROFILE
BH23

eba
A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14103144-01	CB	IM	0
OFFICE	DATE		
EBA-WHSE	June 14, 2013		

Figure 4

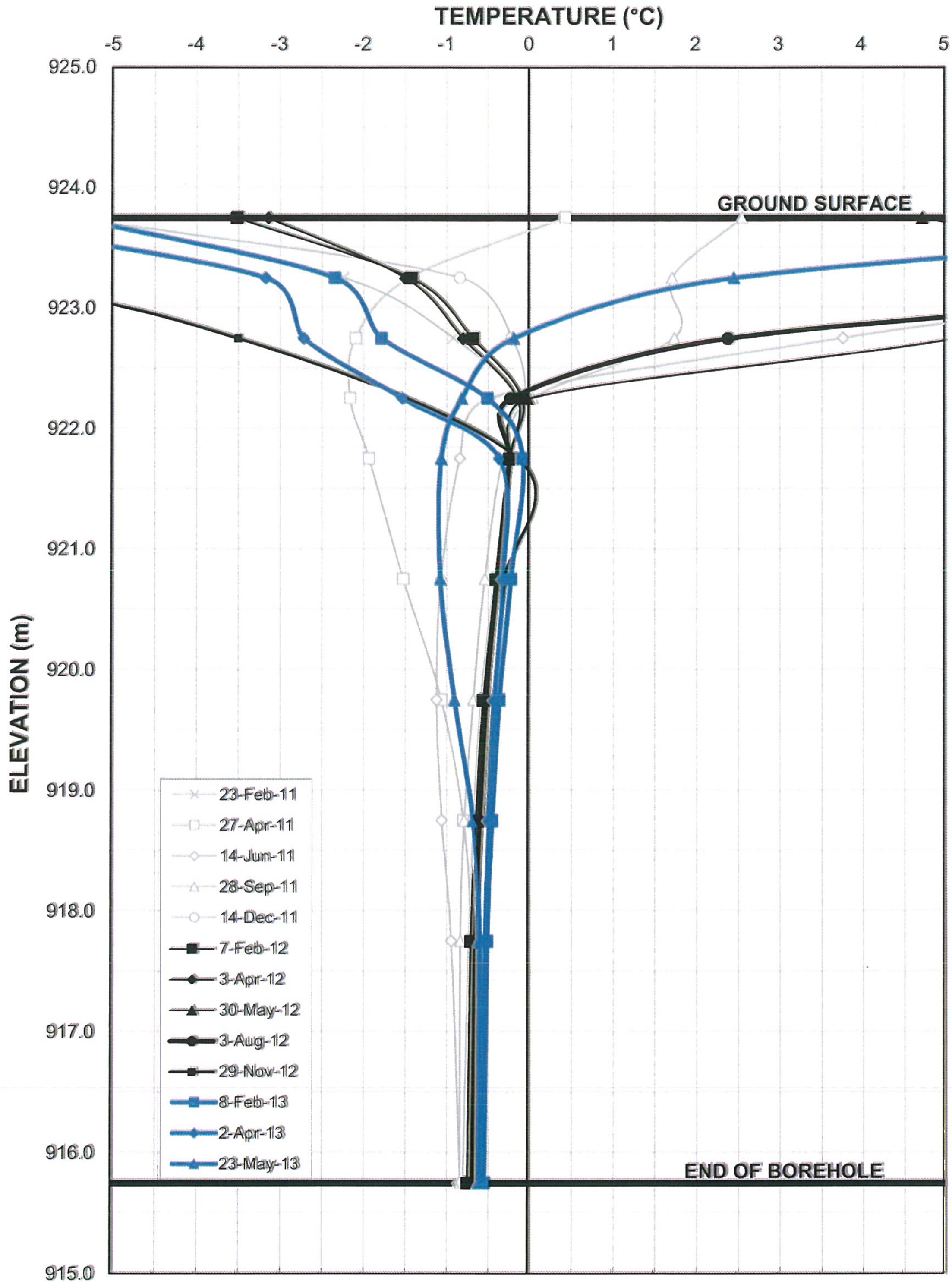


Install Date February 22, 2011
Last Updated May 23, 2013
Cable No: 2263

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH31
Figure T5

CLIENT: NND EBA LAND PROTECTION CORPORATION	GROUND TEMPERATURE PROFILE BH31				
eba A TETRA TECH COMPANY	PROJECT NO. W14103144-01	DWN CB	CKD IM	REV 0	Figure 5
	OFFICE EBA-WHSE	DATE June 14, 2013			

Q:\Whitehorse\Data\0201drawings\Keno\W14103144-01 NELPCo. Alexco DSTF Monitoring 2013\W14103144-01 Fig.1_R0.dwg [FIGURE 5] June 14, 2013 - 3:23:01 pm (BY: BUCHAN, CAMERON)



Install Date February 22, 2011
Last Updated May 23, 2013
Cable No: 2264

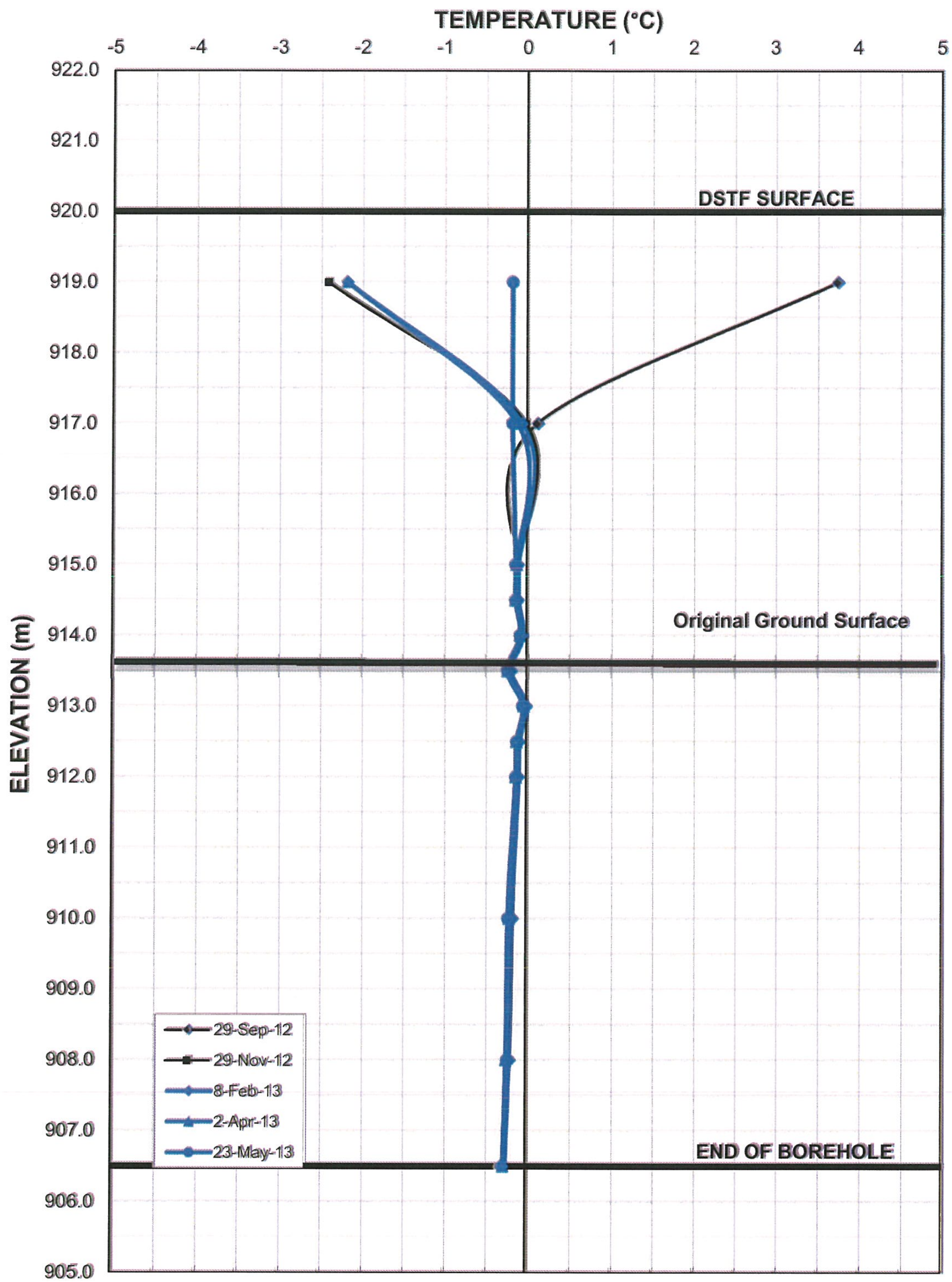
Ground Temperature Profile
Keno Hill District Mill Site Borehole BH32
Figure T6

Q:\Whitehorse\Data\0201drawings\Keno\W14103144-01 NELPCo. Alexco DSTF Monitoring 2013\W14103144-01 Fig.1_R0.dwg [FIGURE 6] June 14, 2013 - 3:23:35 pm (BY: BUCHAN, CAMERON)

CLIENT	
NND EBA LAND PROTECTION CORPORATION	GROUND TEMPERATURE PROFILE BH32

eba
A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV	
W14103144-01	CB	IM	0	Figure 6
OFFICE	DATE			
EBA-WHSE	June 14, 2013			



Install Date August 2, 2012
Last Updated May 23, 2013
Cable No:

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH40
Figure T7

CLIENT	
NND EBA LAND PROTECTION CORPORATION	DSTF MONITORING 2013 KENO HILL DISTRICT, YUKON GROUND TEMPERATURE PROFILE BH40

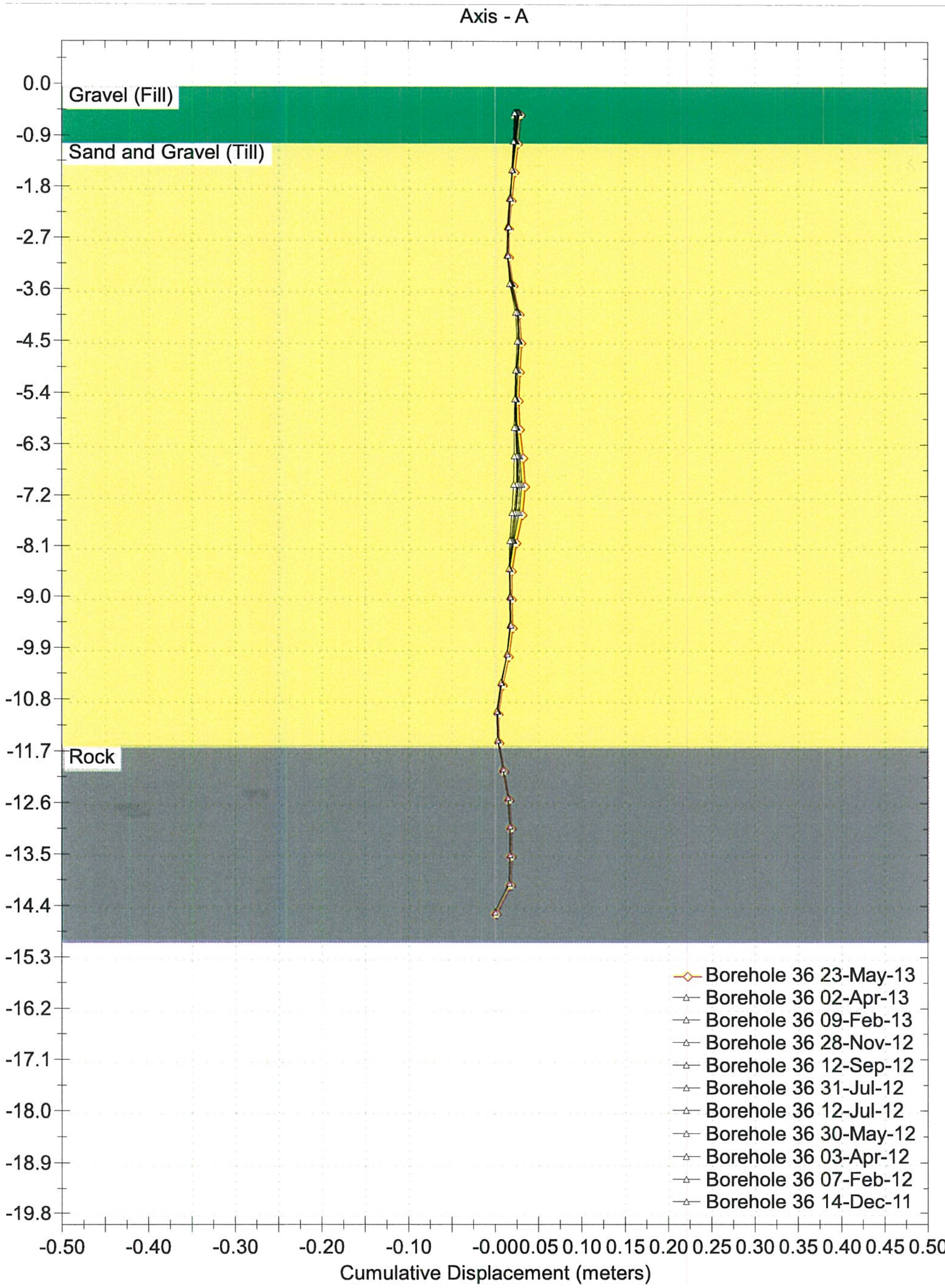
eba A TETRA TECH COMPANY

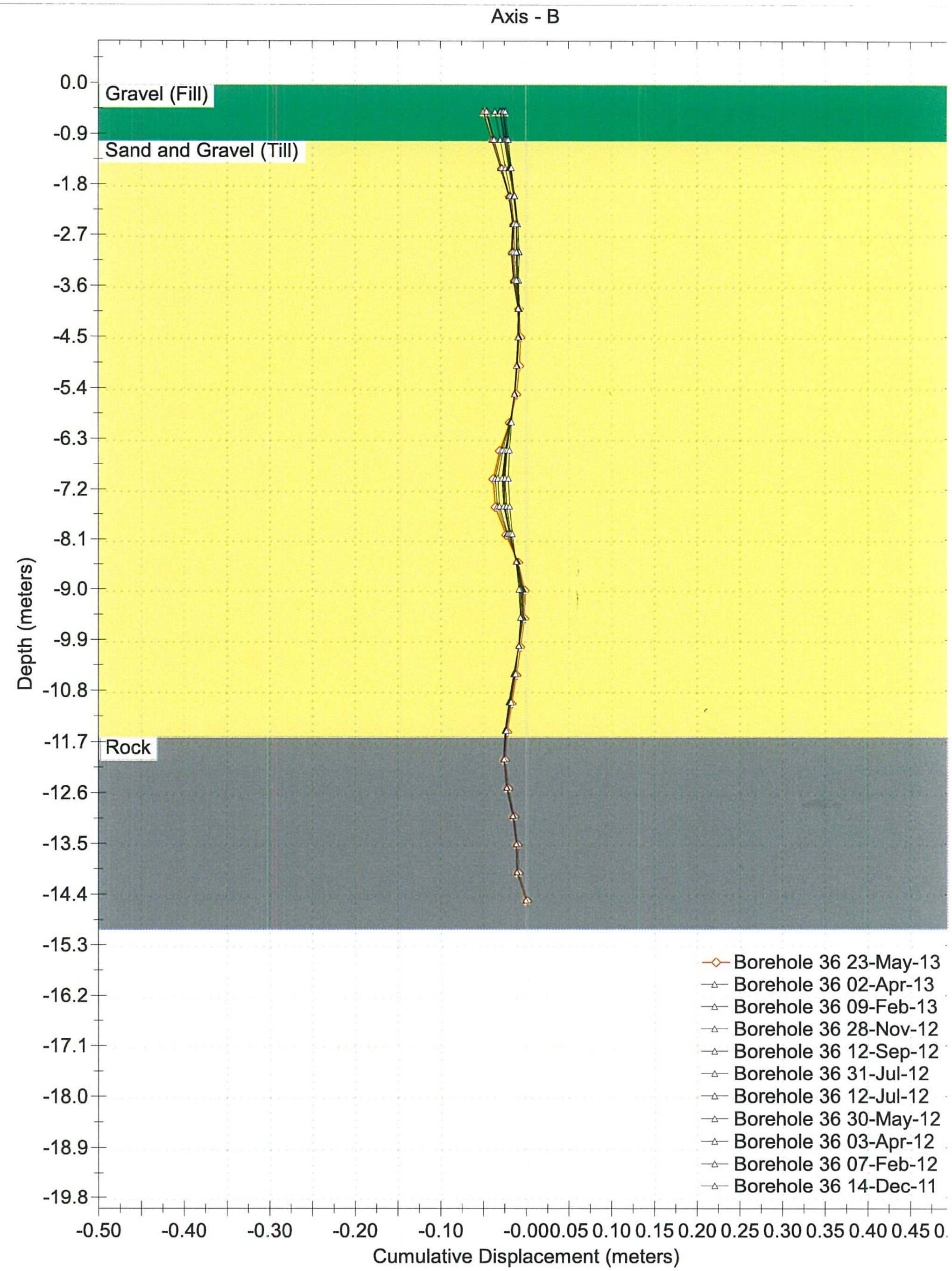
PROJECT NO.	DWN	CKD	REV	
W14103144-01	CB	IM	0	Figure 7
OFFICE	DATE			
EBA-WHSE	June 14, 2013			

Q:\Whitehorse\Data\0201drawings\Keno\W14103144-01 NELPCo. Alexco DSTF Monitoring 2013\W14103144-01 Fig.1_R0.dwg [FIGURE 7] June 17, 2013 - 10:30:32 am (BY: BUCHAN, CAMERON)

ʼorehole : Borehole 36
ʼroject : Keno Hill District Mill
ocation :
lorthing :
asting :
ʼollar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 14.0 meter
A+ Groove Azimuth :
Base Reading : 2011 Oct 07 14:04
Applied Azimuth : 0.0 degrees





EBA Engineering Consultants Ltd. operating as EBA, A Tetra Tech Company
61 Wasson Place
Whitehorse, YT Y1A 0H7 CANADA
p. 867.668.3068 f. 867.668.4349

TECHNICAL MEMO

ISSUED FOR USE

TO:	Kai Woloshyn – Environmental Manager	**DATE:**	November 25, 2013
C:		**MEMO NO.:**	017
FROM:	Ian MacIntyre, EIT	**EBA FILE:**	W14103144-01

SUBJECT: DSTF Instrumentation and Construction Monitoring
Keno Hill District Mill Site

1.0 INTRODUCTION

Alexco Resource Corp (Alexco) retained EBA, A Tetra Tech Company (EBA) to observe construction and operation activities associated with the Dry Stacked Tailings Facility (DSTF) at the Keno Hill District Mill Site. Activities related to the DSTF are to be carried out in accordance with the following documents:

- Operation, Maintenance, and Surveillance Manual, Dry Stack Tailings Facility, Keno Hill District Mill, YT
- Quarter 1 Tailings Placement Provisions, Keno Hill District Mill Site, Yukon
- Runoff Diversion Structure Specifications, Dry Stacked Tailings Facility, Keno Hill District Mill, YT
- Detailed Design, Dry Stacked Tailings Facility, Keno Hill District Mill Site, Yukon

This memo summarizes the on-going monitoring of the DSTF completed by EBA on September 9 and 10, 2013.

