Appendix Q

Closure Drain Installation Summary

Appendix Q.1 – Summary of Closure Drain Concrete Test Results

Appendix Q.2 – Closure Drain Individual Concrete Test Reports

Appendix Q.3 – Closure Drain Installation Daily Reports

Appendix Q.4 – Closure Drain Construction Drawings

Appendix Q.5 – Closure Drain As-built Drawings

Memo

To: Jeff Gaul

From: John W. Roberts

Date: 25 September 2014

Project No.: 74201125N

cc: Austin Creswell, AMEC
Paul Ivancie, AMEC
Andrea Meduna, AMEC

Subject: Squaw Gulch VLF Closure Drain Installation Summary Revised with Detailed Logging Data and Horizontal Component Installation Details (REV 2)

The Closure Drain Installation Project began with a design consisting of 12 drains to be installed into boreholes drilled with orientations ranging from 097° to 140° azimuth and -45° to -49° inclination. The boreholes were to penetrate through varying amounts of Precambrian quartz monzonite (qtzm) before being terminated at approximately 50 feet into the diatreme breccia material. Eleven drains were required to have the average draining capacity of six gallons per minute (gpm) to comply with the drainage requirements for "wettest year" that was used in the hydrology study and system design. The site was designed conservatively with 12 drains. Six of the 12 drains were going to have the drain capacity measured by performing a constant head test. Adjustments to the design would be made by adding or subtracting drains from the original 12 drains, depending on the flows measured from each installed drain as the program progressed.

The following describes the general geology and permeability test results for each borehole drilled and drain installed.

Closure Drain CD-1:

CD-1 was drilled from February 18, 2014 through February 21, 2014. CD-1 penetrated fill to a depth of 10 feet followed by a sequence of qtzm and phonolite dikes (phd) to a depth of 80 feet. Qtzm dominated the borehole from 80 to 640 feet deep. At a depth of 640 feet, the transition zone between the qtzm country rock and the diatreme breccia was penetrated before encountering the diatreme breccia material at a depth of 660 feet. The borehole was terminated at a depth of 720 feet, 80 feet into the diatreme.

The constant head test was attempted by injecting 3,500 gallons of water into CD-1. The head of water was not observed at the surface. A second attempt was made by injecting 4,000 gallons (5.9 hole volumes) of water at a rate of 67 gpm. Again, the head of water was not observed at the surface. The constant head test was unable to be completed with the equipment onsite.

This experience of unexpected hydraulic conditions caused AMEC to change the approach to the tracking and documentation of permeability testing of the drains. This involved sourcing two in situ Level Troll transducers and two 1,000 feet vented cables to perform falling head tests from the maximum head experienced in each drain. The transducer pairs recorded the rate of drainage, and monitored hydraulic connectivity between drains. Constant head tests would still be performed if conditions permitted. Tests were to be conducted on every borehole.

Closure Drain CD-2:

CD-2 was drilled from February 21, 2014 through February 24, 2014. CD-2 penetrated fill to a depth of 5 feet followed by a sequence of qtzm and phd to a depth of 80 feet. Qtzm dominated the borehole from a depth of 80 to 879 feet. The borehole was terminated at a depth of 879 feet. The borehole did not penetrate the diatreme, but was terminated near the Precambrian-Diatreme interface. At a depth of 860 feet the borehole had experienced a change in the inclination from -48° (at the surface) to -67° (delta of -19°). Considering the declination at depth in conjunction with CC&V's Exploration Group's Vulcan model, AMEC decided to terminate the borehole and complete it as a drain, provided that the hole was hydraulically connected to the adjacent holes, which terminated in the diatreme breccia.

A permeability test was completed by injecting 1,069 gallons of water into CD-2 (1.3 hole volumes) at a rate of 67 gpm. The head of water was observed at the surface; however, a constant head test could not be completed due to the capacity of the pump, which had a maximum output of 16 gpm. The equipment on-site at the time of testing prevented the precise determination of the flow rate that CD-2 was draining, with an estimate between 16 to 67 gpm.

Monitoring was performed to observe any hydraulic connectivity between CD-2 and CD-1, and to determine if the local fracture network was connected to the diatreme. A transducer was deployed in CD-1 and CD-2 during the hydraulic testing of CD-2. CD-1 showed the response of an increase in head during the test. CD-2 is in close proximity of the country rock-diatreme contact. This indicates the CD-2 local fracture network is likely interconnected with the diatreme breccia.

Closure Drain CD-3:

CD-3 was drilled from February 24, 2014 through February 27, 2014. CD-3 penetrated fill to a depth of 10 feet followed by a sequence of qtzm and phd to a depth of 197 feet. Qtzm dominated the borehole from depths of 197 to 785 feet. At 785 feet deep the borehole penetrated the transition zone between the qtzm country rock and the diatreme breccia. At 825 feet deep the diatreme was penetrated. The borehole was terminated at a depth of 885 feet.

The formation depths were determined with assistance from a CC&V geologist. Breccia fragments were observed by both AMEC and CC&V under microscope. However, after detailed logging completed by another member of the CC&V Exploration Department it was determined that the borehole did not penetrate the diatreme; the diatreme, as defined by the Exploration Group, is the Cripple Creek Breccia Formation. The detailed logging identified that phonolite breccia material was encountered from 780 to 785 feet deep before penetrating qtzm at 830 feet deep. A sequence of phonolite breccia and qtzm was penetrated from 830 to 855 feet deep before completed penetration into the phonolite breccia. The Exploration Group has identified this as the transition zone into the diatreme breccia.

A constant head test was attempted by injecting 1,970 gallons of water (2.4 hole volumes) into CD-3 at a rate of 94 gpm. The head of water was not observed at the surface. A falling head test was completed and the transducer data shows the entire column of water draining out.

Monitoring was performed to observe any hydraulic connectivity between CD-3 and CD-2, and to determine if the local fracture network was connected to the diatreme. A transducer was deployed in CD-2 during the hydraulic testing of CD-3. CD-2 showed a response of an increase in head during the test. CD-3 is in close proximity of the country rock-diatreme contact. This indicates the CD-3 local fracture network is likely interconnected with the diatreme breccia.

Closure Drain CD-4:

CD-4 was drilled from February 27, 2014 through March 1, 2014. CD-4 penetrated fill to 10 feet deep followed by a sequence of qtzm and phd to a depth of 225 feet. Qtzm dominated the borehole from depths of 225 to 450 feet. The borehole was terminated at 520 feet deep due to an excessive declination which greatly decreased the chances of diatreme penetration.

The borehole was abandoned with grout from 520 to 190 feet deep, where the grout was being lost to the formation through a fracture (190 feet). A shale basket was deployed to a depth of 147 feet, where the hole was grouted to the surface leaving a 53 foot void in the borehole.

Closure Drain CD-4a:

CD-4a was drilled from March 1, 2014 through March 4, 2014. It was moved 4.3 feet away from CD-4 and the inclination was decreased by -2° to -43°. The upper 450 feet did not have samples retained and are presumed to be the same as CD-4. From 450 feet deep, CD-4a penetrated qtzm to a depth of 930 feet. The borehole was terminated at 930 feet deep in qtzm due to a lost drill bit down-hole. Diatreme breccia was originally thought to have been encountered from 870 to 875 feet deep and traces of breccia material from 875 to 930 feet deep, but detailed logging by the Exploration Group after drain completion determined this was altered qtzm.

A constant head test was attempted by injecting 1,963 gallons of water (2.3 hole volumes) into CD-4a at a rate of 67 gpm. The head of water was not observed at the surface. A falling head test was completed and the transducer data shows the entire column of water draining out.

The transducer data from the adjacent drain CD-3 monitoring during the CD-4a permeability testing did not see a response, indicating they are not hydraulically connected. Due to the lack of diatreme breccia penetration and hydraulically isolated characteristics relating to the adjacent drain, CD-4a was abandoned. The borehole was abandoned with grout from 930 to 165 feet deep, where the grout was being lost to the formation through a fracture zone (150 to 170 feet). Bentonite chips were poured from the surface to where they bridged at a depth of 76 feet. The bridge was used as a plug to grout from the surface. The plug is estimated to be 9 feet thick based on the amount of bentonite placed down the hole. The hole was grouted to the surface leaving an approximate 80 foot void in the borehole.

Closure Drain CD-5:

CD-5 was drilled from March 5, 2014 through March 6, 2014. CD-5 penetrated fill to a depth of 15 feet followed by a sequence of qtzm and phd to a depth of 344 feet. The borehole encountered a stope in phd from 344 to 350 feet deep and was terminated.

The borehole was abandoned with grout from 306 feet deep to the surface on March 8, 2014.

Closure Drain CD-6:

CD-6 was drilled from March 7, 2014 through March 11, 2014. CD-6 penetrated fill to a depth of 10 feet followed by a sequence of qtzm and phd to 300 feet deep. Qtzm dominated the borehole from 300 to 927 feet deep. A phd was penetrated at 927 feet depth before encountering qtzm from 948 to 1,039 feet deep. Diatreme breccia was penetrated at 1,039 feet deep and continued to the termination at a depth of 1,090 feet.

The formation depths were determined with CC&V's Geologist's assistance, and breccia fragments were observed by both AMEC and CC&V under microscope. However, after detailed logging completed by another member of the Exploration Department it was determined that the borehole penetrated the diatreme at a depth of 925 feet.

The permeability testing in CD-6 was completed with two constant head tests. The first test ran for 11 minutes at an average rate of 27.8 gpm taking a total of 307.5 gallons of water. The second test ran for 13 minutes at an average rate of 36.2 gpm taking a total of 472.5 gallons of water.

A third test was attempted, but was unsuccessful. Constant head conditions were unable to be achieved by injecting water at 45 gpm, which was the maximum output of the equipment on-site. The transducer showed the borehole continued to drain after testing was completed.

Closure Drain CD-7:

CD-7 was drilled from March 11, 2014 through March 18, 2014. CD-7 penetrated fill to a depth of 20 feet followed by qtzm to 149 feet deep. A phd was penetrated from 149 to 160 feet deep before penetrating qtzm at a depth of 304 feet. A sequence of qtzm and phd was penetrated from 304 to 385 feet deep. Qtzm dominated the borehole from 385 to 885 feet deep. A phd was encountered from 885 to 897 feet before encountering qtzm from 897 to 980 feet deep. Diatreme breccia was encountered from 980 to 990 feet deep. Qtzm was penetrated from 990 to 1,135 feet deep. Diatreme breccia was penetrated from 1,135 to 1,260 feet deep; a qtzm block was encountered from 1,225 to 1,245 feet deep. The borehole was terminated at 1,260 feet deep in diatreme breccia.

A constant head test was attempted by injecting 1,429 gallons of water (1.2 hole volumes) into CD-7 at a rate of 64 gpm. The head of water was not observed at the surface; the transducer data indicated the maximum head of water was 488 feet deep. A falling head test was completed and the transducer data shows the entire column of water draining out.

Closure Drain CD-9:

CD-9 was drilled from March 19, 2014 through March 23, 2014. CD-9 penetrated fill to a depth of 15 feet followed by a sequence of qtzm and phd to a depth of 230 feet. Qtzm dominated the borehole from 230 to 629 feet deep. A phd was penetrated at 629 feet deep before encountering qtzm from 632 to 855 feet deep. A phd was penetrated from 855 to 880 feet deep. Diatreme breccia was penetrated at 880 feet deep and continued to the termination of at a depth of 980 feet; some small qtzm blocks (less than 10 feet) were encountered within this zone.

A constant head test was attempted by injecting 603 gallons of water (0.6 hole volumes) into CD-9 at a rate of 67 gpm. The head of water was not observed at the surface; the transducer data indicates the maximum head of water was 567 feet deep (the borehole was highly fractured from 930 to 935 feet deep). A falling head test was completed and the transducer data shows the entire column of water draining out.

Closure Drain CD-12:

CD-12 was drilled from March 23, 2014 through March 25, 2014. CD-12 penetrated fill to a depth of 15 feet followed by a sequence of qtzm and phd to 382 feet deep. Qtzm dominated the borehole from 382 to 621 feet deep. Diatreme breccia was penetrated at 621 feet deep and continued to the termination at a depth of 700 feet.

A constant head test was completed for 30 minutes at an average rate of 42.3 gpm. A total of 1,283.5 gallons of water (1.8 hole volumes) was injected during the test.

Summary

In summary, a total of ten boreholes were drilled with seven completed as drains (CD-1, CD-2, CD-3, CD-6, CD-7, CD-9, and CD-12). All but two (CD-2 and CD-3) of the seven of the drains penetrated the diatreme. Drains CD-2 and CD-3 are terminated in close proximity of the country

rock-diatreme contact, and are presumed to be connected to the diatreme in the local fracture network as evidenced by hydraulic tracking and testing.

A total drainage capacity of 66 gpm was required by the hydrology study to accommodate the “wettest year”. The closure drain design consisted of 12 drains which required an average 6 gpm to safely satisfy this requirement. The installation and hydraulic testing of the seven drains has yielded a cumulative minimum 395 gpm into the historic, regionally dewatered system. This cumulative gpm value is the sum of the lower flows observed during testing (i.e. 16 gpm in CD-2).

The installation of the subgrade portion of the closure drains was successful in that the achieved flows were 17 times greater than the required per the hydrology study in 58 percent of the designed drains.

Completion for the closure drains began on June 3, 2014. Concrete pads with rebar were poured around each collar per the design. A summary of test results is included in Appendix Q.1 with the individual concrete cylinder test reports presented in this Appendix Q.2.

Photo 1 Closure Drain Pads

Soil Liner Fill material was placed in the PSSA floor around the closure drains, nuclear density tests N37 through N40 presented on Table 11 of under the Tables tab portion of the Record of Construction Report. The material was compacted with a plate tamper and a smooth drum roller. The steel casing was cut flush with the concrete pads.

Photo 2 Soil Liner Fill Material Placement around Closure Drains

Non-woven geomembrane fabric was placed on the soil liner fill, and the horizontal components of the drains were constructed.

Photo 3 Placement of Non-woven Geotextile and PVC Drains

The drains horizontal components were built using 2-inch schedule 80 PVC 0.020 slotted screens, which were coupled with the downhole drain components using a 45° elbow coupler. The horizontal drains were covered with leak detection fill. A sample of the material (LDF1-R

data located in Appendix H.1 and on Table 11) was collected for laboratory testing. The drains were then backfilled over with underdrain fill before having the non-woven geotextile fabric placed over the drains and their appropriate fill designs.

The As-Built Plan and Profile, and Drain Diagrams are provided in Appendix Q.

Please refer to the laboratory testing (Appendix H) and the Daily Reports (Appendix Q.3) for the called out samples and dates mentioned above for specifics.

Please contact me at (303) 935-6505 if you have any questions or concerns.

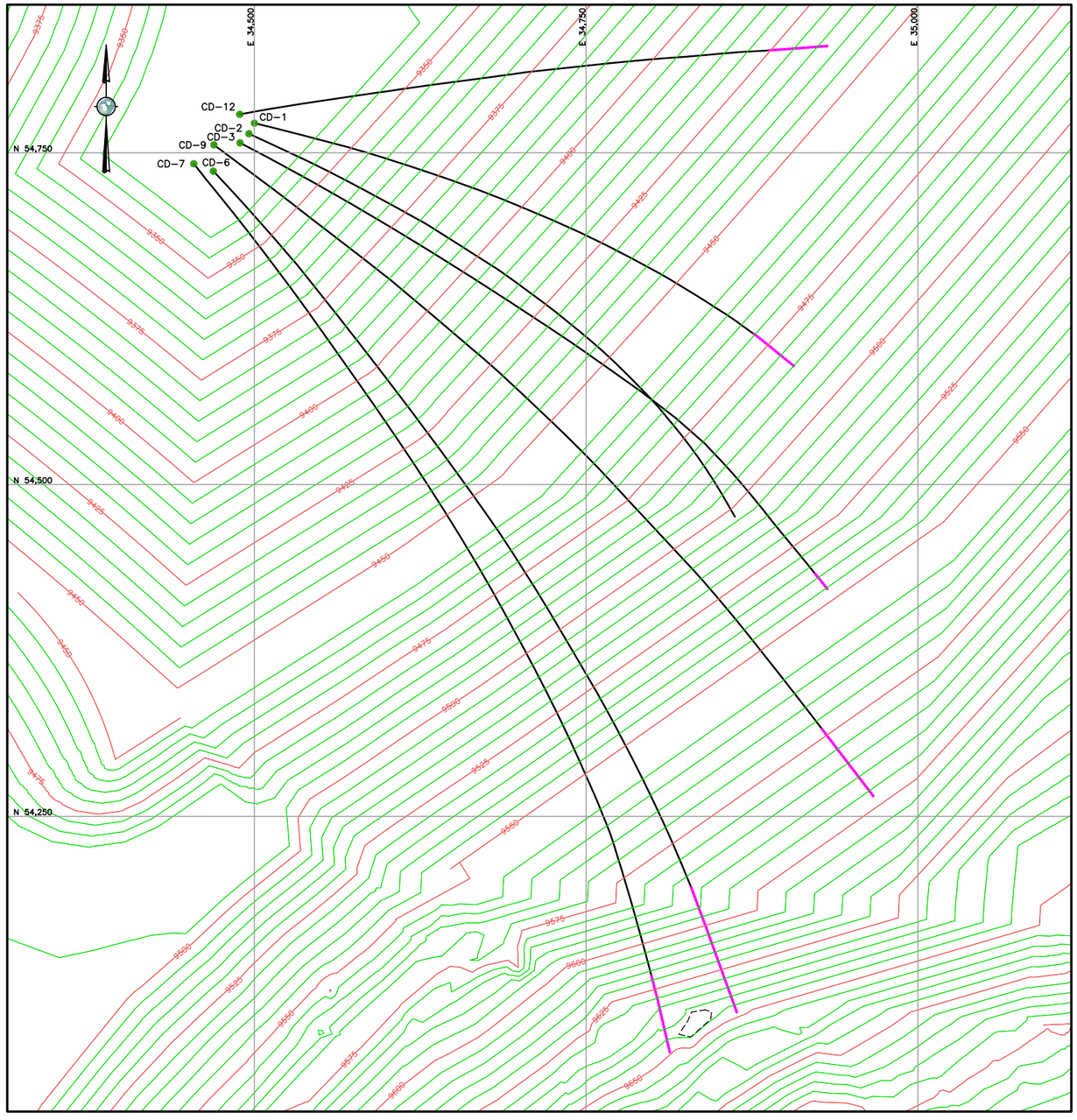
Sincerely,

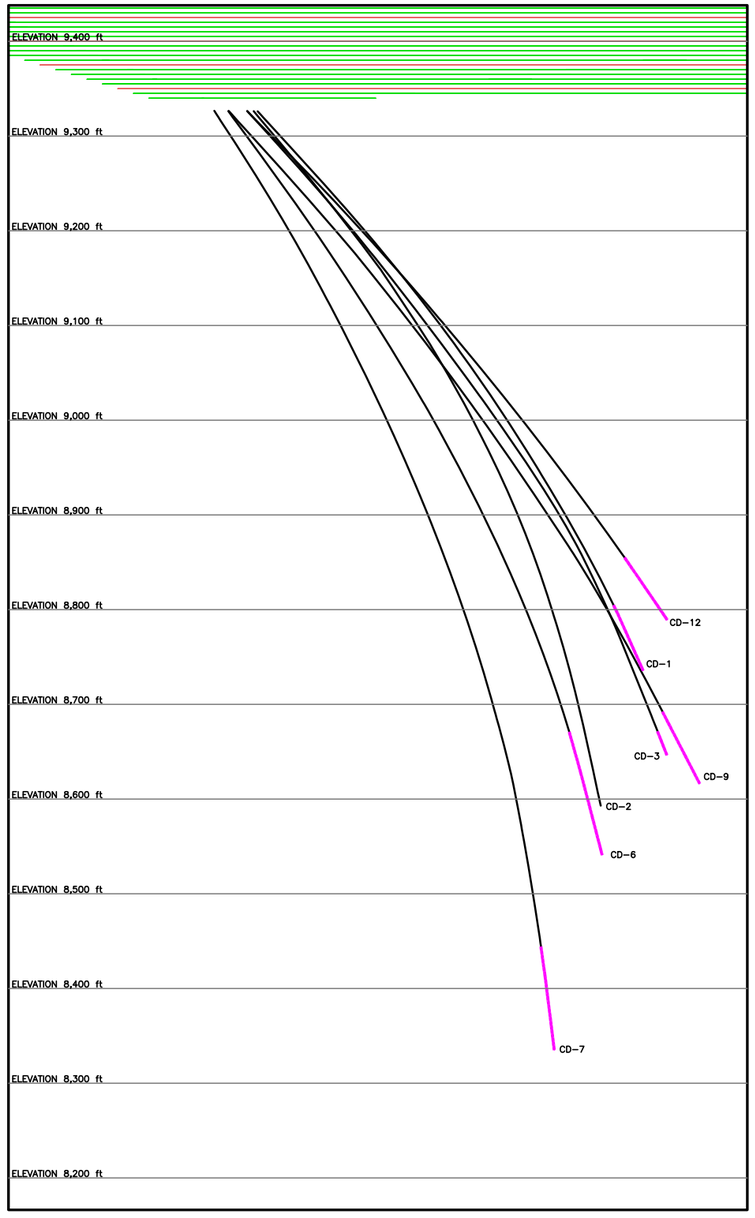
AMEC Environment & Infrastructure, Inc.

John W. Roberts, PG
Project Geologist

Reviewed by:

Paul Ivancie, PG
Senior Associate Hydrogeologist





LEGEND:

- 9500 — PROPOSED GROUND SURFACE CONTOUR EL, FEET
- BOREHOLE
- DIATREME PENETRATED LENGTH
- CD-1 — BOREHOLE COLLAR LOCATION

NOTES:

1. THE CD-2 EXACT FLOW WAS UNABLE TO BE DETERMINED WITH THE EQUIPMENT ONSITE AND IS BETWEEN 16 gpm TO 67 gpm. THE TOTAL gpm SUM IN THE TECHNICAL MEMO WAS CALCULATED USING 16 gpm.
2. DRAIN HOLES CD-4, CD-4a, AND CD-5 WERE ALL ABONDONED AND DID NOT HAVE DRAINS INSTALLED AND ARE NOT SHOWN.
3. DRAIN HOLES CD-3 AND CD-6 WERE REVISED REGARDING THE DIATREME PENETRATION DEPTH AFTER THE CC&V DETAILED LOGGING WAS COMPLETED.
4. AS-BUILT COORDINATES SURVEYED BY AMES.
5. AS-BUILT DEVIATION SURVEYED BY ELK CREEK GYRO.
6. BOREHOLES/DRAINS CD-8, CD-10, AND CD-11 WERE NOT DRILLED.
7. BOREHOLE PROJECTIONS FROM CC&V EXPLORATION GROUP VULCAN MODEL.
8. CONTOURS SHOWN ARE FINAL GRADE.

PROFILE VIEW FACING NORTH

80 0 80 160 FT HORIZONTAL

80 0 80 160 FT VERTICAL

50 0 50 100 FT

AS-BUILT INFORMATION

AMEC ID	COLLAR NORTHING (ft)	COLLAR EASTING (ft)	COLLAR ELEVATION (ft)	TOTAL BOREHOLE LENGTH (ft)	ATTITUDE COLLAR (inc., azi)	ATTITUDE TOTAL DEPTH (inc., azi)	DIATREME PENETRATION	DIATREME ENCOUNTERED DOWN HOLE LENGTH (ft)	HYDRO TEST RATE WATER TAKEN (gpm)
CD-1	54,772.259	34,500.021	9,326.141	720	-47, 103	-60, 129	YES	640	67
CD-2	54,764.352	34,495.873	9,326.214	879	-48, 115	-67, 150	NO	NA	16
CD-3	54,757.493	34,489.135	9,326.318	885	-44, 118	-58, 141	YES	855	94
CD-4	54,752.071	34,480.909	9,326.333	450	-46, 125	-57, 132	NO	NA	NA
CD-4a	54,747.839	34,481.384	9,326.416	930	-42, 125	-64, 148	NO	NA	67
CD-5	54,739.994	34,479.256	9,326.324	350	-44, 129	-44, 134	NO	NA	NA
CD-6	54,736.125	34,469.055	9,326.219	1,090	-43, 137	-53, 160	YES	925	45
CD-7	54,741.739	34,454.318	9,326.602	1,260	-45, 142	-61, 167	YES	1135	64
CD-9	54,755.963	34,469.525	9,326.493	980	-45, 127	-61, 143	YES	880	67
CD-12	54,778.943	34,488.922	9,326.345	700	-46, 080	-56, 086	YES	621	42

DATUM	DRN BY CAS	CHK BY AC
PROJECTION	DSN BY AC	APR BY MEN

CLIENT: CRIPPLE CREEK & VICTOR GOLD MINING COMPANY

PROJECT: SQUAW GULCH VLF

TITLE: CLOSURE DRAIN AS-BUILT PLAN AND PROFILE

ISSUED DATE: 4/8/14

PROJECT No.: 1125N

FIGURE No.: 001

REV: A

S:\Projects\1125N-Squaw VLF CQA\9.0 CADD\9.1 Plan Sheets\Closure Drain Asbuilt\F001 CLOSURE DRAIN ASBUILT PLAN.dwg-4/8/2014 12:20 PM

CRIPPLE CREEK & VICTOR GOLD MINING Co.

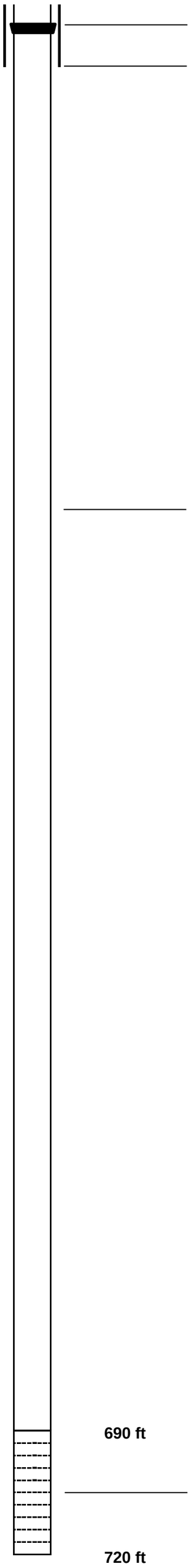
SQUAW GULCH VALLEY LEACH FIELD CLOSURE DRAIN AS-BUILT

Drain ID:	CD-1 (SGR-850)	**Northing:**	54772.259	**Date Installed:**	2/20/2014
Ground Surface Elevation (ft):	9326.141	**Easting:**	34500.021	**Casing Depth (ft):**	18.5
Azimuth Surface:	103.23	**Inclination Surface:**	-47.18	**Borehole TD (ft):**	720
Azimuth TD:	129.01	**Inclination TD:**	-60.09	**Drain TD (ft):**	720

BOREHOLE LITHOLOGY

Fill	**10 ft**
Quartz Monzonite - Phonolite Dike Sequence	
Quartz Monzonite	**80 ft**
Transition zone between Quartz Monzonite and Diatreme Breccia	**640 ft**
	660 ft
Diatreme Breccia	
	690 ft
End Borehole	**720 ft**

DRAIN CONSTRUCTION



- Shale basket at 12 ft, neat cement to surface
- 20 ft 6" surface casing set to 18.5 ft
- 1.5" Schedule 80 PVC Riser
- 30 ft 1.5" Schedule 80 PVC 0.030 Slotted Screen and 2" End Cap

Notes: **Not to Scale**
Depths in ft downhole

CRIPPLE CREEK & VICTOR GOLD MINING Co.

