

# TECHNICAL MEMO

ISSUED FOR USE

**TO:** Vanessa Benwood  
**C:**  
**FROM:** Ian MacIntyre, Justin Pigage  
**DATE:** September 13, 2012  
**MEMO NO.:** 001  
**EBA FILE:** W14103025-01

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**SUBJECT:** Dry Stack Tailings Facility Lower Bench Instrumentation Installation  
Keno Hill District Mill Site, Keno City, Yukon

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## 1.0 INTRODUCTION

Alexco Resource Corp. (Alexco) retained EBA, A Tetra Tech Company (EBA) to coordinate and install a ground temperature cable (GTC) and a shallow monitoring well in the lower bench of the Dry Stack Tailings Facility (DSTF) as part of the ongoing monitoring of the DSTF at the Keno Hill District Mill Site, Keno City, Yukon. Authorization to proceed with this work was provided by Vanessa Benwood, Site Environmental Coordinator, on June 12, 2012.

## 2.0 WORK COMPLETED

EBA arrived on site July 29, 2012 and selected the installation locations. Construction of the DSTF lower bench is nearing completion and it is now possible to install instrumentation within and directly below the facility. This was not possible previously due to ongoing construction. The installation locations are shown on Figure 1 and in Photo 1, attached to this memo.

The shallow monitoring well was installed to the base of the tailings, a depth of 7.5 m from surface, to determine if any free water exists within the pile. W14101035-BH39 was advanced on August 1, 2012 to a final depth of 12.6 m using a Driltech M5 air rotary drill rig operated by Midnight Sun Drilling Co. Ltd. of Whitehorse, Yukon. Slotted 50 mm PVC was installed to a depth of 7.5 m complete with a bentonite plug at depth and at surface. The remainder of the installation was backfilled with silica sand. A 1.5 m protective steel casing was installed at surface.

The GTC was installed to a depth of 13.5 m from surface to determine the temperature within and directly below the DSTF. W14103025-BH40 was advanced on August 2, 2012 to a final depth of 13.7 m. A 50 mm PVC pipe was installed to 13.7 m and grouted to surface with a bentonite based grout. A 1.5 m protective steel casing was installed at surface.

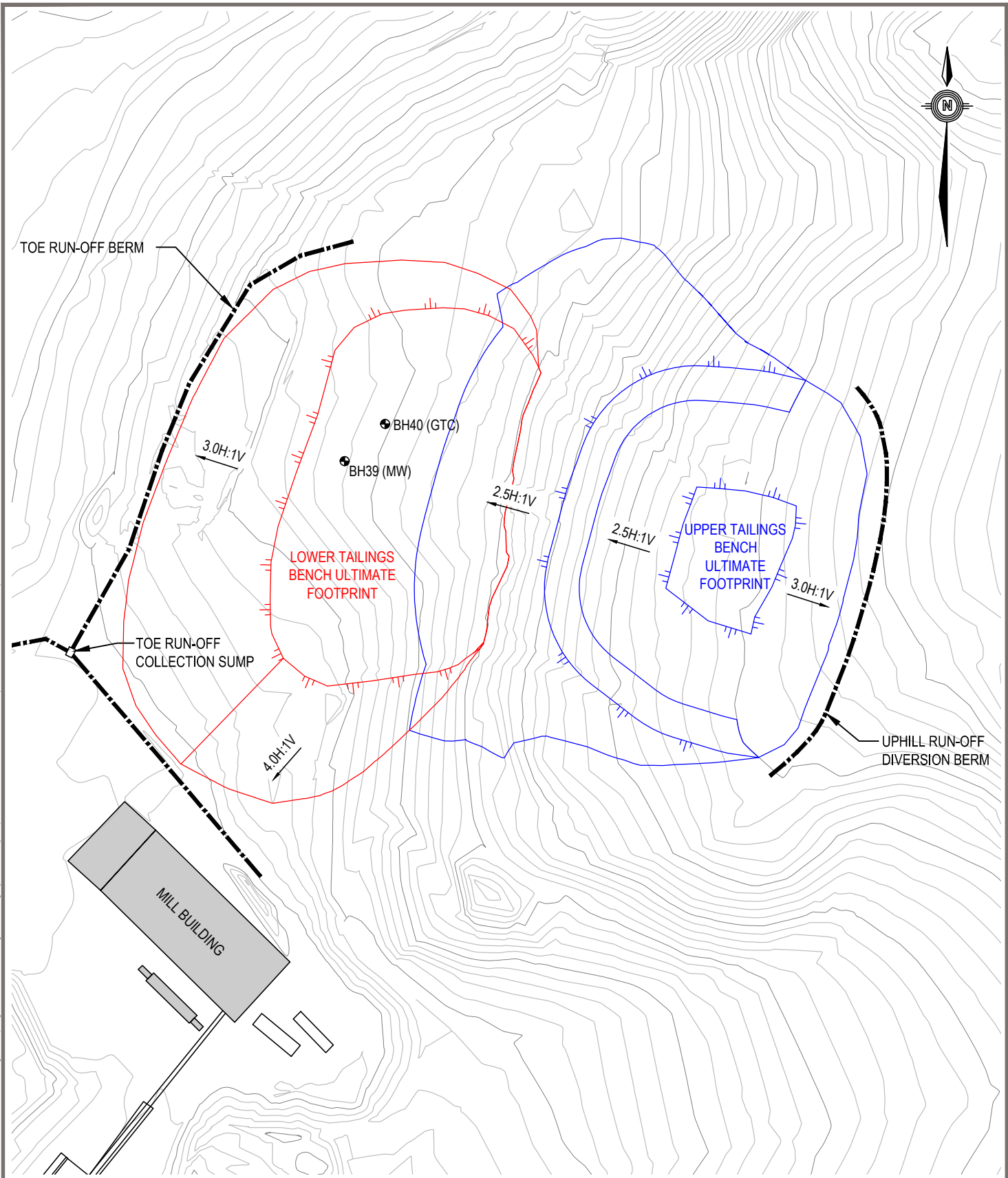
Detailed borehole logs and results from laboratory testing completed on disturbed grab samples collected from the drill cuttings for both installations are attached to this memo. General subsurface conditions consist of tailings, over silt (both frozen and unfrozen), over bedrock.

