



September 30, 2012

Director, Mineral Resources  
Department of Energy, Mines and Resources  
P.O. Box 2703  
Whitehorse, YT  
Y1A 2C6

**Attention: Robert Holmes, Director, Mineral Resources**

Dear Mr. Holmes:

**Re: 2012 Annual Physical Inspection , Quartz Mining Licence QML-0009  
Bellekeno Mine, Yukon**

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As per Quartz Mining Licence QML-0009 Part 2 Clause 14.1 through 14.3, an Annual Physical Inspection of all engineered structures, works and installations was conducted by August 1<sup>st</sup>, 2012.

EBA, A Tetra Tech Company (EBA) was retained to complete the 2012 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 Yukon P.Eng stamped by Mine Manager, Scott Smith.

Several items were identified in both the surface locations and the underground workings that required additional attention. All items identified, as well as the status of completion, are summarized in Table 1 and Table 2 below:

**Table 1. 2012 Annual Physical Inspection of Surface Structures**

Item Number	Location	Item	Date Completed
1	PAG Waste Storage Facility	Complete construction and properly anchor liner.	Completed for 2012-2013 forecasted storage requirements
2	LC Bridge Abutments	Place additional rip rap over remaining exposed geotextile on east bank.	28-Sept-2012
3a	Mill Water Storage Pond	Complete anchoring of liner	30-Sept-2012
3b	Mill Water Storage Pond	Install safety ropes or ladders.	Equipment arrives Oct-2012, installed within 30 days of arrival
4	DSTF	Repair cracks in south slope face.	13-Sept-2012

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Head Office

T. 604 633 4888

Alexco Resource Corp.  
200 Granville Street  
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Vancouver, BC V6C 1S4

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**Table 2. 2012 Annual Physical Inspection of Underground Workings**

Item Number	Location	Item	Date Completed
1	SW Main Ramp	Check scaling below central remuck	15-Oct-2012
2	7-48 N Intersection	Rehab req'd prior to development	30-Nov-2012
3	SW 820 VR bottom brow	Bagged screen to clear	15-Oct-2012
4	600 Incline Intersection	Pillar damage requires repair	30-Nov-2012
5	99-625 S Escape way	Bagged screen, brow to support. Shotcrete arch to place	15-Oct-2012
6	680 South	Rehab with 10' SWX and screen	15-Oct-2012

Please find attached the required reports for the Annual Physical Inspection.

Attachment A: 2012 Annual Physical Inspection of Surface Structures  
 Attachment B: 2012 Annual Physical Inspection of Underground Workings  
 Attachment C: 2012 Underground As-Built

If you have any questions or require further details, please contact the undersigned at [vbenwood@alexcoresource.com](mailto:vbenwood@alexcoresource.com).

Sincerely,

**ALEXCO KENO HILL MINING CORP.**

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Vanessa Benwood  
 Site Environmental Coordinator  
 Bellekeno Minesite

CC: Steve Buyck, Lands Manager, FNNND  
 Tim Hall, ARG  
 Brad Thrall, ARG  
 Jim Harrington, AEG



ALEXCO KENO HILL MINING CORP.  
QUARTZ MINING LICENCE QML-0009  
2012 ANNUAL PHYSICAL INSPECTION  
BELLEKENO MINE SITE  
KENO HILL SILVER DISTRICT  
YUKON

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APPENDIX A

2012 ANNUAL PHYSICAL INSPECTION  
SURFACE STRUCTURES

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August 30, 2012

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

ISSUED FOR USE  
EBA FILE: W14103024-01  
Via Email: vbenwood@alexcoresource.com

**Attention:** Vanessa Benwood, Site Environmental Coordinator

**Subject:** 2012 Annual Inspection – Surface Engineered Earth Structures  
Bellekeno Minesite, Keno City, Yukon

## 1.0 INTRODUCTION

Alexco Resource Corporation (Alexco) retained EBA, A Tetra Tech Company (EBA), to complete the 2012 annual inspection of the engineered earth structures located throughout the Bellekeno Mine site (shown on Figure 1). In partial fulfilment of their Quartz Mining Licence (QML-0009) Alexco requires annual inspections of all engineered underground and surface structures. Alexco identified the following surface engineered earth structures as requiring inspection:

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

## 2.0 SCOPE OF SERVICES

EBA's scope of services for the 2012 annual inspection is as follows:

- Complete a visual inspection of the surface engineered earth structures at the Bellekeno Minesite prior to August 1, 2012.
- 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.