2.0 WORK COMPLETED

EBA conducted 30 compaction tests on the DSTF during the September 2013 visit. The compaction results including the UTM coordinates and elevations (NAD83 datum) of each test are attached to this memo. Test locations were recorded with a handheld GPS receiver accurate to within 5 m horizontally. As part of an ongoing effort to verify the accuracy of nuclear compaction results, EBA also completed six drive sample density tests.

EBA has been collecting ground temperature cable (GTC) readings since November 2009 and slope indicator (SI) readings since September 2010 at the DSTF. During the September 2013 site visit, EBA collected GTC readings from boreholes BH15, BH17, BH18, BH23, BH31, BH32, and BH40; and SI readings from boreholes BH28 and BH36. Current GTC and slope indicator readings are attached to this memo.

In BH30 an ice blockage was encountered at 3.9 m below ground surface preventing SI readings from being taken. Please refer to the discussion below for recommendations on remedial actions.

EBA has been recording water level readings within the DSTF since August 2012. During the September 2013 visit, EBA recorded the water level in BH39, located in the lower tailings bench.

3.0 DISCUSSION

EBA completed 30 compaction tests on exposed tailings during the site visit. The majority of compaction tests met or exceeded the compaction requirements. Of those tests that did not meet specifications, most were along the DSTF's side slopes where regrading was being conducted (loosening the surface). Detailed compaction records are attached to this memo. In-situ moisture contents determined from drive sampling have been used to calibrate moisture and density results obtained using nuclear methods. EBA believes the overall compactive effort in construction of the DSTF to date is adequate.

Ongoing GTC and slope indicator readings allow monitoring of any changes to the ground conditions during DSTF construction and operation. To date, no readings requiring additional review have been recorded. However readings taken from BH40 indicated a damaged ground temperature cable. This will be addressed during the next site visit. Additionally, BH30 was blocked with ice at a depth of 3.9 m below ground surface, and should be steamed to remove the ice blockage prior to the next site visit. It is critical that the steaming process is carefully executed so as not to overheat and damage the delicate SI pipe. If readings are still not possible after the blockage has been removed, other options may have to be considered.

Water level readings in the DSTF from BH39 indicated presence of water at 5.75 m from surface (approximately 0.5 m of water at the bottom of the borehole.) The near complete reduction in water in the piezometer suggests the previous recorded water level was a result of spring melt water ponded on the surface of the DSTF, and not indicative of free water within the tailings.

4.0 CLOSURE

The next site visit is not scheduled at this time as operation of the mill and tailings placement has been suspended for the winter season. It is important that ongoing monitoring of the instrumentation on site is completed despite the suspension of construction activities. EBA recommends an instrument reading trip take place in January 2014. The dates of the proposed site visit will be confirmed with Alexco site personnel.

We trust this memo meets your present requirements. Should you have any questions or comments, please contact us.

COMPACTION DENSITY TEST SUMMARY REPORT

ASTM Designation D2922 & D3017

Project: Dry Stacked Tailings Facility
Keno Hill District Mill Site
Project No.: W14103144-01
Client: Alexco Resource Corporation
Attention:
Contractor: Alexco Resource Corporation

Test Apparatus: Nuclear **Troxler No:** 38813
Specified Compaction: 95 % Std. Proctor Max. Dry Density
Specified Moisture (MC):
Temperature Air: 10 ºC **Soil:** ºC
Date Tested: See below **By:** IM
Construction Period:

Soil Description: Tailings (2080@13%)
Material Usage/Zone:

Date yyyy/mm/dd	Test No. / Probe (mm)	Location:	Elevation (m)	Dry Density (kg/m³)	MC %	Max. Dry Density	Opt. MC %	Comp % SPD
2013/05/23	**136** / 250	N 7086932 E 484040	936	2059	12.6	2080	13	**99.0**
	137 / 250	N 7086930 E 484031	936	2045	12.6	2080	13	**98.3**
	138 / 250	N 7086930 E 484025	936	2083	12.6	2080	13	**100.1**
	139 / 250	N 7086945 E 484015	936	2145	12.6	2080	13	**103.1**
	140 / 250	N 7086911 E 484027	936	2074	12.6	2080	13	**99.7**
	141 / 250	N 7086918 E 484043	936	2132	12.6	2080	13	**102.5**
	142 / 300	N 7086952 E 0484052	936	2098	12.6	2080	13	**100.9**
	143 / 250	N 7086931 E 0484047	936	2096	12.6	2080	13	**100.8**
2013/09/10	**144** / 250	N 7086921 E 484036	935	1986	13.7	2080	13	**95.5**
	145 / 250	N 7086930 E 484037	935	2062	12.7	2080	13	**99.1**
	146 / 250	N 7086941 E 484046	935	2207	9.6	2080	13	**106.1**
	147 / 250	N 7086973 E 483987	935	2086	13.3	2080	13	**100.3**

Remarks: Moisture contents have been corrected using insitu moistures as sampled on site.

Copies:

Reviewed By: [signature]

Data presented hereon is for the sole use of the stipulated client. EBA is not responsible, nor can be held liable, for use made of this report by any other party, with or without the knowledge of EBA. The testing services reported herein have been performed by an EBA technician to recognized industry standards, unless otherwise noted. No other warranty is made. These data do not include or represent any interpretation or opinion of specification compliance or material suitability. Should engineering interpretation be required, EBA will provide it upon written request.

eba A TETRA TECH COMPANY

COMPACTION DENSITY TEST SUMMARY REPORT

ASTM Designation D2922 & D3017

Project: Dry Stacked Tailings Facility
Keno Hill District Mill Site
Project No.: W14103144-01
Client: Alexco Resource Corporation
Attention:
Contractor: Alexco Resource Corporation

Test Apparatus: Nuclear **Troxler No:** 38813
Specified Compaction: 95 % Std. Proctor Max. Dry Density
Specified Moisture (MC):
Temperature Air: 10 ºC **Soil:** ºC
Date Tested: See below **By:** IM
Construction Period:

Soil Description: Tailings (2080@13%)
Material Usage/Zone:

Date yyyy/mm/dd	Test No. / Probe (mm)	Location:	Elevation (m)	Dry Density (kg/m³)	MC %	Max. Dry Density	Opt. MC %	Comp % SPD
2013/09/10	**148** / 250	N 7086953 E 483990	935	2219	12.9	2080	13	**106.7**
	149 / 250	N 7086930 E 484031	935	2154	10.5	2080	13	**103.6**
	150 / 250	N 7086945 E 4844036	935	1996	10.9	2080	13	**96.0**
	151 / 250	N 7086937 E 484029	935	1899	12.6	2080	13	**91.3**
	152 / 250	N 7086927 E 484025	935	1948	12.0	2080	13	**93.7**
	153 / 250	N 7086922 E 484009	935	1957	12.4	2080	13	**94.1**
	154 / 300	N 7086934 E 0484013	935	2142	14.6	2080	13	**103.0**
	155 / 250	N 7086943 E 0484018	935	2065	15.7	2080	13	**99.3**
	156 / 250	N 7086958 E 484022	935	1951	8.9	2080	13	**93.8**
	157 / 250	N 7086966 E 484014	935	1951	10.5	2080	13	**93.8**
	158 / 250	N 7086950 E 484005	935	2104	13.7	2080	13	**101.2**
	159 / 250	N 7086940 E 484000	935	2000	14.0	2080	13	**96.2**

Remarks: Moisture contents have been corrected using insitu moistures as sampled on site.

Copies:

Reviewed By: ____________

Data presented hereon is for the sole use of the stipulated client. EBA is not responsible, nor can be held liable, for use made of this report by any other party, with or without the knowledge of EBA. The testing services reported herein have been performed by an EBA technician to recognized industry standards, unless otherwise noted. No other warranty is made. These data do not include or represent any interpretation or opinion of specification compliance or material suitability. Should engineering interpretation be required, EBA will provide it upon written request.

eba
A TETRA TECH COMPANY

COMPACTION DENSITY TEST SUMMARY REPORT

ASTM Designation D2922 & D3017

Project: Dry Stacked Tailings Facility
Keno Hill District Mill Site
Project No.: W14103144-01
Client: Alexco Resource Corporation
Attention:
Contractor: Alexco Resource Corporation

Test Apparatus: Nuclear **Troxler No:** 38813
Specified Compaction: 95 % Std. Proctor Max. Dry Density
Specified Moisture (MC):
Temperature **Air:** 10 ºC **Soil:** ºC
Date Tested: See below **By:** IM
Construction Period:

Soil Description: Tailings (2080@13%)
Material Usage/Zone:

Date yyyy/mm/dd	**Test No.** / Probe (mm)	**Location:**	Elevation (m)	Dry Density (kg/m³)	MC %	Max. Dry Density	Opt. MC %	Comp % SPD
2013/09/10	**160** / 250	N 7086927 E 483995	935	2021	9.8	2080	13	**97.2**
	161 / 250	N 7086913 E 483990	935	1973	9.8	2080	13	**94.9**

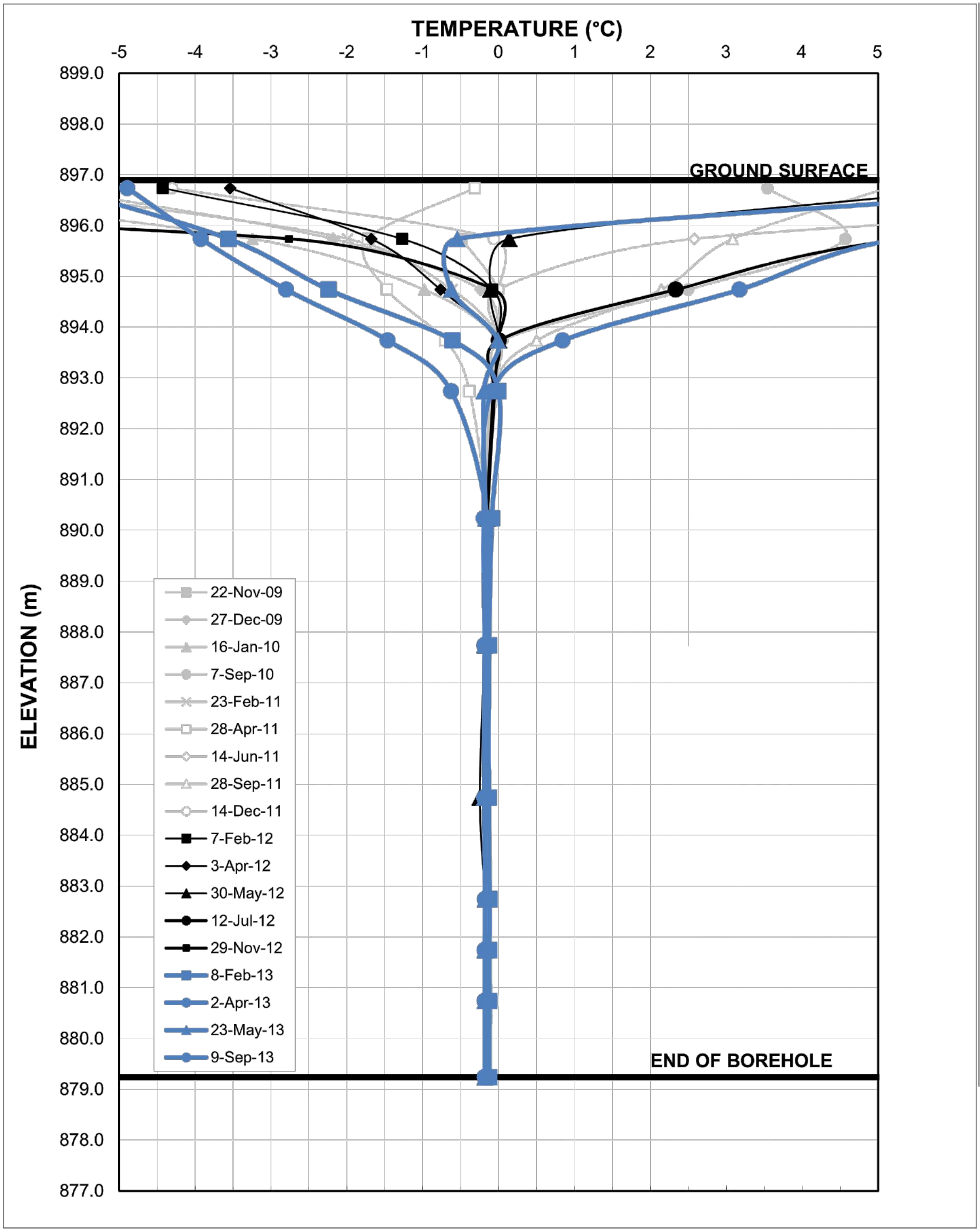
Remarks: Moisture contents have been corrected using insitu moistures as sampled on site.