### **3.0 CONCLUSION**

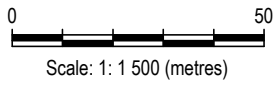
EBA continually monitors the performance of the DSTF through instrumentation readings and visual inspections. The shallow monitoring well and GTC installed in the lower bench of the DSTF will be included in these routine inspections.

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

C:\Whitehorse\Drawings\Keno\W14103025-01 Instrumentation & Tailings Sampling\W14103025-01 Fig\_1\_RO.dwg [FIGURE 1] September 13, 2012 - 10:31:43 am (BY: BUCHAN, CAMERON)



**STATUS**  
 ISSUED FOR USE



CLIENT



**ALEXCO**



**eba**  
A TETRA TECH COMPANY

**DRY STACKED TAILINGS FACILITY  
KENO HILL DISTRICT MILL SITE, YUKON**

**SITE PLAN SHOWING  
INSTRUMENTATION INSTALL LOCATIONS**

PROJECT NO. W14103025-01	DWN CB	CKD JTP	REV 0
OFFICE EBA-WHSE	DATE September 11, 2012		

**Figure 1**



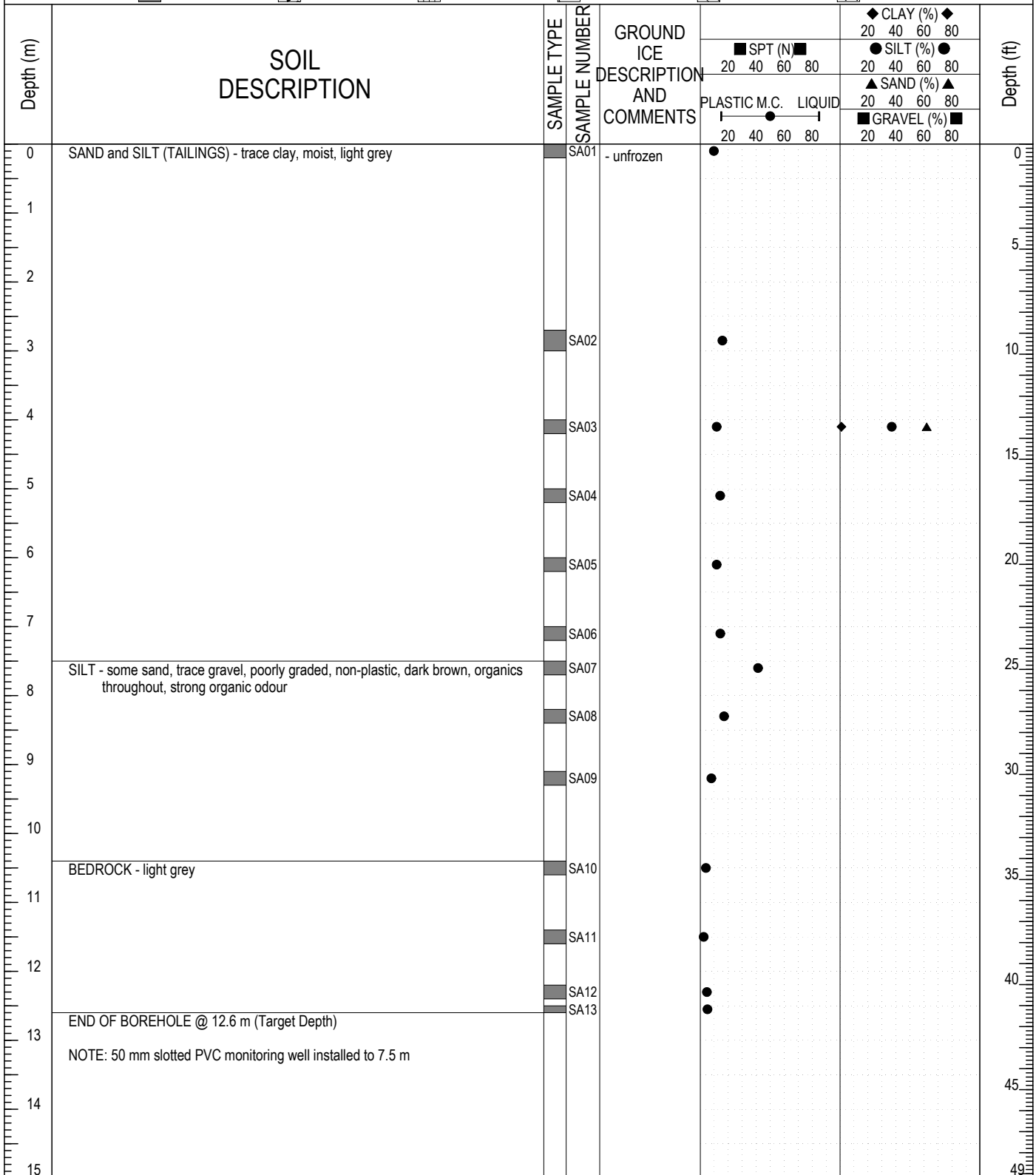
**Photo 1:** DSTF Lower Bench - Instrumentation Location  
Facing West  
August 2, 2012




**Photo 2:** DrilTech M5 Truck Mounted Drill Rig  
Facing South  
August 2, 2012

Dry Stack Tailings Facility GTC Installation	CLIENT: Alexco Resource Corp. Ltd.	BOREHOLE NO: W14103025-BH39
Keno Hill District Mill Site	DRILL: Air Rotary (MS Drlitech)	PROJECT NO: W14103025-01
Keno City, YT	7086938N; 483973E; Zone 8	