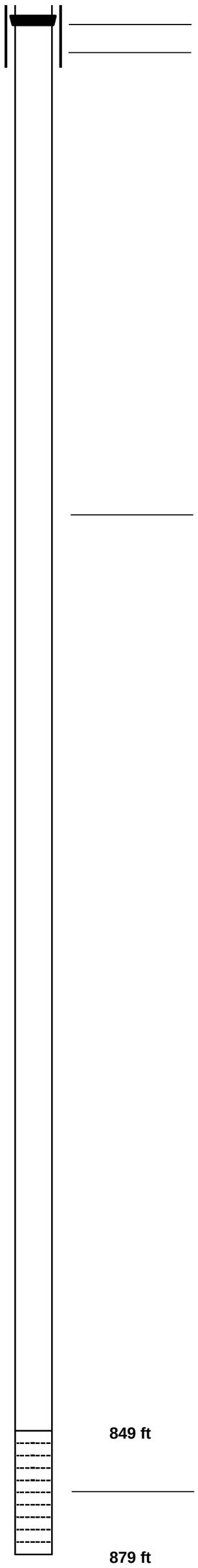
SQUAW GULCH VALLEY LEACH FIELD CLOSURE DRAIN AS-BUILT

Drain ID:	CD-2 (SGR-835)	**Northing:**	54764.352	**Date Installed:**	2/23/2014
Ground Surface Elevation (ft):	9326.214	**Easting:**	34495.873	**Casing Depth (ft):**	20
Azimuth Surface:	114.88	**Inclination Surface:**	-47.59	**Borehole TD (ft):**	879
Azimuth TD:	150.21	**Inclination TD:**	-66.47	**Drain TD (ft):**	879

BOREHOLE LITHOLOGY

Fill	**5 ft**
Quartz Monzonite - Phonolite Dike Sequence	
Quartz Monzonite	**80 ft**
End Borehole	**879 ft**

DRAIN CONSTRUCTION



Shale basket at 10 ft, cemented to surface	
20.7 ft 6" surface casing set to 20 ft	
1.5" Schedule 80 PVC Riser	
	849 ft
30 ft 1.5" Schedule 80 PVC 0.030 Slotted Screen and 2" End Cap	
	879 ft

Notes: **Not to Scale**
Depths in ft downhole

CRIPPLE CREEK & VICTOR GOLD MINING Co.

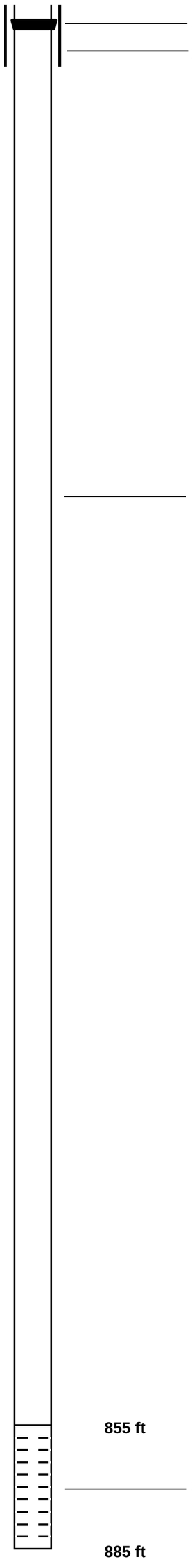
SQUAW GULCH VALLEY LEACH FIELD CLOSURE DRAIN AS-BUILT

Drain ID:	CD-3 (SGR-836)	**Northing:**	54757.493	**Date Installed:**	2/26/2014
Ground Surface Elevation (ft):	9326.318	**Easting:**	34489.135	**Casing Depth (ft):**	18.7
Azimuth Surface:	117.49	**Inclination Surface:**	-44.25	**Borehole TD (ft):**	885
Azimuth TD:	141.33	**Inclination TD:**	-57.80	**Drain TD (ft):**	885

BOREHOLE LITHOLOGY

Fill	**10 ft**
Quartz Monzonite - Phonolite Dike Sequence	
Quartz Monzonite	**197 ft**
End Borehole	**885 ft**

DRAIN CONSTRUCTION



Notes: **Not to Scale**
Depths in ft downhole

CRIPPLE CREEK & VICTOR GOLD MINING Co.

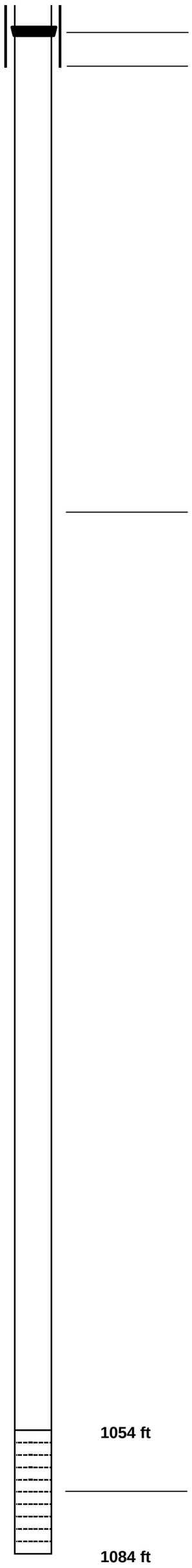
SQUAW GULCH VALLEY LEACH FIELD CLOSURE DRAIN AS-BUILT

Drain ID:	CD-6 (SGR-843)	**Northing:**	54736.125	**Date Installed:**	3/10/2014
Ground Surface Elevation (ft):	9326.219	**Easting:**	34469.055	**Casing Depth (ft):**	18.8
Azimuth Surface:	136.63	**Inclination Surface:**	-43.30	**Borehole TD (ft):**	1090
Azimuth TD:	160.09	**Inclination TD:**	-52.66	**Drain TD (ft):**	1084

BOREHOLE LITHOLOGY

Fill	**10 ft**
Quartz Monzonite - Phonolite Dike Sequence	
Quartz Monzonite	**300 ft**
Phonolite Dike	**927 - 948 ft**
Contact between Quartz Monzonite and Diatreme Breccia	**1039 ft**
Diatreme Breccia	
End Borehole	**1090 ft**

DRAIN CONSTRUCTION



- Shale basket at 12 ft, cemented to surface
- 20 ft 6" surface casing set to 18.8 ft
- 1.5" Schedule 80 PVC Riser
- **1054 ft**
- 30 ft 1.5" Schedule 80 PVC 0.030 Slotted Screen and 2" End Cap
- **1084 ft**

Notes: **Not to Scale**
Depths in ft downhole

CRIPPLE CREEK & VICTOR GOLD MINING Co.

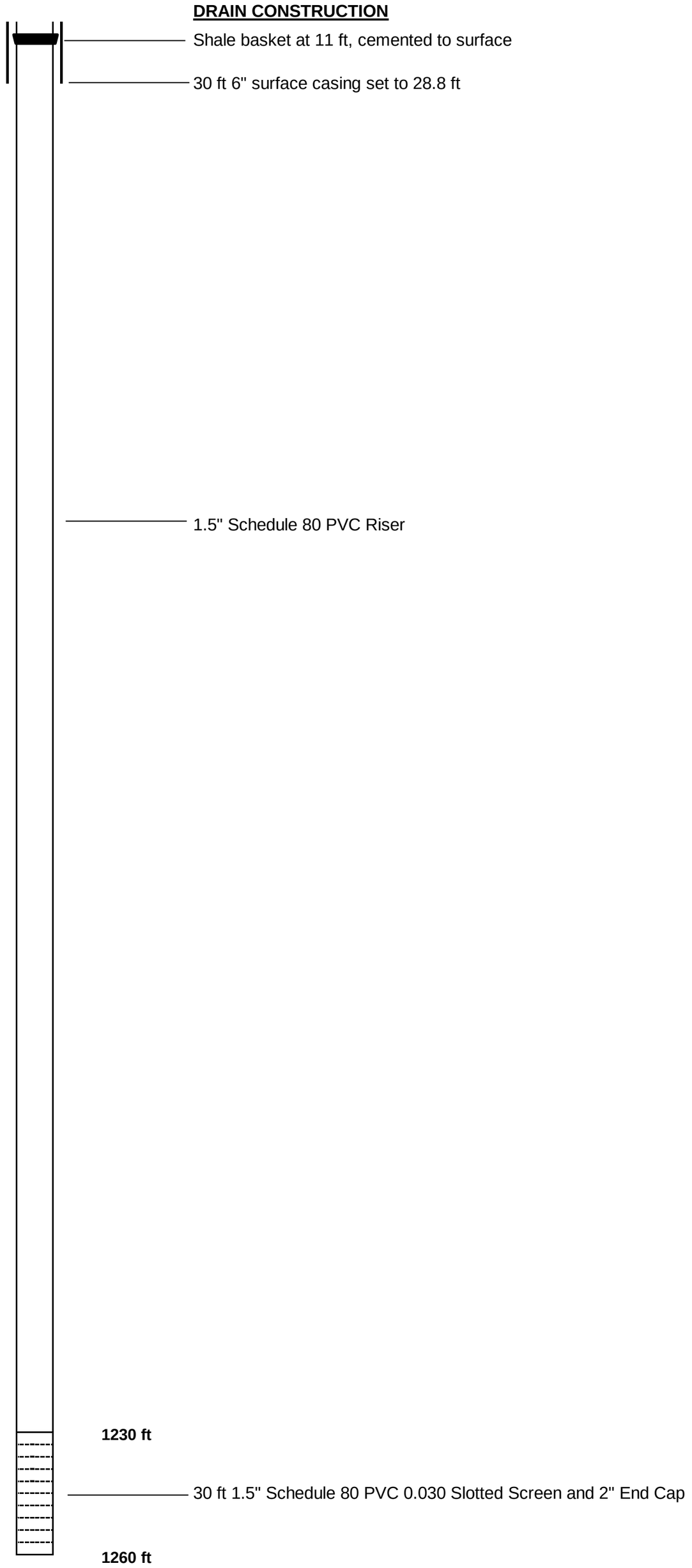
SQUAW GULCH VALLEY LEACH FIELD CLOSURE DRAIN AS-BUILT

Drain ID:	CD-7 (SGR-844)	**Northing:**	54741.739	**Date Installed:**	3/16/2014
Ground Surface Elevation (ft):	9326.602	**Easting:**	34454.318	**Casing Depth (ft):**	28.8
Azimuth Surface:	141.59	**Inclination Surface:**	-44.50	**Borehole TD (ft):**	1260
Azimuth TD:	166.97	**Inclination TD:**	-61.17	**Drain TD (ft):**	1260

BOREHOLE LITHOLOGY

Fill	**20 ft**
Quartz Monzonite	
Phonolite Dike	**149 - 160 ft**
Quartz Monzonite	
Quartz Monzonite - Phonolite Dike Sequence	**304 ft**
Quartz Monzonite	**385 ft**
Phonolite Dike	**885 - 897 ft**
Quartz Monzonite	
Diatreme Breccia	**980 - 990 ft**
Quartz Monzonite	
Diatreme Breccia	**1135 ft**
End Borehole	**1260 ft**

DRAIN CONSTRUCTION



Notes: **Not to Scale**
Depths in ft downhole

CRIPPLE CREEK & VICTOR GOLD MINING Co.

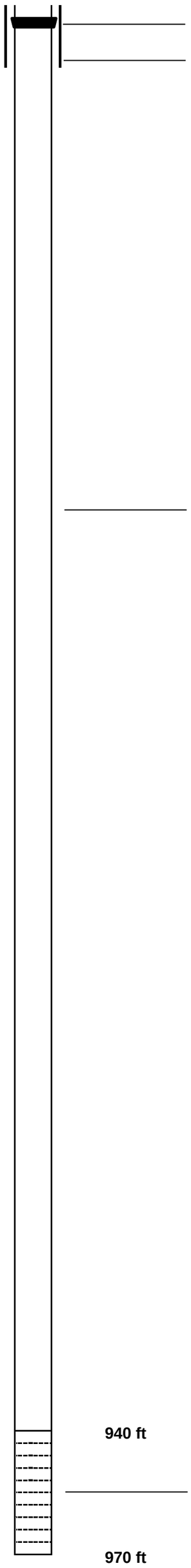
SQUAW GULCH VALLEY LEACH FIELD CLOSURE DRAIN AS-BUILT

Drain ID:	CD-9 (SGR-846)	**Northing:**	54755.963	**Date Installed:**	3/23/2014
Ground Surface Elevation (ft):	9326.493	**Easting:**	34469.525	**Casing Depth (ft):**	19.6
Azimuth Surface:	126.89	**Inclination Surface:**	-44.50	**Borehole TD (ft):**	980
Azimuth TD:	142.55	**Inclination TD:**	-61.17	**Drain TD (ft):**	970

BOREHOLE LITHOLOGY

Fill	**15 ft**
Quartz Monzonite - Phonolite Dike Sequence	
Quartz Monzonite	**230 ft**
Phonolite Dike	**629 - 632 ft**
Phonolite Dike	**855 - 880 ft**
Contact between Quartz Monzonite and Diatreme Breccia	**880 ft**
Diatreme Breccia	
End Borehole	**980 ft**

DRAIN CONSTRUCTION



- Shale basket at 6 ft, cemented to surface
- 6" surface casing set to 19.6 ft
- 1.5" Schedule 80 PVC Riser
- **940 ft**
- 30 ft 1.5" Schedule 80 PVC 0.030 Slotted Screen and 2" End Cap
- **970 ft** (10 ft cave-in at bottom of hole)

Notes: **Not to Scale**
Depths in ft downhole

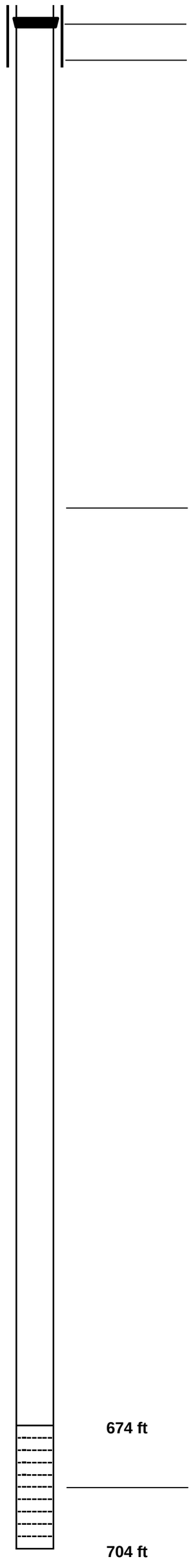
CRIPPLE CREEK & VICTOR GOLD MINING Co.
SQUAW GULCH VALLEY LEACH FIELD CLOSURE DRAIN AS-BUILT

Drain ID:	CD-12 (SGR-849)	**Northing:**	54778.943	**Date Installed:**	3/23/2014
Ground Surface Elevation (ft):	9326.345	**Easting:**	34488.922	**Casing Depth (ft):**	19.8
Azimuth Surface:	079.75	**Inclination Surface:**	-45.46	**Borehole TD (ft):**	704
Azimuth TD:	085.70	**INclination TD:**	-55.73	**Drain TD (ft):**	704

BOREHOLE LITHOLOGY

Fill	**15 ft**
Quartz Monzonite - Phonolite Dike Sequence	
Quartz Monzonite	**382 ft**
Contact between Quartz Monzonite and Diatreme Breccia	**621 ft**
Diatreme Breccia	
	674 ft
End Borehole	**704 ft** **704 ft**

DRAIN CONSTRUCTION



Shale basket at 12 ft, cemented to surface

6" surface casing set to 19.8 ft

1.5" Schedule 80 PVC Riser

30 ft 1.5" Schedule 80 PVC 0.030 Slotted Screen and 2" End Cap

Notes: **Not to Scale**
Depths in ft downhole

Appendix Q.1

Summary of Closure Drain Concrete Test Results

Cripple Creek & Victor Mining Company
Squaw Gulch VLF Pregnant Solution Storage Area
Closure Drain Concrete Testing Summary

SPECIMEN NO.	DATE PLACED	TIME BATCHED	TIME SAMPLED	LOCATION	MIX DESIGN NUMBER	FIELD TEST RESULTS				LABORATORY TEST RESULTS						
						SLUMP (in)	AIR CONTENT (%)	UNIT WEIGHT (pcf)	SAMPLE TEMP. (ºF)	CURING AGE AT TIME OF TEST (days)	LOAD (pounds)	AREA (in^2)	DESIGN STRENGTH (psi)	COMPRESSIVE STRENGTH (psi)	PERCENT OF DESIGN (%)	FRACTURE TYPE
CD-1	6/3/2014	10:07 AM	10:37 AM	Closure Drain	4001	5.00	NT	NT	68	3	24,955	12.57	4,000	1,990	50%	2
CD-1										7	30,595	12.57	4,000	2,430	61%	3
CD-1										28	36,645	12.57	4,000	2,920	73%	2
CD-1										28	40,085	12.57	4,000	3,190	80%	2
CD-1*										56	42,120	12.57	4,000	3,351	84%	2

Notes:
* Non-structural, accepted by Engineer

Appendix Q.2

Closure Drain Individual Concrete Test Reports

REPORT OF CONCRETE CYLINDER TEST

AMEC Environment & Infrastructure

Licensee Address

Project Number: 74201125N0 - Closure Drain Report Number: 1
Project:
Client:
Address:

Attn:

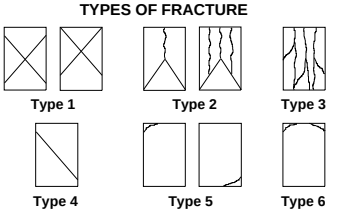
FIELD TEST CONDITIONS AND RESULTS (ASTM C 31)

Date Placed: 6/3/2014
Time Sampled: 10:37 am
Location of Sample: Closure Drain
Supplier: NorthWest Ready Mix
Truck Number: 73 Ticket Number: 1675
Mix Number: 4001 Time Placed: 10:32 am
Design Strength: 4000 Time Batched: 10:07 am
Batch Size: 3 yds
Slump: 5.00" (ASTM C 143) Air Content: N/T (ASTM C 173) Unit Weight: N/T (ASTM C 138)
Concrete Temp: 68 (ASTM C 1064) Ambient Temp: 62
Water Added: 0 Technician: RBR
Initial Curing: Final Curing:
Max Field Curing Temp.: Min Field Curing Temp.:

LABORATORY TEST RESULTS (ASTM C 39)

Specimen	Test Date	Age	Load	Diameter	Area	Strength	Percent of Design	Type of Fracture
CD-1	6/6/2014	3	24955	4.00	12.57	1990	50%	2
CD-1	6/10/2014	7	30595	4.00	12.57	2430	61%	3
CD-1	7/1/2014	28	36645	4.00	12.57	2920	73%	2
CD-1	7/1/2014	28	40085	4.00	12.57	3190	80%	2
CD-1	7/29/2014	56	42120	4.00	12.57	3350	84%	2

Remarks:



Copies to:

Reported by:

Tim Burkhard
Project Resident

Appendix Q.3

Closure Drain Installation
Daily Reports

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: AMES Construction / AK Drilling

Project Number: 74201125N0.****.****

Date: 02.17.14

Day: Monday

Temperature:
Low: 30°F
High: 45°F

Weather Conditions:
Cloud Cover: Partly cloudy
Precipitation: NA
Wind: SSE 6 to 9 mph

AMEC Personnel On Site

John Roberts	10.0	Hrs
	0.0	Hrs
	0.0	Hrs

		Hrs

Project concerns: None at this time.
CONSTRUCTION ACTIVITIES and PROGRESS:

Drilling:
No drilling activities today. AK turned over a signed contract at 1600. Ames is still waiting for insurance documentation. The crew received their Site Specific training, and plan to start drilling at 1200 tomorrow, 2-18-2014.

The rig was at the mine entry this morning (photo attached). I met with Rick, Ames survey, to discuss alignment of the rig for set up over each drain. I plan to meet with the mine geologists in the morning to look at some diatreme samples and to discuss the down-hole survey data (i.e. data received, time lag for data, procedure based on equipment type, etc.).

Submitted by:
John Roberts

Reviewed by: X
Timothy Burkhard
Submitted: Date: 02.17.2014

Daily progress photos:

AK’s RC rig and pipe truck at mine entrance.

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: AMES Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 02.18.2014
Day: Tuesday

Temperature:
Low: 36°F
High: 45°F

Weather Conditions:
Cloud Cover: Mostly sunny
Precipitation: NA
Wind: WNW 5 to 15 mph

AMEC Personnel On Site

John Roberts	13.0	Hrs
	0.0	Hrs
	0.0	Hrs

		Hrs

Project concerns: None at this time.

DRILLING ACTIVITIES and PROGRESS:

0630 Arrive at AMEC job trailer. Safety. Spoke with Jeff Gaul about meeting with the CC&V geologist.

0700 AK arrived at their lay down. We discussed: (1) the possibility of adjusting the collars to leave room for the crew to work when adjacent to the slope toe; (2) AK will perform a downhole deviation survey every 100ft (starting at 300ft) which will be compared with Foresight's survey (mine downhole survey crew – to be completed at TD of each borehole); (3) the work will be completed working 24/7 with crew changes at noon and midnight, and a foreman onsite roughly 0700 to 1900; and (4) equipment would be mobed into site at 0800 and drilling will commence at 1200.

0730 Went with Eric Lorenson (AMEC) to the CC&V geology office and met with Scott McANally. He showed us hand samples and chips of the material we will most likely encounter while drilling this site. We looked at the proposed boreholes in Vulcan; some of the holes near the south end of the PSSA might have to go deeper than previously estimated. Scott gave us logs and chip trays from the previous holes drilled by AMEC along with logs from the other holes in the area that were used to create the diatreme-Precambrian contact. He is available under normal working hours for assistance with contact identification.

1000 Delivered sample bags and chip trays to the site with Scott.

1020 Went to get a site badge with the AK crew.

1100 Back at the site. Rick, Ames survey, met us at the site to confirm the location of the underdrain primary pipe and orient the rig. The rig azimuth was set at 103° Mine North and 87° from Magnetic North. The inclination was set at 49° from horizontal. AK continued to set up equipment.

1345 Moved up to the HWY 67 turn out to wait for a blast. AK went to get water (had to wait for a blast in the pit).

1410 Back onsite.

1500 AK arrived with from water run; they are still getting organized with equipment and the newly arrived night crew.

1515 Began to advance 6-inch welded steel surface casing with a 6¼-inch bit.

1540 Casing set to 18.7ft depth. Switched over to 4 ¾-inch bit.

1630 Back hoe at site to excavate a small sump for drill returns.

1700 Began drilling from 18.7ft depth.

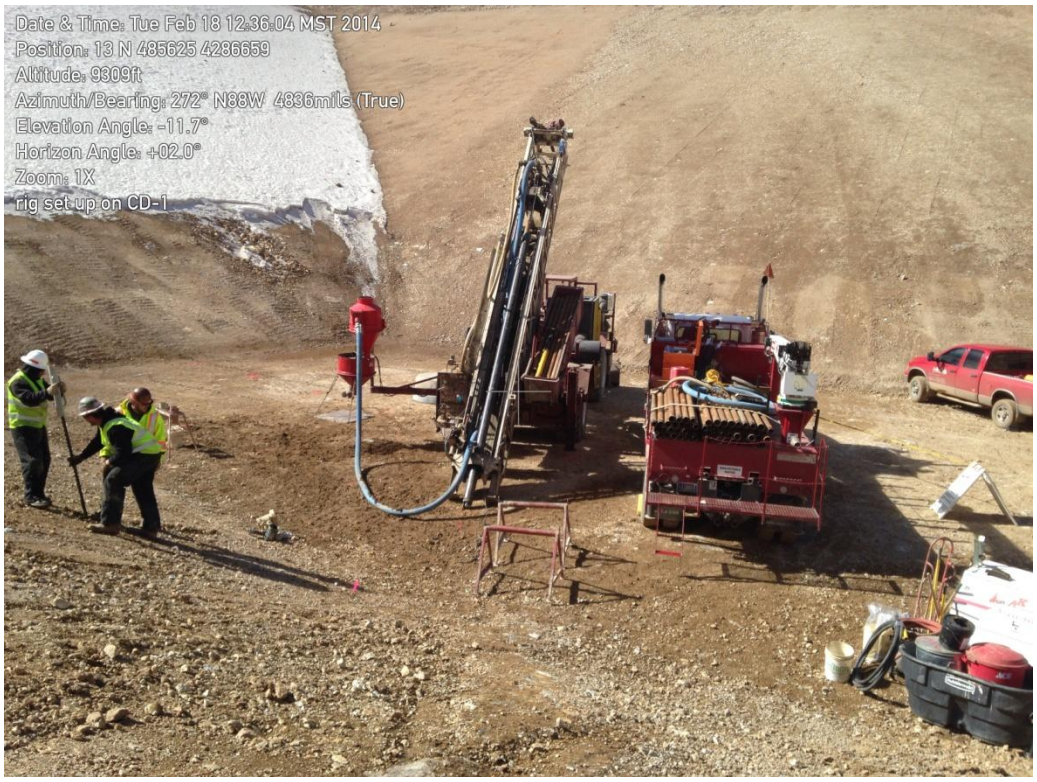
1845 Left drill site for AMEC trailer. Drill depth 75ft. Drillers will continue to approximately 300ft depth before stopping to survey the hole. They will call if there is any issue.

PVC for drain construction has not yet arrived to site. The constant head test manifold and hoses are onsite. I will look at the set up tomorrow more closely.