Copies:

Reviewed By: [signature]

Data presented hereon is for the sole use of the stipulated client. EBA is not responsible, nor can be held liable, for use made of this report by any other party, with or without the knowledge of EBA. The testing services reported herein have been performed by an EBA technician to recognized industry standards, unless otherwise noted. No other warranty is made. These data do not include or represent any interpretation or opinion of specification compliance or material suitability. Should engineering interpretation be required, EBA will provide it upon written request.

eba A TETRA TECH COMPANY



Install Date	August 30, 2009
Last Updated	September 10, 2013
Cable No:	2207

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH15
Figure T1

Q:\Whitehorse\Data\0201drawings\Keno\W14103144-01 NELPCo. Alexco DSTF Monitoring 2013\W14103144-01 Sep 2013 Fig.1-6_R0.dwg [FIGURE 1] November 06, 2013 - 3:21:52 pm (BY: FULLER, KEN)

CLIENT

NND EBA LAND PROTECTION CORPORATION

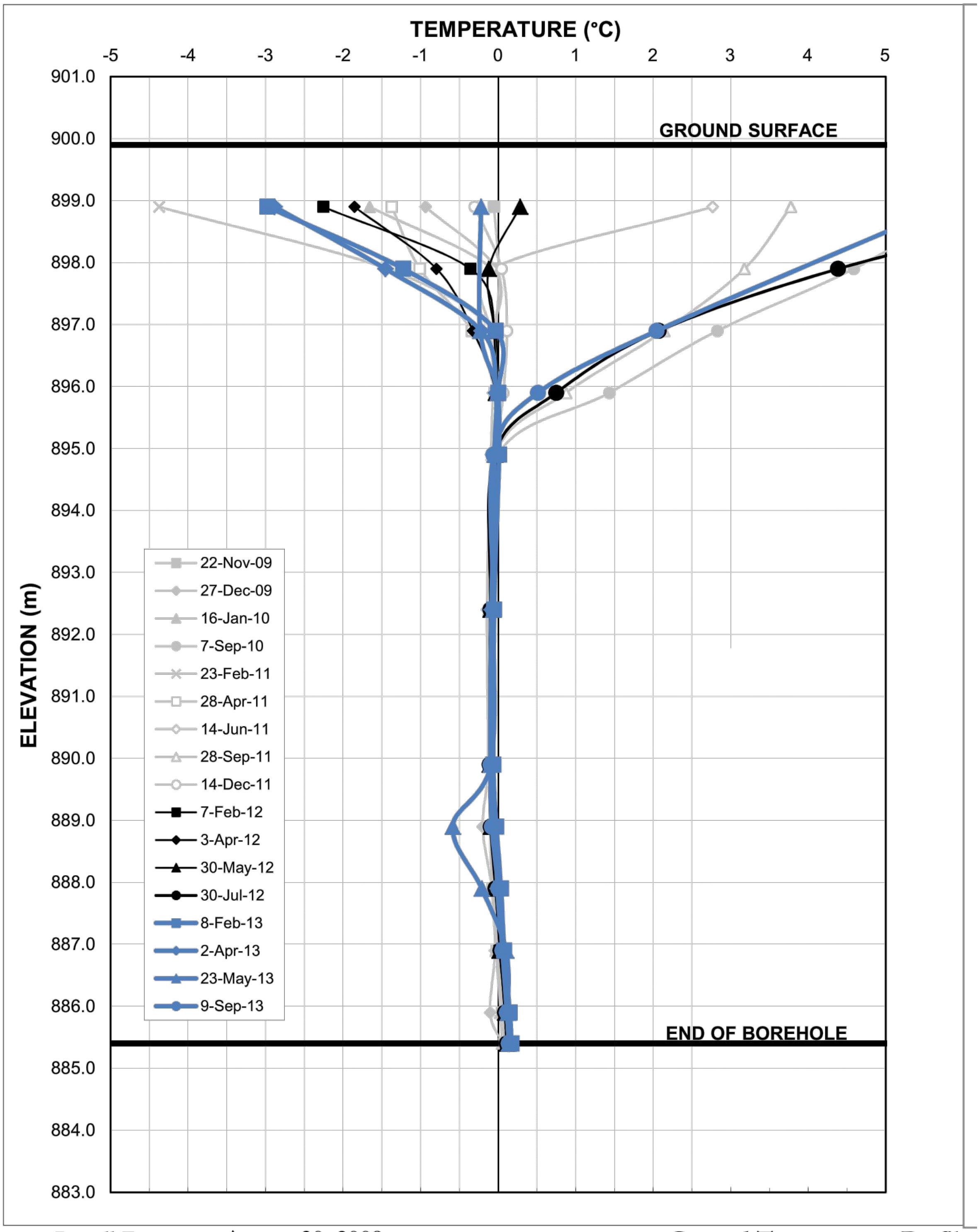
eba A TETRA TECH COMPANY

DSTF MONITORING 2013
KENO HILL DISTRICT, YUKON

GROUND TEMPERATURE PROFILE
BH15

PROJECT NO.	DWN	CKD	REV
W14103144-01	KF	IM	0
OFFICE	DATE		
EBA-WHSE	November 6, 2013		

Figure 1



Install Date	August 30, 2009
Last Updated	September 10, 2013
Cable No:	2208

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH17
Figure T2

Q:\Whitehorse\Data\0201drawings\Keno\W14103144-01 NELPCo. Alexco DSTF Monitoring 2013\W14103144-01 Sep 2013 Fig.1-6_R0.dwg [FIGURE 2] November 06, 2013 - 3:21:55 pm (BY: FULLER, KEN)

CLIENT
NND EBA LAND PROTECTION CORPORATION

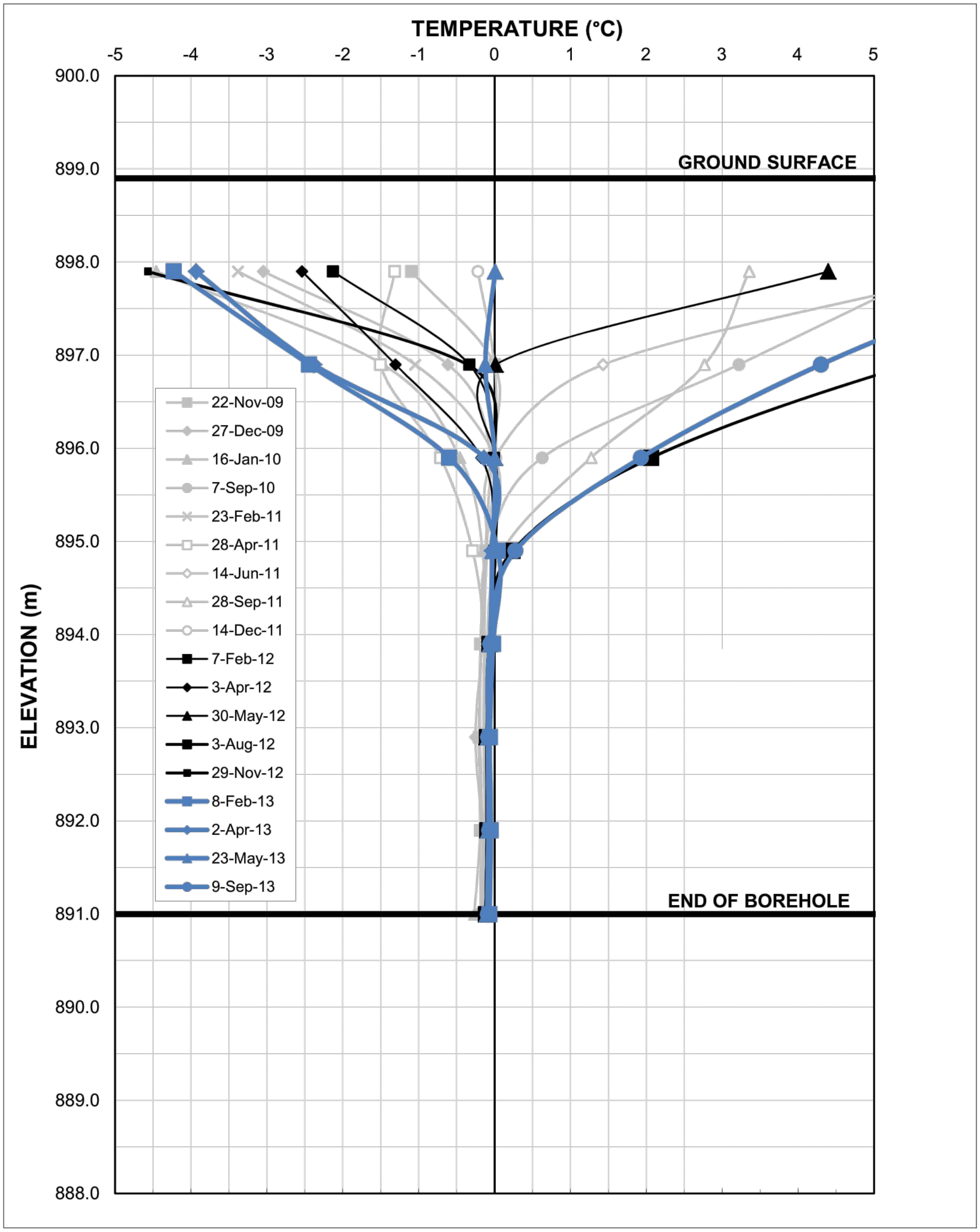
eba
A TETRA TECH COMPANY

DSTF MONITORING 2013
KENO HILL DISTRICT, YUKON

GROUND TEMPERATURE PROFILE
BH17

PROJECT NO.	DWN	CKD	REV
W14103144-01	KF	IM	0
OFFICE	DATE		
EBA-WHSE	November 6, 2013		

Figure 2



Install Date	September 2, 2009
Last Updated	September 10, 2013
Cable No:	2209

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH18
Figure T3

Q:\Whitehorse\Data\0201drawings\Keno\W14103144-01 NELPCo. Alexco DSTF Monitoring 2013\W14103144-01 Sep 2013 Fig.1-6_R0.dwg [FIGURE 3] November 06, 2013 - 3:21:59 pm (BY: FULLER, KEN)

CLIENT

NND EBA LAND PROTECTION CORPORATION

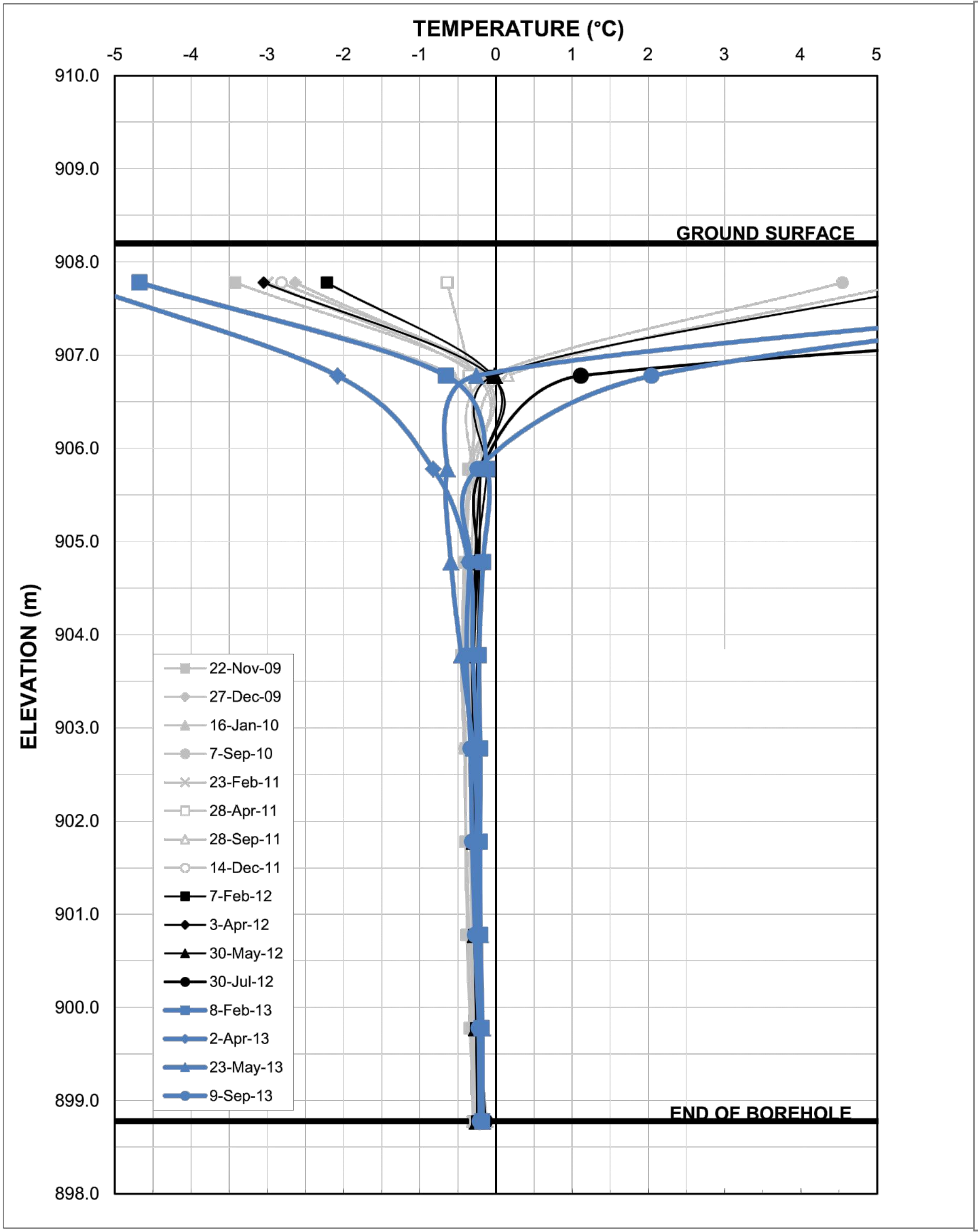
eba
A TETRA TECH COMPANY

DSTF MONITORING 2013
KENO HILL DISTRICT, YUKON

GROUND TEMPERATURE PROFILE
BH18

PROJECT NO.	DWN	CKD	REV
W14103144-01	KF	IM	0
OFFICE	DATE		
EBA-WHSE	November 6, 2013		

Figure 3



Install Date	September 29, 2009
Last Updated	September 10, 2013
Cable No:	2210

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH23
Figure T4

Q:\Whitehorse\Data\0201drawings\Keno\W14103144-01 NELPCo. Alexco DSTF Monitoring 2013\W14103144-01 Sep 2013 Fig.1-6_R0.dwg [FIGURE 4] November 06, 2013 - 3:22:01 pm (BY: FULLER, KEN)

CLIENT
NND EBA LAND PROTECTION CORPORATION

eba A TETRA TECH COMPANY

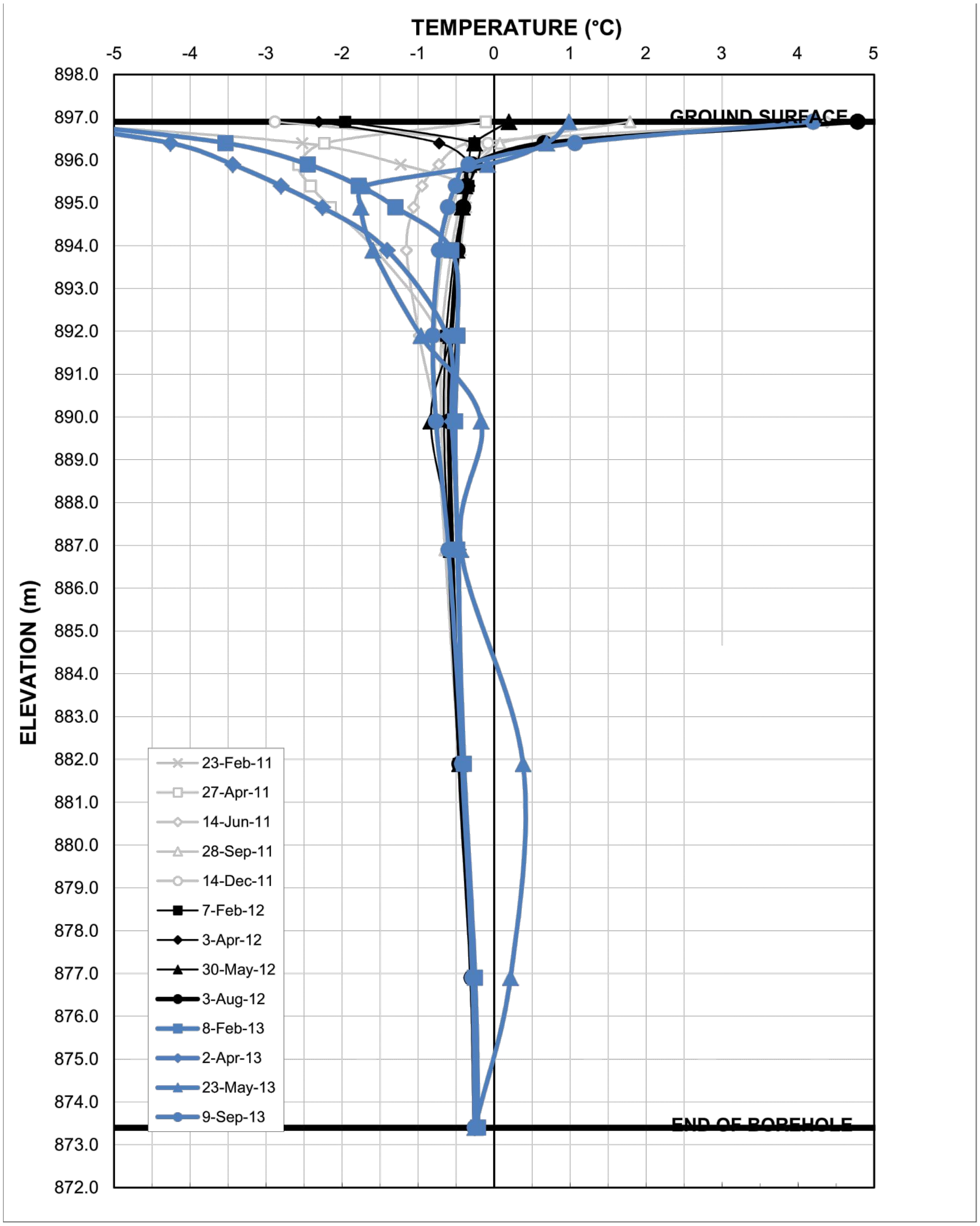
DSTF MONITORING 2013
KENO HILL DISTRICT, YUKON