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

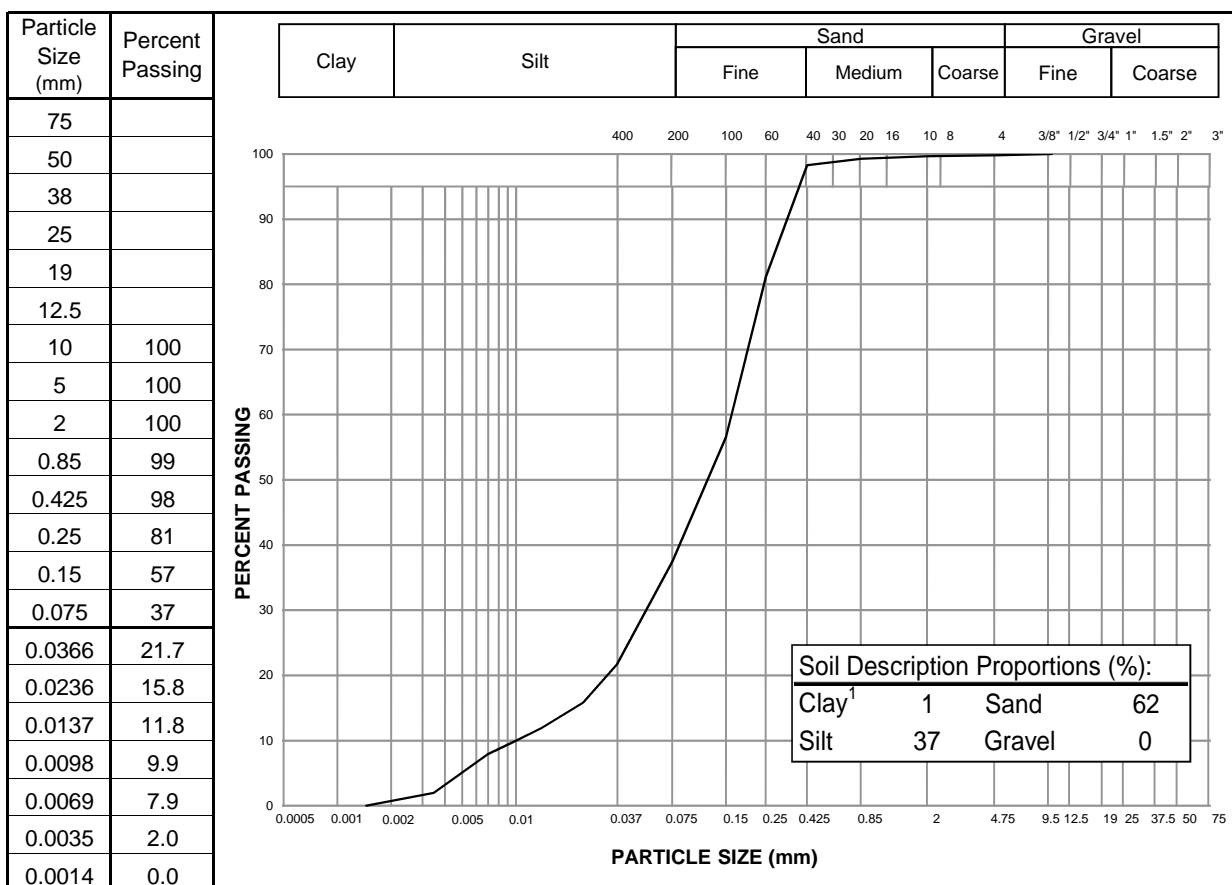


	LOGGED BY: IM	COMPLETION DEPTH: 12.6m
	REVIEWED BY: JTP	COMPLETE: 8/1/2012
	DRAWING NO:	Page 1 of 1

## PARTICLE SIZE ANALYSIS REPORT

ASTM D422, C136 & C117

Project: DSTF GTC Installation	Sample No.: SA03
Project No.: W14103025-01	Material Type: Tailings
Site: Keno Hill District Mill Site	Sample Loc.: BH39
Client: Alexco Resource Corp. Ltd.	Sample Depth: 4.0 - 4.2 m
Client Rep.: Vanessa Benwood	Sampling Method: Grab
Date Tested: August 10, 2012 By: SMS	Date sampled: August 6, 2012
Soil Description <sup>2</sup> : SAND and SILT - trace clay	Sampled By: IM
Moisture Content: 11.7%	USC Classification: Cu: 16.3 Cc: 2.0



Notes: <sup>1</sup> The upper clay size of 2 um, per the Canadian Foundation Engineering Manual  
<sup>2</sup> The description is visually based & subject to EBA description protocols