Submitted by:
John Roberts

Reviewed by: 
Timothy Burkhard
Submitted: Date: 02.18.2014

Daily progress photos:




Date & Time: Tue Feb 18 18:04:54 MST 2014
Position: 13 N 485610 4286659
Altitude: 9342ft
Azimuth/Bearing: 269° S89W 4782mils (True)
Elevation Angle: -14.9°
Horizon Angle: +00.1°
Zoom: 1X
CD-1 - drilling from 50ft depth, 4 3/4" bit, excavating shallow sump for returns

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: AMES Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 02.19.2014
Day: Wednesday

Temperature:
Low: 26°F
High: 45°F

Weather Conditions:
Cloud Cover: Clear/Cloudy
Precipitation: < 1-inch snow
Wind: WNW 7 to 15 mph

AMEC Personnel On Site

John Roberts	13.5	Hrs
	0.0	Hrs
	0.0	Hrs

		Hrs

Project concerns: PVC for drain construction is not on site.

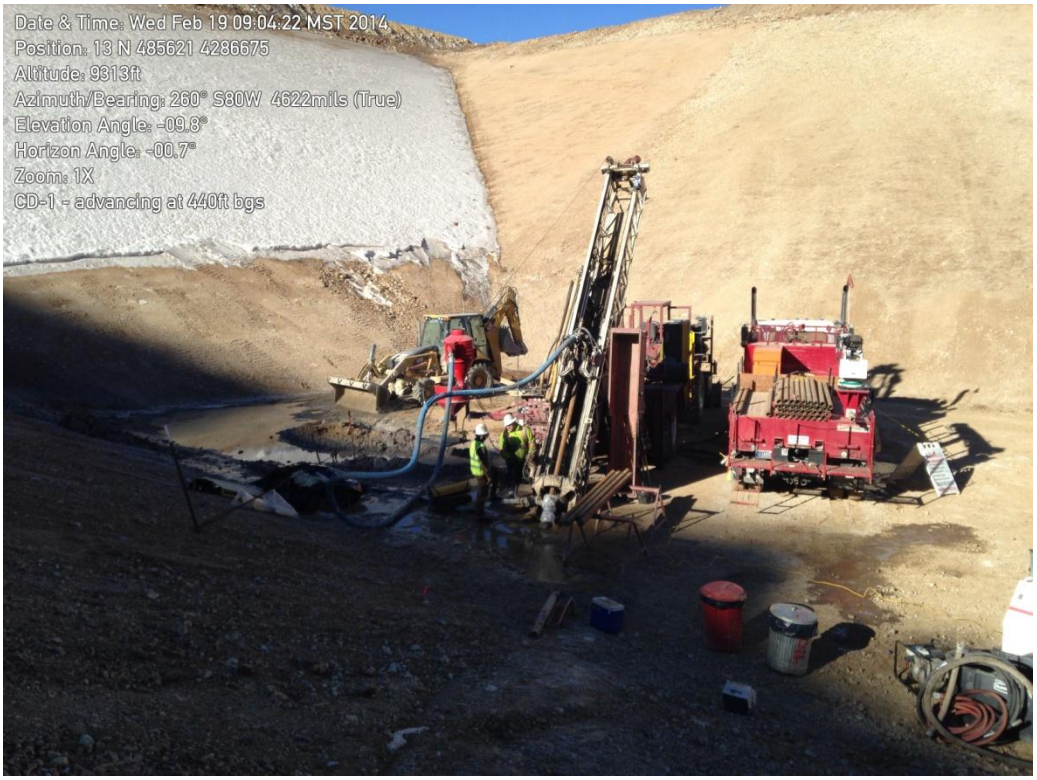
DRILLING ACTIVITIES and PROGRESS:

0000-0115	Advanced CD-1 (SGR-850) from 260 to 300 ft depth at a rate of 32 ft/hr. The borehole is being drilled with air and water only; there are no additives (i.e. bentonite gel, foam, etc.).
0115-0245	AK performed downhole survey in 50 ft intervals. Borehole deviation of 7° azimuth and 4° inclination (the inclination was set to 49° prior to drilling; drilling kicked the bit to a 47° start; at 300 ft depth the inclination was 51°). AK is using the Reflex Gyro Survey tool; the tool is calibrated before *and after* each use for data verification. The hole will be surveyed by the mine's survey contractor, Elk Creek Gyro, which will give a comparison.
0245-1150	Advanced CD-1 from 300 to 473 ft depth at a rate of 19.2 ft/hr. Night crew arrived onsite (1135). 10 minute warning for blast. Crew change.
1150-1215	Shutdown for blast.
1215-1515	Advanced CD-1 from 473 to 500 ft depth at a rate of 9 ft/hr.
1515-1600	AK performed downhole survey in 50 ft intervals. Borehole deviation of 14° azimuth and 8° inclination (the inclination was set to 49° prior to drilling; drilling kicked the bit to a 47° start; at 500 ft depth the inclination was 55°). AK will not survey the remaining length of borehole to TD; they will contact Foresight to survey to TD. All subsequently drilled holes will have surveys completed in 100 ft intervals to observe progress and spatial relation to previously installed drains.
1600-2400	Advanced CD-1 from 500 to 580 ft depth at a rate of 10 ft/hr. Day crew took over drilling activities from 580 ft depth (2400).

Submitted by:
John Roberts

Reviewed by: X
Timothy Burkhard
Submitted: Date: 02.20.2014

Daily Progress Photos:




Date & Time: Wed Feb 19 15:32:38 MST 2014
Position: 13 N 485604 4286674
Altitude: 9352ft
Azimuth/Bearing: 328° N32W 5831mils (True)
Elevation Angle: -17.7°
Horizon Angle: +00.5°
Zoom: 1X
calibrating Reflex gyro


Date & Time: Wed Feb 19 15:35:56 MST 2014
Position: 13 N 485601 4286654
Altitude: 9372ft
Azimuth/Bearing: 020° N20E 0356mils (True)
Elevation Angle: -07.1°
Horizon Angle: +01.0°
Zoom: 1X
performing downhole survey at 500ft depth in CD-1


Date & Time: Wed Feb 19 15:47:05 MST 2014
Position: 13 N 485606 4286669
Altitude: 9866ft
Azimuth/Bearing: 306° N54W 5440mils (True)
Elevation Angle: -10.3°
Horizon Angle: +00.3°
Zoom: 1X
post survey calibration at 500ft depth in CD-1
NON POTABLE WATER
DANGER
ELECTROCUTION HAZARD

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: AMES Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 02.20.2014
Day: Thursday

Temperature:
Low: 3° F
High: 14° F

Weather Conditions:
Cloud Cover: Cloudy/Clear
Precipitation: NA
Wind: WNW 7 to 30 mph

AMEC Personnel On Site

John Roberts	18	Hrs
Eric Lorenson	7.0	Hrs
	0.0	Hrs

		Hrs

Project concerns: None at this time.

DRILLING ACTIVITIES and PROGRESS:

0000-0800 Advanced CD-1 (SGR-850) from 580 to 665 ft depth at a rate of 10.6 ft/hr. AMEC onsite at 0145 (600 ft depth) to observe drill cuttings and identify the Precambrian quartz monzonite-diatreme boundary. The estimated depth to the contact is 616 ft depth based our design geometry, current modeling by CC&V's geologists, and without factoring in borehole deviation.

0730 Diatreme penetrated at 660 ft depth.

The drain construction materials arrived on the evening of 2/19/2014 at AK's staging area

0800-1115 Down due to Bean pump and water line frozen on rig. Met with Joey from Elk Creek Gyro Survey. Their azimuth will be given with respect to True North, and then converted to mine coordinates during processing. Then we will be able to make a comparison with AK's survey.

1115-1200 Advanced CD-1 from 665 to 677 ft depth at a rate of 20.6 ft/hr. Night crew arrived onsite (1150). Crew change.

1200-1450 Advanced CD-1 from 677 to 720 ft depth at a rate of 15.2 ft/hr.

1300-1335 Took the chip tray, with Eric, to Scott McAnally at CC&V's geology office to confirm the penetration of the diatreme at 660 ft depth. After looking at the chips under the microscope, it was observed that the diatreme was penetrated around 640 ft depth. However, there is a 20 ft transition zone before the breccia material becomes the dominant formation. Based on these observations AMEC will terminate CD-1 at 710 ft depth. AK was Kelly-down at 720 ft depth right as AMEC returned to the rig.

1450 TD borehole CD-1 (SGR-850) at 720 ft depth. Elk Creek onsite to survey the hole.

1450-1630 Elk Creek set up and performed the deviation survey of the hole. The results will be emailed to AMEC by the end-of-day on 2/21/2014.

1630-1800 AK to inventory drain materials, source heaters and trip out the drill string. AMEC representatives John Roberts and Eric Lorenson met to discuss monitoring activities into the evening.

1800-1930 AK called to inform us they had the wrong shale baskets ordered/delivered with the rest of the drain materials. We met them at their staging area to look at their inventory, and find a solution.

1930-2015 All workers back at the drill site. John Roberts went over the SOP for the constant head test with the driller and Eric. John left site at 2015.

2015-2235 Tripped out drill string. Prepare to run constant head test.

2235-0010 Began to fill the borehole with an estimated 2,000gal water by gravity feed. At 2300 the 2000gal was depleted. AK switched to the accessory truck, which had an estimated 1,500gal water, and gravity fed the water into the borehole. The 1,500gal never brought the water to the surface. AK took the 4,000gal water truck to be refilled.

The total volume of the borehole is 674.6 gallons, including the 1.3ft of casing stick-up. An estimated 5.2 hole volumes of water never filled the hole

The following information will be repeated on the 2/21/2014 Daily Report.

0100-0055 Wait for the 4,000gal water truck to return from getting a load of water.

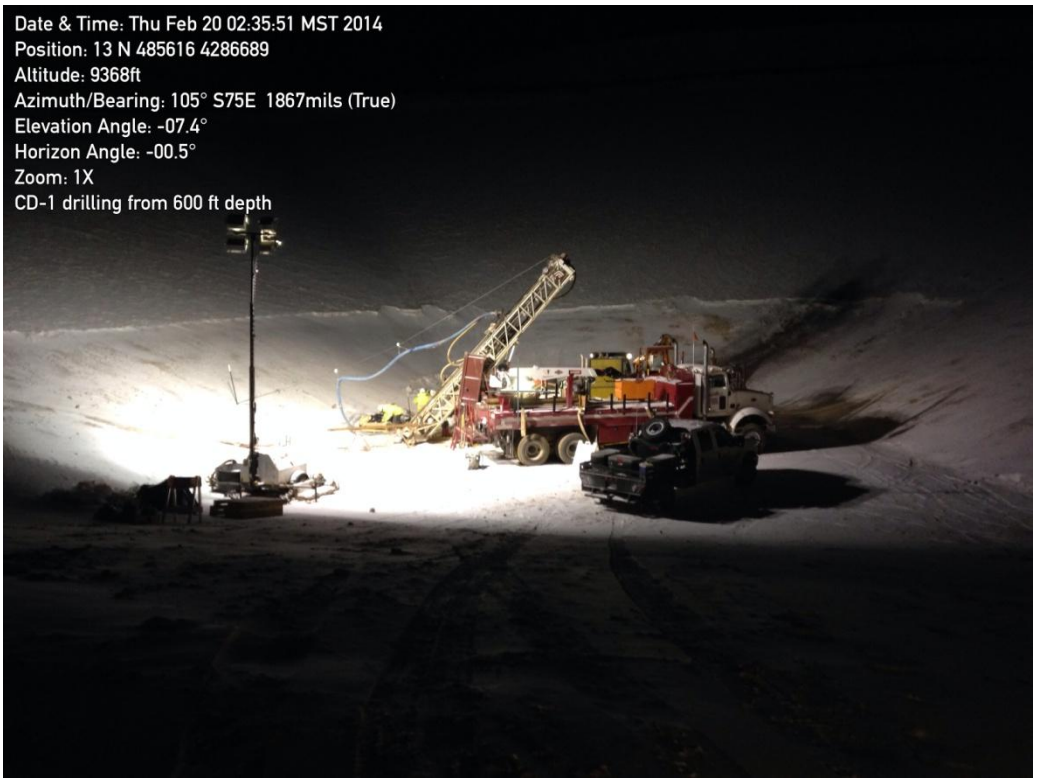
0055-0155 Gravity fed 4,000gal of water into CD-1 (approx. 67gpm) and never brought the water to the surface (5.9 hole volumes). The drain rate was too great to perform a constant head test.

0155-0500 Constructed drain. 2-inch threaded end cap, 30ft of 0.030 slotted screen (3, 10ft sections), 700ft of blank riser pipe, and a shale basket installed at 12ft downhole below grade.

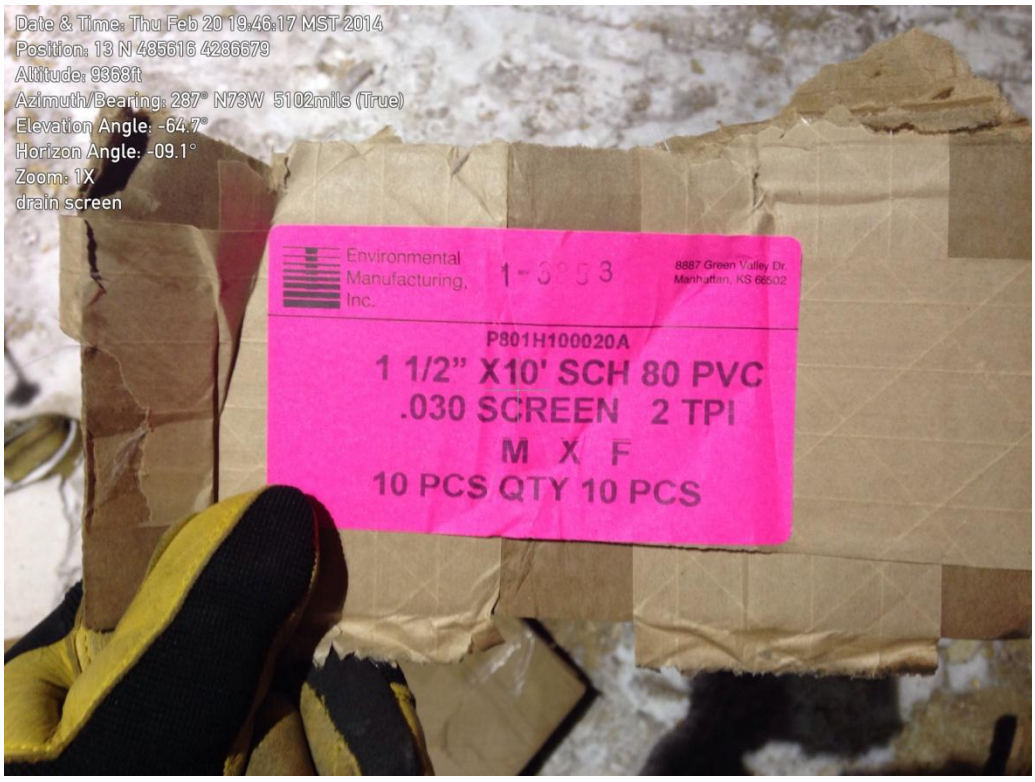
Submitted by:
John Roberts

Reviewed by: X
Timothy Burkhard
Submitted: Date: 02.21.2014

Daily Progress Photos:




Date & Time: Thu Feb 20 15:25:24 MST 2014
Position: 13 N 484919 4288588
Altitude: 10430ft
Azimuth/Bearing: 281° N79W 4996mils (True)
Elevation Angle: -16.0°
Horizon Angle: +00.5°
Zoom: 1X
Elk Creek Gyro performing deviation survey of CD-1. TD = 720ft


Date & Time: Thu Feb 20 19:46:17 MST 2014
Position: 13 N 485616 4286679
Altitude: 9368ft
Azimuth/Bearing: 287° N73W 5102mils (True)
Elevation Angle: -64.7°
Horizon Angle: -09.1°
Zoom: 1X
drain screen
Environmental Manufacturing, Inc.
8887 Green Valley Dr.
Manhattan, KS 66502
P801H100020A
1 1/2" X10' SCH 80 PVC
.030 SCREEN 2 TPI
M X F
10 PCS QTY 10 PCS


PILOT G-2

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: AMES Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 02.21.2014
Day: Friday

Temperature:
Low: 11° F
High: 24° F

Weather Conditions:
Cloud Cover: Partly Cloudy
Precipitation: NA
Wind: WNW 6 to 12 mph

AMEC Personnel On Site

John Roberts	12.5	Hrs
Eric Lorenson	6.0	Hrs
	0.0	Hrs

		Hrs

Project concerns: None at this time.

DRILLING ACTIVITIES and PROGRESS:

CD-1 deviation survey completed by Elk Creek Gyro to 700ft depth measured a final azimuth of 129° (mine north) and an inclination of 60°.

The following information up to 0500 was reported on the 2/20/2014 Daily Report.

0010-0055	Wait for the 4,000gal water truck to return from getting a load of water.
0055-0155	Gravity fed 4,000gal of water into CD-1 (approx. 67gpm) and never brought the water to the surface (5.9 hole volumes). The drain rate was too great to perform a constant head test.
0155-0500	Constructed drain. 2-inch threaded end cap, 30ft of 0.030 slotted screen (3, 10ft sections), 700ft of blank riser pipe, and a shale basket installed at 12ft downhole below grade.
0500-1210	AK cleaned up site, performed rig maintenance and grouted the upper 10ft of the drain/surface casing (grout remained 0.5ft below Soil Liner Fill elevation), put sand in the drain annulus, and welded on the extension.
1210-1300	Ames survey onsite to orient the drill for CD-2 (SGR-835) on 114° (mine north).
1300-1420	Set 6-inch surface casing (20.7 lf) over drill string and prepare to install.
1420-1440	Began to advance surface casing at 47°. Very hard drilling at 3ft depth.
1440-1515	Shutdown for blast.
1515-1650	Advance casing to 19.6 ft depth. Switched tooling over to 4 ¾-inch bit
1650-1830	Started advancing CD-2 from 19.6 to 100 ft depth at a rate of 48.1 ft/hr.
1830-2030	AK performed a deviation survey at 100 ft depth. I was contacted by AK and informed the deviation was approx 1° south in azimuth. The data was not saved. AK is to continue drilling and surveying every one-hundred ft so long as the deviation is south.

2030-2330 Advance CD-2 from 100 to 200 ft depth at a rate of 33.3 ft/hr.

2330-2400 AK performed deviation survey to 200 ft depth. Data was not saved. According to the driller, the deviation was 3° south.

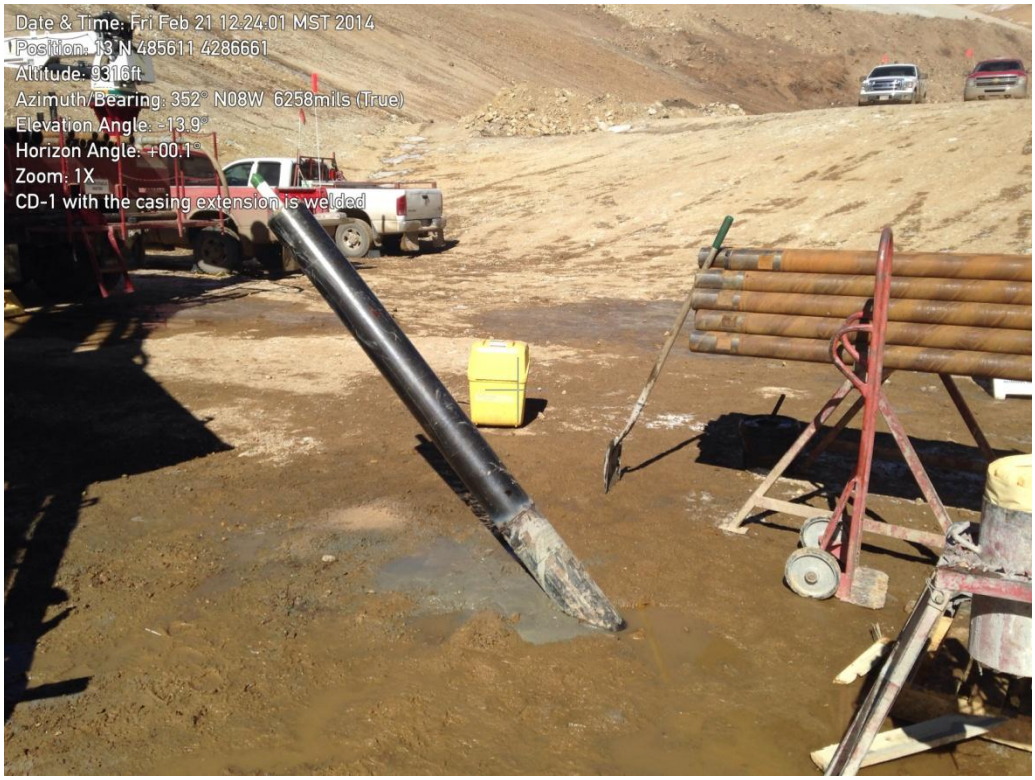
As of this morning:

0750 AK hit 300 ft depth. Setting up for a deviation survey.

Submitted by:
John Roberts

Reviewed by: X
Timothy Burkhard
Submitted: Date: 02.22.2014

Daily Progress Photos:


Date & Time: Fri Feb 21 12:24:01 MST 2014
Position: 13 N 485611 4286661
Altitude: 9316ft
Azimuth/Bearing: 352° N08W 6258mils (True)
Elevation Angle: -13.9°
Horizon Angle: +00.1°
Zoom: 1X
CD-1 with the casing extension is welded


Date & Time: Fri Feb 21 12:24:35 MST 2014
Position: 13 N 485622 4286662
Altitude: 9336ft
Azimuth/Bearing: 284° N76W 5049mils (True)
Elevation Angle: -13.7°
Horizon Angle: -00.7°
Zoom: 1X
orienting CD-2 on the design azimuth 114


Date & Time: Fri Feb 21 13:16:39 MST 2014
Position: 13 N 485624 4286663
Altitude: 9357ft
Azimuth/Bearing: 285° N75W 5067mils (True)
Elevation Angle: -13.6°
Horizon Angle: -01.0°
Zoom: 1X
setting CD-2 6" surface casing on drill string


Date & Time: Fri Feb 21 16:31:56 MST 2014
Position: 13 N 485631 4286670
Altitude: 9365ft
Azimuth/Bearing: 269° S89W 4782mils (True)
Elevation Angle: -70.5°
Horizon Angle: -74.9°
Zoom: 1X
new 4 3/4 hammer for CD-2


Date & Time: Fri Feb 21 16:32:58 MST 2014
Position: 13 N 485612 4286665
Altitude: 9346ft
Azimuth/Bearing: 288° N72W 5120mils (True)
Elevation Angle: -23.1°
Horizon Angle: -01.1°
Zoom: 1X
CD-2 surface casing set 19.6ft bgs

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: AMES Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 02.22.2014
Day: Saturday

Temperature:
Low: 18° F
High: 29° F

Weather Conditions:
Cloud Cover: Clear to Partly Cloudy
Precipitation: NA
Wind: WNW 6 to 12 mph

AMEC Personnel On Site

John Roberts	8.5	Hrs
		Hrs
	0.0	Hrs

		Hrs

Project concerns: None at this time.

DRILLING ACTIVITIES and PROGRESS:

0000-0600	AK finished the deviation survey at 200ft depth. The hammer/bit would not work; had to trip out.
0600-0750	Advance CD-2 from 200 to 300ft depth at a rate of 54.6 ft/hr.
0750-0845	AK performed a deviation survey at 300ft depth. Deviation at 300ft is 9° south (right) azimuth (114° design and 123.1° at 300ft), and 5° inclination (47° design and 52.4° at 300ft).
0845-1145	Advance CD-2 from 300 to 400ft depth at a rate of 33.3 ft/hr.
1145-1245	AK performed a deviation survey to 400ft depth. Survey was discarded due to incorrectly entered data prior to survey.
1245-1615	Drill rig broke down.
1615-1700	AK performed a second deviation survey to 400ft depth. Deviation at 400ft is 12° south (right) azimuth (114° design and 126.0° at 400ft), and 8° inclination (47° design and 55.2° at 400ft).
1700-2030	Advanced CD-2 from 400 to 500 ft depth at a rate of 28.6 ft/hr.
2030-2130	AK performed a deviation survey to 500ft depth. While the measured deviation shows that the direction of the borehole does not compromise CD-1, the survey depths are incorrect and the data was discarded.
2130-0100	Advanced CD-2 from 500 to 600 ft depth at a rate of 28.6 ft/hr. Crew change at 2400.

As of this morning:

0100-0250 Completed the 600ft depth deviation survey. Again, the measured deviation shows that the direction of the bore does not compromise CD-1, the survey depths are incorrect and the data was discarded.

0250-0550 Advanced CD-2 from 600 to 700 ft depth at a rate of 33.3 ft/hr.

0550-0715 AK performed a deviation survey at 700ft depth. Deviation at 700ft is 26° south (right) azimuth (114° design and 140.0° at 700ft), and 19° inclination (47° design and 64.6° at 700ft).

Today's plan is to identify the diatreme, reach TD, have Elk Creek Gyro survey the hole, perform a hydraulic conductivity test in CD-2 with transducers deployed in CD-1 and CD-2, and construct the drain.

Submitted by:
John Roberts

Reviewed by: X
Timothy Burkhard
Submitted: Date: 02.23.2014

Daily Progress Photos:

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: AMES Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 02.23.2014
Day: Sunday

Temperature:
Low: 23° F
High: 39° F

Weather Conditions:
Cloud Cover: Clear to Partly Cloudy
Precipitation: NA
Wind: WNW 8 to 24 mph

AMEC Personnel On Site

John Roberts	20.5	Hrs
Matt Hartz	11	Hrs
	0.0	Hrs

		Hrs

Project concerns: None at this time.

DRILLING ACTIVITIES and PROGRESS:

0100-0250 Completed the 600ft depth deviation survey. Again, the measured deviation shows that the direction of the bore does not compromise CD-1, the survey depths are incorrect and the data was discarded.

0250-0550 Advanced CD-2 from 600 to 700 ft depth at a rate of 33.3 ft/hr.

0550-0715 AK performed a deviation survey at 700ft depth. Deviation at 700ft is 26° south (right) azimuth (114° design and 140.0° at 700ft), and 19° declination (47° design and 64.6° at 700ft).

0715-1130 Advance CD-2 from 700 to 820 ft depth at a rate of 28.2 ft/hr. The diatreme has not yet been encountered.

1030 Matt Hartz (AMEC) onsite with transducers.

1130-1230 AK performed deviation survey to 800ft depth. Deviation at 800ft is 35° south (right) azimuth (114° design and 149° at 800ft), and 21° declination (47° design and 68° at 800ft).

1230-1445 AK made a trip to their staging area to get more drill rods.

1445-1830 Advanced CD-2 from 820 to 877 ft depth at a rate of 15.2 ft/hr. At 875 ft depth the torque on the drill string got high. AK added foam to the water, and considered tripping out until the torque reduced and ream back to bottom.