GROUND TEMPERATURE PROFILE
BH23

PROJECT NO.	DWN	CKD	REV
W14103144-01	KF	IM	0

OFFICE	DATE
EBA-WHSE	November 6, 2013

Figure 4



Install Date	February 22, 2011
Last Updated	September 10, 2013
Cable No:	2263

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH31
Figure T5

CLIENT
NND EBA LAND PROTECTION CORPORATION

A TETRA TECH COMPANY

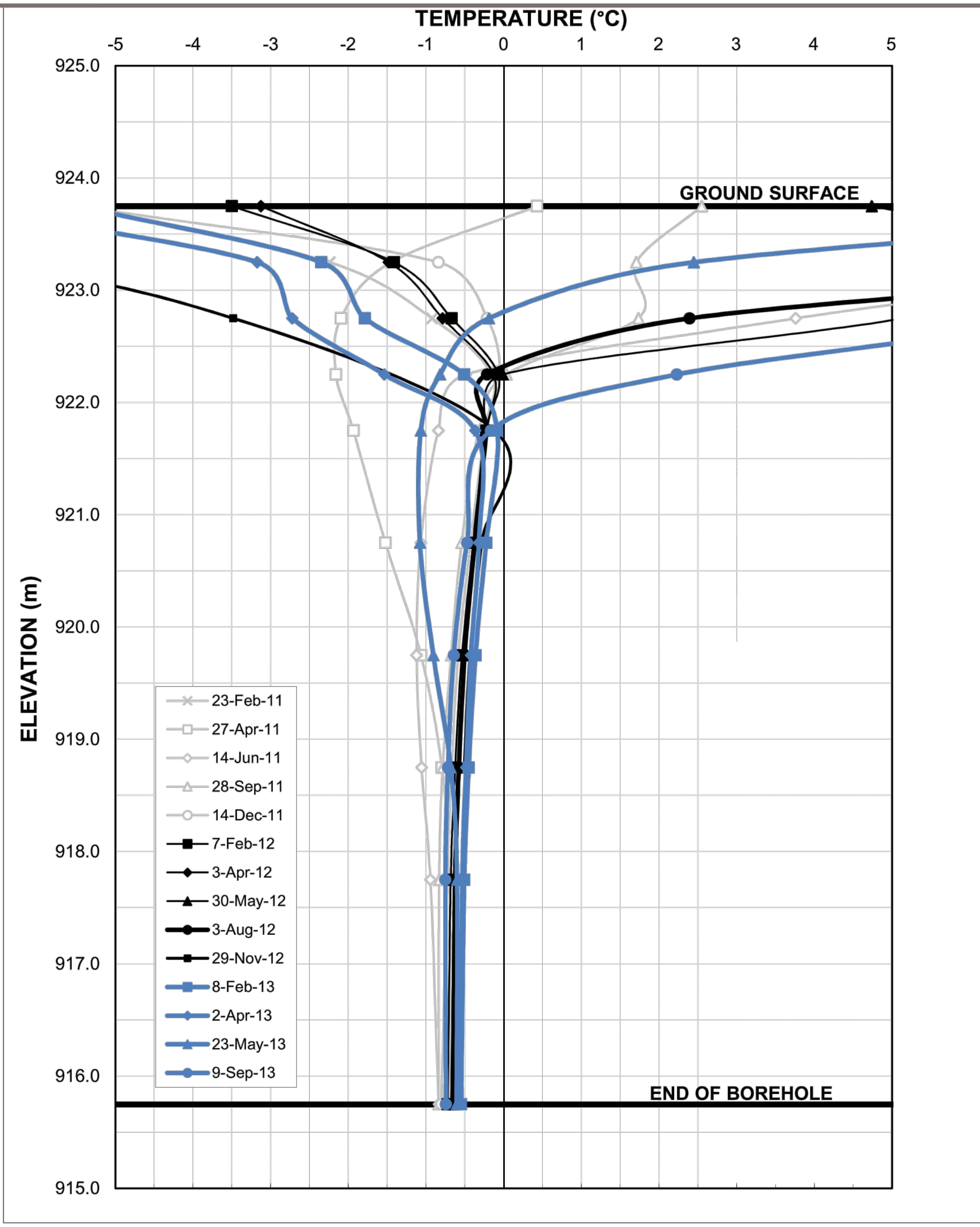
DSTF MONITORING 2013
KENO HILL DISTRICT, YUKON

GROUND TEMPERATURE PROFILE
BH31

PROJECT NO.	DWN	CKD	REV
W14103144-01	KF	IM	0
OFFICE	DATE		
EBA-WHSE	November 6, 2013		

Figure 5

Q:\Whitehorse\Data\0201drawings\Keno\W14103144-01 NELPCo. Alexco DSTF Monitoring 2013\W14103144-01 Sep 2013 Fig.1-6_R0.dwg [FIGURE 5] November 06, 2013 - 3:22:04 pm (BY: FULLER, KEN)



Install Date February 22, 2011
Last Updated September 10, 2013
Cable No: 2264

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH32
Figure T6

CLIENT

NND EBA LAND PROTECTION CORPORATION

A TETRA TECH COMPANY

DSTF MONITORING 2013
KENO HILL DISTRICT, YUKON

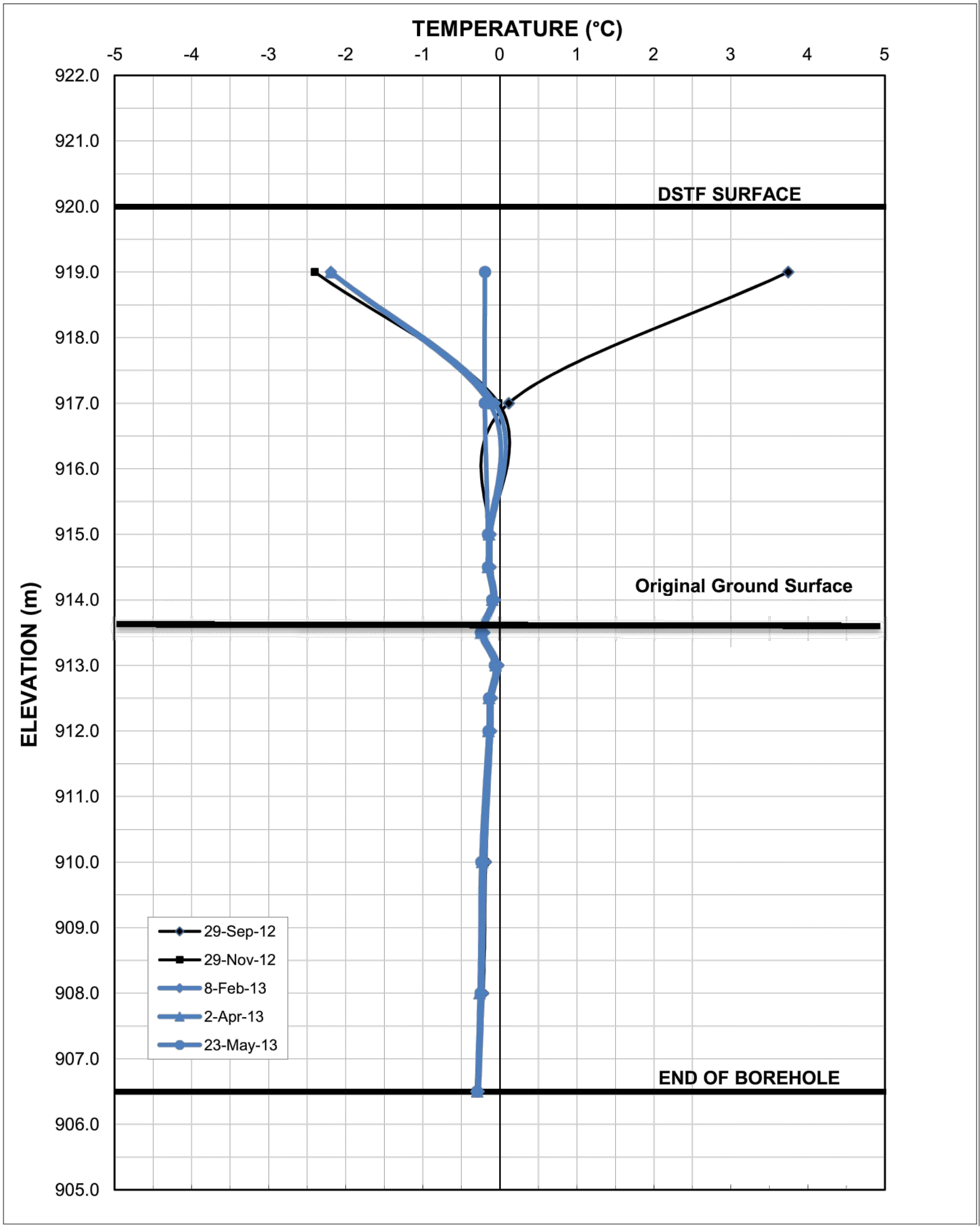
GROUND TEMPERATURE PROFILE
BH32

PROJECT NO.	DWN	CKD	REV
W14103144-01	KF	IM	0

OFFICE	DATE
EBA-WHSE	November 6, 2013

Figure 6

Q:\Whitehorse\Data\0201drawings\Keno\W14103144-01 NELPCo. Alexco DSTF Monitoring 2013\W14103144-01 Sep 2013 Fig.1-6_R0.dwg [FIGURE 6] November 06, 2013 - 3:22:07 pm (BY: FULLER, KEN)



Install Date	August 2, 2012	**Ground Temperature Profile**
Last Updated	September 10, 2013	**Keno Hill District Mill Site Borehole BH40**
Cable No:		**Figure T7**

Q:\Whitehorse\Data\0201drawings\Keno\W14103144-01 NELPCo. Alexco DSTF Monitoring 2013\W14103144-01 Sep 2013 Fig.1-6_R0.dwg [FIGURE 7] November 06, 2013 - 3:22:09 pm (BY: FULLER, KEN)

CLIENT

NND EBA LAND PROTECTION CORPORATION

eba A TETRA TECH COMPANY

DSTF MONITORING 2013
KENO HILL DISTRICT, YUKON

GROUND TEMPERATURE PROFILE
BH40

PROJECT NO.	DWN	CKD	REV	
W14103144-01	KF	IM	0	Figure 7
OFFICE	DATE			
EBA-WHSE	November 6, 2013			

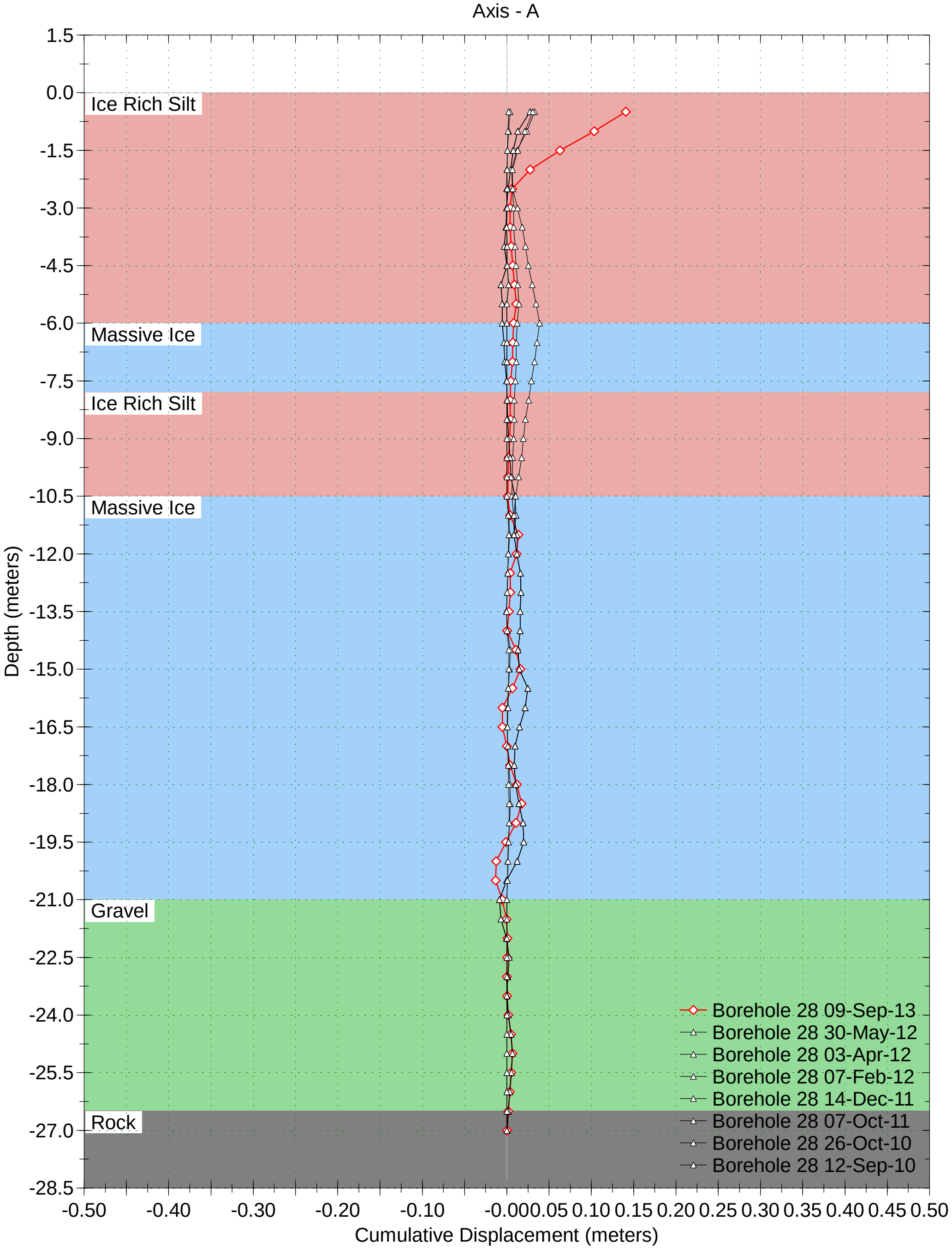
RST Instruments Ltd.

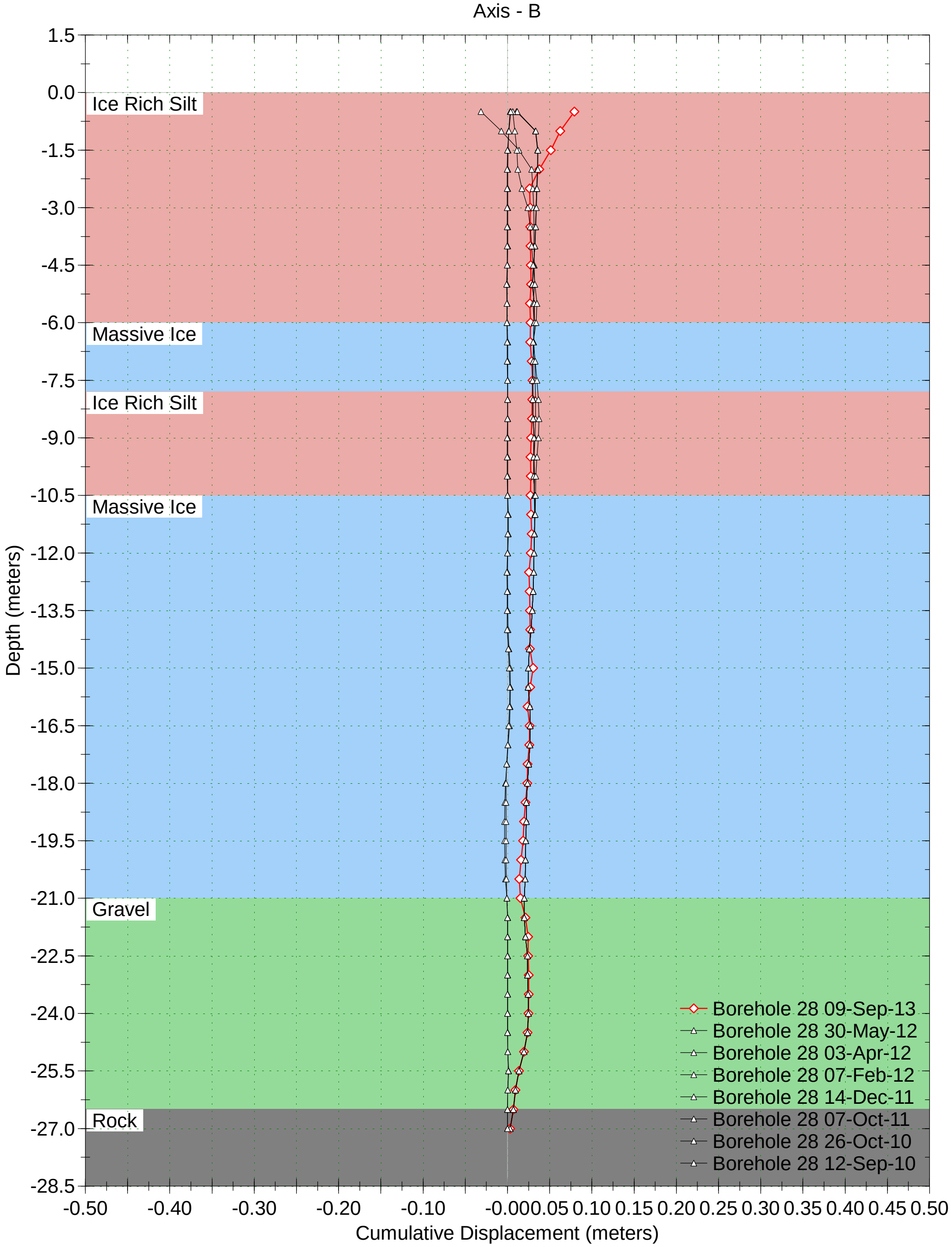
CUMULATIVE DISPLACEMENT

Inclinalysis v. 2.43.1

Borehole : Borehole 28
Project : Keno Hill District Mill
Location : DSTF
Northing : 7086985
Easting : 484026
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 27.0 meters
A+ Groove Azimuth :
Base Reading : 2010 Aug 22 08:23
Applied Azimuth : 0.0 degrees