Specification: \_\_\_\_\_

Remarks: \_\_\_\_\_

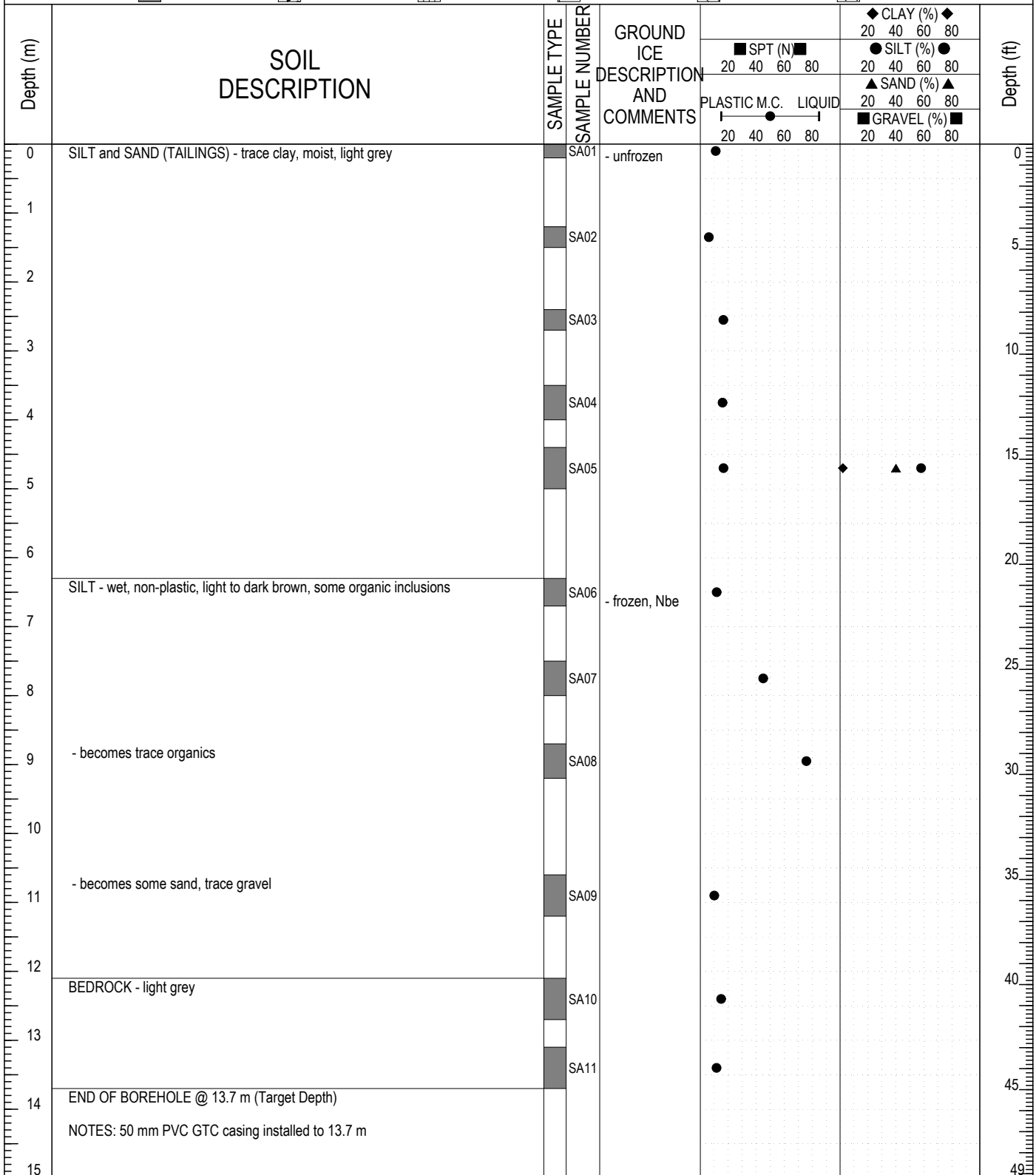
Reviewed By:

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Dry Stack Tailings Facility GTC Installation	CLIENT: Alexco Resource Corp. Ltd.	BOREHOLE NO: W14103025-BH40
Keno Hill District Mill Site	DRILL: Air Rotary (MS Drlitech)	PROJECT NO: W14103025-01
Keno City, YT	7086944N; 483983E; Zone 8	