1600 Matt Hartz off site to rest in preparation for nightshift.

1830 Called TD on the hole at 877 ft depth. AMEC rep. spoke with Scott McAnally, CCV's Mine Geologist, about the formation and deviation at the current depth, and with Austin Creswell, AMEC's Design Engineer. The decision was made to call the hole, have Elk Creek survey the hole, trip out the drill string, deploy the transducers in CD-1 (completed drain) and CD-2 (open hole) and complete a

constant head test. Based on the results of the test, we will decide whether to complete the hole as a drain or abandon it with cement grout.

1830-2015 Matt Hartz back onsite for nightshift.

AK to fix their light plant and get a load of water in preparation for the constant head test while waiting for Elk Creek to arrive and survey CD-2.

2015-2145 Elk Creek performed a deviation survey to 860ft depth. Deviation at 860ft is 35° south (right) azimuth (114° design and 150° at 860ft), and 18° declination (47° design and 67° at 860ft).

2145-2400 Tripped out 300ft of drill string.

As of this morning:

Matt Hartz performed a falling head test in CD-2 using the transducers; the Bean pump onsite would not produce more than approx. 2gpm. The falling head test gave us flows ranging from 16 to 7 gpm. The test is still going on in CD-2. A second transducer was deployed in CD-1, but the data has not been studied at this time.

AK is performing rig maintenance.

AMEC is going to meet with Scott McAnally, CCV's Geologist, to plot the two holes in Vulcan and consider the possibility of continuing the drilling and penetrating the diatreme in CD-2.

Submitted by:
John Roberts

Reviewed by: 
Timothy Burkhard
Submitted: Date: 02.24.2014

Daily Progress Photos:

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: AMES Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 02.24.2014
Day: Monday

Temperature:
Low: 23° F
High: 44° F

Weather Conditions:
Cloud Cover: Clear
Precipitation: NA
Wind: NW 5 to 11 mph

AMEC Personnel On Site

John Roberts	12.5	Hrs
Matt Hartz	13	Hrs
	0.0	Hrs

		Hrs

Project concerns: None at this time.

DRILLING ACTIVITIES and PROGRESS:

0000-0230	Trip out drill string. The hammer/bit is completely worn out; it was brand new for this hole.
0230-0500	Attempted to perform a constant head test. There was trouble getting flows >2gmp through the flow meter. It was thought the pump was not working properly, but this appears not to be the case. Ran out of water in one truck.
0500-0700	Performed a falling head test in CD-2 with a transducer deployed to approximately 870ft depth. Initial observed rates of dissipation ranged from 7 to 16gpm. Transducer was left in the hole to continue the test. Further data analysis to follow.
0700-0910	Matt and John cross-shift at the AMEC trailer. This included a progress report by phone to Austin, AMEC's Design Engineer. AK began rig maintenance.
0910-1015	John took the chips and Elk Creek's deviation survey data to Scott McAnally, CCV's Mine Geologist, to confirm the hole did not penetrate the diatreme by looking at the chips under the microscope, and to plot CD-1 and CD-2 in Vulcan to determine the likelihood of penetrating the diatreme through continuing drilling.
1015-1345	Conversations took place between AMEC, CC&V, and AK regarding how to proceed with hole CD-2, due to the deviation and having not penetrated the diatreme. The course of action decided was to install the drain pipe in CD-2, but not cement it in place, set up the rig over CD-3, and subsequently test the diatreme in CD-3 to prove/disprove that it is hydraulically connected to CD-2 before the decision is made to complete/abandon CD-2.
1345-1415	Down for blasting in the VLF.
1415-1510	Removed transducer from CD-2 and staged drain supplies adjacent to the collar.
1510-1630	Installed drain with a 2"-threaded cap, 30lf of 0.030 slotted screen, and 850lf of sch. 80 PVC riser pipe to the bottom depth of 879ft.

1630-1900 Moved equipment around and set the rig over CD-3. Rig was set to the design azimuth of 116°. The declination of the hole is being adjusted by AK from 47° to 45° in an attempt to have the final declination closer to the design.

1900-1930 AMEC shift change

1900-2030 Advanced 6-inch casing. Downloaded data from transducers and removed transducer from drain CD-1.

2030-2210 Advanced CD-3 (SGR-836) to 100ft depth.

2210-2300 AK performed a deviation survey to 100ft depth. Deviation at 100ft is 2° south (right) azimuth (116° design and 118° at 100ft), and +2° declination (47° design and 45° at 100ft).

2300-2400 Advanced CD-3 to 140ft depth.

As of this morning:

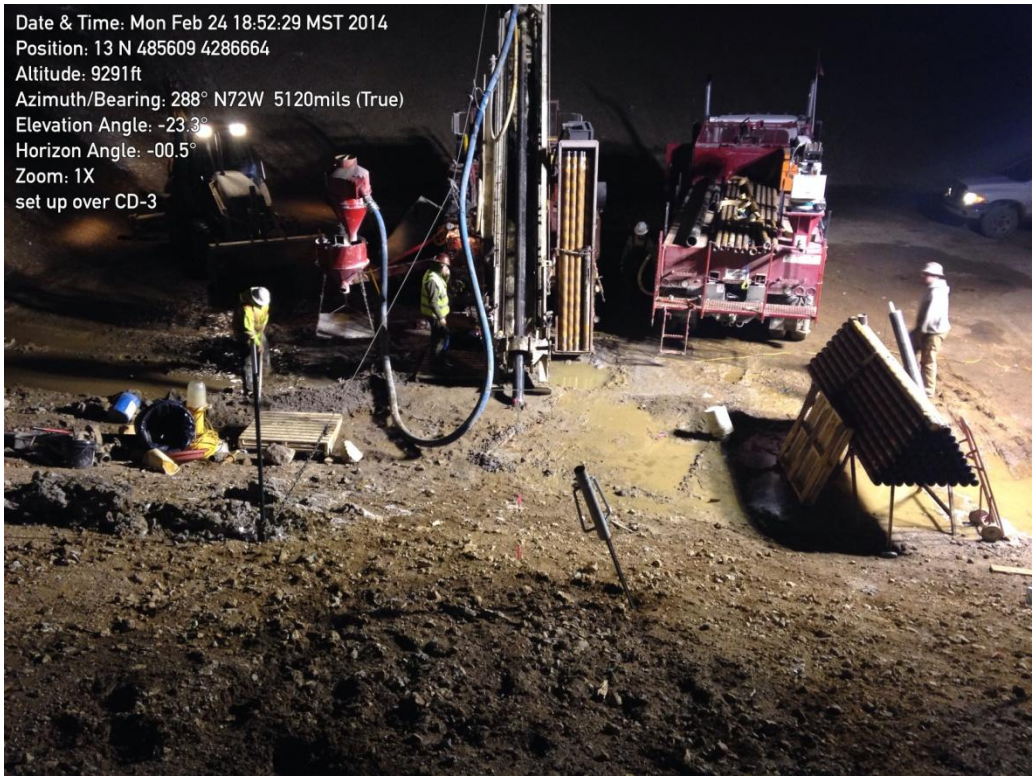
At 0620 CD-3 was at 320 ft depth, and is continuing to advance the borehole.

The 300ft depth deviation survey showed a change in azimuth of 5.3°, and in declination of 3.3°.

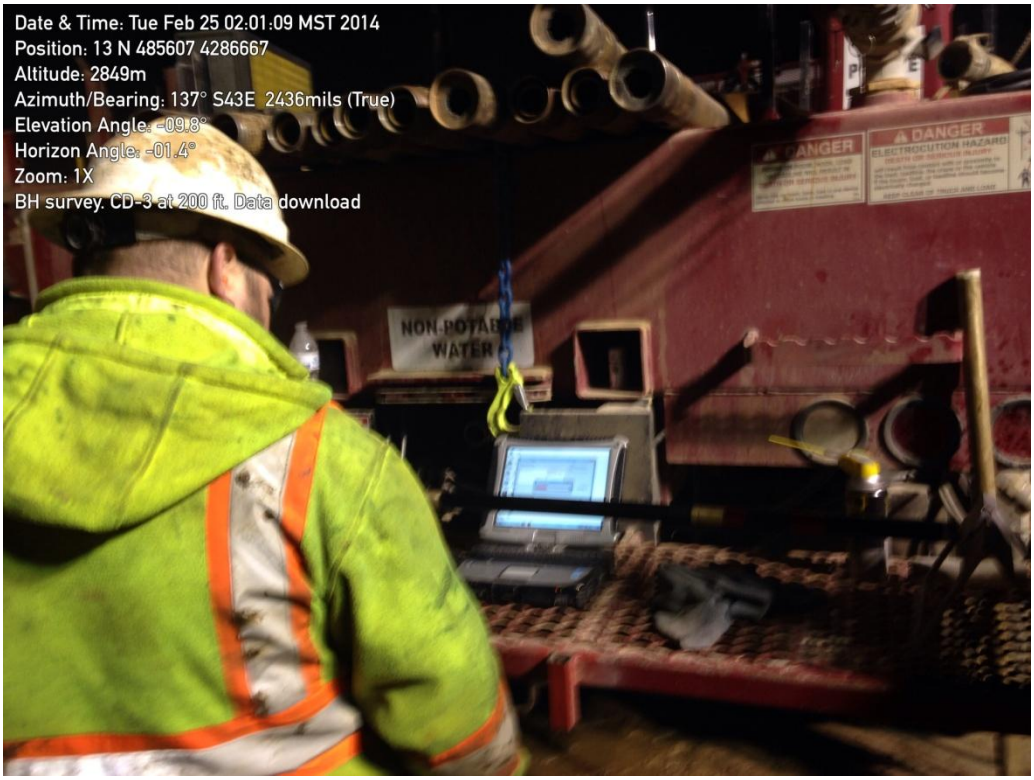
Submitted by:
John Roberts

Reviewed by: X
Timothy Burkhard
Submitted: Date: 02.25.2014

Daily Progress Photos:


Date & Time: Mon Feb 24 18:52:29 MST 2014
Position: 13 N 485609 4286664
Altitude: 9291ft
Azimuth/Bearing: 288° N72W 5120mils (True)
Elevation Angle: -23.3°
Horizon Angle: -00.5°
Zoom: 1X
set up over CD-3


Date & Time: Mon Feb 24 19:01:45 MST 2014
Position: 13 N 485600 4286665
Altitude: 9498ft
Azimuth/Bearing: 271° N89W 4818mils (True)
Elevation Angle: -06.8°
Horizon Angle: -00.5°
Zoom: 1X
advancing casing at 45deg


Date & Time: Tue Feb 25 02:01:09 MST 2014
Position: 13 N 485607 4286667
Altitude: 2849m
Azimuth/Bearing: 137° S43E 2436mils (True)
Elevation Angle: -09.8°
Horizon Angle: -01.4°
Zoom: 1X
BH survey. CD-3 at 200 ft. Data download
DANGER
DANGER
ELECTROCUTION HAZARD
WATER

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 02.25.2014
Day: Tuesday

Temperature:
Low: 21° F
High: 43° F

Weather Conditions:
Cloud Cover: Clear
Precipitation: NA
Wind: W 6 to 15 mph

AMEC Personnel On Site

John Roberts	12.5	Hrs
Matt Hartz	12.5	Hrs
	0.0	Hrs

		Hrs

Project concerns: None at this time.

DRILLING ACTIVITIES and PROGRESS:

0000-0130 Advanced CD-3 to 200 ft depth.

0130-0220 AK performed a deviation survey at 200 ft depth. Deviation at 200ft is 2° south (right) azimuth (116° design and 118° at 200ft), and +1° declination (47° design and 46° at 200ft).

0220-0500 Advanced CD-3 to 300 ft depth at a rate of 37.6 ft/hr.

0500-0600 AK performed a deviation survey at 300 ft depth. Deviation at 300ft is 5° south (right) azimuth (116° design and 121° at 300ft), and 1° declination (47° design and 48° at 300ft).

0600-0810 Advanced CD-3 from 300 to 400 ft depth at a rate of 46.1 ft/hr.

0700 Matt and John cross-shift at the AMEC trailer.

0810-0910 AK performed a deviation survey at 400 ft depth. Deviation at 400ft is 7° south (right) azimuth (116° design and 123° at 400ft), and 2° declination (47° design and 49° at 400ft).

0910-1300 Advanced CD-3 to 500 ft depth at a rate of 26.1 ft/hr.

1300-1430 AK performed a deviation survey at 500 ft depth. Deviation at 500ft is 8° south (right) azimuth (116° design and 124° at 500ft), and 3° declination (47° design and 50° at 500ft).

AMEC went to Scott McAnally's office to go over the Vulcan model and look at chips again from CD-2. There appears to be a couple of diatreme fragments in the last 15ft of CD-2. However, looking at the model with the CD-1 and collar as-built data entered, it appears that there may need up to another 100 or 150ft of drilling before full penetration of the diatreme.

1430-1800 AK advanced CD-3 from 500 to 600ft depth at a rate of 28.6 ft/hr.

1800-1855 AK performed a deviation survey at 600 ft depth. Deviation at 600ft is 14° south (right) azimuth (116° design and 130° at 600ft), and 7° declination (47° design and 54° at 600ft).

1830 Matt Hartz onsite.

1930 John Roberts off site.

1855-2145 Advanced CD-3 from 600 to 700 ft depth at a rate of 35.3 ft/hr.

2145-2215 AK performed a deviation survey at 700 ft depth. Deviation at 700ft is 22° south (right) azimuth (116° design and 138° at 700ft), and 9° declination (47° design and 56° at 700ft).

2215-2400 Advanced CD-3 to 740 ft depth.

As of this morning:

John Roberts onsite at 0600 to look at chips. The diatreme appeared to be penetrated at 825ft depth. J. Roberts took the chips for confirmation with Scott McAnally at 0700. Under a microscope traces of diatreme material were observed from 790ft depth, but full penetration was at 825ft depth. The hole was called TD at 885ft depth. Elk Creek Gyro was onsite to run their deviation survey at 0830.

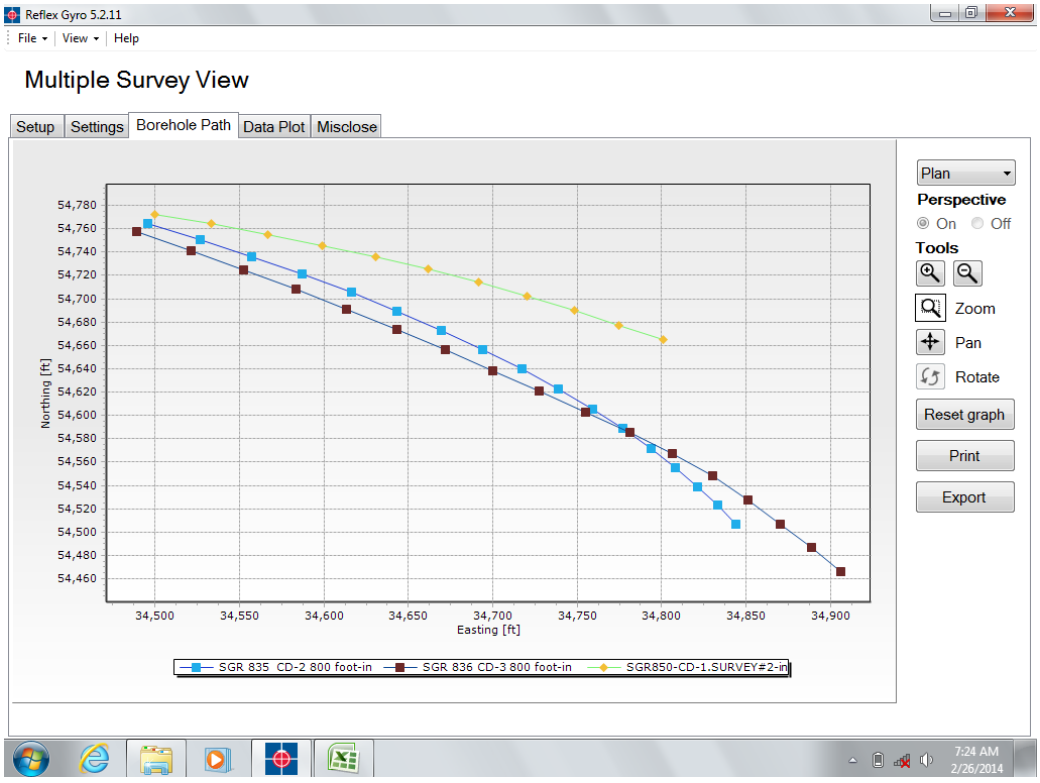
The day's plan, following Elk Creek's survey, is to trip out the drill string, install the PVC, deploy the transducers into CD-3 and CD-2, run a constant head *and* falling head test in CD-3, retrieve the CD-3 transducer, complete the CD-3 drain with cement, and set up over CD-4.

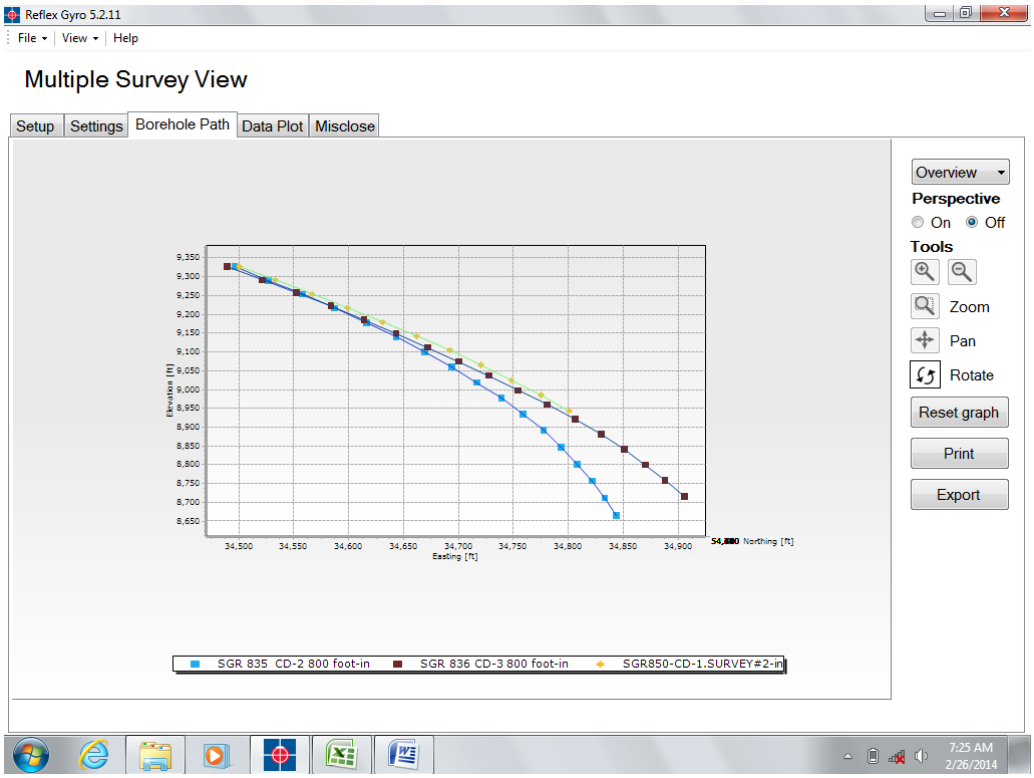
Please see the attached photos. There are screen shots of AK's computer with the Reflex software showing the borehole path of CD-1, CD-2 and CD-3. The northings, eastings, and elevations were supplied by Ames as As-Builts on 2/25/2014. This is presented here as information only. The Elk Creek Gyro survey data is what is being used by the CCV geologists for the Vulcan model.

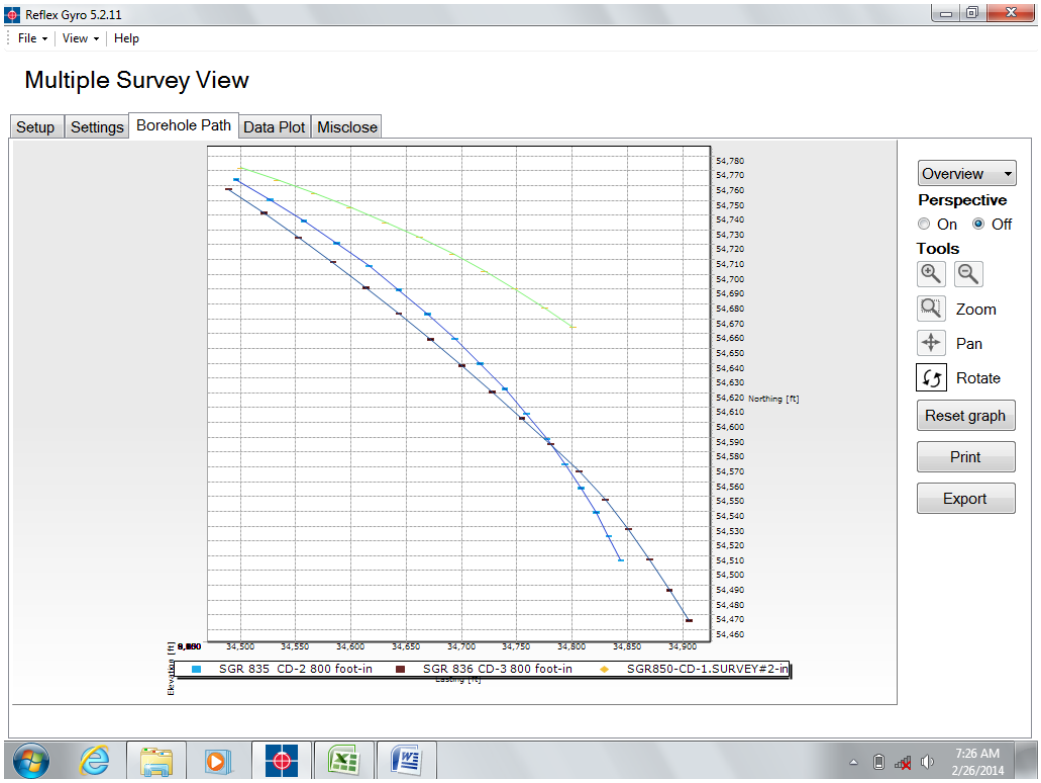
Submitted by:
John Roberts

Reviewed by: X _____
Timothy Burkhard
Submitted: Date: 02.26.2014

Daily Progress Photos:




Reflex Gyro 5.2.11
File
View
Help
Multiple Survey View
Setup
Settings
Borehole Path
Data Plot
Misclose
Overview
Perspective
On
Off
Tools
Zoom
Pan
Rotate
Reset graph
Print
Export
Elevation [ft]
Easting [ft]
Northing [ft]
SGR 835 CD-2 800 foot-in
SGR 836 CD-3 800 foot-in
SGR850-CD-1.SURVEY#2-in
7:25 AM
2/26/2014


Reflex Gyro 5.2.11
File
View
Help
Multiple Survey View
Setup
Settings
Borehole Path
Data Plot
Misclose
Overview
Perspective
On
Off
Tools
Zoom
Pan
Rotate
Reset graph
Print
Export
Northing [ft]
SGR 835 CD-2 800 foot-in
SGR 836 CD-3 800 foot-in
SGR850-CD-1.SURVEY#2-in
7:26 AM
2/26/2014

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 02.26.2014
Day: Wednesday

Temperature:
Low: 10° F
High: 37° F

Weather Conditions:
Cloud Cover: Clear
Precipitation: NA
Wind: W 6 to 15 mph

AMEC Personnel On Site

John Roberts	14	Hrs
Matt Hartz	14	Hrs
	0.0	Hrs

		Hrs

Project concerns: None at this time.

DRILLING ACTIVITIES and PROGRESS:

0000-0200 Advanced CD-3 to 800 ft depth at a rate of 26.7 ft/hr.

0200-0240 AK performed a deviation survey at 800 ft depth. Deviation at 800ft is 24° south (right) azimuth (116° design and 140° at 800ft), and 11° declination (47° design and 58° at 800ft).

0240-0720 CD-3 was called TD at 885ft depth.

0600 John Roberts onsite to look at the chips. The diatreme appeared to be penetrated at 825ft depth. J. Roberts took the chips for confirmation with Scott McAnally at 0700. Under a microscope traces of diatreme material were observed from 790ft depth, but full penetration was at 825ft depth. The hole was called TD at 885ft depth. Elk Creek Gyro was onsite to run their deviation survey at 0830.

0720-0830 Set up transducers for the permeability testing in CD-3 and connectivity observations in CD-2. AK performed maintenance on their water truck while waiting for Elk Creek to arrive and survey the hole.

0830-1100 Elk Creek Performed a deviation survey to 880 ft depth. Deviation at 800ft is 25° south (right) azimuth (116° design and 141° at 880ft), and 11° declination (47° design and 58° at 880ft).

1100-1345 AK tripped RC rods from the hole.

1345-1415 AK shut down for Ames blasting in the VLF.

1415-1500 The drain PVC was installed with a 2-inch end cap, 30lf of 0.030 slotted screen, and 350lf of schedule 80 riser pipe before becoming hung up on a fracture in the quartz monzonite.

1500-1600 Trip out PVC.

1600-1930 AK went back into the hole with the drill string to perform a wiper trip of the hole.

1930-2040 AK let the rods sit for an hour before airing up to clean out any sloughed material at the bottom.

2040-2245 Flushed hole and tripped rods out.

2245-2345 The drain PVC was installed with a 2-inch end cap, 30lf of 0.030 slotted screen, and 860lf of schedule 80 riser pipe to 885.5ft depth.

2345-2400 Crew change.

As of this morning:

A falling head test was performed in CD-3 with transducers deployed in CD-3 and CD-2. A constant head test was not completed due to the inability to bring the water to the surface in the hole. Water was placed in the hole at a rate of 93.8gpm. The data was downloaded from the transducers and sent to the Design Engineer for analysis.

AK is completing CD-3 with cement and setting up over CD-4 to start drilling.