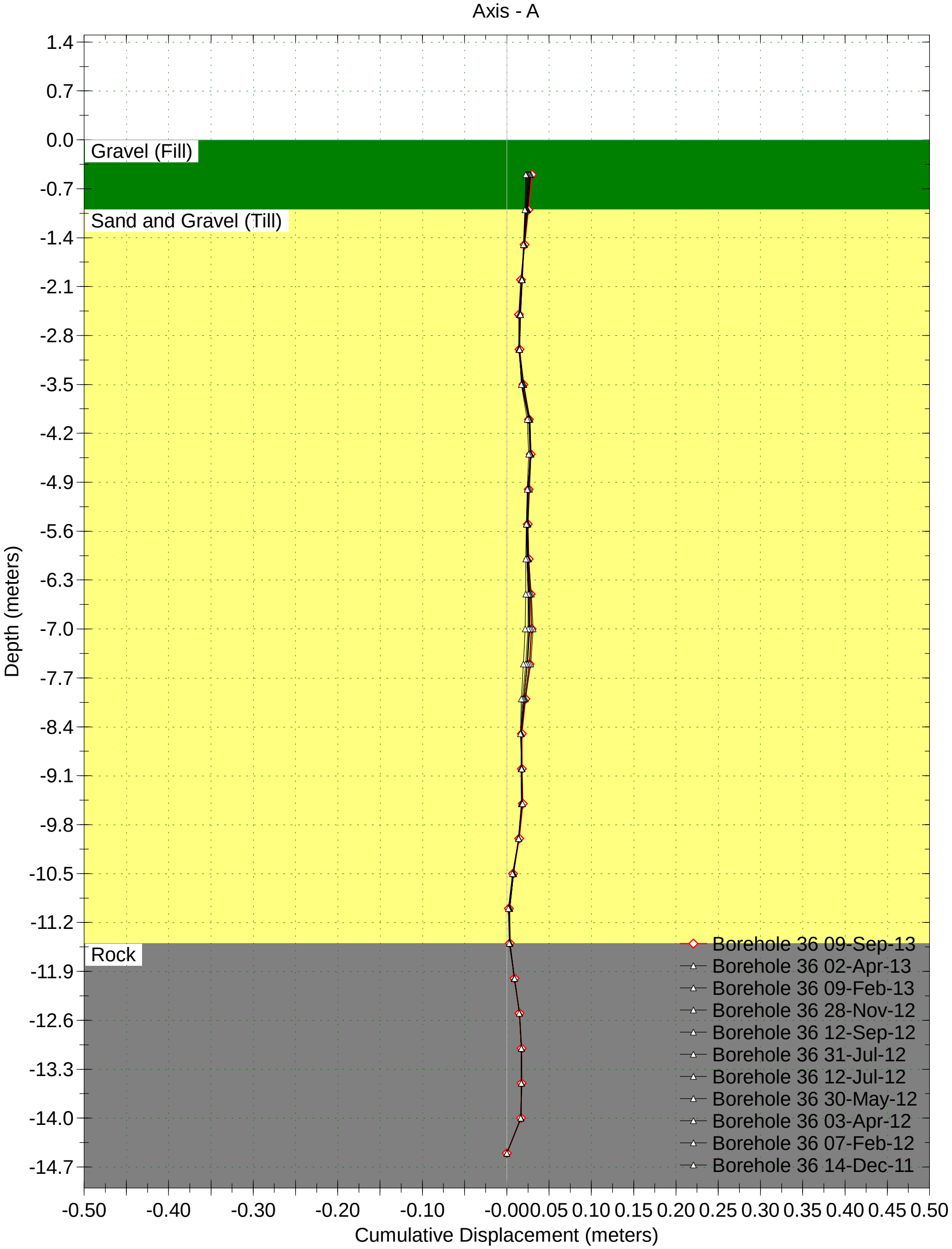


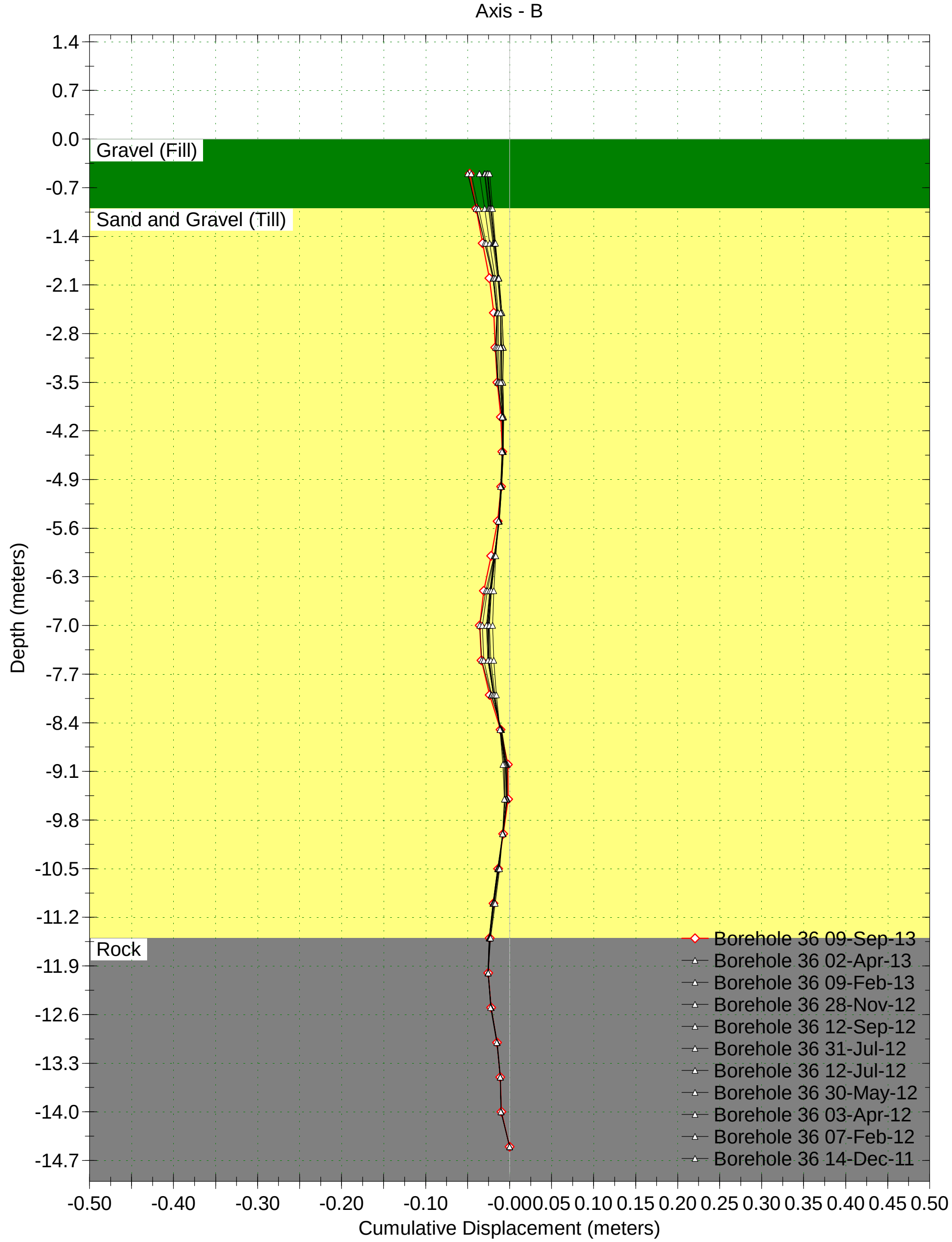


RST Instruments Ltd. | CUMULATIVE DISPLACEMENT | Inclinalysis v. 2.43.1

Borehole : Borehole 36
Project : Keno Hill District Mill
Location :
Northing :
Easting :
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 14.0 meters
A+ Groove Azimuth :
Base Reading : 2011 Oct 07 14:04
Applied Azimuth : 0.0 degrees





APPENDIX E

2013 NOISE MONITORING RESULTS

3 Calcite Business Centre, 151 Industrial Road
Whitehorse, Yukon Y1A 2V3
Phone (867) 668-6463 Fax (867) 633-4882
www.accessconsulting.ca

Memorandum

To: Yukon Government Energy Mines and Resources, and Yukon Government Tourism and Culture Branch

From: Holly Goulding, Access Consulting Group

CC: Kai Woloshyn, Alexco Resource Corp.

Date: March 17, 2014

Re: Keno Hill Silver District Mining Operations – Noise Monitoring Reporting Q4

INTRODUCTION

As part of the Keno Hill Silver District Mining Operations Noise Management Plan (the Plan) Alexco Keno Hill Mining Corp. (AKHM) has been monitoring noise levels in Keno City. The Plan was developed to address any potential noise effects that might occur with the addition of the two new mines, Lucky Queen and Onek 990. In addition to noise mitigation measures and the creation of a Noise Disturbance Notification Form and Noise Disturbance Register to track noise disturbance claims, AKHM committed to monitor noise levels within the community at various locations to assess the actual versus predicted noise levels and to determine if the noise abatement measures are effective.

The predicted noise levels were presented in the Noise Impact Assessment (NIA) completed by Patching Associates Acoustical Engineering Ltd (PAAE) conducted during the *Yukon Environmental and Socio-Economic Assessment Act* (YESAA) process (Project 2011-0315). The NIA identifies the noise sources from the current mining-related activities, noise receptors, and predicts the anticipated noise level from all existing sources and those associated with the addition of Lucky Queen and Onek 990 mining operations.

This memo presents noise monitoring results for Q4 October to December, 2013 (and also includes January and February 2014) and a summary of any noise complaints received over this time period in the Noise Complaint Registry.

NOISE RECEPTORS

AKHM has monitored noise at the five locations selected in the NIA as being potential noise receptors within the 2 km radius study area around Keno City. Starting in November 2013, noise has also been monitored at the Keno City campground. These locations are listed in Table 1 and shown in Figure 1.

Table 1 Representative Locations Assessed in Keno City

Monitoring Location	GPS Location	Description
R01	N63.90827 W135.29599	East end Residence, north side of Lightning Creek Road
R02	N63.91019 W135.29968	Residence, east side of Sign Post Road
R03	N63.91023 W135.30205	Town Center, north from the Snack Bar
R04	N63.91239 W135.30376	Residence, west side of Wernecke Road
R05	N63.90851 W135.30993	Residence, about 850m east from the Mill
Cmpgrnd	N63.90772 W135.29998	Keno City campground

The background noise levels experienced by these locations vary considerably, depending on location and local activities. Past and proposed Lucky Queen and Onek 990 mining operations are in addition to normal fluctuations in background levels. Climate parameters, such as relative humidity, temperature, and temperature inversions impact the sound level and propagation experienced by each of these receptors.

MONITORING TIMING

For the period from October 2013 to February 2014 three monitoring events took place during the month of November, two events took place in the months of December and January, and one event took place in February for a total of 8 monitoring events. No mining or milling took place in the Keno Hill Silver District for the entire measurement period.

RESULTS

The results from the 8 monitoring events from November 2013 to February 2014, in addition to results from all previous monitoring events, are presented in Appendix A. All readings were taken using an Extech integrating sound level datalogger model 407780 to measure average dBA over 10 minutes. The wind speed, wind direction, temperature and precipitation data from the Keno District Mill weather station associated with each noise monitoring event have been reported as these can have a significant effect on measured noise levels. Any notable noise sources associated with the monitoring event was also documented.

Noise levels measured at all testing locations were well within or below the 50-90 dBA range deemed "what is socially acceptable for daytime noise limits" as defined in the past YESAB assessment for the Bellekeno Mine development (Project 2009-0030). Only one measurement was above 50 dBA, occurring on January 20th at R05 (68.1 dBA), corresponding to the grader going by.

Figure 2 shows the noise levels measured compared to the predicted current and proposed mining operations noise levels plus ambient sound levels from the NIA. Many of the measurements exceeded the predicted levels, which range from 32 to 39 dBA, despite the fact that operations have temporarily ceased.

At R03 and R04 measurements exceeded the predictions on November 16th, December 31st and January 29th; in addition at R03 predictions were exceeded on November 29th and January 20th. Observations for these events included bird and animal activity, people and vehicles, including the water truck and grader, and the flagpole dinging in the wind.

At R05 two measurements exceeded the predictions, the January 20th exceedance discussed above, and another on November 16th associated with animals and human activity at a distance of approximately 200m from the sound meter. For R01, only the February 5th measurement exceeded the predicted noise levels, associated with animal noises and ice cracking.

During the measurement period only three measurements were taken at R02, and all were below the predicted noise level. Finally, at the campground all measurements were close to or below 30 dBA.

Given that all measurements were made during the temporary shutdown period, these observations indicate that baseline noise levels in Keno City are greater than those predicted in the NIA and that many of the notable noise sources are not linked to Keno mining or milling operations.

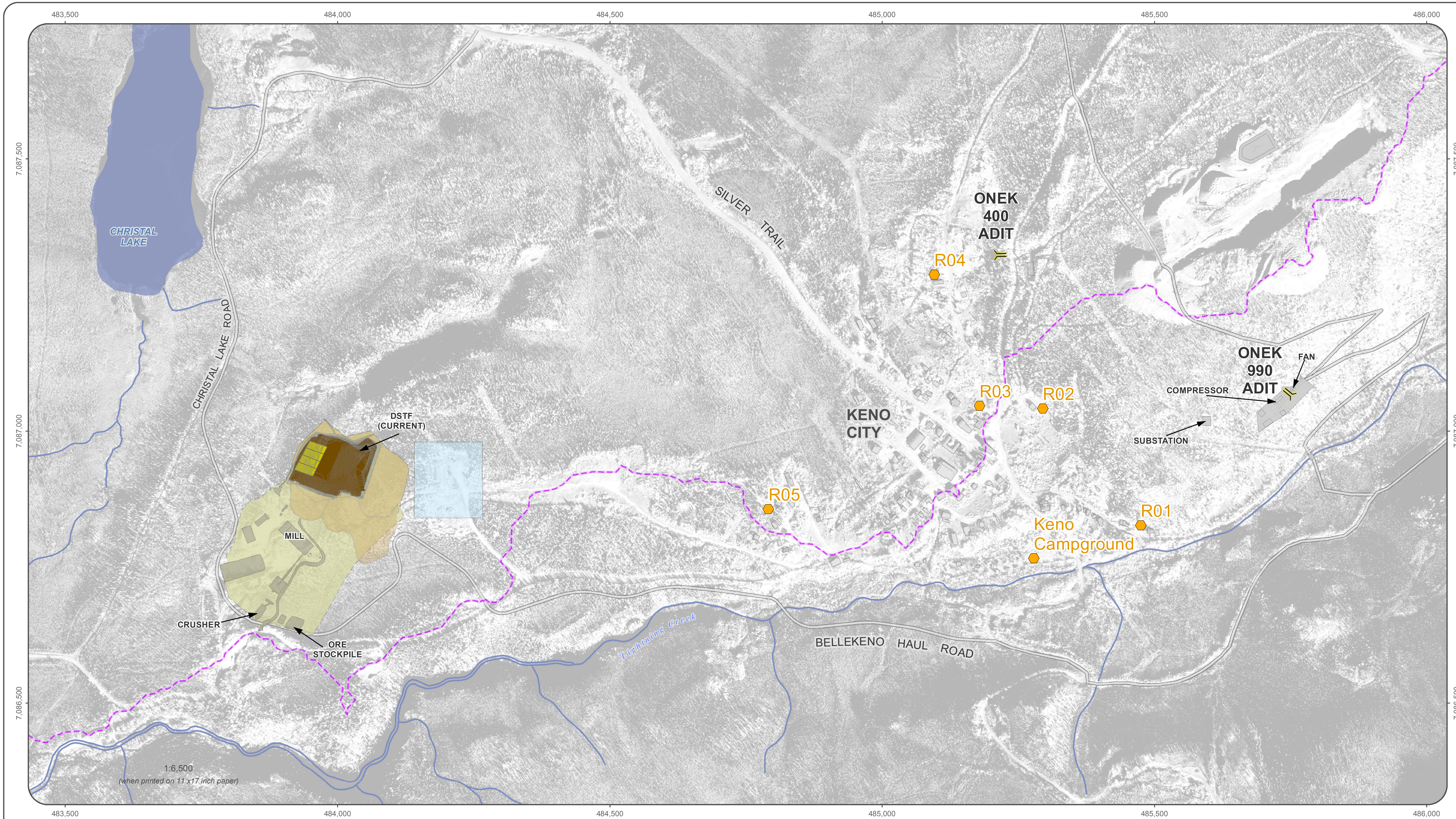
NOISE COMPLAINTS

No noise complaints received by Keno residents were provided by Alexco to Access Consulting.

CONCLUSION

Noise levels measured at all noise receptors were well within or below the 50-90 dBA range deemed to be socially acceptable for daytime noise limits. Compared to the predicted current and proposed mining operations noise levels plus ambient sound levels from the NIA, many of the measurements exceed the predicted levels, which range from 32 to 39 dBA, despite the temporary cessation of mining and milling operations in the Keno Hill Silver District. It is recommended that proposed mining operations noise levels plus ambient sound levels generated in the NIA be revised using the noise monitoring data collected during the temporary closure period prior to the re-commencement of mining in the Keno Hill Silver District.

Given the short measurement interval of 10 minutes, measurements could have been influenced by fluctuations in background levels and climate parameters impacting noise levels and propagation. Thus, over a longer interval of measurement it is possible that lower noise levels might have been measured.