## 3.0 SITE INSPECTION

The site inspection was completed by Mr. Ian MacIntyre of EBA's Whitehorse office on July 13, 2012. The following sections detail the results of the inspection and any resulting recommended remedial actions. Photographs of the inspected surface engineered earth structures and noted deficiencies are attached to this report.

### 3.1 PAG Waste Storage Facility

The PAG Waste Storage Facility is located south of the Bellekeno Mine portal, as shown on Figure 1. The perimeter berms of the facility appeared intact with no visible signs of instability or erosion (Photos 1 and 2). The vertical geotextile wrapped extraction culvert, waste piles, and completed liner system appeared stable (Photo 3).

The storage facility has not been completed and little work has been done since the 2011 Inspection to bring it nearer to completion. While the material being stored within the facility appeared to be properly contained; construction of the facility should be completed to reduce the risk of uncontrolled release and allow for additional storage capacity.

Within the completed portion of the facility (northern half) the liner anchoring trench along the east berm appeared finished. Elsewhere, loose material was piled on top of the berm to hold the liner in place (Photo 4). The liner anchoring trench should be finished for the remainder of the completed facility (north and west berms).

### 3.2 Bellekeno 625 Water Treatment Pond

The Bellekeno 625 water treatment pond is located east of the Bellekeno Mine haul road where it passes the waste rock pile. The location is shown on Figure 1. The pond and surrounding structures (vehicle barriers, walkways, and piping) appeared stable at the time of the inspection. The liner system appeared intact and no liner tension or bulging was observed. The pond berms and liner anchoring trenches appeared intact and stable. No remedial action is recommended for the Bellekeno 625 water treatment pond at this time (Photos 5 through 7).

### 3.3 Waste Rock Pile

The waste rock pile is located along the Bellekeno Mine haul road, north of the portal. The location is shown on Figure 1. The pile and side slopes appeared stable at the time of the inspection (Photos 8 and 9). No remedial action is recommended for the waste rock pile at this time.

### 3.4 Lightning Creek Bridge Abutments

The Lightning Creek Bridge is located on the Bellekeno Mine haul road near Keno City. The location is shown on Figure 1. The bridge abutments are constructed of earth filled timber cribbing and no indications of movement or instability were observed at the time of the inspection (Photos 10 and 11).

The geotextile that had been exposed immediately above the water line at the time of the inspection in 2011 has been adequately covered in additional rip rap material. However, riprap placed along the east

bank of Lightning Creek to protect the abutments from scour does not adequately cover the underlying geotextile near the creek's edge (Photo 12). Additional riprap should be placed as an added precaution.

### **3.5 Mill Water Storage Pond**

The mill water storage pond is located at the Bellekeno Mill Site approximately 1 km west of Keno City. The location is shown on Figure 1. No visible seepage was observed and the pond berms appeared stable at the time of the inspection. The liner system appeared intact with no loose seams, liner tension, or liner bulging observed (Photos 13 and 14).

The liner anchoring trench for the North West side of the pond is not completed and is exposed along the entire length of the pond (Photo 15). To reduce the potential of damage due to high winds, it is recommended that the liner be properly anchored and buried.

From a safety standpoint, it is also recommended that ropes or ladders be laid into the pond along its length. As the pond does not freeze in the winter, if a worker falls into the water they will be able to exit the high slopes more easily.

### **3.6 Dry Stacked Tailings Facility**

The dry stacked tailings facility (DSTF) is located at the Bellekeno Mill Site approximately 1 km west of Keno City. The location is shown on Figure 1. Construction of the DSTF was ongoing at the time of the inspection. The gravel drainage blanket, geosynthetic clay liner, geonet, and geotextile placed to date appeared intact under the placed tailings.

The tailings appear to have been placed in accordance with the design with the lower bench being mostly completed to date (Photo 16). The crest elevation has been brought back down to its final design elevation in accordance with the 2011 inspection recommendations. This has allowed the placement of cover material to begin over the west facing slope (Photo 17).

Minor cracking along the south slope face and adjacent to the haul road was observed at the time of the inspection (Photo 18). This is likely due to the combination of loose placement of material along the slope surface and heavy rainfall in the weeks leading up to the inspection. It is recommended that the affected areas be pulled back in benches and re-worked.

The upper bench slope is currently being prepared for liner installation to allow for the placement of tailings up the slope.