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

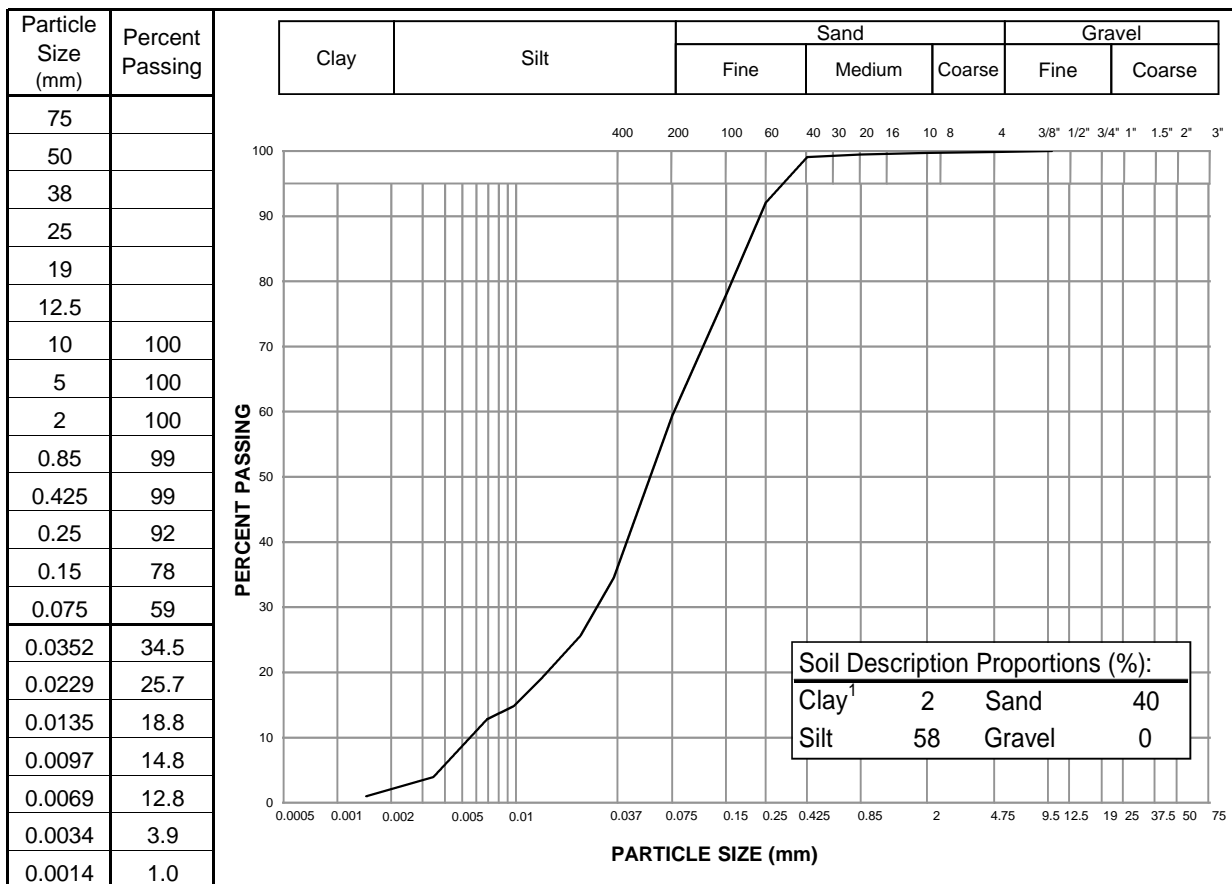


	LOGGED BY: IM	COMPLETION DEPTH: 13.7m
	REVIEWED BY: JTP	COMPLETE: 8/2/2012
	DRAWING NO:	Page 1 of 1

## PARTICLE SIZE ANALYSIS REPORT

ASTM D422, C136 & C117

Project: DSTF GTC Installation	Sample No.: SA05
Project No.: W14103025-01	Material Type: Tailings
Site: Keno Hill District Mill Site	Sample Loc.: BH40
Client: Alexco Resource Corp. Ltd.	Sample Depth: 4.4 - 5.0 m
Client Rep.: Vanessa Benwood	Sampling Method: Grab
Date Tested: August 10, 2012 By: SMS	Date sampled: August 6, 2012
Soil Description <sup>2</sup> : SILT and SAND - trace clay	Sampled By: IM
Moisture Content: 16.6%	USC Classification: Cu: 13.4 Cc: 1.9



Notes: <sup>1</sup> The upper clay size of 2 um, per the Canadian Foundation Engineering Manual  
<sup>2</sup> The description is visually based & subject to EBA description protocols

Specification: \_\_\_\_\_

Remarks: \_\_\_\_\_

Reviewed By: *[Signature]*

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