Aerial photography flight date: July 13th 2006. Ortho-rectification produced by Challenger Geomatics Ltd. Data obtained from EBA: "As built" spatial data: Mill pond (Y.E.S.), Mill structure, and current DSTF footprints, Roads (In House survey December 11th 2011). Design spatial data: Conveyance and water collection, diversion ditches and berm.

Datum: NAD 83; Projection: UTM Zone 8N

This drawing has been prepared for the use of Access Mining Consultants Ltd.'s client and may not be used, reproduced or relied upon by third parties, except as agreed by Access Mining Consultants Ltd. and its client, as required by law or for use of governmental reviewing agencies. Access Mining Consultants Ltd. accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without Access Mining Consultants Ltd.'s express written consent.

- Noise Monitoring Station
- Roads
- Watercourse
- Watershed Boundaries
- Mill Site Footprint
- DSTF Cover and Revegetation Phase I
- Land Disposition Garbage Dump
- Buildings/Structures
- DSTF 322,000 Tonnes Design
- As Built, DSTF, Sept2013

AKHM

ACCESS

KENO HILL SILVER DISTRICT MINING OPERATIONS

FIGURE 1

NOISE MONITORING STATIONS

MARCH 2014

I:\Keno_Area_Mines\FM\Map\02_Permit\YESAB\NoiseMonitoring\FM_NoiseMonManagement_20140318.mxd
(Last edited by: jpan;3/18/2014/11:16 AM)

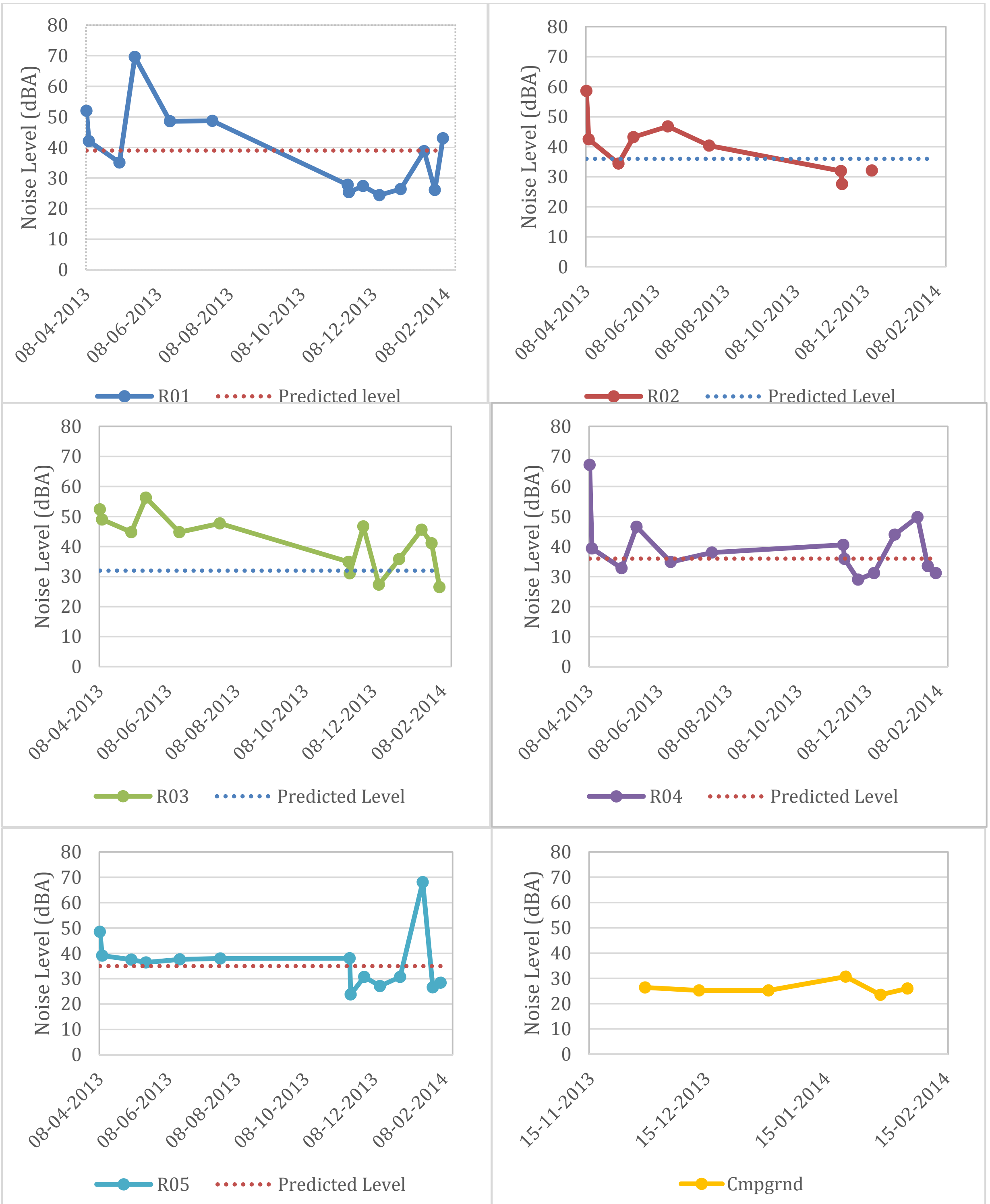


Figure 2 Keno Noise Monitoring Data

APPENDIX A

KENO NOISE MONITORING DATA

Keno Noise Monitoring Data

Date	Location	Time	Temp (°C)	Wind	Precipitation	dB	Observations
08-04-2013	R01	12:26	2	Windy SSE	None	52.0	
08-04-2013	R02	12:05	2	Windy SSE	None	58.6	
08-04-2013	R03	11:45	2	Windy SSE	None	52.4	
08-04-2013	R04	11:25	2	Windy SSE	None	67.2	A dog barked 2 times
08-04-2013	R05	11:04	2	Windy SSE	None	48.5	
10-04-2013	R01	11:33	-6	Light SSW	None	42.1	
10-04-2013	R02	13:00	-6	Light SSW	None	42.5	
10-04-2013	R03	12:40	-6	Light SSW	None	49.0	Doors slamming. People talking
10-04-2013	R04	12:20	-6	Light SSW	None	39.4	
10-04-2013	R05	12:00	-6	Light SSW	None	39.1	
06-05-2013	R01	15:30	2	Wind West	None	35.1	Backup alarm at Onek. Tarps flapping in wind
06-05-2013	R02	15:30	2	Slight breeze	None	34.4	
06-05-2013	R03	15:30	2	Windy	None	44.8	Dog barking. Boart truck
06-05-2013	R04	15:30	2	Slight breeze	None	32.8	
06-05-2013	R05	15:30	2	Slight breeze	None	37.5	Dog barking
19-05-2013	R01	10:25	-2	Light (<10km/h) N	Light snow	69.6	Creek flowing loud. Squirrels making noise. Tarp flapping. Volvo going by on the BKR
19-05-2013	R02	10:10	-2	Light (<10km/h) E	Light snow	43.2	Creek flowing below. A few birds chirping. Boart pickup went by
19-05-2013	R03	9:55	-2	Light (<10km/h) E	Light snow	56.3	A few birds. Talking and trucks in town in the distance. Water truck went by
19-05-2013	R04	9:30	-2	Light (<10km/h) E	Light snow	46.6	Lots of birds calling and a woodpecker pecking close by
19-05-2013	R05	8:55	-2	Light (<10km/h) E	Light snow	36.4	A few birds and a squirrel chirping
18-06-2013	R01	16:25	22	Light (<10km/h) S	None	48.6	Creek flowing. Leaves rustling
18-06-2013	R02	16:10	22	Light (<10km/h) S	None	46.8	Volvo on BKR. 2 vehicles drove past. Gusts of wind rustling trees. Chainsaw nearby in town
18-06-2013	R03	15:55	22	Light (<10km/h) S	None	44.8	People talking and walking close by. 2 Vehicles driving through town and 1 driving by
18-06-2013	R04	15:40	21	Light (<10km/h) S	None	34.9	Wind rustling leaves. Birds calling
18-06-2013	R05	14:55	21	Light (<15km/h) S	None	37.6	Wind rustling leaves. Volvo on the BKR
24-07-2013	R01	11:07	23	Light (<20km/h) S	None	48.7	Leaves rustling. Creek nearby. Birds chirping
24-07-2013	R02	10:55	23	Light (<10km/h) S	None	40.4	Three vehicles driving nearby. Leaves rustling
24-07-2013	R03	10:43	23	Light (<10km/h) S	None	47.7	Backup alarm at Mill. Leaves rustling. Someone in town hammering. Two vehicles drove by
24-07-2013	R04	10:30	23	Light (<10km/h) SE	None	38.0	Backup alarm at Mill. Mill crusher. Leaves rustling. Car drove by twice. Car on Silver Trail
24-07-2013	R05	10:14	23	Calm	None	38.0	Backup alarm at Mill. Volve down BKR. Mill crusher
16-11-2013	R01	14:11	-20	Calm	None	27.8	Birds
16-11-2013	R02	13:51	-20	Calm	None	31.9	Squirrel, ravens, birds noise
16-11-2013	R03	13:35	-20	Calm	None	34.9	Squirrel, ravens, birds noise+ truck
16-11-2013	R04	13:20	-20	Calm	None	40.6	Lots of ravens activity, birds
16-11-2013	R05	14:27	-20	Calm	None	38.1	Birds, truck plus door slaming + humain voive + dog barking. All at about 200 m from sound meter
17-11-2013	R01	12:46	-30	Calm	None	25.4	Birds
17-11-2013	R02	12:25	-30	Calm	None	27.6	Birds, squirrel and vehicule
17-11-2013	R03	12:07	-30	Calm	None	31.1	Ravens, squirrel and vehicule
17-11-2013	R04	11:48	-30	Calm	None	35.9	Ravens

17-11-2013	R05	13:01	-30	Calm	None	23.8	Quiet
29-11-2013	Cmpgrnd	15:08	-23	Calm	None	26.4	Chainsaw in town, birds chirping
29-11-2013	R01	14:52	-23	Calm	None	27.4	Birds chirping, snowmobile in distance
29-11-2013	R03	14:36	-23	Calm	None	46.7	Ravens, chainsaw and dog barking in distance, water truck drove by and backed up (alarm) nearby
29-11-2013	R04	14:20	-23	Calm	None	29.0	Squirrels and little birds in distance, ravens flying by, person coughing, doors closing, dog barking
29-11-2013	R05	13:59	-24	Calm	None	30.7	Raven calling, snowmobile in distance, squirrel nearby
13-12-2013	Cmpgrnd	10:55	-20	N-W Calm	None	25.2	Quiet, birds singing once
13-12-2013	R01	10:35	-20	N-W Calm	None	24.4	Quiet
13-12-2013	R02	10:17	-20	N-W Calm	None	32.1	Raven, birds, squirrel
13-12-2013	R03	10:02	-20	N-W Calm	None	27.3	Raven ,birds, squirrel
13-12-2013	R04	9:44	-20	N-W Calm	None	31.2	Raven flying and walking around. Birds singing
13-12-2013	R05	11:13	-20	N-W Calm	None	27.1	Quiet, squirrel
31-12-2013	R05	13:52	-18	calm	None	30.7	A few little birds chirping
31-12-2013	R04	14:06	-18	Calm	None	44.0	Lots of ravens flying, calling. Dog chewing on bone nearby. Person walking by, closing door
31-12-2013	R03	14:20	-17	Light (<10km/h)S	None	35.8	Two vehicles drove through town. Flagpole dinging in the wind. People talking, walking in town
31-12-2013	R01	14:34	-17	Calm	None	26.4	Little birds chirping. Raven flew by
31-12-2013	Cmpgrnd	14:49	-17	Calm	None	25.2	Ravens calling in distance. Someone coughing. Little birds chirping
20-01-2014	R04	14:04	-14	Calm	None	49.8	Distant grader. Birds. Vehicle
20-01-2014	R03	14:24	-13	Calm	None	45.6	Distant grader. Birds
20-01-2014	Cmpgrnd	14:39	-13	Calm	None	30.7	Distant grader
20-01-2014	R01	15:13	-14	Calm	None	38.8	Distant grader. Vehicle
20-01-2014	R05	14:56	-14	Calm	None	68.1	Grader went by
29-01-2014	R05	15:07	-12	Calm	None	26.6	Squirrels, whiskeyjack calling nearby
29-01-2014	R04	15:23	-12	Calm	None	33.5	Small bird chirping, ravens calling and flying by
29-01-2014	R03	15:36	-12	Calm	None	41.1	Ravens calling, truck driving by, squirrel chatting, small bird chirping
29-01-2014	R01	15:50	-12	Calm	None	26.1	Squirrel chatting, door closing in distance, birds calling, neighbour getting firewood
29-01-2014	Cmpgrnd	16:06	-12	Calm	None	23.5	Squirrel chatting, bird chirping, ravens flying over and calling
05-02-2014	R05	12:55	-20	Light (5km/h)	None	28.4	Raven calling, squirrel chattering
05-02-2014	R04	13:12	-20	Light(<5km/h)	None	31.2	Small bird chirping, ravens calling and flying, door closing in distance X3, neighbour getting firewood
05-02-2014	R03	13:27	-20	Light(<5km/h)	None	26.5	Ravens calling in distance. Squirrel chattering, small birds, truck creaking
05-02-2014	R01	13:40	-18	Light(<5km/h)	None	43.0	Squirrel chattering, ice inside old dump truck (beside sample site) cracked loudly, birds chirping
05-02-2014	Cmpgrnd	13:59	-19	Light(<5km/h)	None	26.0	Small birds chirping, ravens in distance

*All readings are taken using an Extech integrating sound level datalogger model 407780 to measure DBA for 10 min.Reading from 16/11/13 taken with an Casella CEL-63X model.(Laeq, Db.)

APPENDIX F

2013 DUST MONITORING RESULTS

3 Calcite Business Centre, 151 Industrial Road
Whitehorse, Yukon Y1A 2V3
Phone (867) 668-6463 Fax (867) 667-6680
www.accessconsulting.ca

Memorandum

To: Alexco Resource Corp.

From: Catherine Henry, Access Consulting Group

CC: Kai Woloshyn, Alexco Resource Corp.

Date: March 13, 2014

Re: Air Quality Data Summary, Keno, YT

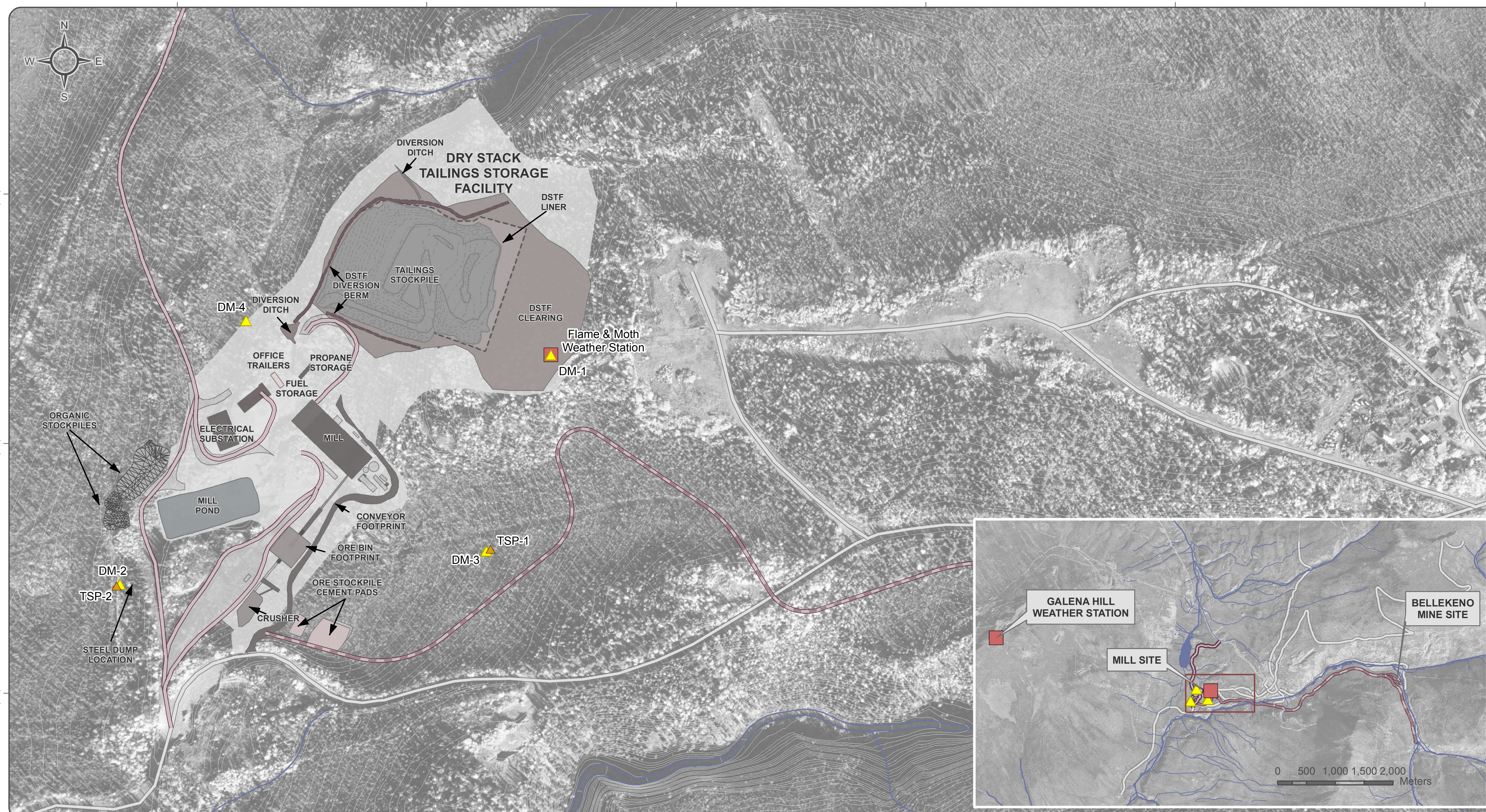
1. Introduction

In accordance with Clause 69 of the Decision Document for the assessment of the Bellekeno Mine Project (YESAB File Number 2009-0030), dustfall monitoring was installed at two initial locations near the Keno District Mill site in March 2011 and two additional sampling locations were established in August 2011. Bergerhoff dust monitoring gauges were initially selected as the appropriate instrumentation to carry out this program. In accordance with clauses 36 and 37 of the Decision Document for the assessment of the Onek and Lucky Queen Deposit production (YESAB File Number 2011-0315), total suspended particulates (TSP) monitoring was subsequently initiated in August 2012 and dustfall monitoring was discontinued in January 2013. This memorandum presents the results of the TSP monitoring to date.