The DSTF monitoring being completed by EBA is ongoing and no issues involving the structural integrity of the DSTF have arisen to date.

A foot print expansion for the DSTF is currently underway to allow for capacity increase in tailings placement. To date EBA's recommendations appear to have been followed.

## 4.0 CONCLUSIONS

EBA has concluded that the structures inspected pose no significant risk to the environment or human health and safety. The recommended remediation measures stated in the previous sections should be completed as soon as possible. The inspected structures should be monitored frequently and repaired as required. Additional photographs taken during the site investigation are available upon request.

A summary of recommendations is presented in the following Table 1:

**Table 1 – Summary of Recommendations**

Item Description	Recommended Maintenance	Status
PAG Waste Storage Facility	Complete construction and properly anchor liner.	
Lightning Creek Bridge Abutments	Place additional rip rap over remaining exposed geotextile on east bank.	
Mill Water Storage Pond	Complete anchoring of liner. Install safety ropes or ladders.	
DSTF	Repair cracks in south slope face.	

## 5.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Alexco Resource Corporation and their agents. 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 Corporation, 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 General Conditions provided in Appendix A of this report.

## 6.0 CLOSURE

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

Sincerely,  
EBA, A Tetra Tech Company

Prepared by:



Ian MacIntyre  
Geotechnical Technician, Arctic Region  
Direct Line: 867.668.2071 x254  
imacintyre@eba.ca

Reviewed by:



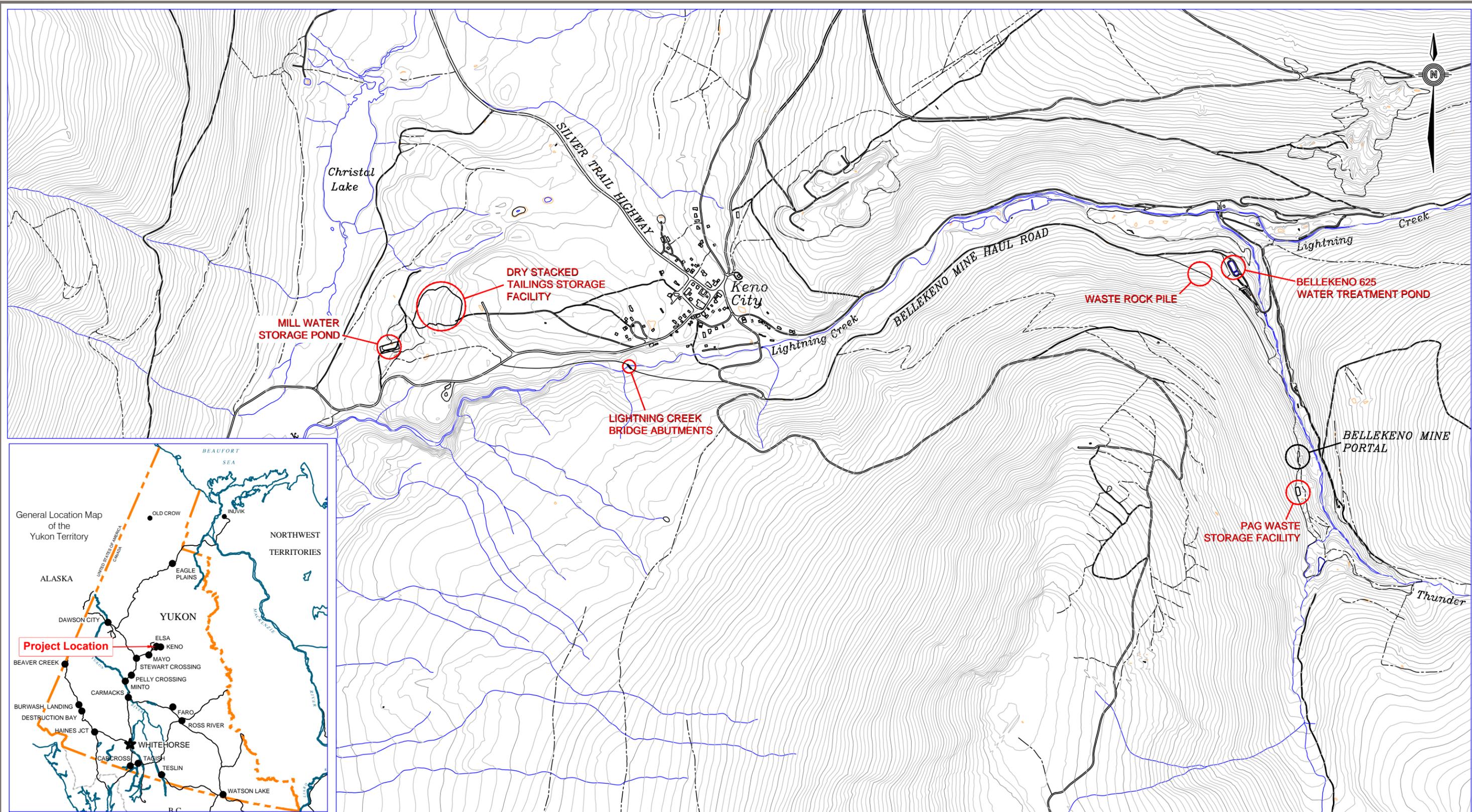
Richard Trimble, M. Sc. (Eng.), P.Eng., FEC  
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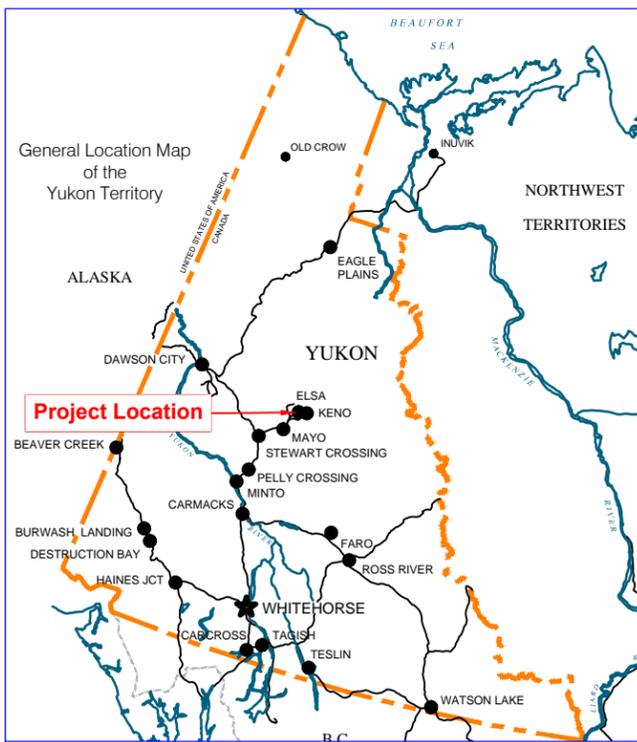
# FIGURES