Submitted by:
John Roberts

Reviewed by: 
Timothy Burkhard
Submitted: Date: 02.26.2014

Daily Progress Photos:

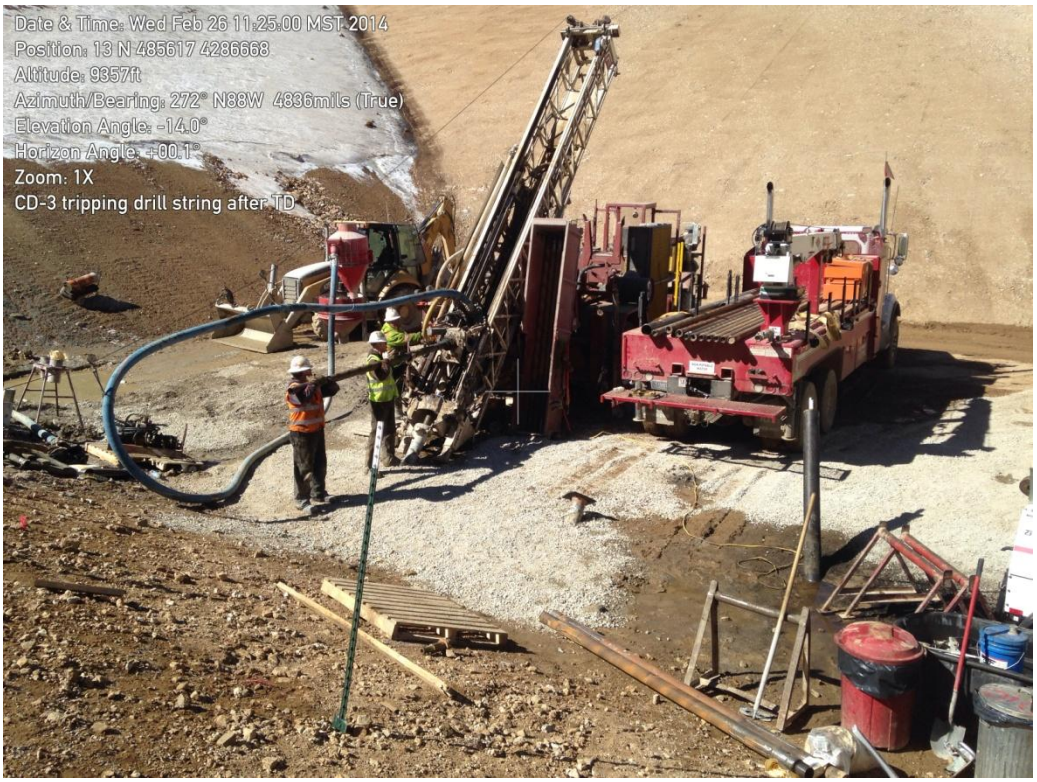
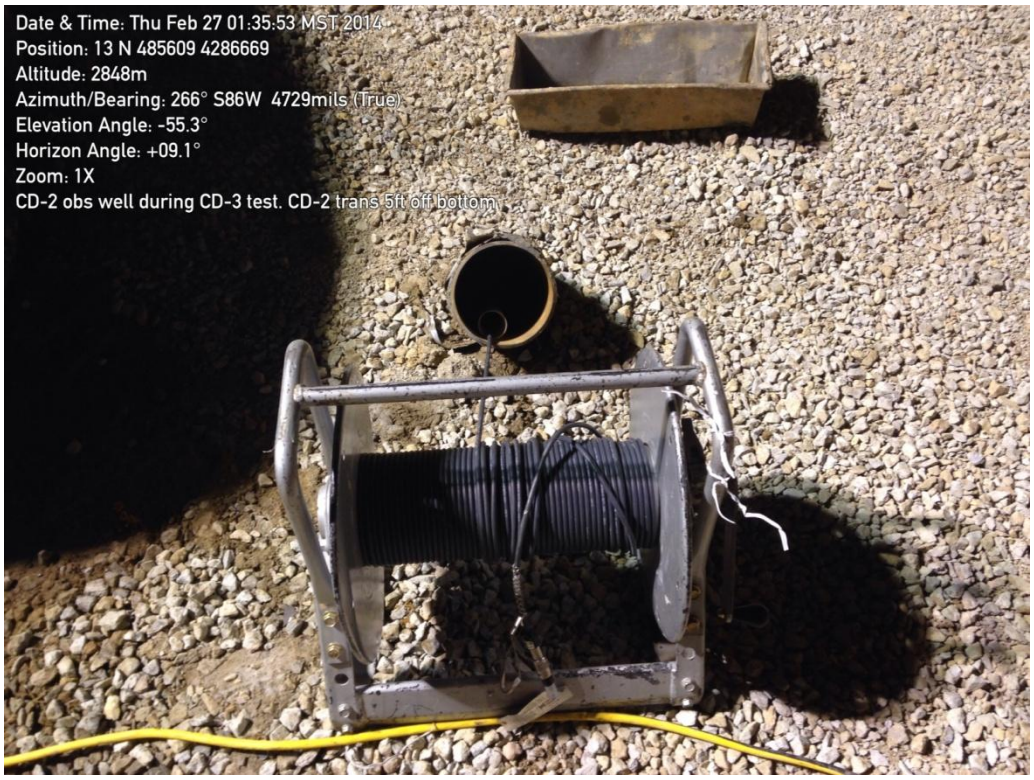


Photo 2. This is the first attempt to install the drain


Date & Time: Thu Feb 27 01:35:53 MST 2014
Position: 13 N 485609 4286669
Altitude: 2848m
Azimuth/Bearing: 266° S86W 4729mils (True)
Elevation Angle: -55.3°
Horizon Angle: +09.1°
Zoom: 1X
CD-2 obs well during CD-3 test. CD-2 trans 5ft off bottom

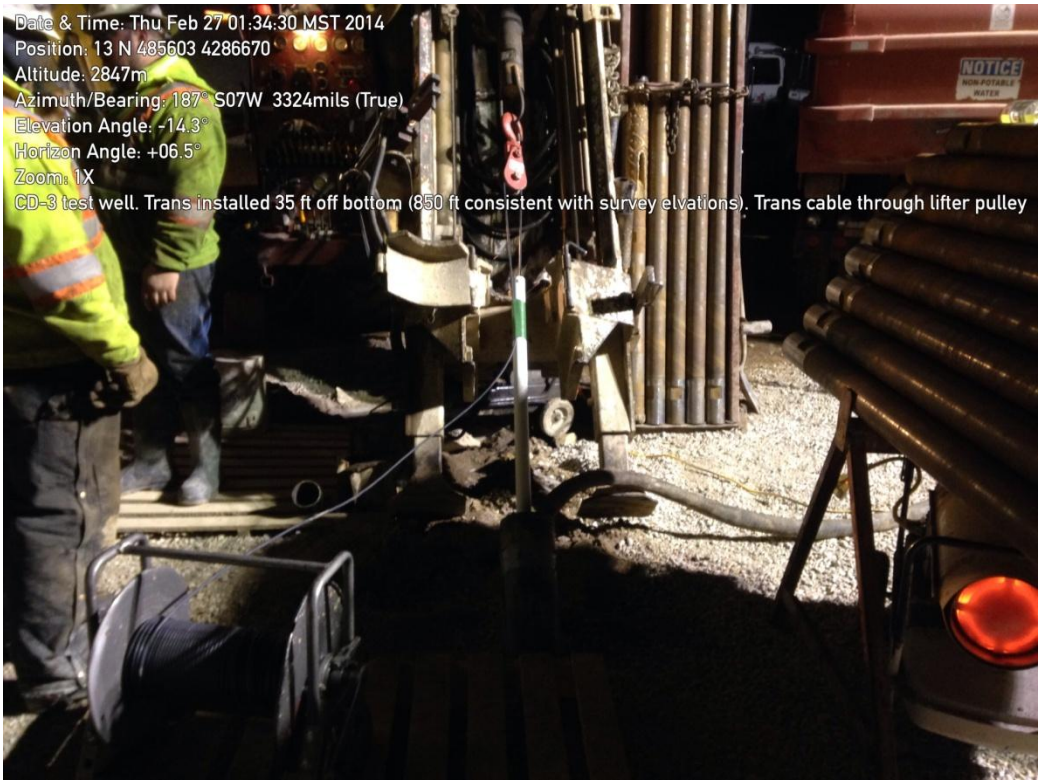

Date & Time: Thu Feb 27 01:34:30 MST 2014
Position: 13 N 485603 4286670
Altitude: 2847m
Azimuth/Bearing: 187° S07W 3324mils (True)
Elevation Angle: -14.3°
Horizon Angle: +06.5°
Zoom: 1X
CD-3 test well. Trans installed 35 ft off bottom (850 ft consistent with survey elvations). Trans cable through lifter pulley
NOTICE
NON-POTABLE WATER

Photo 5. Drain is installed to 885.5 ft depth

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 02.27.2014
Day: Thursday

Temperature:
Low: 19° F
High: 37° F

Weather Conditions:
Cloud Cover: Clear to Snow
Precipitation: NA
Wind: SSE 0 to 5 mph

AMEC Personnel On Site

John Roberts	13	Hrs
Matt Hartz	12	Hrs
	0.0	Hrs

		Hrs

Project Concerns: AK will no longer be performing deviation surveys on any of the boreholes. Their supervisor is taking the Reflex gyro to another project. AK is firm that it's the CCV's responsibility to survey the holes, and their deviation surveys were a "favor" until the other project started.

CD-4's began with a declination 2° steeper than design.

The 100ft depth was measured with a declination of 3° steeper than the design.

The 400ft depth survey measured the azimuth at 127° south and the dip at 54° (9° out of design - 6° out of tolerance).

DRILLING ACTIVITIES and PROGRESS:

0000-0200	Different flow meter was tested for proper working order.
0200-0110	Measured flow rate of water from the 4,000gal truck by filling a 150gal tank in 1:36.34 (minutes:seconds). 93.8gpm.
0110-0141	AMEC deployed and started transducers in CD-2 (874ft depth) and CD-3 (850ft depth).
0141-0202	Gravity fed 1,970 gallons of water into CD-3. Water did not come to the surface; could not perform a constant head test.
0202-0557	Ran falling head test.
0557-1015	Removed transducers, cemented CD-3, and set rig over CD-4.
1015-1035	Advanced CD-4 casing to 19.1 ft depth at 123° azimuth and 46° declination. The driller said that installing the casing 1-2° steeper than the design was necessary to allow for the casing to "settle back" during advancement.
1035-1415	AK to wait for a new heavy steel lead rod to arrive onsite, clean up site, and prepare for the night crew to take over and start drilling after the 1200 blast.

1415-1530 Advanced CD-4 from 19.1 to 100ft depth at a rate of 64.2 ft/hr. AMEC informed the night crew about the mast being set at 46° for casing advancement, and that correction to the design dip should be made.

1530-1615 AK performed a deviation survey to 100 ft depth. Deviation at 100ft is 1° south (right) azimuth (123° design and 124° at 100ft), and 3° declination (45° design and 48° at 100ft).

1615- 1745 Advanced CD-4 from 100 to 200 ft depth at a rate of 33.3 ft/hr.

1745-1915 AK performed a deviation survey to 200 ft depth. Deviation at 200ft is 3° south (right) azimuth (123° design and 126° at 200ft), and 5° declination (45° design and 50° at 200ft). The survey was successful on the fourth attempt.

1915-2115 Advanced to 240 ft depth before the alternator went out on the rig.

2115-2215 Replaced alternator.

2215-2315 The replacement alternator went out.

2315-0000 Wait for crew change to bring another alternator to the site.

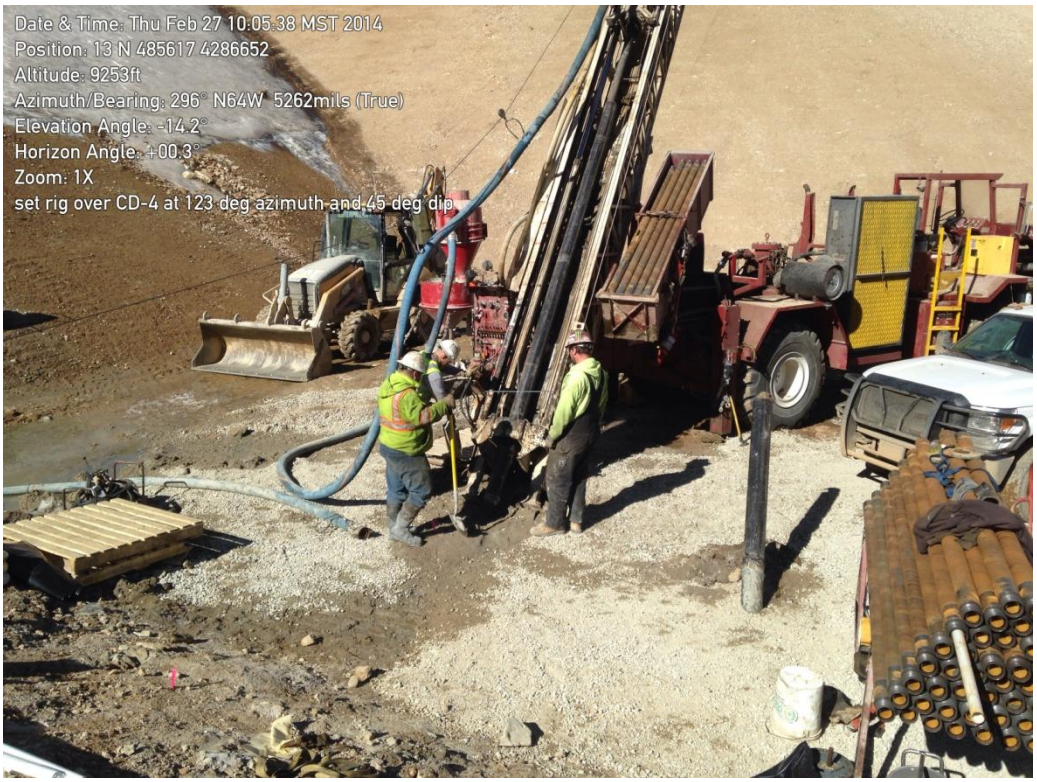
As of this morning:

AK resumed drilling activities at 0100 from 240ft depth. At 0630 the drill depth was 420ft depth. AK's 400ft depth deviation survey (0500) measured the azimuth at 127° south and the dip at 54° (9° out of design - 6° out of tolerance).

Submitted by:
John Roberts

Reviewed by: X 
Timothy Burkhard
Submitted: Date: 02.28.2014

Daily Progress Photos:




Date & Time: Thu Feb 27 14:03:30 MST 2014
Position: 13 N 485600 4286661
Altitude: 9369ft
Azimuth/Bearing: 014° N14E 0249mils (True)
Elevation Angle: -10.9°
Horizon Angle: -44.5°
Zoom: 1X
new lead rod used from 20ft depth in CD-4


Date & Time: Thu Feb 27 14:05:17 MST 2014
Position: 13 N 485601 4286648
Altitude: 9385ft
Azimuth/Bearing: 004° N04E 0071mils (True)
Elevation Angle: -34.8°
Horizon Angle: -00.3°
Zoom: 2X
CD-4 new bit


Date & Time: Thu Feb 27 14:17:23 MST 2014
Position: 13 N 485608 4286670
Altitude: 9355ft
Azimuth/Bearing: 265° S85W 4711mils (True)
Elevation Angle: -09.4°
Horizon Angle: -00.6°
Zoom: 1X
CD-4 drilling from 20ft depth

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 02.28.2014
Day: Friday

Temperature:
Low: 19° F
High: 37° F

Weather Conditions:
Cloud Cover: Clear to Snow
Precipitation: NA
Wind: SSE 0 to 5 mph

AMEC Personnel On Site

John Roberts	12.5	Hrs
Matt Hartz	12	Hrs
	0.0	Hrs

		Hrs

Project Concerns: 300gal of lost grout to the formation at 190ft depth. There is concern about grout sealing flow paths for drainage and migrating into the CD-3 drain annulus.

DRILLING ACTIVITIES and PROGRESS:

0000-0100 Day crew arrived and installed the new alternator.

0100-0145 AK performed a deviation survey to 300 ft depth. Deviation at 300ft is 5° south (right) azimuth (123° design and 128° at 300ft), and 7° declination (45° design and 52° at 300ft).

0145-0500 Advanced CD-4 from 300 to 400ft depth at a rate of 30.8 ft/hr.

0100-0145 AK performed a deviation survey to 400 ft depth. Deviation at 400ft is 5° south (right) azimuth (123° design and 128° at 400ft), and 9° declination (45° design and 54° at 400ft).

0500-0815 Advanced CD-4 to 490ft depth. AK Reflex Gyro tool was taken off site to another project at 0815.

Elk Creek will complete the 100ft interval deviation surveys. The 500ft depth survey was not completed.

1030-1200 AK decided to abandon CD-4 due to the deviation. There was discussion with AMEC, Ames and CCV about salvage, abandon, and new location for the CD-4a collar. Ames told AK it was their decision, and relayed the recommendations that AMEC had regarding the location of the replacement CD-4a collar.

AK's abandonment plan was to plug the hole from TD (520ft) to 100ft depth with Abandonite (20% solid bentonite grout), and cement to plug the hole from 100ft to the surface.

1200-1650 AK sourced Benseal (granular bentonite approx #4 sieve), and Quikcrete cement. There was one bag of bentonite gel available to add to the cement (2-8% by dry weight) to prevent shrinkage.

AMEC expressed concern regarding procedure using Benseal, pumping it down the hole before hydration, and getting the sufficient volume down to completely plug the hole. The

total hole volume is 65.5ft^3 (489.6gal). The bentonite section (100-520ft) volume is 51.7ft^3 (386.6gal), and the cement plug section (0-100ft) volume is 13.8ft^3 (103.0gal).

The Reflex Gyro was brought back to site, and will be here for another week. Elk Creek will complete the surveys from thereafter.

1650-1730 Rick, Ames survey, was onsite to layout an offset line for the CD-4a location. Ames is not inclined cut into the east slope to allow for the CD-4a collar to be moved in the east direction, allowing for the new bore to stay above the abandoned CD-4 hole. The CD-4a collar will be offset 2.5ft south and approximately 3ft east towards the toe of the slope.

1730-1830 Elk Creek onsite to perform final deviation survey. The survey was completed to 450ft depth.

1830-1900 AK prepared to mix Benseal and plug the hole.

1900 AMEC cross shift at job trailer.

1900-1930 AK pumped 1st batch of Benseal down CD-4 from 400ft depth. 150gal of water, 4 bags (50lbs) of Benseal and 1 gallon of polymer (to help slow bentonite hydration).

1930-2120 Attempted to mix a 2nd batch of 300gal water and 12 bags of Benseal into a slurry and pump from 300ft depth. The batch hydrated in the mixing tub and was unusable. Estimated 3.5 bags were pumped before the batch was discarded.

2120-2225 Mixed a 3rd batch of 50gal water and 3 bags of Benseal into a slurry and pump from 300ft depth.

2225-2400 AK made a trip to the yard to get more abandonment materials, and planned to hold off mixing the next batch for the day crew.

As of this morning:

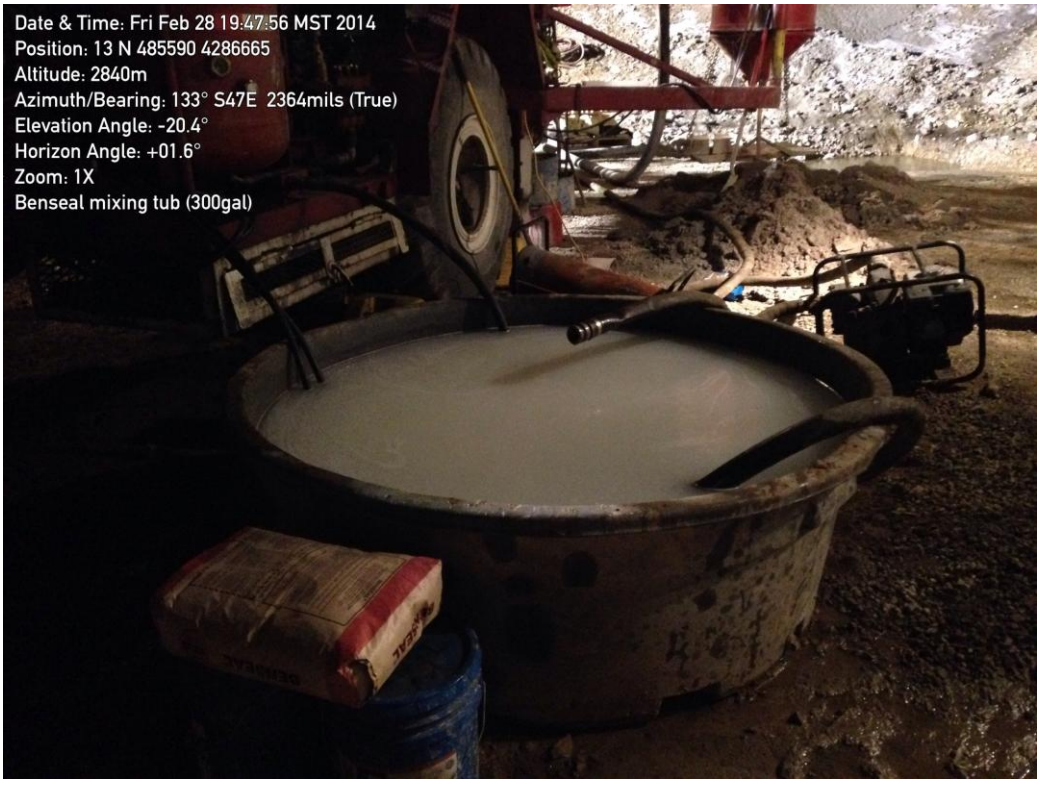
AK used the PVC for a tremmie pipe and tagged the Benseal at 185ft depth; Benseal was observed on the tip of the tremmie pipe when it was tripped out. This is the location of a large fracture zone (185-195ft depth) based on chips. A 300gal batch of 2% bentonite-cement grout was pumped at 175ft depth. All of the grout was lost to the formation through the fracture; this was observation was made by tripping out the tremmie pipe and observing no grout on the outside of the pipe.

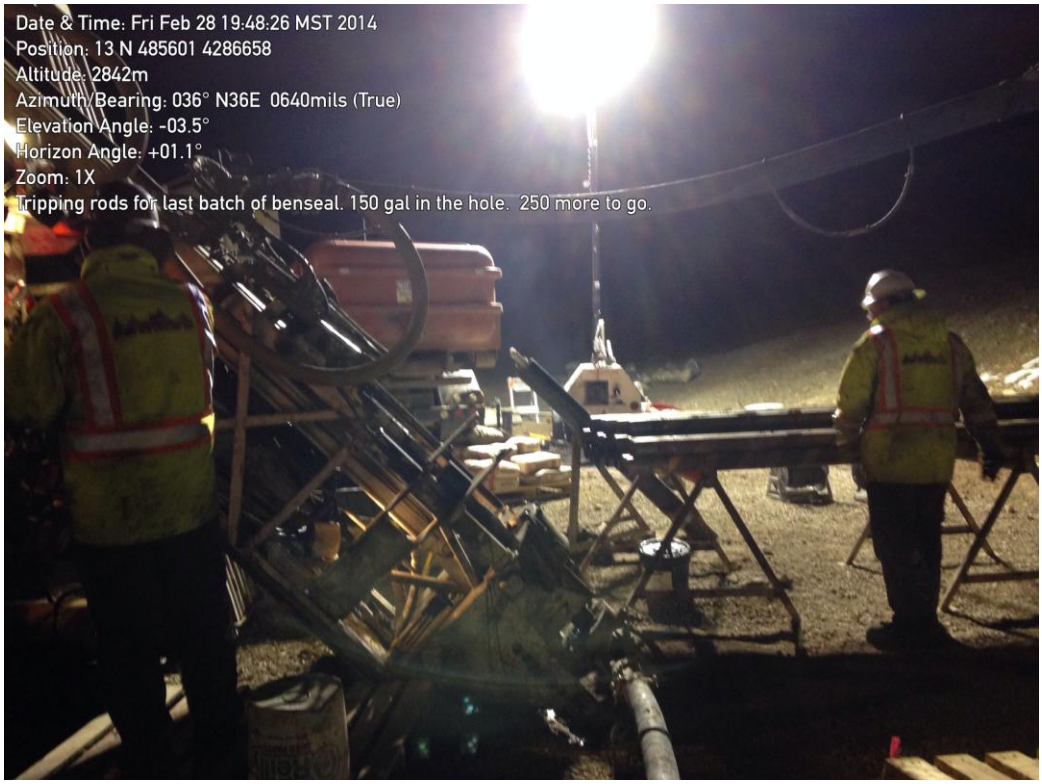
AK is going to attempt to deploy PVC to 185ft depth with a shale basket at some depth above the fracture zone and grout to the surface. AMEC rep. John Roberts spoke with Austin Creswell, the Design Engineer, about this practice, and determined that it would be ok to grout the hole with a void, but it was up to AK to determine if it was legal per the State of Colorado. This information was relayed to AK at 0913 by phone.

Submitted by:
John Roberts

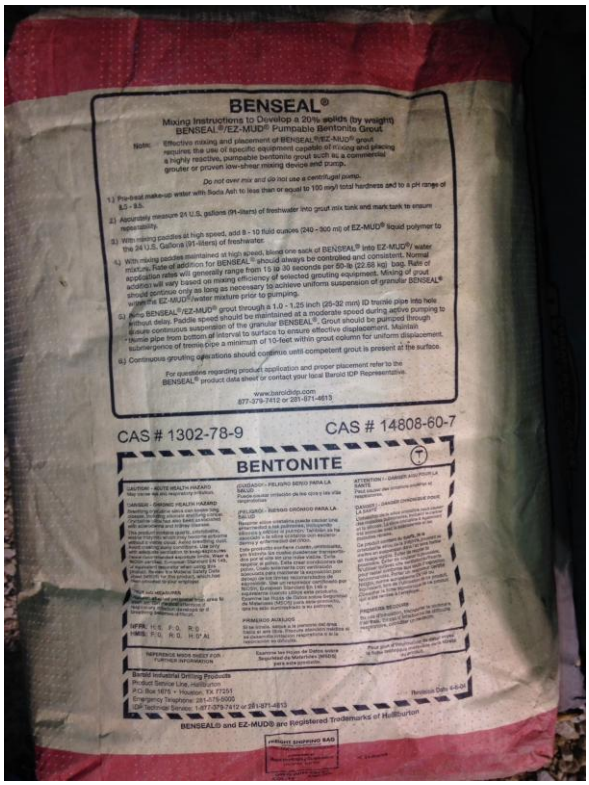
Reviewed by: X
Timothy Burkhard
Submitted: Date: 03.01.2014

Daily Progress Photos:




Date & Time: Fri Feb 28 19:48:26 MST 2014
Position: 13 N 485601 4286658
Altitude: 2842m
Azimuth/Bearing: 036° N36E 0640mils (True)
Elevation Angle: -03.5°
Horizon Angle: +01.1°
Zoom: 1X
Tripping rods for last batch of benseal. 150 gal in the hole. 250 more to go.


Date & Time: Fri Feb 28 20:27:03 MST 2014
Position: 13 N 485593 4286669
Altitude: 2868m
Azimuth/Bearing: 230° S50W 4089mils (True)
Elevation Angle: -33.4°
Horizon Angle: +03.9°
Zoom: 1X
Way to much benseal.