2. Instrumentation and Methodology

Two BGI Omni Ambient Air Quality Samplers (see Figure 1) were commissioned in August 2012, one to the East of the mill and crusher (TSP-1) and one at the toe of the dry stack tailings facility (TSP-2). The locations are shown on Figure 2. The BGI Omni samplers are set up with Total Suspended Particulates (TSP) inlets, and use the filter reference method. Samples are collected over 24-hour periods and sent to Maxxam Analytics laboratory for gravimetric analysis and ICP metals mass spectrometry. Four samples per location are collected every month, in order to capture the different weather conditions that may affect dust sources and transport. The BGI Omni Ambient Air Quality Samplers cannot collect samples below -20°C and therefore some winter months will have reduced data collected.

Figure 1 BGI Omni Ambient Air Quality Sampler



Aerial photography flight date: July 13th 2006. Ortho-rectification produced by Challenger Geomatics Ltd. Data obtained from EBA: “As built” spatial data: Mill pond (Y.E.S.), Mill structure, and current DSTF footprints, Roads (In House survey December 11th 2011). Design spatial data: Conveyance and water collection, diversion ditches and berm.

Datum: NAD 83; Projection: UTM Zone 8N

This drawing has been prepared for the use of Access Mining Consultants Ltd.'s client and may not be used, reproduced or relied upon by third parties, except as agreed by Access Mining Consultants Ltd. and its client, as required by law or for use of governmental reviewing agencies. Access Mining Consultants Ltd. accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without Access Mining Consultants Ltd.'s express written consent.

Main Map: 1:3,000 Inset Map: 1:65,000
(when printed on 11 x17 inch paper)

0 50 100 150 200 Meters

- Total Suspended Particulates Monitor
- Dust Monitor Station
- Dry Stack Tailings
- Design PU
- AsBuilt; As Built
- Mill Access Road
- Haul Road
- Local Road

AKHM

ACCESS

ALEXCO KENO HILL MINING CORP.

FIGURE 2
DUST MONITORING AND WEATHER STATION LOCATIONS

Drawn By JP	FEBRUARY 2013	Verified by VB

I:\ALEX-05-01\Bellekeno\GIS\mxd\Annual_Reports\2012\Dust_Monitoring_Stns_20130214.mxd
(*Last edited by: jpan;2/14/2013/13:20 PM*)

3. Results

3.1. Total Suspended Particulates

Results of the gravimetric analyses can be converted into 24-hour average ambient concentrations based on the flow rate of the instruments. This can then be compared with the Yukon Ambient Air Quality Standard (YAAQS) of 120 µg/m³ for TSP (24-hour average). Table 1 below shows that all results are well below the Yukon TSP standard, most results being between 5 to 20 times below. Note that 57% and 51% of samples were below detection limit for TSP-1 and TSP-2 respectively. Also note that the air quality monitors are located 160 (TSP-1) and 46 (TSP-2) meters away from the dry stack tailings storage facility (DSFTF) and 163 (TSP-1) and 240 (TSP-2) meters away from the crusher, while the nearest residence is at a distance of 710 meters from the DSTSF and 860 meters from the crusher. TSP levels experienced at the nearest residence would therefore be lower than what was measured at TSP-1 or TSP-2.

Table 1 24-Hour Average Total Suspended Particulate Results, 2012-2013

Sample Date	TSP-1 (µg/m³)	TSP-2 (µg/m³)
23/08/2012	10.1	12.8
27/09/2012	<5.6	<5.6
29/09/2012	<5.6	<5.6
16/10/2012	5.8	-
17/10/2012	<5.6	-
23/10/2012	53.2	-
15/12/2012	<5.6	13.6
14/01/2013	<5.6	-
16/01/2013	<5.6	<5.6
23/03/2013	<5.6	18.2
24/03/2013	<5.6	23.2
25/03/2013	<5.6	13.5
26/03/2013	9.6	11.1
07/04/2013	-	17.1
10/04/2013	5.7	7.2
13/04/2013	<5.6	6.9
15/04/2013	6.5	6.5
16/04/2013	7.2	6.4
28/05/2013	6.8	-
16/06/2013	8.2	-
17/06/2013	-	<5.6
18/06/2013	47.2	6.3
21/06/2013	7.2	<5.6

Sample Date	TSP-1 (μg/m³)	TSP-2 (μg/m³)
23/06/2013	-	<5.6
24/06/2013	<5.6	-
28/06/2013	-	62.2
19/07/2013	5.6	<5.6
20/07/2013	12.2	<5.6
21/07/2013	<5.6	<5.6
22/07/2013	<5.6	10.1
22/08/2013	<5.6	<5.6
23/08/2013	<5.6	-
24/08/2013	<5.6	-
25/08/2013	<5.6	<5.6
26/08/2013	-	<5.6
28/08/2013	-	7.2
31/08/2013	-	<5.6
21/09/2013	-	<5.6
24/09/2013	<5.6	<5.6
27/09/2013	<5.6	<5.6
28/09/2013	<5.6	<5.6
29/09/2013	<5.6	-
30/09/2013	-	6.0
24/10/2013	-	<5.6
25/10/2013	7.6	<5.6
26/10/2013	<5.6	<5.6
27/10/2013	6.8	<5.6
28/10/2013	<5.6	-
28/11/2013	7.8	8.8
29/11/2013	7.6	7.5
30/11/2013	8.9	8.5
1/12/2013	6.7	7.2

3.2. METAL SPECIATION

There are no ambient air quality standards for metals in Yukon, however the Ontario Ministry of Environment has developed a comprehensive list of Ambient Air Quality Criteria (AAQC) that includes 24-hour average concentrations for a number of metals. Tables 2 and 3 below present the 24-hour average concentrations measured at TSP-1 and TSP-2 respectively. For reference, the Ontario AAQCs are indicated in the first row where available and exceedences of these criteria are shown in red.

Very few exceedences of the Ontario AAQCs are observed overall, in fact samples are below the detection limit for most parameters. Parameters for which exceedences have occurred include lead (5% of samples) at TSP-1 and cadmium (2.5% of samples), lead (2.5% of samples) and manganese (7.5% of samples) at TSP-2. Note that the detection limit for beryllium and cadmium is greater than the Ontario AAQC and in many cases, it cannot be determined if exceedences of these parameters have occurred.

Table 2 24-Hour Average Metal Concentrations, TSP-1, 2012-2013

Sample Date	Aluminum (Al), total µg/m³	Antimony (Sb), total µg/m³	Arsenic (As), total µg/m³	Barium (Ba), total µg/m³	Beryllium (Be), total µg/m³	Boron (B), total µg/m³	Cadmium (Cd), total µg/m³	Calcium (Ca), total µg/m³	Chromium (Cr), total µg/m³	Cobalt (Co), total µg/m³	Copper (Cu), total µg/m³	Iron (Fe), total µg/m³	Lead (Pb), total µg/m³	Magnesium (Mg), total µg/m³	Manganese (Mn), total µg/m³	Molybdenum (Mo), total µg/m³	Nickel (Ni), total µg/m³	Phosphorus (P), total µg/m³	Potassium (K), total µg/m³	Selenium (Se), total µg/m³	Silver (Ag), total µg/m³	Sodium (Na), total µg/m³	Strontium (Sr), total µg/m³	Sulphur (S), total µg/m³	Tin (Sn), total µg/m³	Titanium (Ti), total µg/m³	Vanadium (V), total µg/m³	Zinc (Zn), total µg/m³	Zirconium (Zr), total µg/m³
Ontario AAQC (24-hr avg)		**25**	**0.3**	**10**	**0.01**	**120**	**0.025**		**0.5**	**0.1**	**50**	**4**	**0.5**		**0.4**	**120**	**0.2**			**10**	**1**		**120**		**10**	**120**	**2**	**120**	
23/08/12	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.486	<0.042	<0.069	<0.069	0.554	0.174	0.061	0.045	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.708	<0.111	<0.028	<0.042	0.118	<0.069
27/09/12	0.667	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	1.722	<0.042	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.039	<0.069
23/10/12	0.653	<0.278	<0.111	0.022	<0.011	<0.042	<0.028	1.153	<0.042	<0.069	<0.069	2.528	1.083	0.308	0.301	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.569	<0.111	<0.028	<0.042	0.558	<0.069
15/12/12	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	<0.042	<0.069	<0.069	0.194	0.139	<0.042	0.053	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.094	<0.069
14/01/13	0.403	<0.278	<0.111	0.010	<0.011	<0.042	<0.028	2.069	<0.042	<0.069	<0.069	0.815	<0.111	0.217	0.026	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	0.875	0.007	0.556	0.174	<0.028	<0.042	0.196	<0.069
16/01/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.444	<0.042	<0.069	<0.069	0.126	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.039	<0.069
23/03/13	0.292	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	1.347	<0.042	<0.069	<0.069	0.318	<0.111	0.072	0.034	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.347	<0.111	<0.028	<0.042	0.043	<0.069
24/03/13	<0.278	<0.278	<0.111	0.019	<0.011	<0.042	<0.028	0.597	<0.042	<0.069	<0.069	0.293	<0.111	0.094	0.066	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.067	<0.069
25/03/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.057	<0.069	<0.069	0.181	<0.111	0.058	0.021	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.039	<0.069
26/03/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	<0.042	<0.069	<0.069	0.168	<0.111	0.057	0.019	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.050	<0.069
10/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.043	<0.069	<0.069	0.272	<0.111	0.082	0.017	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.292	<0.111	<0.028	<0.042	0.035	<0.069
13/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.306	0.053	<0.069	<0.069	0.465	<0.111	0.106	0.022	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.375	<0.111	<0.028	<0.042	0.038	<0.069
15/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.047	<0.069	<0.069	0.169	<0.111	0.061	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.333	<0.111	<0.028	<0.042	<0.028	<0.069
16/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	<0.042	<0.069	<0.069	0.107	<0.111	0.046	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/05/13	5.292	<0.278	<0.111	0.009	<0.011	0.264	<0.028	8.722	0.049	<0.069	<0.069	0.313	<0.111	0.222	0.013	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	0.583	0.017	0.306	<0.111	<0.028	<0.042	0.079	<0.069
16/06/13	5.236	<0.278	<0.111	0.012	<0.011	0.264	<0.028	8.597	0.076	<0.069	<0.069	0.879	0.224	0.211	0.083	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	0.722	0.016	0.292	<0.111	<0.028	<0.042	0.164	<0.069
18/06/13	0.861	<0.278	<0.111	0.019	<0.011	<0.042	<0.028	1.417	0.075	<0.069	<0.069	2.153	0.794	0.318	0.218	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	0.569	0.005	0.681	<0.111	0.042	<0.042	0.382	<0.069
21/06/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.319	0.068	<0.069	<0.069	0.372	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	0.431	<0.004	<0.278	<0.111	<0.028	<0.042	0.058	<0.069
24/06/13	<0.278	<0.278	<0.111	0.018	<0.011	<0.042	<0.028	<0.278	0.103	<0.069	<0.069	0.450	<0.111	<0.042	0.018	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	0.444	<0.004	<0.278	<0.111	<0.028	<0.042	0.032	<0.069
19/07/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.128	<0.069	<0.069	0.419	<0.111	<0.042	0.017	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.032	<0.069
20/07/13	<0.278	<0.278	<0.111	0.005	<0.011	<0.042	<0.028	0.444	0.100	<0.069	<0.069	1.367	<0.111	0.096	0.175	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.096	<0.069
21/07/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.106	<0.069	<0.069	0.322	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
22/07/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.119	<0.069	<0.069	0.493	<0.111	<0.042	0.032	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.051	<0.069
22/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.078	<0.069	<0.069	0.383	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.029	<0.069
23/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.053	<0.069	<0.069	0.194	<0.111	0.054	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
24/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.088	<0.069	<0.069	0.388	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
25/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.046	<0.069	<0.069	0.208	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
24/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.096	<0.069	<0.069	0.319	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
27/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.086	<0.069	<0.069	0.435	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.083	<0.069	<0.069	0.351	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
29/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.088	<0.069	<0.069	0.672	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
25/10/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.096	<0.069	<0.069	0.360	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
26/10/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.115	<0.069	<0.069	0.269	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069

Sample Date	Aluminum (Al), total $\mu g/m^3$	Antimony (Sb), total $\mu g/m^3$	Arsenic (As), total $\mu g/m^3$	Barium (Ba), total $\mu g/m^3$	Beryllium (Be), total $\mu g/m^3$	Boron (B), total $\mu g/m^3$	Cadmium (Cd), total $\mu g/m^3$	Calcium (Ca), total $\mu g/m^3$	Chromium (Cr), total $\mu g/m^3$	Cobalt (Co), total $\mu g/m^3$	Copper (Cu), total $\mu g/m^3$	Iron (Fe), total $\mu g/m^3$	Lead (Pb), total $\mu g/m^3$	Magnesium (Mg), total $\mu g/m^3$	Manganese (Mn), total $\mu g/m^3$	Molybdenum (Mo), total $\mu g/m^3$	Nickel (Ni), total $\mu g/m^3$	Phosphorus (P), total $\mu g/m^3$	Potassium (K), total $\mu g/m^3$	Selenium (Se), total $\mu g/m^3$	Silver (Ag), total $\mu g/m^3$	Sodium (Na), total $\mu g/m^3$	Strontium (Sr), total $\mu g/m^3$	Sulphur (S), total $\mu g/m^3$	Tin (Sn), total $\mu g/m^3$	Titanium (Ti), total $\mu g/m^3$	Vanadium (V), total $\mu g/m^3$	Zinc (Zn), total $\mu g/m^3$	Zirconium (Zr), total $\mu g/m^3$
27/10/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.103	<0.069	<0.069	0.331	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/10/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.097	<0.069	<0.069	0.308	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/11/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.028	0.086	<0.069	<0.069	0.308	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.042	0.069
29/11/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.028	0.104	<0.069	<0.069	0.358	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.028	0.069
30/11/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.028	0.083	<0.069	<0.069	0.361	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.028	0.069
01/12/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.028	0.085	<0.069	<0.069	0.417	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.028	0.069