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Figure 1      Site Plan Showing Structure Locations



Q:\Whitehorse\Data\0201\Drawings\Keno\W14103024\_Fig\_1\_R0.dwg [FIGURE 1] August 16, 2012 - 3:19:46 pm (BY: BUCHAN, CAMERON)



0 500  
Scale: 1: 15 000 (metres)

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

CLIENT



2012 ANNUAL INSPECTION  
BELLEKENO MINE SITE - KENO CITY, YUKON

SITE PLAN SHOWING  
STRUCTURE LOCATIONS

PROJECT NO. W14103024	DWN CB	CKD JTP	REV 0
OFFICE EBA-WHSE	DATE August 16, 2012		

Figure 1

# PHOTOGRAPHS

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**Photo 1:** PAG Waste Storage Facility  
Completed and partially completed sections of liner.  
July 13, 2012



**Photo 2:** PAG Waste Storage Facility  
Liner not adequately anchored along west berm  
July 13, 2012



**Photo 3:** PAG Waste Storage Facility  
East perimeter berm  
July 13, 2012



**Photo 4:** PAG Waste Storage Facility  
July 13, 2012



**Photo 5:** Belkeno 625 Water Treatment Pond  
July 13, 2012



**Photo 6:** Belkeno 625 Water Treatment Pond  
July 13, 2012



**Photo 7:** Belkeno 625 Water Treatment Pond  
July 13, 2012



**Photo 8:** Belkeno Waste Rock Pile  
July 13, 2012



**Photo 9:** Belkeno Waste Rock Pile  
July 13, 2012



**Photo 10:** Lightning Creek Bridge Abutments  
Facing East  
July 13, 2012



**Photo 11:** Lightning Creek Bridge Abutments  
Facing West  
July 13, 2012



**Photo 12:** Lightning Creek Bridge Abutments  
Exposed geotextile on East Abutment  
July 13, 2012



**Photo 13:** Mill Water Storage Pond  
July 13, 2012



**Photo 14:** Mill Water Storage Pond  
Exposed liner along pond berm  
July 13, 2012



**Photo 15:** Mill Water Storage Pond  
July 13, 2012



**Photo 16:** DSTF Lower Bench  
Facing west  
July 13, 2012



**Photo 17:** DSTF Lower Bench  
Early stages of cover placement  
July 13, 2012



**Photo 18:** DSTF Lower Bench  
Cracking on south slope along haul road  
July 13, 2012



**Photo 19:** DSTF Lower Bench  
South slope and haul road  
July 13, 2012



**Photo 20:** DSTF Lower Bench  
Seepage collection system  
July 13, 2012

# APPENDIX A

## EBA'S GENERAL CONDITIONS

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# GENERAL CONDITIONS

## GEOTECHNICAL REPORT

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

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### 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.



ALEXCO KENO HILL MINING CORP.  
QUARTZ MINING LICENCE QML-0009  
2012 ANNUAL PHYSICAL INSPECTION  
BELLEKENO MINE SITE  
KENO HILL SILVER DISTRICT  
YUKON

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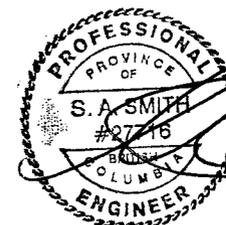
APPENDIX B

2012 ANNUAL PHYSICAL INSPECTION  
UNDERGROUND WORKINGS

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Inspected Heading Name	Date	Inspected by	Ground Conditions	Ground Support	Status	Action? (and/or Comments)	Req'd By
SW Main Ramp (Portal to Face Below 930)	22/09/2012	DB	Good				
Below LG Remuck Lt Shoulder and Back						Check Scale required, Area marked with an X and arrow.	15/10/2012
7-48 N intersection						Intersection requires rehab prior to developing	30/11/2012
Below 725 Acc				Failed Mechanical Bolt		Area to be monitored, has been rehabed over initial support	N/A
800 Rp intersection (Super Sump)				Failed Mechanical Bolt		Area to be monitored, has been rehabed over initial support	N/A
SW 810 Refuge intersection				Corroded Split Set		Area to be monitored, has been rehabed over initial support	N/A
SW 820 VR bottom brow				Screen Bagged		Debag screen, resupport	15/10/2012
600 Incline intersection				Pillar at transformer damaged by equipment making turn		Rehab in progress, shotcrete complete	30/11/2012
SW Central Decline (820 Acc - SW Central Incline)	22/09/2012	DB	Good	Rebar, split sets, screen, straps	ok	No Concerns noted	N/A
SW Central Incline ( Sw Central Dec - SW 630 VR)	22/09/1012	DB	Good	Rebar, split sets, screen, straps	ok	No Concerns noted	N/A
99-625 South	22/09/2012	DB	Fair	Bagged Screen at intersection below 555 and old 635 cuts		Shotcrete arch markedup, debag screen and shoot arch	15/10/2012
SW 625 and Bypass (Portal to 625 N)	22/09/2012	DB	Fair	Post off header at charging station		Station not in use, flagged off, to be repaired.	N/A
SW 810 C1 Acc	05/09/2012	DB		Cracking shotcrete	completed	fiber shotcrete reapplied. Old shotcrete was cracking.	N/A
SW 870 Acc	24/09/2012		good			no concerns	N/A
SW 900 S	04/09/2012	DB	good	brow created by failed spiling	completed	Shotcrete arch marked up	N/A
SW 930	03/09/2012		good			no concerns	N/A
SW 960 Acc	03/09/2012		good	rebar/screen/straps/split sets		no concerns	N/A
555 Acc	25/09/2012		good			no concerns	N/A
690C3 Acc	25/09/2012		good			no concerns	N/A
680 South	25/09/2012		good	scaled shotcrete off shoulder/back at R9	ongoing	rehab with 10' SWX and screen	15/10/2012
SW 770 S	24/09/2012		good			no concerns	N/A





ALEXCO KENO HILL MINING CORP.  
QUARTZ MINING LICENCE QML-0009  
2012 ANNUAL PHYSICAL INSPECTION  
BELLEKENO MINE SITE  
KENO HILL SILVER DISTRICT  
YUKON