BENSEAL®
Mixing Instructions to Develop a 20% solids (by weight)
BENSEAL®/EZ-MUD® Pumpable Bentonite Grout
Note: Effective mixing and placement of BENSEAL®/EZ-MUD® grout requires the use of specific equipment capable of mixing and placing a highly reactive, pumpable bentonite grout such as a commercial grouter or proven low-shear mixing device and pump.
Do not over mix and do not use a centrifugal pump.
1.) Pre-treat make-up water with Soda Ash to less than or equal to 100 mg/l total hardness and to a pH range of 8.5 - 9.5.
2.) Accurately measure 24 U.S. gallons (91-liters) of freshwater into grout mix tank and mark tank to ensure repeatability.
3.) With mixing paddles at high speed, add 8 - 10 fluid ounces (240 - 300 ml) of EZ-MUD® liquid polymer to the 24 U.S. Gallons (91-liters) of freshwater.
4.) With mixing paddles maintained at high speed, blend one sack of BENSEAL® into EZ-MUD®/ water mixture. Rate of addition for BENSEAL® should always be controlled and consistent. Normal application rates will generally range from 15 to 30 seconds per 50-lb (22.68 kg) bag. Rate of addition will vary based on mixing efficiency of selected grouting equipment. Mixing of grout should continue only as long as necessary to achieve uniform suspension of granular BENSEAL® with the EZ-MUD®/water mixture prior to pumping.
5.) Pump BENSEAL®/EZ-MUD® grout through a 1.0 - 1.25 inch (25-32 mm) ID tremie pipe into hole without delay. Paddle speed should be maintained at a moderate speed during active pumping to ensure continuous suspension of the granular BENSEAL®. Grout should be pumped through tremie pipe from bottom of interval to surface to ensure effective displacement. Maintain submergence of tremie-pipe a minimum of 10-feet within grout column for uniform displacement.
6.) Continuous grouting operations should continue until competent grout is present at the surface.
For questions regarding product application and proper placement refer to the BENSEAL® product data sheet or contact your local Baroid IDP Representative.
www.baroididp.com
877-379-7412 or 281-871-4613
CAS # 1302-78-9
CAS # 14808-60-7
BENTONITE
Baroid Industrial Drilling Products
Product Service Line, Halliburton
P.O. Box 1675 • Houston, TX 77251
Emergency Telephone: 281-575-5000
IDP Technical Service: 1-877-379-7412 or 281-871-4613
BENSEAL® and EZ-MUD® are registered Trademarks of Halliburton


Date & Time: Sat Mar 1 02:20:00 MST 2014
Position: 13 N 485605 4286662
Altitude: 2809m
Azimuth/Bearing: 328° N32W 5831mils (True)
Elevation Angle: -22.4°
Horizon Angle: +04.2°
Zoom: 1X
250 gallons, AK crew mixing the Quickcrete.

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.01.2014
Day: Saturday

Temperature:
Low: 19° F
High: 37° F

Weather Conditions:
Cloud Cover: Clear to Snow
Precipitation: <1-inch
Wind: SSE 0 to 10 mph

AMEC Personnel On Site

John Roberts	13	Hrs
Matt Hartz	12	Hrs
	0.0	Hrs

		Hrs

Project Concerns: 300gal of lost grout to the formation at 190ft depth. There is concern about grout sealing flow paths for drainage and migrating into the CD-3 drain annulus.

DRILLING ACTIVITIES and PROGRESS:

0000-0040 Day crew arrived from getting more grouting supplies.

0040-0300 Tripped-in PVC tremmie pipe to 185ft depth (the tremmie pipe hit refusal on Benseal or a fracture down the hole – there was bentonite completely around the tip of the tremmie pipe when removed; however, a fracture zone is present as indicated by the coarseness of the chips recovered during drilling). Mix grout batch: 250gal water, 20 bags (92.6lbs) Type I/II Portland cement, and ¾ bag (37.5lbs) of bentonite gel.

0300-0345 Pumped grout batch (approx 280gal total) from 175ft depth. The hole volume from 185ft depth is 181.25gal (24.23ft^3). The grout did not come to the surface. The tremmie pipe was tripped-out and no grout was observed on the outside walls of the pipe. The grout was likely all lost to the formation through the fracture zone from 180-190.

0345-0930 The breaker-arm (hydraulic wrench on mast for breaking pipe) broke on the rig. AK to the staging area to try and break hammer to change the bit.

0630 John Roberts onsite. Working with AK to come up with a way to plug the hole to the surface. AMEC spoke with Austin Creswell, the Design Engineer, about installing PVC with a shale basket above the fracture zone, and determined that it would be ok to grout the hole with a void, but it was up to AK to determine if it was legal per the State of Colorado. This information was relayed to AK at 0913 by phone.

0930-1015 AK tripped-in 150lf of blank riser sch. 80 PVC with a threaded end cap on the bottom and a shale basket fastened 1ft above the end cap to 148ft depth. The PVC was suspended on from the surface casing via a clamp. Approximately 150gal of grout was pumped from the surface. The batch consisted of 130gal water, 8 bags (92.6lbs) Type I/II Portland cement, and ¼ bag (12.5lbs) of bentonite gel. The grout came up to approximately 30ft depth. AK was to let the grout set for a few hours before mixing a neat cement to plug the hole to the surface.

1015-1230 Day crew prepared equipment to move to **CD-4a**. Night crew arrived 30min late due to getting more cement from the hardware store.

1230-1330 Night crew onsite. Set rig over CD-4a at 123° azimuth (off set 2.5ft south from original orientation) and **43°** declination (**design 45°**).

1330-1700 CD-4 was completely abandoned with neat cement to the surface with approximately 90gal of grout (approx. 70gal water and 8, 92.6lb bags of Type I/II Portland cement).

The drilling mechanics on the rig won't engage due to the rear axle not disengaging from the drive on the rig. Down to mitigate the problem before advancing casing.

1700-1815 Rig works after hooking up the compressor to the water truck to build-up enough air to start the drill. Advanced surface casing to 19.5 ft depth.

1815-1920 Advanced CD-4a from 19.5 to 100ft depth at a rate of 74.5 ft/hr. The 'left-twist' stabilizer is part of the borehole assembly (BHA), and was placed immediately above the hammer.

1920-1940 AK performed a deviation survey to 100ft depth. Deviation at 100ft is 0° south (right) azimuth (123° design and 123° at 100ft), and +2° declination (45° design and 43° at 100ft).

1940-2100 Advanced CD-4a from 100 to 200ft depth at a rate of 75 ft/hr.

2100-2115 AK performed a deviation survey to 200ft depth. Deviation at 200ft is 2° south (right) azimuth (123° design and 125° at 100ft), and 1° declination (45° design and 46° at 200ft).

2115-2330 Advanced CD-4a from 200 to 220ft depth at a rate of 8.9 ft/hr.

2330-2400 Night crew tripped out drill string to remove the 'left-twist' stabilizer. Left rods for day crew to trip back in the hole to bottom.

As of this morning:

At 0600, AK performed a deviation survey to 400ft depth. Deviation is 5° south (right) azimuth (123° design and 128° at 400ft), and 7° declination (45° design and 52° at 400ft). Advancement of the hole continues to 500ft depth before the next deviation survey.

Submitted by:
John Roberts

Reviewed by: X _____
Timothy Burkhard
Submitted: Date: 03.02.2014

Daily Progress Photos:


Date & Time: Sat Mar 1 14:59:03 MST 2014
Position: 13 N 484901 4288628
Altitude: 10422ft
Azimuth/Bearing: 003° N03E 0053mils (True)
Elevation Angle: -33.2°
Horizon Angle: -00.5°
Zoom: 1X
completed CD-4 abandonment.

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.02.2014
Day: Sunday

Temperature:
Low: 18° F
High: 39° F

Weather Conditions:
Cloud Cover: Overcast
Precipitation: NA
Wind: NW 3 to 6 mph

AMEC Personnel On Site

John Roberts	12.5	Hrs
Matt Hartz	12	Hrs

Project Concerns: Reflex gyro is roughly 0.5°-1.5° difference between surveys at the same depth.

DRILLING ACTIVITIES and PROGRESS:

0000-0300	Day crew tripped-in drill string to 220ft depth at drilled to 300ft depth at a rate of 26.7 ft/hr.
0300-0325	AK performed a deviation survey to 300ft depth. Deviation is 5° south (right) azimuth (123° design and 128° at 300ft), and 4° declination (45° design and 49° at 300ft).
0325-0600	Advanced CD-4a from 300 to 400ft depth at a rate of 38.8 ft/hr.
0600-0635	AK performed a deviation survey to 400ft depth. Deviation is 6° south (right) azimuth (123° design and 129° at 400ft), and 7° declination (45° design and 52° at 400ft).
0635-0915	Advanced CD-4a from 400 to 500ft depth at a rate of 37.0 ft/hr.
0700	AMEC cross shift.
0915-1000	AK performed a deviation survey to 500ft depth. Deviation is 8° south (right) azimuth (123° design and 131° at 500ft), and 9° declination (45° design and 54° at 500ft).
1000-1100	AK performed rig maintenance.
1100-1330	Advanced CD-4a from 500 to 600ft depth at a rate of 40.0 ft/hr.
	AK crew change 1210. Resume sampling for CCV's exploration group at 520ft depth per Scott McAnally.
1330-1415	AK performed a deviation survey to 600ft depth. Deviation is 10° south (right) azimuth (123° design and 133° at 600ft), and 10° declination (45° design and 55° at 600ft).
1415-1800	Advanced CD-4a from 600 to 700ft depth at a rate of 26.7 ft/hr. The use of foam and polymer (1:300 gallons) began from 600ft depth.
1800-1835	AK performed a deviation survey to 700ft depth. Deviation is 12° south (right) azimuth (123° design and 135° at 700ft), and 12° declination (45° design and 57° at 700ft).
1835-2200	Advanced CD-4a from 700 to 800ft depth at a rate of 41.3 ft/hr.

2200-2250 AK performed a deviation survey to 800ft depth. Deviation is 18° south (right) azimuth (123° design and 141° at 800ft), and 12° declination (45° design and 57° at 800ft).

2250-2400 Drilling from 810ft depth

As of this morning:

The diatreme was believed to have been penetrated at approximately 800ft depth around 0030. A second look at the chips was taken by AMEC rep John Roberts at 0400, and the decision was made to continue drilling. Matt Hartz was back at the rig (0440) to inform AK that drilling needed to continue. AK was back at the bottom of the hole and drilling at 0630. The chips were taken to Scott McAnally, CCV's geologist, at 0730, and it was confirmed that traces of the diatreme were in the 860-870ft range. Drilling should continue to complete diatreme penetration.

Scott showed us the updated Vulcan model of the diatreme contact with the new information from holes CD-1 and CD-3 incorporated. It appears that as you move south, the contact orientation changes from near vertical to an east dipping.

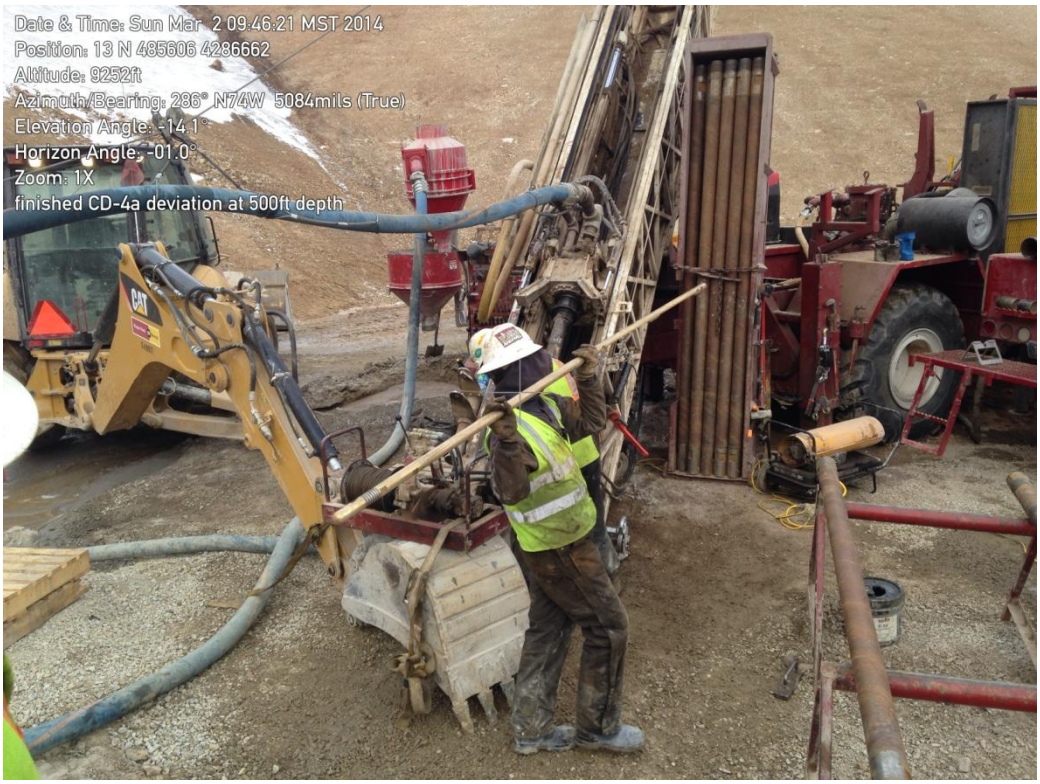
The contact is approx. 660ft in CD-1 and 825ft in CD-3. The associated Elk Creek measured attitudes in those areas are 59°, 126° and 58°, 140°, respectively. In CD-3, the attitude around 660ft depth is 54°, 137°.

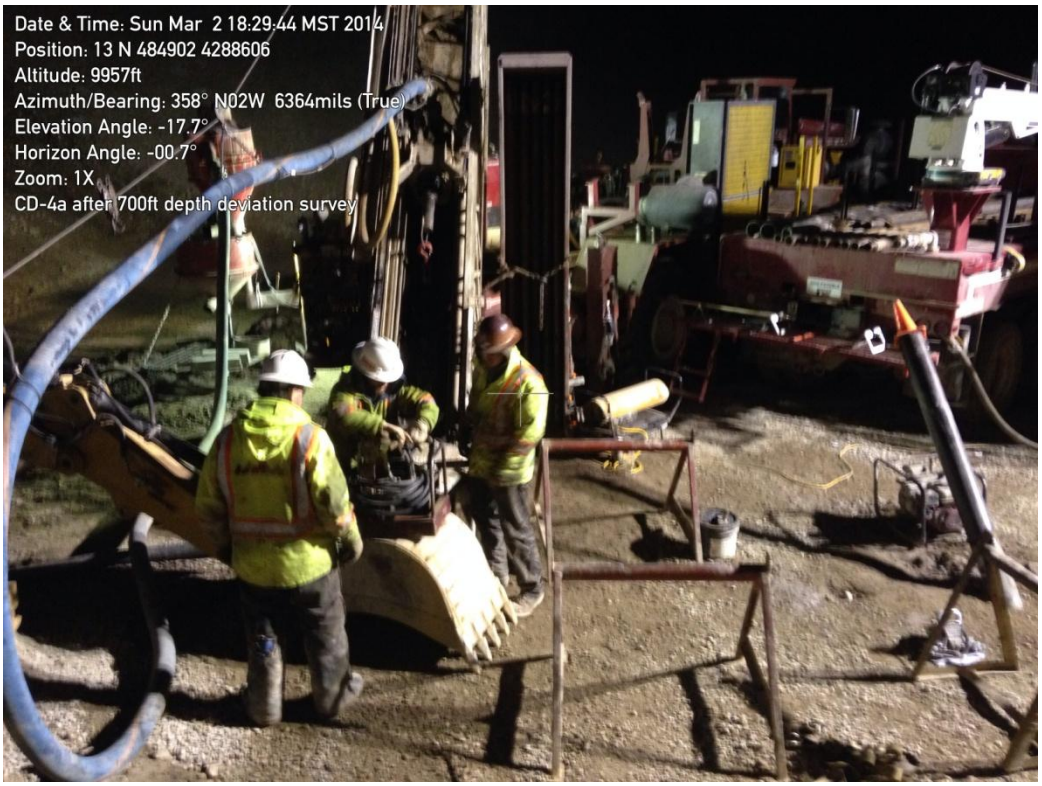
At 1100 the current depth of CD-4a is 925ft. There is not enough CFM to lift the cuttings and water to the surface. AK will have to bring their other compressor down from the yard to complete the drilling.

Submitted by:
John Roberts

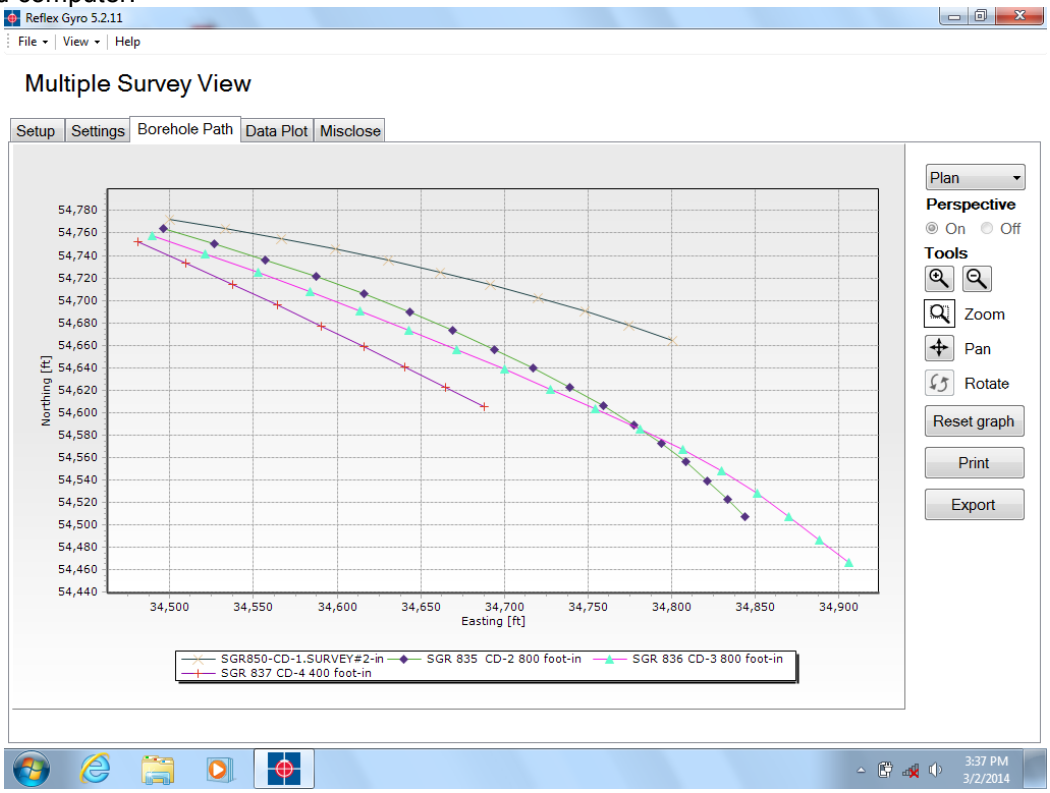
Reviewed by: X
Timothy Burkhard
Submitted: Date: 03.03.2014

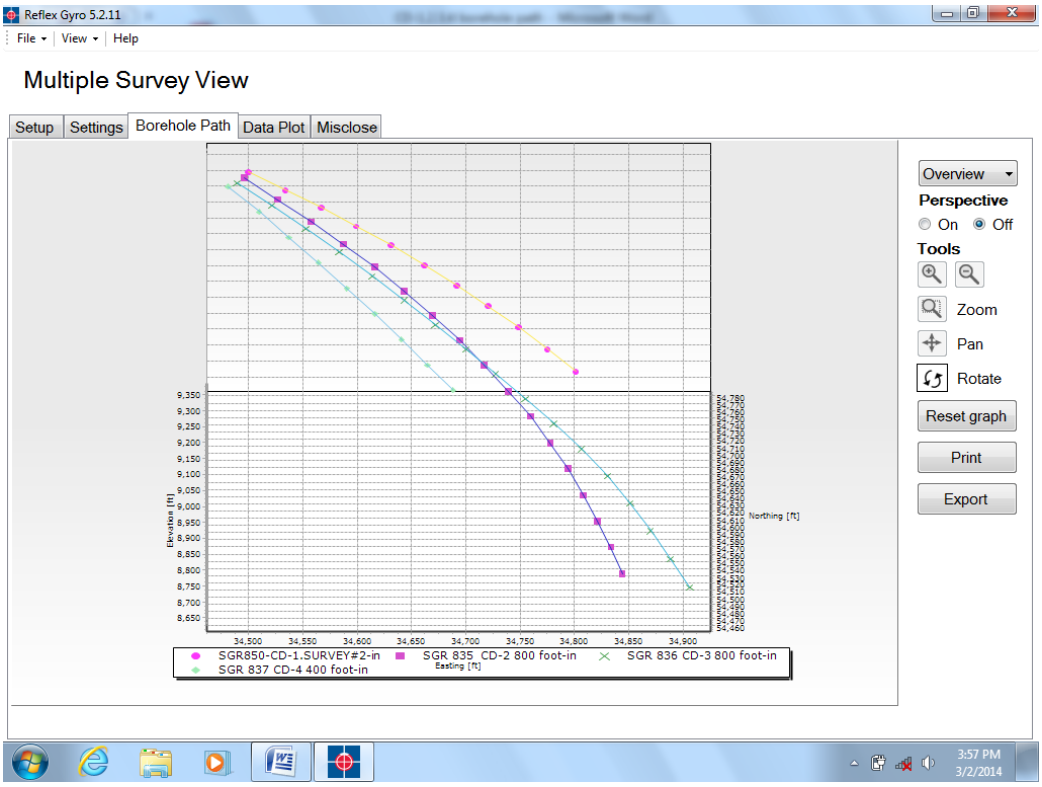
Daily Progress Photos:

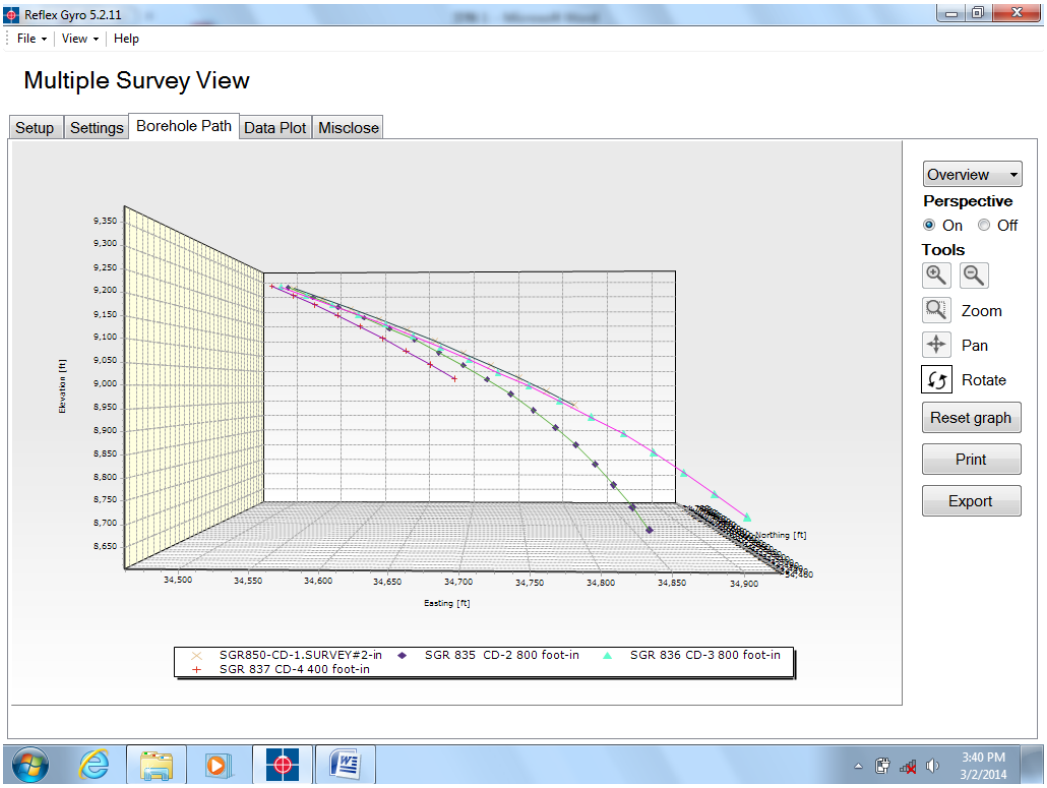


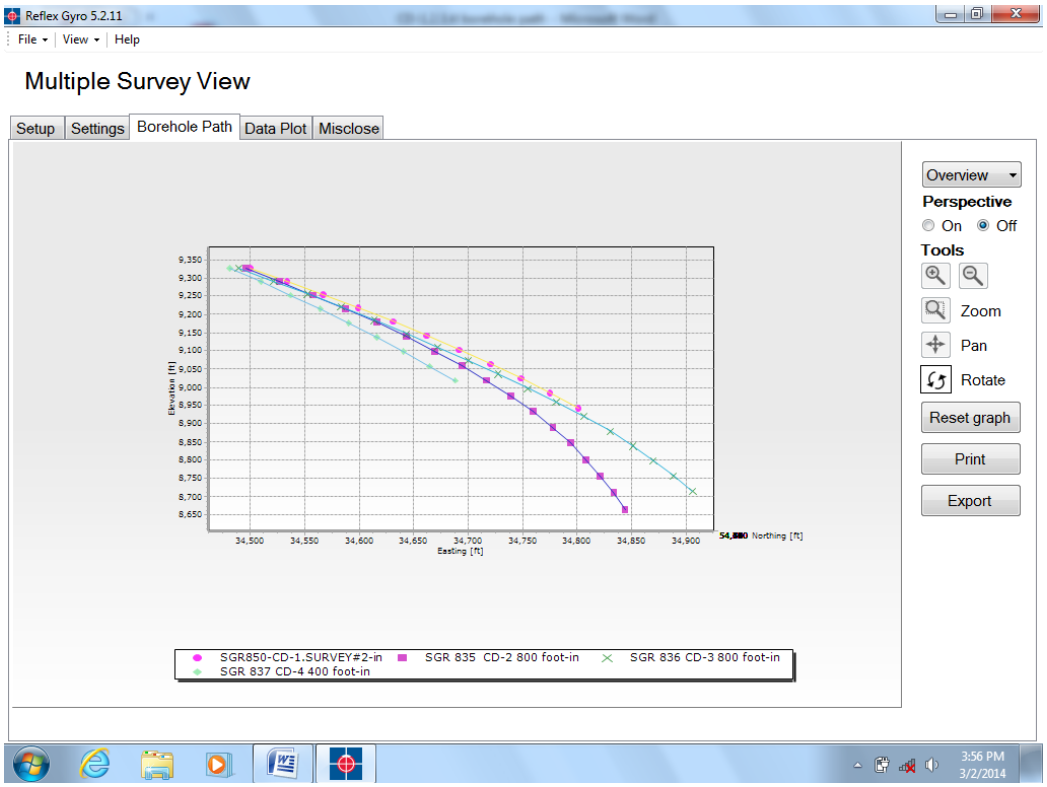


The following are screen-shots of the Reflex software plots of CD-1, 2, 3 and 4 deviation surveys from AK's field computer.