Table 3 24-Hour Average Metal Concentrations, TSP-2, 2012-2013

Sample Date	Aluminum (Al), total $\mu g/m^3$	Antimony (Sb), total $\mu g/m^3$	Arsenic (As), total $\mu g/m^3$	Barium (Ba), total $\mu g/m^3$	Beryllium (Be), total $\mu g/m^3$	Boron (B), total $\mu g/m^3$	Cadmium (Cd), total $\mu g/m^3$	Calcium (Ca), total $\mu g/m^3$	Chromium (Cr), total $\mu g/m^3$	Cobalt (Co), total $\mu g/m^3$	Copper (Cu), total $\mu g/m^3$	Iron (Fe), total $\mu g/m^3$	Lead (Pb), total $\mu g/m^3$	Magnesium (Mg), total $\mu g/m^3$	Manganese (Mn), total $\mu g/m^3$	Molybdenum (Mo), total $\mu g/m^3$	Nickel (Ni), total $\mu g/m^3$	Phosphorus (P), total $\mu g/m^3$	Potassium (K), total $\mu g/m^3$	Selenium (Se), total $\mu g/m^3$	Silver (Ag), total $\mu g/m^3$	Sodium (Na), total $\mu g/m^3$	Strontium (Sr), total $\mu g/m^3$	Sulphur (S), total $\mu g/m^3$	Tin (Sn), total $\mu g/m^3$	Titanium (Ti), total $\mu g/m^3$	Vanadium (V), total $\mu g/m^3$	Zinc (Zn), total $\mu g/m^3$	Zirconium (Zr), total $\mu g/m^3$
Ontario AAQC (24-hr avg)		**25**	**0.3**	**10**	**0.01**	**120**	**0.025**		**0.5**	**0.1**	**50**	**4**	**0.5**		**0.4**	**120**	**0.2**			**10**	**1**		**120**		**10**	**120**	**2**	**120**	
23/08/12	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	<0.042	<0.069	<0.069	0.439	0.736	0.047	0.033	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.736	<0.111	<0.028	<0.042	0.108	<0.069
27/09/12	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.375	<0.042	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.039	<0.069
15/12/12	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	<0.042	<0.069	<0.069	0.533	0.181	0.076	0.066	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.122	<0.069
16/01/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	<0.042	<0.069	<0.069	0.143	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
23/03/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.375	<0.042	<0.069	<0.069	1.431	0.321	0.089	0.407	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.389	<0.111	<0.028	<0.042	0.244	<0.069
24/03/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.486	<0.042	<0.069	<0.069	1.174	0.361	0.124	0.651	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.389	<0.111	<0.028	<0.042	0.278	<0.069
25/03/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.417	0.056	<0.069	<0.069	1.163	0.367	0.108	0.390	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.403	<0.111	<0.028	<0.042	0.264	<0.069
26/03/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.375	0.046	<0.069	<0.069	0.921	0.153	0.117	0.290	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.319	<0.111	<0.028	<0.042	0.142	<0.069
07/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.486	<0.042	<0.069	<0.069	1.161	0.417	0.119	0.471	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.333	<0.111	<0.028	<0.042	0.294	<0.069
10/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.043	<0.069	<0.069	0.439	<0.111	0.081	0.049	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.069	<0.069
13/04/13	0.306	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.044	<0.069	<0.069	0.199	<0.111	0.081	0.017	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.375	<0.111	<0.028	<0.042	<0.028	<0.069
15/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.047	<0.069	<0.069	0.268	<0.111	0.079	0.025	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.333	<0.111	<0.028	<0.042	<0.028	<0.069
16/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.043	<0.069	<0.069	0.165	<0.111	0.065	0.013	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.319	<0.111	<0.028	<0.042	<0.028	<0.069
17/06/13	0.361	<0.278	<0.111	0.009	<0.011	<0.042	<0.028	0.708	<0.042	<0.069	<0.069	0.232	<0.111	0.053	0.016	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
18/06/13	1.583	<0.278	<0.111	0.005	<0.011	0.071	<0.028	2.569	0.122	<0.069	<0.069	0.825	0.133	0.094	0.078	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	0.542	0.005	<0.278	<0.111	<0.028	<0.042	0.096	<0.069
21/06/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.089	<0.069	<0.069	0.432	<0.111	<0.042	0.014	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	0.472	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
23/06/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.361	0.054	<0.069	<0.069	0.282	<0.111	0.072	0.017	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.031	<0.069
28/06/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.500	0.054	<0.069	<0.069	0.414	<0.111	0.082	0.046	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	0.319	<0.111	<0.028	<0.042	0.071	<0.069
19/07/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.117	<0.069	<0.069	0.526	<0.111	<0.042	0.027	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.039	<0.069
20/07/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.065	<0.069	<0.069	0.381	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
21/07/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.096	<0.069	<0.069	0.500	<0.111	<0.042	0.052	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.029	<0.069
22/07/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.292	0.094	<0.069	<0.069	1.122	<0.111	0.071	0.134	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.092	<0.069
22/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.094	<0.069	<0.069	0.314	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
25/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.050	<0.069	<0.069	0.185	<0.111	0.047	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069

Sample Date	Aluminum (Al), total µg/m^3	Antimony (Sb), total µg/m^3	Arsenic (As), total µg/m^3	Barium (Ba), total µg/m^3	Beryllium (Be), total µg/m^3	Boron (B), total µg/m^3	Cadmium (Cd), total µg/m^3	Calcium (Ca), total µg/m^3	Chromium (Cr), total µg/m^3	Cobalt (Co), total µg/m^3	Copper (Cu), total µg/m^3	Iron (Fe), total µg/m^3	Lead (Pb), total µg/m^3	Magnesium (Mg), total µg/m^3	Manganese (Mn), total µg/m^3	Molybdenum (Mo), total µg/m^3	Nickel (Ni), total µg/m^3	Phosphorus (P), total µg/m^3	Potassium (K), total µg/m^3	Selenium (Se), total µg/m^3	Silver (Ag), total µg/m^3	Sodium (Na), total µg/m^3	Strontium (Sr), total µg/m^3	Sulphur (S), total µg/m^3	Tin (Sn), total µg/m^3	Titanium (Ti), total µg/m^3	Vanadium (V), total µg/m^3	Zinc (Zn), total µg/m^3	Zirconium (Zr), total µg/m^3
26/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.074	<0.069	<0.069	0.496	<0.111	<0.042	0.012	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.046	<0.069
28/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.071	<0.069	<0.069	0.496	<0.111	<0.042	0.046	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.122	<0.069
31/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.057	<0.069	<0.069	0.200	<0.111	0.047	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
21/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.097	<0.069	<0.069	0.347	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
24/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.114	<0.069	<0.069	0.424	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
27/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.126	<0.069	<0.069	0.479	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	0.036	<0.278	0.086	<0.069	<0.069	0.338	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.047	<0.069
30/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.069	<0.069	<0.069	0.450	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
24/10/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.076	<0.069	<0.069	0.326	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
25/10/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.096	<0.069	<0.069	0.303	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
26/10/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.667	0.124	<0.069	<0.069	0.311	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
27/10/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.075	<0.069	<0.069	0.268	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/11/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.028	0.083	<0.069	<0.069	0.538	<0.111	<0.042	0.042	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.042	0.069
29/11/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.028	0.069	<0.069	<0.069	0.361	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.028	0.069
30/11/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.028	0.079	<0.069	<0.069	0.372	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.028	0.069
01/12/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.028	0.096	<0.069	<0.069	0.363	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.028	0.069

3.3. WIND ANALYSIS

An analysis of the hourly wind speed and direction collected since June 2011 at the Keno District Mill weather station (shown on Figure 2), at a height of 10 meters, indicates that dominant winds are blowing from the North and from the Southeast. The average wind speed is 1.24 m/s and winds are calm 18.30% of the time. The wind rose in Figure 3 depicts this information. Note that the wind sensor experienced occasional icing during the winter months and extended periods of zero wind speed were excluded from this analysis. Also, winter wind speeds may occasionally be underestimated due to the presence of ice on the sensor, but these occurrences cannot be detected in the data record.

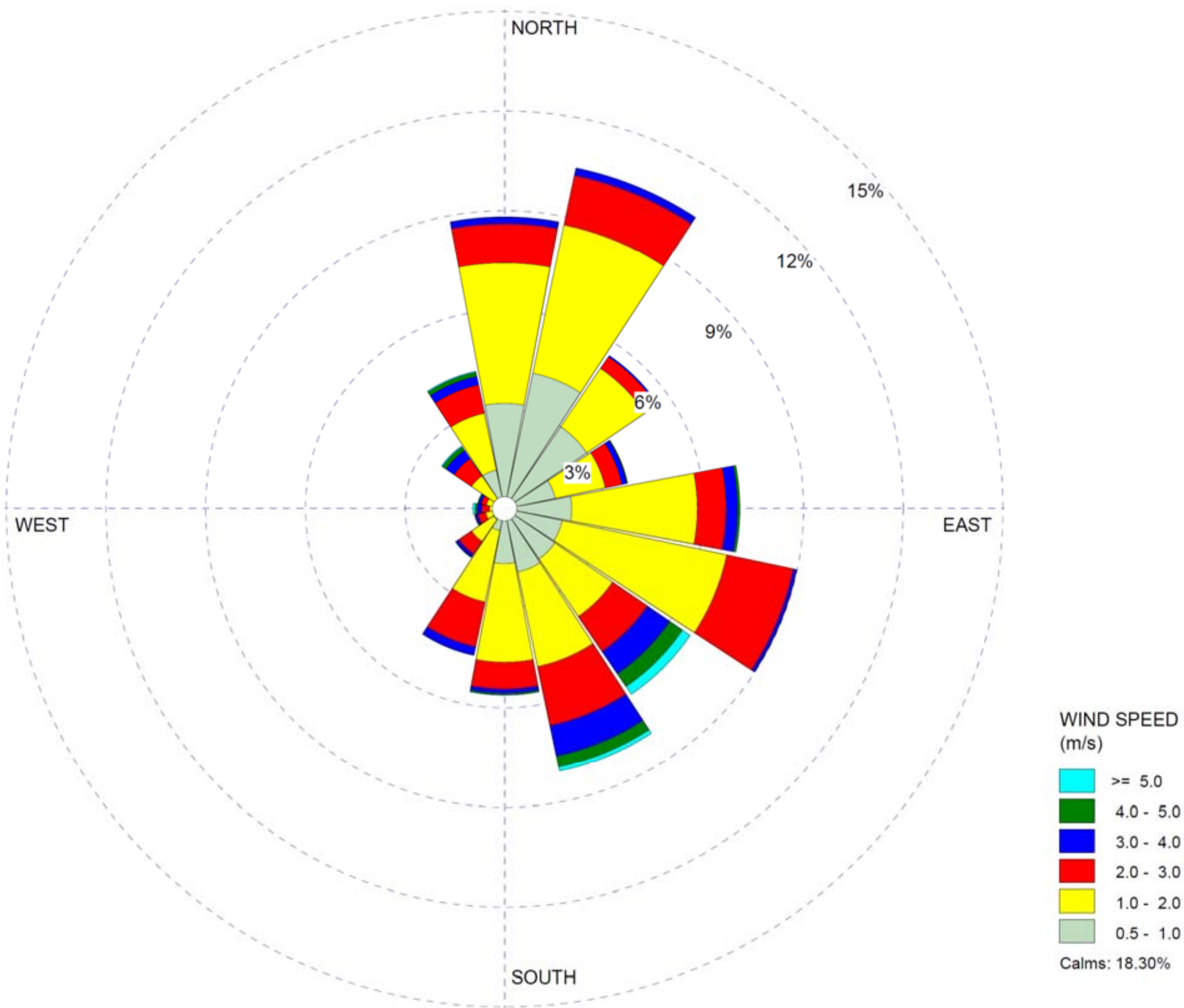


Figure 3 Wind Rose (direction blowing from), Keno District Mill Weather Station, June 2011-Jan.2014

Based on the wind data above in Figure 3 and referring back to Figure 2, we can see that air quality station TSP-1 is located generally upwind from the DSTF and crusher and that station TSP-2 is generally downwind from them. The average TSP concentration is slightly higher at TSP-2 than at TSP-1 (9.2 $\mu g/m^3$ versus 8.5 $\mu g/m^3$), however both values are over ten times below the YAAQS. When comparing metal concentrations, only manganese is higher on average at TSP-2, while all the other metals are equal or higher at TSP-1. Figure 4 shows that comparison for all parameters that were above detection limit for at least one sample. Note that to provide a conservative estimate for both TSP and metal concentrations, detection limits (RDL) were used to calculate averages for samples that were below RDL, therefore overestimating the actual average values.

Dust originating from the DSTF would be expected to contain high concentrations of iron, manganese, calcium, zinc, lead, magnesium, arsenic and aluminum, based on metal characterization analyses of the tailings conducted monthly in 2012 and 2013. Metal speciation results of the air samples obtained to date indicate that only manganese is found in higher concentrations downwind from the DSTF. Therefore, the DSTF could be contributing source of ambient dust observed at TSP-2, but other sources are likely the predominant source being measured.

On days where TSP levels were higher than average and where exceedences of the Ontario AAQCs were observed for lead at TSP-1, winds were generally blowing from the Northeast and from the East (on October 23, 2012 and June 18, 2013 respectively). A source of TSP in this case could have been the roads. Roads within the vicinity of the TSP stations include mine access roads as well as public roads including Duncan Creek Road.

On days where TSP levels were higher than average and/or where exceedences of the Ontario AAQCs were observed for lead at TSP-2, winds were generally blowing from the N-NNE (on August 23, 2012). On days TSP levels were higher than average and/or where exceedences of the Ontario AAQCs were observed for manganese at TSP-2, winds were generally blowing from the NE (March 23-24, 2013) and from the East (April 7, 2013). In this case the DSTF could have been the main source of TSP at TSP-2. On days where exceedences of the Ontario AAQCs were observed for cadmium at TSP-2, winds were generally blowing from the NE, so the DSTF could have been a source in the case as well.

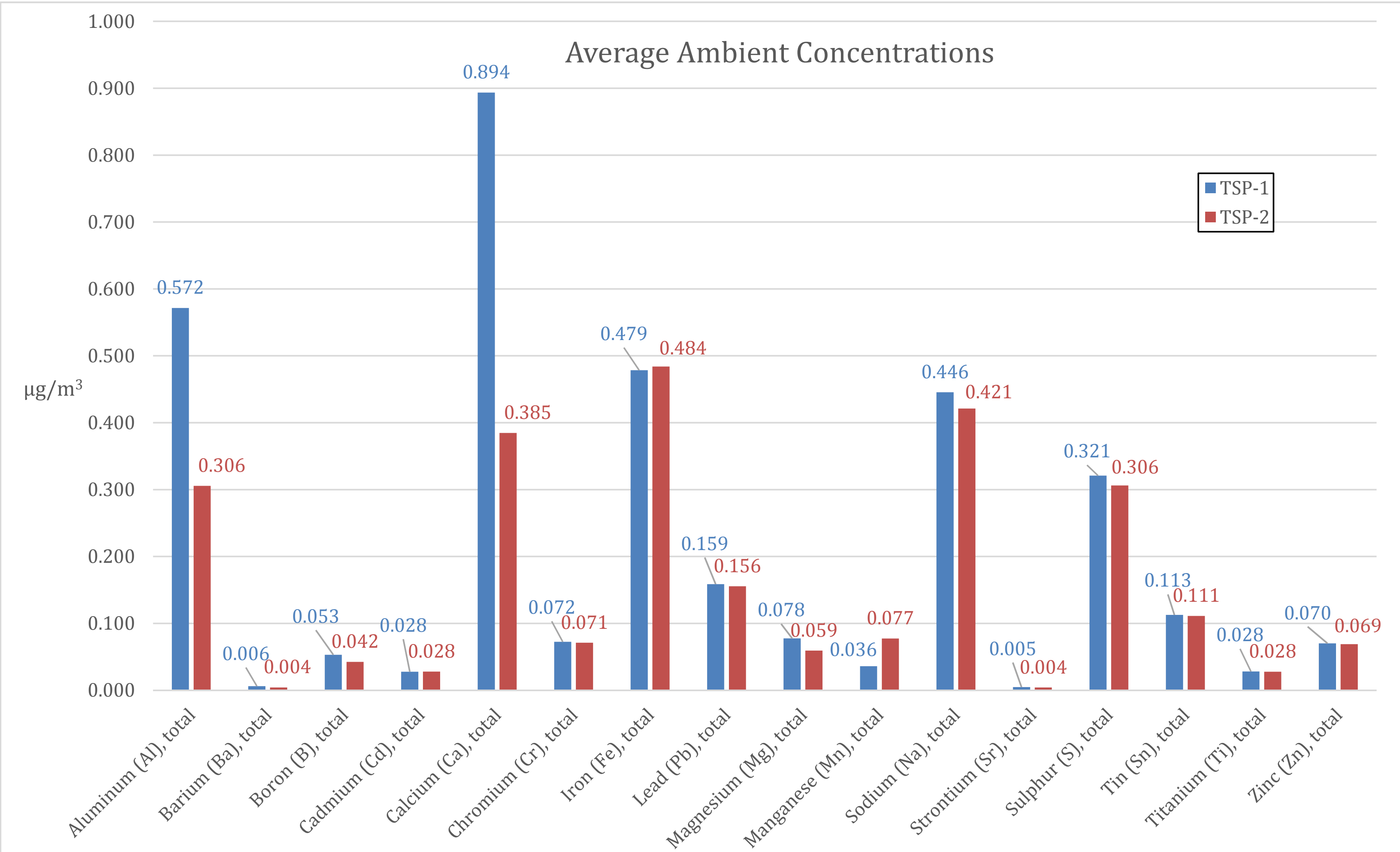


Figure 4 Average Ambient Metal Concentrations

3.4. CONCLUSION

- All TSP samples collected to date near the District Mill and DSTF are on average at least 10 times below the Yukon air quality standard for TSP.
- Two metal concentrations (lead) exceeded the Ontario ambient air quality criteria for TSP-1 out of 39 samples collected to date and 5 exceedances (3 manganese, 1 lead and 1 cadmium) were measured at TSP-2 from 40 samples collected to date. Air quality samples will continue to be collected 4 times per month to identify if these are infrequent events or if any trends can be established.
- A few samples were damaged during transport to the lab and could not be analyzed. Precautions have been taken to prevent this from happening again in the future.
- Access understands through discussion with Alexco that the Yukon Government collected air quality samples (PM2.5) in 2013 in the Keno City area. It is recommended that the data collected by Yukon Government be combined with the Alexco data once it becomes available in the annual Quartz Mining Licence report.

4. REFERENCES

Ontario Ministry of Environment. 2012. Ontario's Ambient Air Quality Criteria. Standards Development Branch. PIBS#6570e01. April 2012.

Yukon Environment. 2010. Yukon Ambient Air Quality Standards. April 2010.