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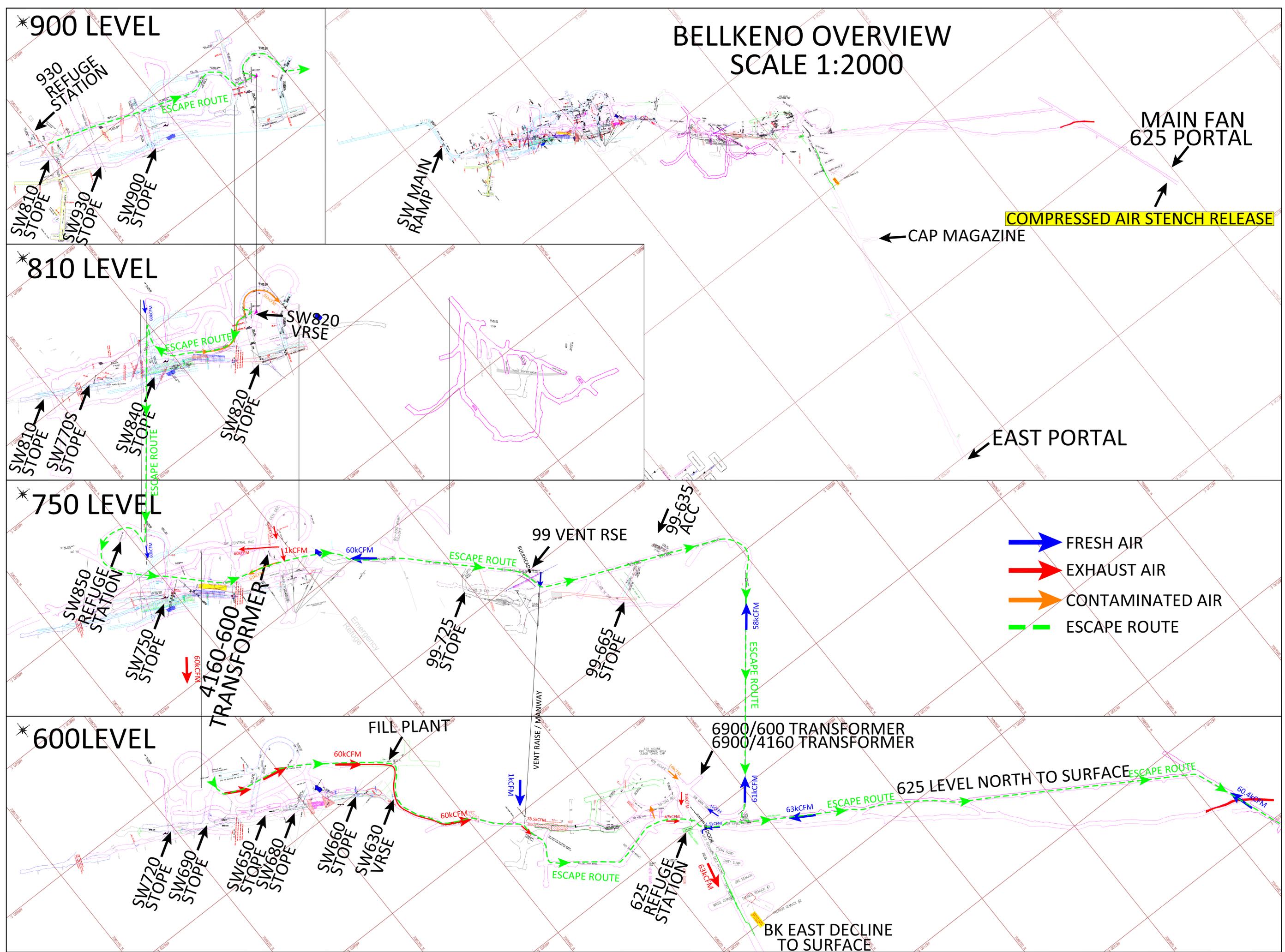
APPENDIX C

2012 UNDERGROUND AS-BUILT

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# BELLKENO OVERVIEW SCALE 1:2000



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

TITLE: Bellekeno Level Composite	
Drawn by: D. Baker	Scale: 1:1000
Date: 13 July 2012	Approval: _____ Date: _____
File: H:\BellekenoUnderground\Development-Planning\Promine...composites	



ALEXCO RESOURCE CORP  
BELLKENO MINE