Reflex Gyro 5.2.11
File
View
Help
Multiple Survey View
Setup
Settings
Borehole Path
Data Plot
Misclose
Overview
Perspective
On
Off
Tools
Zoom
Pan
Rotate
Reset graph
Print
Export
Elevation [ft]
Northing [ft]
Easting [ft]
SGR850-CD-1.SURVEY#2-in
SGR 835 CD-2 800 foot-in
SGR 836 CD-3 800 foot-in
SGR 837 CD-4 400 foot-in
3:57 PM
3/2/2014


Reflex Gyro 5.2.11
File
View
Help
Multiple Survey View
Setup
Settings
Borehole Path
Data Plot
Misclose
Overview
Perspective
On
Off
Tools
Zoom
Pan
Rotate
Reset graph
Print
Export
Elevation [ft]
Northing [ft]
Easting [ft]
SGR850-CD-1.SURVEY#2-in
SGR 835 CD-2 800 foot-in
SGR 836 CD-3 800 foot-in
SGR 837 CD-4 400 foot-in
3:40 PM
3/2/2014


Reflex Gyro 5.2.11
File
View
Help
Multiple Survey View
Setup
Settings
Borehole Path
Data Plot
Misclose
Overview
Perspective
On
Off
Tools
Zoom
Pan
Rotate
Reset graph
Print
Export
Elevation [ft]
Easting [ft]
Northing [ft]
SGR850-CD-1.SURVEY#2-in
SGR 835 CD-2 800 foot-in
SGR 836 CD-3 800 foot-in
SGR 837 CD-4 400 foot-in
3:56 PM
3/2/2014

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.03.2014
Day: Monday

Temperature:
Low: 19° F
High: 39° F

Weather Conditions:
Cloud Cover: Partly Cloudy
Precipitation: NA
Wind: NNE 5 mph

AMEC Personnel On Site

John Roberts	13	Hrs
Matt Hartz	13.5	Hrs
	0.0	Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: The Vulcan model of the diatreme contact has been updated by Scott McAnally, and the contact appears to change from a vertical trending orientation to an east dipping orientation as you progressively move south. This increases the drill depths from what was originally estimated based on previous work.

DRILLING ACTIVITIES and PROGRESS:

0000-0150 Advanced CD-4a to 850ft depth. The diatreme was believed to be penetrated around 800ft depth. Called Elk Creek for a survey.

0150-0305 Elk Creek performed a deviation survey to 850ft depth. Deviation is 22° south (right) azimuth (123° design and 145° at 850ft), and 16° declination (45° design and 61° at 850ft).

0305-0445 AK tripped-out drill string to approximately 200ft depth.

AMEC rep. John Roberts looked at the chips for a second opinion and determined that full penetration of the diatreme had not occurred, and that drilling had to continue.

0445-0630 Matt Hartz back at the rig to inform AK. Tripped-in drill string to bottom (850ft).

0630-1100 Advanced CD-4a from 850 to 925ft depth at a rate of 16.7 ft/hr.

John Roberts onsite 0630.

0730 John and Matt to the chips to Scott McAnally's office to look at them under the microscope and get another opinion. Scott observed traces of the breccia material from 860 to 870ft depth, and confirmed that drilling should continue.

Scott showed us the updated Vulcan model of the diatreme contact with the new information from holes CD-1 and CD-3 incorporated. It appears that as you move south, the contact changes from near vertical to dipping towards the east.

The contact is approx. 660ft in CD-1 and 825ft in CD-3. The associated Elk Creek measured attitudes in those areas are 59°, 126° and 58°, 140°, respectively. In CD-3, the attitude around 660ft depth is 54°, 137°.

1100-1345 AK stopped drilling to get their large compressor and more drill rods.

1345-1410 Down for blasting.

1410-1600 Set up compressor and prepare to continue drilling from 925ft.

1630-2200 Drill will not advance. AK to trip out and check the bit.

After consideration and discussion of the circumstances with deviation, diatreme contact east dip of approximately 80° (+/-5° - per Scott McAnally), and the length of cable for maximum transducer deployment, the plan for CD-4a is to advance to 985ft depth and TD the hole (the hole could be advanced as deep as 1035ft depth if the diatreme breccia is penetrated by 985ft depth). The drain PVC will be installed, but not grouted. AMEC will deploy the transducers in CD-4a and CD-3. AMEC will perform a constant head and falling head test in CD-4a, and monitor CD-3 for influence.

2200-2400 AK worked on getting the bit off the hammer.

As of this morning:

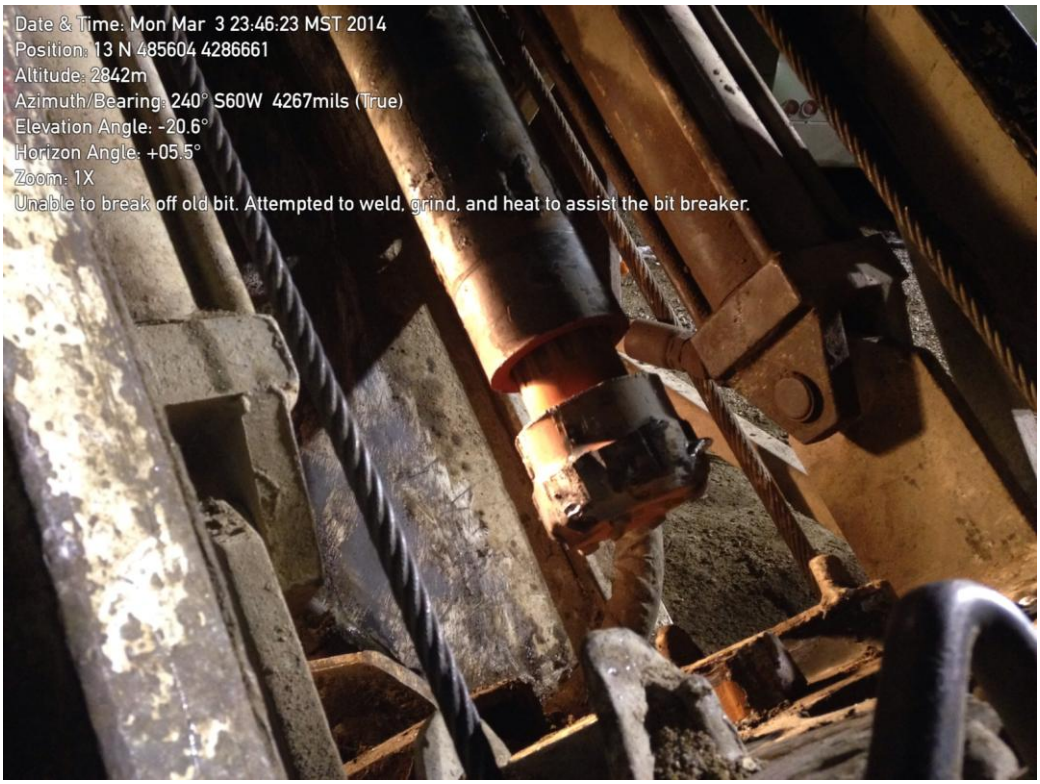
AK could not get back to the bottom of the hole with the new bit due to the decrease in hole diameter. AK began to ream the hole to 4 ¾-inches from approximately 800ft depth. They advanced the drill to approximately 915ft depth before the bit sheared into pieces. AK is currently tripping-out of the hole. Elk Creek was not called to survey to TD.

Today's plan is to install the CD-4a PVC drain pipe (not completed with cement) and perform a constant head and falling head test, and monitor CD-3 during the test(s).

Submitted by:
John Roberts, PG

Reviewed by: X
Timothy Burkhard
Submitted: Date: 03.04.2014

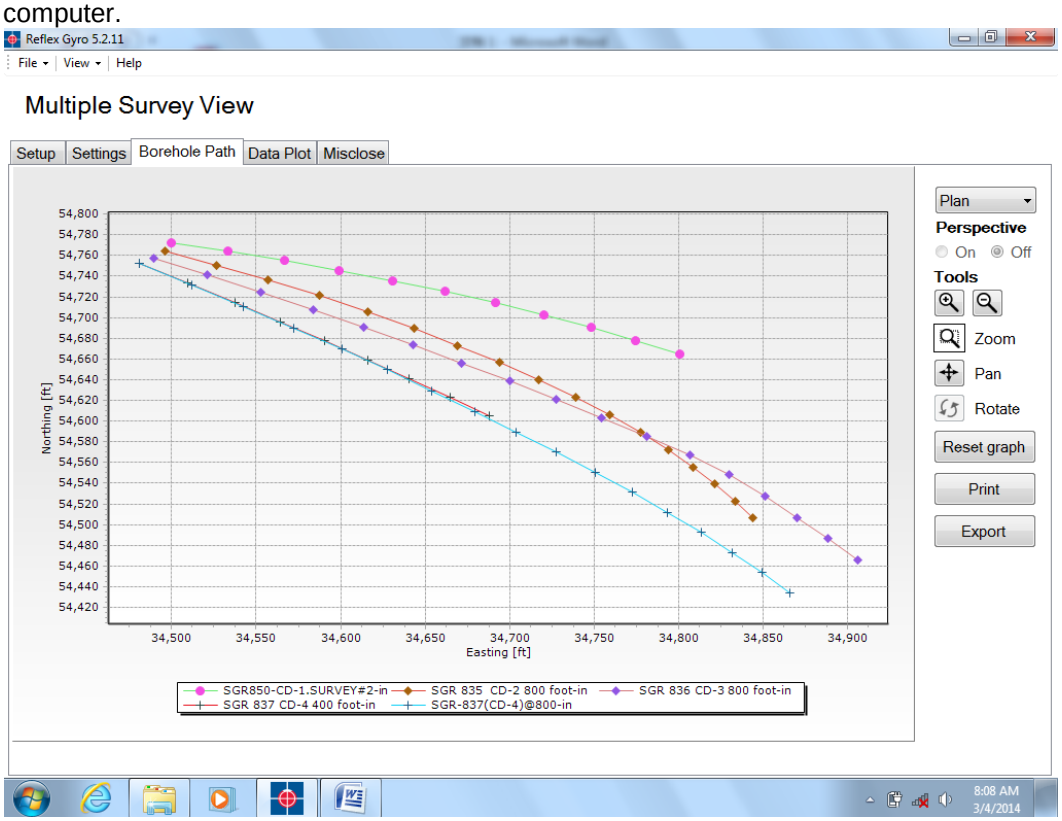
Daily Progress Photos:



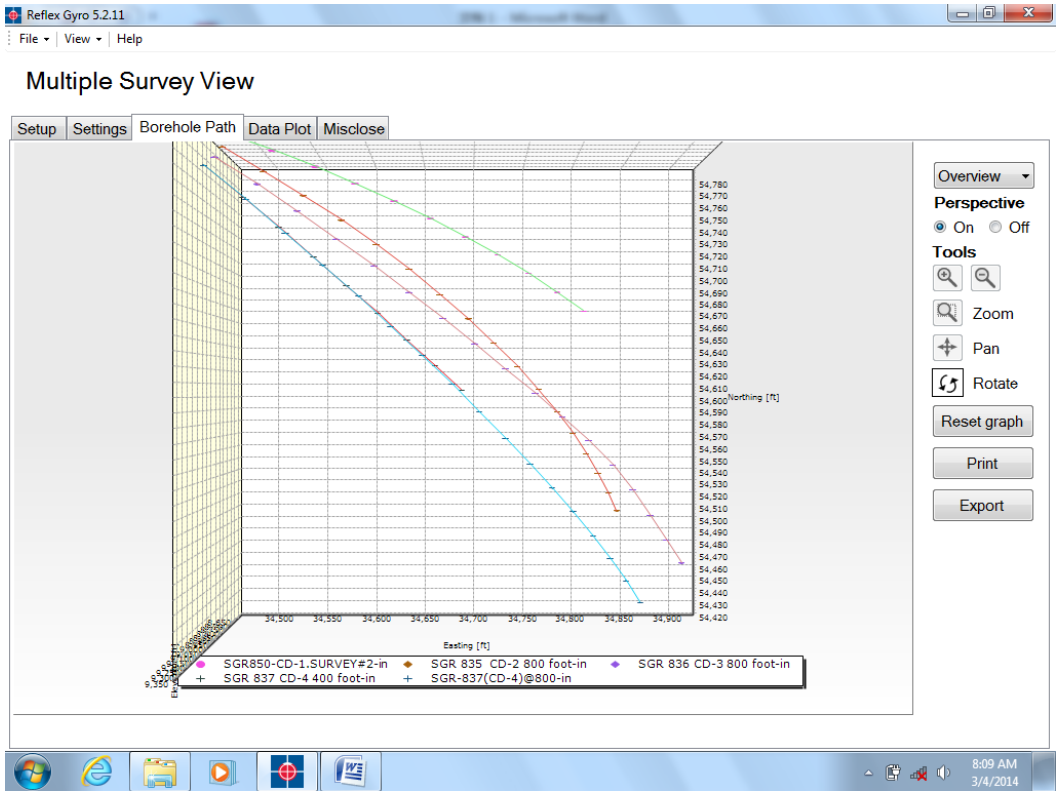

Date & Time: Tue Mar 4 08:47:33 MST 2014
Position: 13 N 485603 4286662
Altitude: 9356ft
Azimuth/Bearing: 058° N58E 1031mils (True)
Elevation Angle: -86.7°
Horizon Angle: -88.8°
Zoom: 1X
bit lost down holw CD-4a. hammer cracked


Date & Time: Tue Mar 4 09:24:16 MST 2014
Position: 13 N 485608 4286673
Altitude: 9387ft
Azimuth/Bearing: 030° N30E 0533mils (True)
Elevation Angle: -78.6°
Horizon Angle: -75.9°
Zoom: 1X
new heavy steel rods for stabilization

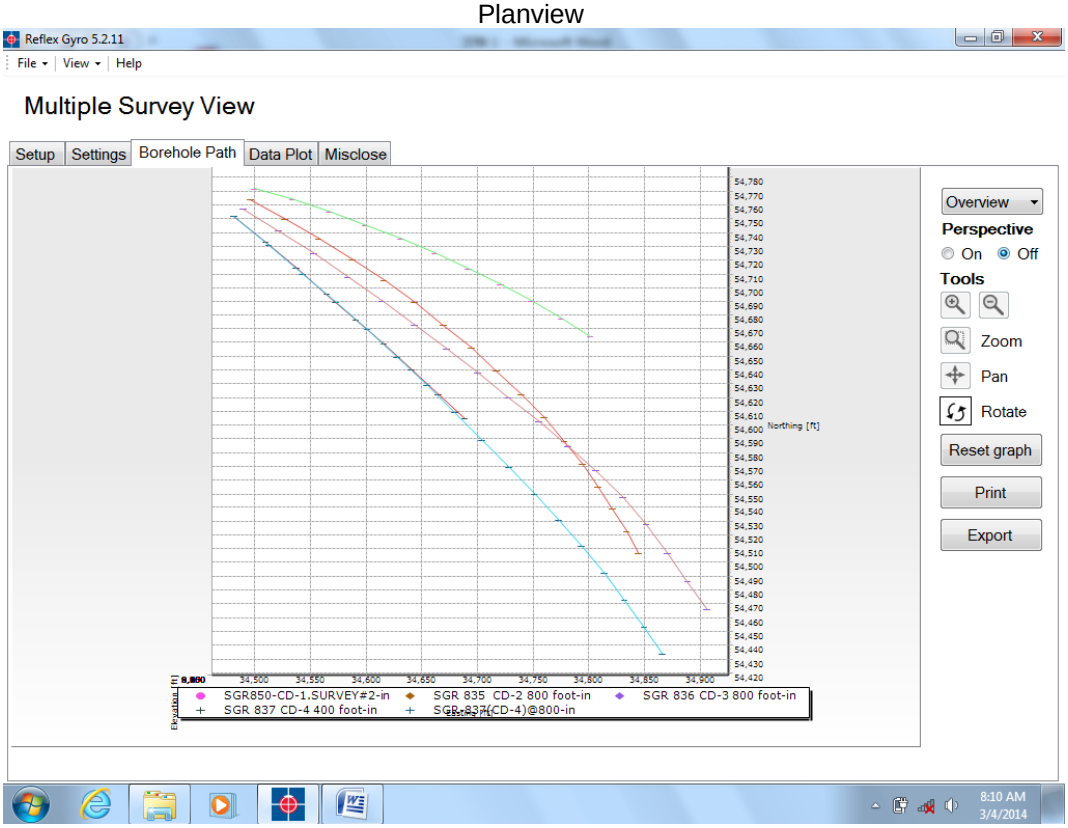
The following are different perspectives of the drilled holes CD-1, 2, 3, 4, and 4a from the Reflex software on AK's computer.



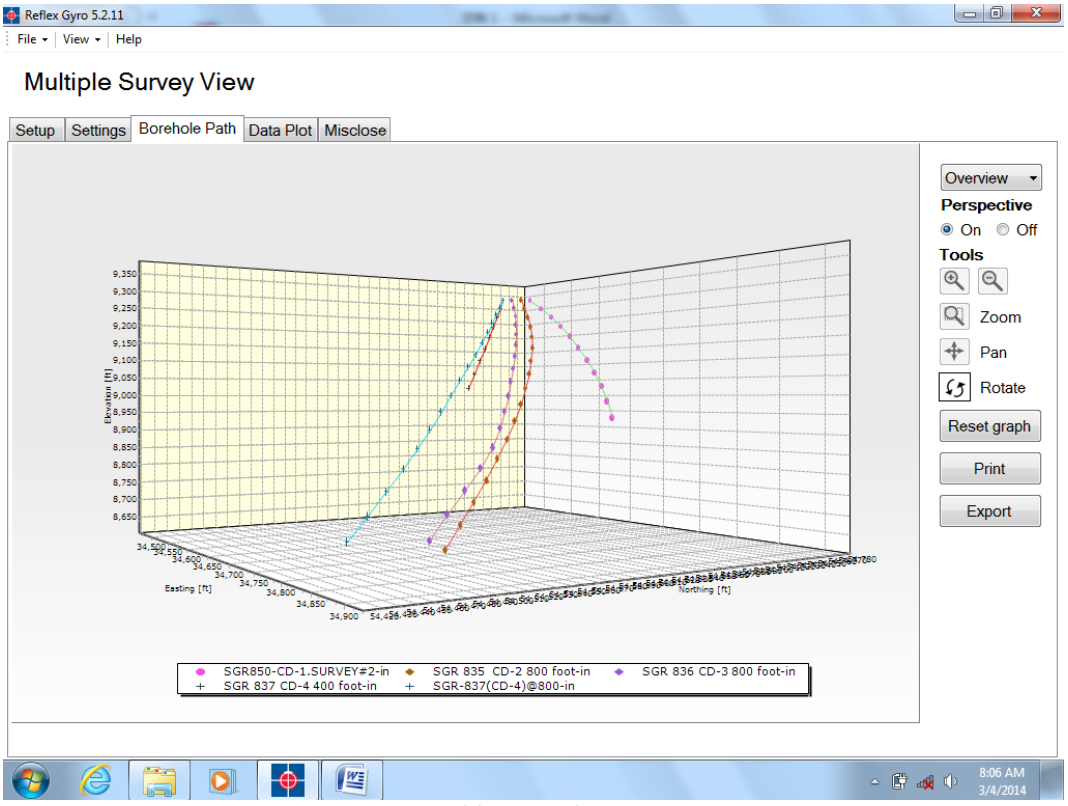
Planview



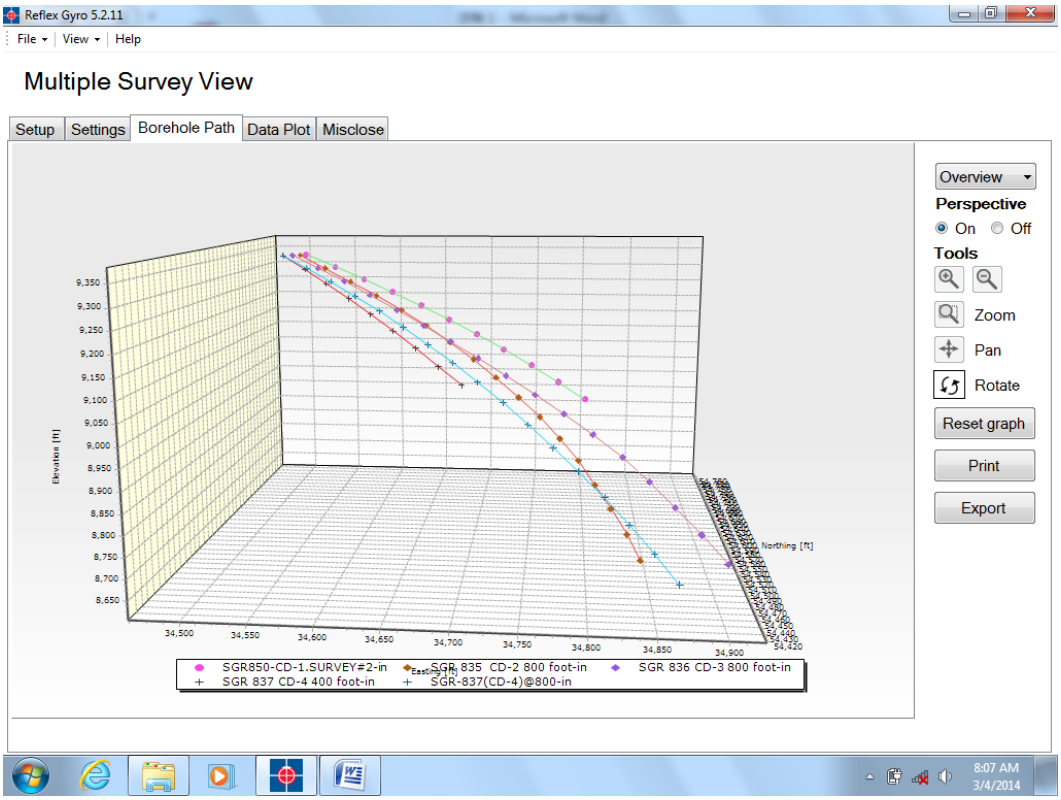
Planview



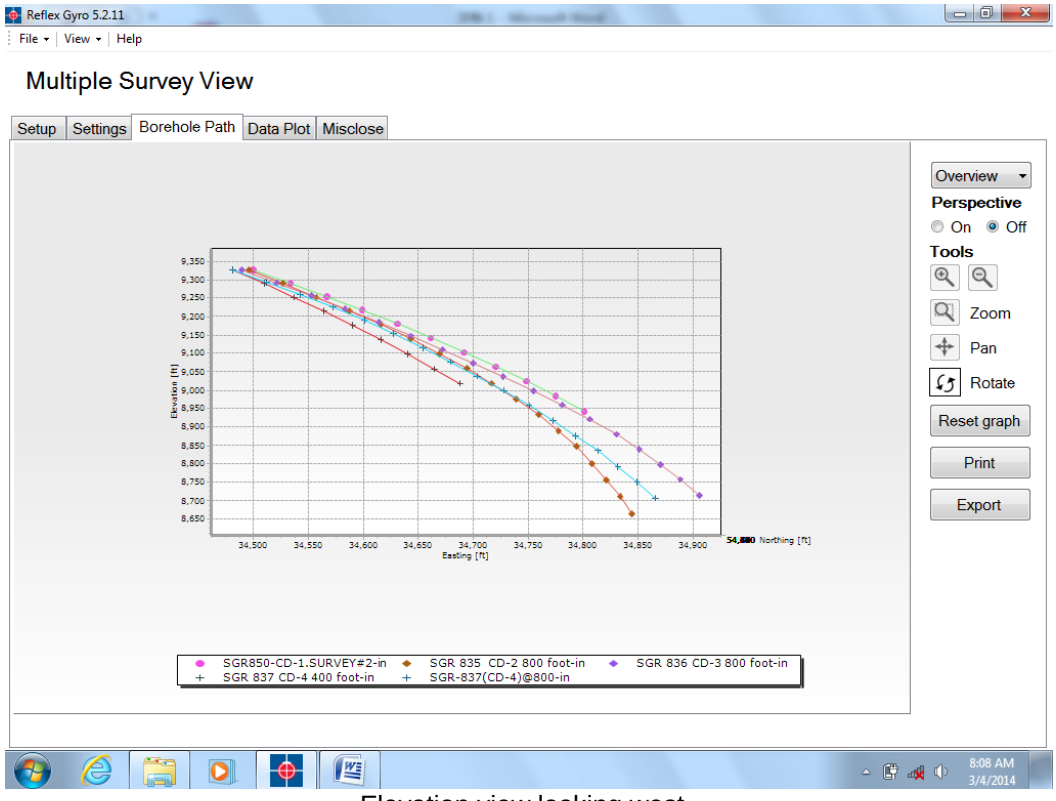
Planview



Looking Southwest



Looking West



Elevation view looking west.

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.04.2014
Day: Tuesday

Temperature:
Low: 18° F
High: 41° F

Weather Conditions:
Cloud Cover: Partly Cloudy
Precipitation: NA
Wind: S 7 mph

AMEC Personnel On Site

John Roberts	13	Hrs
Matt Hartz	12.5	Hrs
	0.0	Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0130	AK worked on changing bits in the hammer.
0130-0320	The bit was added to the hammer and the rods were tripped-in to 800ft depth before becoming tight in the hole due to the decrease in borehole diameter as the original bit wore out.
0320-0455	AK reamed out hole to 915ft depth before the bit sheared off. Bit fragments were lifted to the surface with the returns.
0455-0845	Finished tripping-out of CD-4a.
0645	AMEC crew change.
0845-1200	Staged equipment in preparation for PVC drain install. AK filled both trucks with water in preparation for a constant head and falling head test in CD-4a.
1200-1400	AK crew change. AK filling out paperwork.
1230	AMEC prepared transducers for hydro-testing and deployed a transducer in CD-3 to 884ft depth.
1400-1545	Installed PVC pipe with a 2” end cap, 30lf of 0.030 slotted screen and 920lf of sch 80 blank riser pipe to a depth of 915ft depth.
	AMEC deployed a transducer in CD-4a to 910ft depth for the hydro-test.
1545-1652	Stage water trucks, hoses, flow meter, turned on transducers, etc. for the CD-4a testing.
1652-1721	Injected a slug of water into CD-4a.
	Total hole volume: 853.2gal.
	Flow rate of added water: 67.3gpm.

	Total water injected: 1962.8gal (2.3 hole volumes).
1721-1830	Stopped adding water to CD-4a (1721) due to losing head; maximum head achieved 511ft (vertical) above the transducer (516ft above TD).
1830-2045	Pulled transducer from CD-4a. AMEC discussed alignment of CD-5 with AK. At AK's discretion, they can move the collar and adjust the attitude of the hole to achieve the target of diatreme penetration and a minimum of 500ft of vertical depth from the collar. AK was in close communication with Tony King regarding how to proceed.
1845	Matt Hartz onsite.
2000	John Roberts off site.
2045-2110	Installed shale basket and centalizers on CD-4a. The drain is ready for grout if it's approved for use.
2110-2335	AK set the rig over CD-5. The attitude of the drill string is per AMEC's design (45°, 129°). The collar has been moved approximately 2ft towards the toe of the east slope of the pond.
2335-2400	AK performed paperwork while waiting for crew change.

As of this morning:

The day crew advanced the casing. However, during the advancement a boulder was hit and the casing was kicked-off alignment. The casing was pulled from the ground. The hole was grouted. AK plans to offset a couple feet and start again. AK's borehole assembly will consist of a 5-inch bit, stabilizers, and three 20ft RC rods before using 10ft rods. They plan to drill to 500ft depth as they would any other exploration hole. They will reduce to 4 ¾inch bit at 500ft, and they will adjust their penetration rate based on the deviation survey.

The hydro-testing did not show response in CD-3 after adding a slug of water to CD-4a. Looking at the vertical profile, CD-4a is below CD-3. If they are hydraulically connected, it would be from CD-3 to CD-4a, which did not completely penetrate the diatreme.

Submitted by:
John Roberts, PG

Reviewed by: X
Timothy Burkhard
Submitted: Date: 03.05.2014

Daily Progress Photos:


Date & Time: Tue Mar 4 14:03:47 MST 2014
Position: 13 N 485605 4286661
Altitude: 9332ft
Azimuth/Bearing: 102° S78E 1813mils (True)
Elevation Angle: -19.2°
Horizon Angle: -00.5°
Zoom: 1X
CD-4a drain PVC install


Date & Time: Tue Mar 4 17:13:54 MST 2014
Position: 13 N 485603 4286660
Altitude: 9338ft
Azimuth/Bearing: 360° N00W 6400mils (True)
Elevation Angle: -40.9°
Horizon Angle: +03.9°
Zoom: 1X
CD-4a hydro test.

Date & Time: Tue Mar 4 03:30:07 MST 2014
Position: 13 N 485604 4286659
Altitude: 2853m
Azimuth/Bearing: 074° N74E 1316mils (True)
Elevation Angle: -85.9°
Horizon Angle: -87.5°
Zoom: 1X
CD-5 alinging with Ames Azi

Date & Time: Wed Mar 5 03:59:22 MST 2014
Position: 13 N 485608 4286656
Altitude: 2857m
Azimuth/Bearing: 072° N72E 1280mils (True)
Elevation Angle: -86.2°
Horizon Angle: -88.6°
Zoom: 1X
CD-5 something moved. est. 1-2 degrees Azi

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.05.2014
Day: Wednesday

Temperature:
Low: 18° F
High: 37° F

Weather Conditions:
Cloud Cover: Mostly Sunny
Precipitation: NA
Wind: WNW 6 mph

AMEC Personnel On Site

John Roberts	13	Hrs
Matt Hartz	12.5	Hrs
	0.0	Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0245	AK set up over CD-5 on Ames survey azimuth layout 129° and a dip of 42°.
0245-0415	During casing advancement, the azimuth kicked-off from alignment.
0415-0700	Pulled casing, sourced cement from lay-down area, and grouted hole with neat cement mix (5 bags (92.6lbs) of Type I/II Portland cement and 30gal water).
0645	AMEC crew change.
0700-1030	AK moved the collar for CD-5 approximately 4ft towards the toe of the slope from CD-4a.
1030-1115	Advanced casing to 18.5ft depth at 45°, 129°.
1115-1200	AK assembled their BHA: 5-inch bit/hammer, 5-inch stabilizer, 25ft rods, and 5-inch stabilizer.
1200-1310	AK crew change, paperwork.
1310-1330	Shut down for **CODE 90**.
1330-1600	AK has a new driller for the nightshift. Set up equipment (large compressor, air-line, water-line, etc.). The second stabilizer was not added due to a miscommunication during the crew change with the new driller.
1600-1700	AK advanced CD-5 from 18.5 to 100ft depth at a rate of 81.5 ft/hr.
1700-1750	AK performed a deviation survey to 100ft depth. Deviation is 1° south (right) azimuth (129° design and 130° at 100ft), and +2° declination (45° design and 43° at 100ft).
1750-2000	AK advanced CD-5 from 100 to 200ft depth at a rate of 46.1 ft/hr.
2000-2030	AK performed a deviation survey to 200ft depth. Deviation is 2° south (right) azimuth (129° design and 131° at 200ft), and +2° declination (45° design and 43° at 200ft).

2030-2245 AK advanced CD-5 from 200 to 300ft depth at a rate of 46.1 ft/hr.

2245-2315 AK performed a deviation survey to 300ft depth. Deviation is 2° south (right) azimuth (129° design and 131° at 300ft), and +2° declination (45° design and 43° at 300ft).

2315-2400 AK continued drilling to 400ft depth.

As of this morning:

AK encountered a collapsed underground mine working from 344 to 350ft depth (4.3ft vertical height). The driller experienced a series of approximately 0.5ft resistance and 1ft drops during advancement through the zone. The hole was TD at 350ft depth.

Elk Creek performed a deviation survey to 340ft depth. Deviation is 5° south (right) azimuth (129° design and 134° at 340ft), and +1° declination (45° design and 44° at 340ft).

AK is going to deploy PVC to 350ft depth with a shale basket at approximately 335ft depth before grouting CD-5 to the surface. The casing will be cut off just below the current grade similar to the abandonment of CD-4.

AK will move to CD-6 and begin drilling.

Submitted by:
John Roberts, PG

Reviewed by: X
Timothy Burkhard
Submitted: Date: 03.06.2014

Daily Progress Photos:

Date & Time: Wed Mar 5 11:39:39 MST 2014
Position: 13 N 485610 4286655
Altitude: 9274ft
Azimuth/Bearing: 064° N64E 1138mils (True)
Elevation Angle: -89.8°
Horizon Angle: -89.9°
Zoom: 1X
lower stabilizer and 5" bit BHA

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.06.2014
Day: Thursday

Temperature:
Low: 24° F
High: 63° F

Weather Conditions:
Cloud Cover: Overcast
Precipitation: NA
Wind: ESE 7 mph

AMEC Personnel On Site

John Roberts	13	Hrs
Matt Hartz	12.5	Hrs
Jessica Malone	11	Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: CD-5 has not yet been abandoned, and CD-6 is being drilled. The $CaSO_4$ additive to the CD-5 grout batch (2nd attempt) will act against the set-up of the cement. During drilling of CD-6 there is a potential for grout from CD-5 (3rd attempt) to have an impact on CD-6.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0320	AK's hammer wouldn't work during drilling to 400ft depth. Tripped-out rods to check the bit. AK went to the lay-down area to get a new foot-valve for the hammer.
0320-0430	Tripped back into CD-5.
0430-0530	AK advanced CD-5 to 344ft depth before encountering an underground mine working. The working extended from 344 to 350ft depth (4.3ft vertical height). It is believed to have collapsed due to the driller experiencing a series of approximately 0.5ft of resistance and 1ft drops during advancement.
	CD-5 TD 350ft depth
0530-0635	Wait for Elk Creek to arrive onsite for TD deviation survey.
0635-0730	Elk Creek performed TD deviation survey. The survey was performed to 340ft depth. Deviation was 5° south (right) azimuth (129° design and 134° at 340ft), and +1° declination (45° design and 44° at 340ft).
0730-0930	Trip-out drill string.
0930-1115	Trip-in PVC to 350ft depth. A shale basket was deployed to 330ft depth.
1115-1145	Prepare tremmie pipe for grouting CD-5.
1145-1215	Down for Ames blast.
1215-1500	Moved rig off CD-5; installed shale basket and tremmie pipe; prepared to grout the hole, fill in the sump, and layout CD-6.

1500-1730 AK pumped 450gal of neat cement into CD-5 from 250ft depth in two stages. The first batch was 21 bags (92.6lbs) of Type I/II Portland cement and approximately 220gal of water; the first batch was 14 bags (92.4lbs) of Type I/II Portland cement and approximately 130gal of water. The shale basket would not support the weight of the cement.

1500 Jessica Malone (AMEC) arrived onsite to cover the nightshift for the next several nights. She was taken to get her Site-Specific training completed, and to Scott McAnally's office to look at examples of the diatreme breccia and Precambrian material.

1730-1930 Trip-out tremmie pipe and PVC with the shale basket.

1900 AMEC crew change. Jessica to stay on most of nightshift with Matt to observe and transition to the shift.

1930-2030 Trip-in PVC with 3 shale baskets attached with a spacing of 20, 30, and 40ft from the bottom of the hole (326, 316, and 306ft depth). Holes were drilled in the PVC above each basket. The PVC holding the shale baskets was used as the tremmie pipe.

2030-2200 Mixed a batch of grout (7 bags (92.4lbs) Type I/II Portland cement, approximately 30gal of water, and approximately 10lbs of Plaster of Paris ($CaSO_4$). The $CaSO_4$ was added in an attempt to accelerate the cement's cure time.

2200-2400 AK set the rig over CD-6 and advanced the casing at 44°, 136° (design attitude is 45°, 136°) just before crew change. AK's borehole assembly (BHA) set up is as follows:

5-inch bit and interchange (7ft),

4 ¾-inch stabilizer (5ft),

20ft of drill rods, and

4 ¾-inch stabilizer (5ft).

As of this morning:

The $CaSO_4$ added to the grout mix as an accelerator counteracted with the hydration of the cement (due to the SO_4 ions, and to a lesser degree with cold water, cold cement, and cold ambient temperature) causing the grout to not set up. Sample collected has not set after 12 hours.

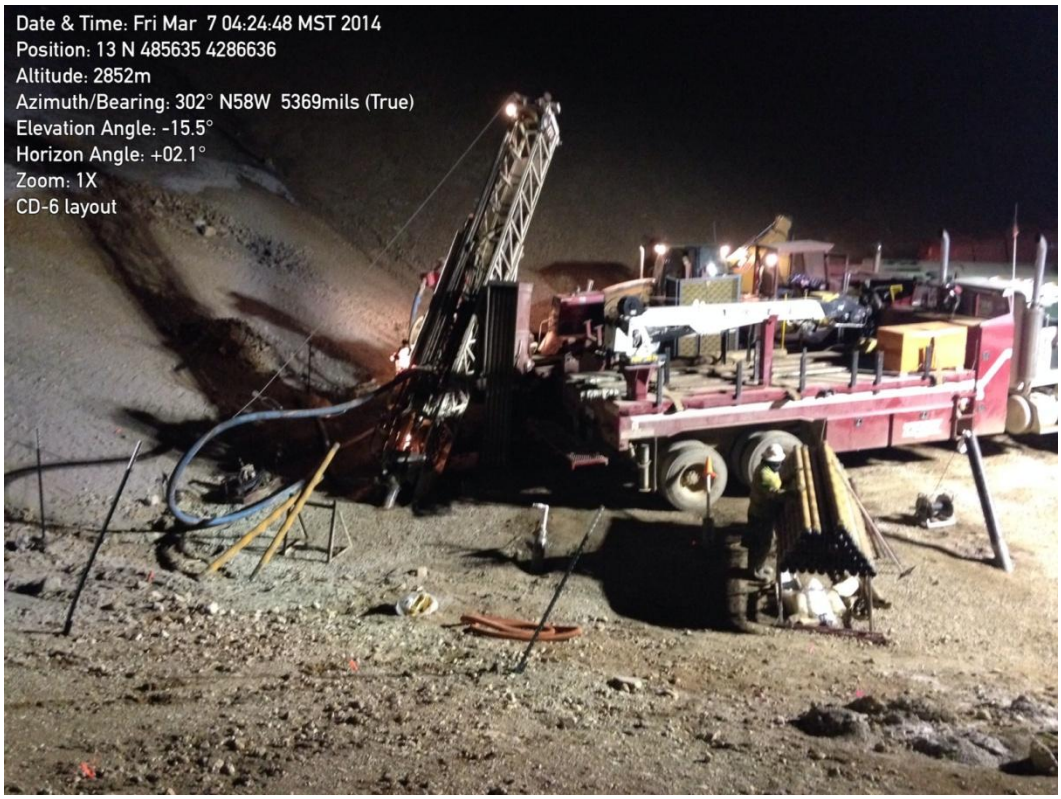
AK will add another batch of approx 30gal of grout (neat cement) by tremmie pipe to CD-5 and wait for it to set before grouting to the surface.

AK is advancing CD-6 to 200ft depth. A deviation survey was performed at 100ft depth. Deviation is 1° south (right) azimuth (136° design and 137° at 100ft), and +3° declination (45° design and 42° at 100ft).

Submitted by:
John Roberts, PG

Reviewed by: X
Timothy Burkhard
Submitted: Date: 03.07.2014

Daily Progress Photos:


Date & Time: Fri Mar 7 04:24:48 MST 2014
Position: 13 N 485635 4286636
Altitude: 2852m
Azimuth/Bearing: 302° N58W 5369mils (True)
Elevation Angle: -15.5°
Horizon Angle: +02.1°
Zoom: 1X
CD-6 layout

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.07.2014
Day: Friday

Temperature:
Low: 12° F
High: 36° F

Weather Conditions:
Cloud Cover: Overcast with Snow
Precipitation: >5-inches
Wind: 0 mph

AMEC Personnel On Site

John Roberts	11.5	Hrs
Matt Hartz	10.5	Hrs
Jessica Malone	7.5	Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: AK has not completed the abandonment of CD-5 as of the morning of 3.8.2014.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0100	AK prepared equipment to start drilling with the 5-inch bit BHA.
0100-0400	AK advanced CD-6 from 19 to 100ft depth at a rate of 30.3 ft/hr.
0330	Jessica Malone (AMEC) offsite. Matt Hartz remained to complete monitoring for his last shift.
0400-0430	AK performed a deviation survey at 100ft depth. Deviation is 1° south (right) azimuth (136° design and 137° at 100ft), and +3° declination (45° design and 42° at 100ft).
0430-0700	Advanced CD-6 from 100 to 200ft depth at a rate of 40.0 ft/hr.
0630	AMEC crew change.
0700-0745	AK performed a deviation survey at 200ft depth. Deviation is 3° south (right) azimuth (136° design and 139° at 200ft), and +3° declination (45° design and 42° at 200ft).
0745-1015	Advanced CD-6 from 200 to 300ft depth at a rate of 40.0 ft/hr.
1015-1100	AK performed a deviation survey at 300ft depth. Deviation is 4° south (right) azimuth (136° design and 140° at 300ft), and +2° declination (45° design and 43° at 300ft).
1100-1200	Advanced CD-6 from 300 to 340ft depth at a rate of 40.0 ft/hr.
1200	AK crew change.
1200-1330	AK night crew prepared to drill from 340.
1330-1530	Advanced CD-6 from 340 to 400ft depth at a rate of 30.0 ft/hr.
1530-1615	AK performed a deviation survey at 400ft depth. Deviation is 5° south (right) azimuth (136° design and 141° at 400ft), and +1° declination (45° design and 44° at 400ft).

1615-1730	Advanced CD-6 from 400 to 430ft depth at a rate of 24.0 ft/hr.
1730-1800	AK shut down drilling activities due to the rapid accumulation of snow (5-inches in approx. 2 hours). They are almost out of water and the road grades are too steep to safely drive the water truck back down to the rig, and with Ames gone, there is no one to help pull a pick up free if it can't drive the way out of the mine on the steep roads.
	AK tripped-out 60ft of rods and prepared the site for a temporary shutdown.
1800	All workers left the PSSA.

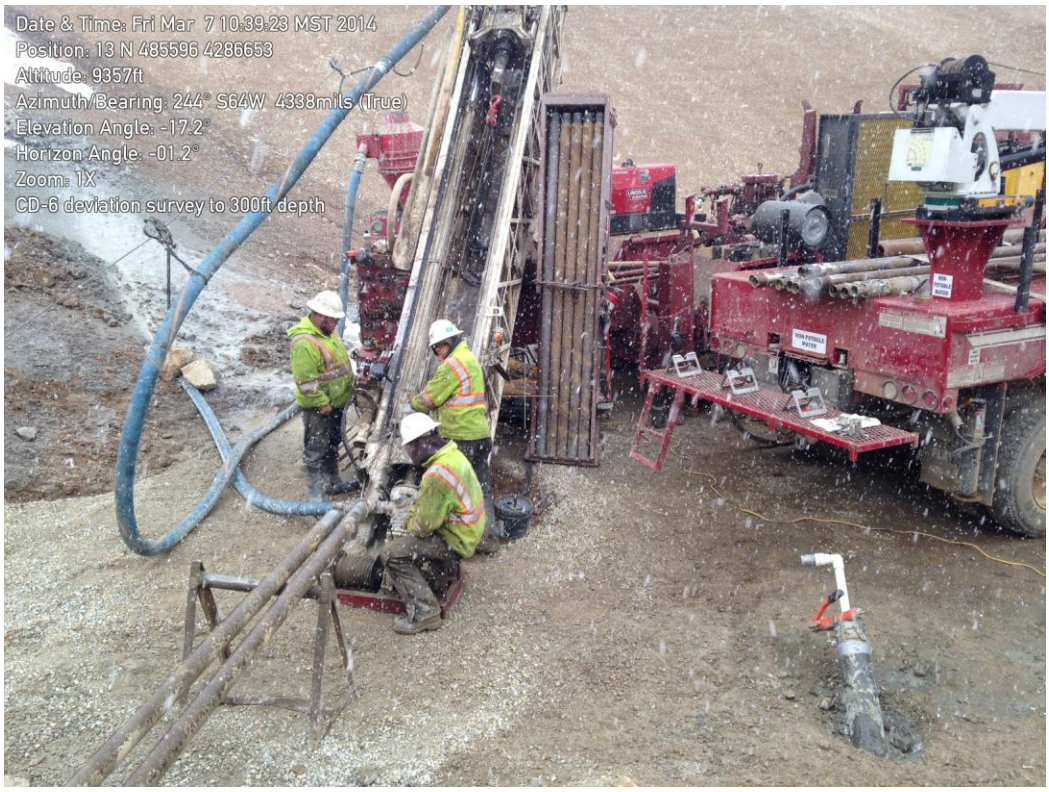
As of this morning:

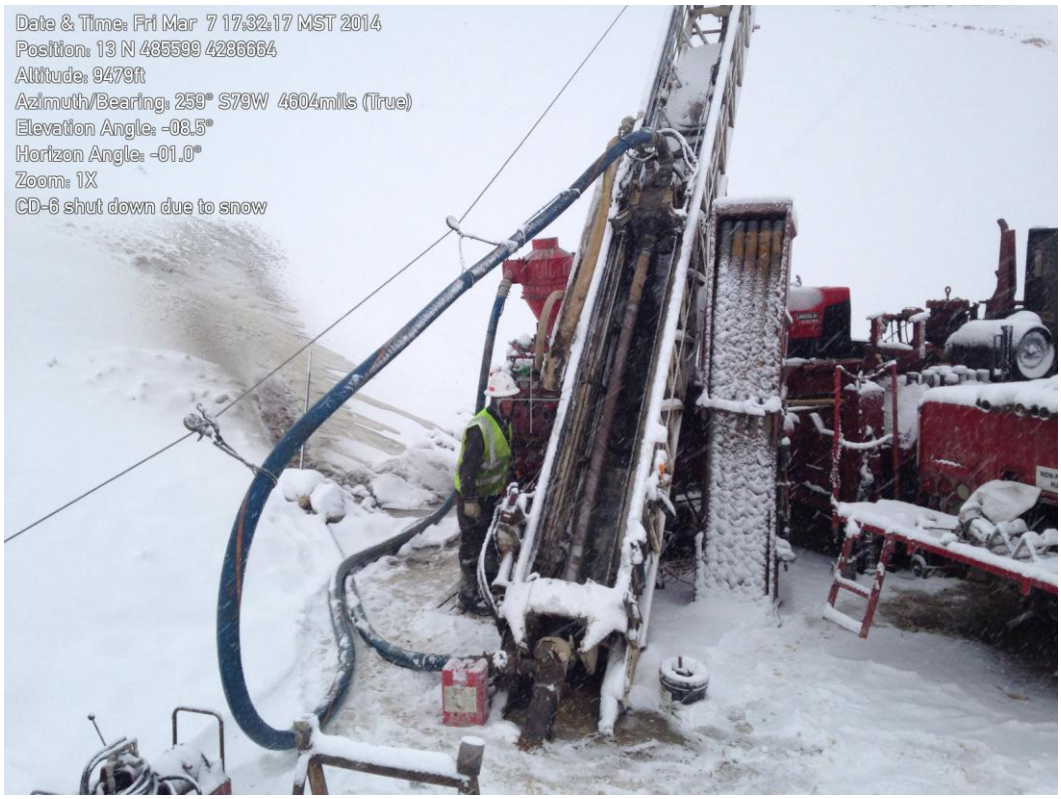
AK is waiting for the road to be cleared before they resume drilling CD-6 from 430ft depth.

Submitted by:
John Roberts, PG

Reviewed by: X
Timothy Burkhard
Submitted: Date: 03.08.2014

Daily Progress Photos:




Date & Time: Fri Mar 7 17:32:17 MST 2014
Position: 13 N 485599 4286664
Altitude: 9479ft
Azimuth/Bearing: 259° S79W 4604mils (True)
Elevation Angle: -08.5°
Horizon Angle: -01.0°
Zoom: 1X
CD-6 shut down due to snow

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.08.2014
Day: Saturday

Temperature:
Low: 19° F
High: 36° F

Weather Conditions:
Cloud Cover: Partly Cloudy
Precipitation: NA
Wind: ENE 5 mph

AMEC Personnel On Site

John Roberts	7.5	Hrs
Jessica Malone	9.5	Hrs
		Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0700	AK shutdown due to weather.
0700-1230	AK onsite to remove snow from the drill site and prepare the site for the night crew to continue advancing CD-6 from 430ft depth.
0830	John Roberts (AMEC) onsite.
1200	AK crew change
1230-1415	AK advanced CD-6 from 430 to 500 ft depth at a rate of 40 ft/hr.
1415-1530	AK performed a deviation survey to 500ft depth. Deviation is 7° south (right) azimuth (136° design and 143° at 500ft), and 0° declination (45° design and 45° at 500ft).
1530-1745	AK advanced CD-6 from 500 to 560 ft depth at a rate of 20 ft/hr.
1745-2000	Tripped-out of hole to check/change the bit. The foot clamp went out on the rig during the trip-out.
2000-2200	AK went to their lay-down area to look for parts to fix the foot clamp.
2200-2400	AK back at the rig. Tripped-in to 460ft depth before having to ream the hole back to bottom. AK did not reduce the bit size; they are still drilling a 5-inch hole.

As of this morning:

AK performed a deviation survey to 700ft depth. Deviation is 12° south (right) azimuth (136° design and 148° at 700ft), and 2° declination (45° design and 47° at 700ft). They are drilling CD-6 from 700ft depth with no diatreme breccia fragments yet observed in the return samples.

AK grouted CD-5 to the surface and cut the surface casing off below grade.

Submitted by:
John Roberts, PG

Reviewed by: X
Timothy Burkhard
Submitted: Date: 03.09.2014

Daily Progress Photos:

Photo 3. CD-5 was grouted to the surface and the casing was cut approximately 0.5ft below grade per Ames.

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.09.2014
Day: Sunday

Temperature:
Low: 25° F
High: 48° F

Weather Conditions:
Cloud Cover: Clear
Precipitation: NA
Wind: Calm to ENE 3 mph

AMEC Personnel On Site

John Roberts	12	Hrs
Jessica Malone	11.5	Hrs
		Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0130 AK advanced CD-6 from 560 to 600 ft depth at a rate of 80 ft/hr.

0130-0300 AK performed a deviation survey to 600ft depth. Deviation is 10° south (right) azimuth (136° design and 146° at 600ft), and 1° declination (45° design and 46° at 600ft).

Daylight Savings Time adjusted the clock from 0200 to 0300.

0300-0615 AK advanced CD-6 from 600 to 700 ft depth at a rate of 30.7 ft/hr.

0400-0600 AK completed the CD-5 abandonment with one batch of neat cement grout consisting of 20 bags (92.4lbs) of Type I/II Portland cement and 250gal of water. The casing was cut off 0.5ft below existing grade.

0615-0640 AK performed a deviation survey to 700ft depth. Deviation is 12° south (right) azimuth (136° design and 148° at 700ft), and 2° declination (45° design and 47° at 700ft).

0640-1000 Advanced CD-6 from 700 to 800 ft depth at a rate of 42.9 ft/hr.

0700 AMEC crew change.

1000-1045 AK performed a deviation survey to 800ft depth. Deviation is 15° south (right) azimuth (136° design and 151° at 800ft), and 4° declination (45° design and 49° at 800ft).

1045-1500 Advanced CD-6 from 800 to 900 ft depth at a rate of 23.5 ft/hr. No breccia has been observed in the samples. The last 20ft of drilling was very time consuming. AK considered tripping-out to check their bit.

1500-1730 AK attempted to perform a deviation survey to 900ft depth. The wench-line used to run the survey is not fast enough to get the gyro to each measurement interval (50ft in 20sec) deeper than 600ft. This survey did not reach the current hole depth of 900ft.

Elk Creek was called to come out and measure the deviation of CD-6 to 900ft depth.

1730-1815	Flushed hole with foam while waiting for Elk Creek to arrive.
1815-1950	Elk Creek performed a deviation survey to 900ft depth. Deviation is 20° south (right) azimuth (136° design and 156° at 900ft), and 5° declination (45° design and 50° at 900ft).
	AMEC crew change.
1950-2400	Advanced CD-6 from 900 to 975 ft depth at a rate of 34.6 ft/hr.

As of this morning:

At 0350 the diatreme was penetrated at 1040ft depth. The hole was advanced to 1090ft depth, where it was called for TD. Elk creek is performing the final deviation survey. AK will trip-out the drill string and trip-in the drain PVC. AMEC will conduct a constant and falling head test.

AK will set up over CD-7 and continue as planned.

Submitted by:
John Roberts, PG

Reviewed by: X
Timothy Burkhard
Submitted: Date: 03.10.2014

Daily Progress Photos:

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.10.2014
Day: Monday

Temperature:
Low: 25° F
High: 48° F

Weather Conditions:
Cloud Cover: Partly Sunny
Precipitation: NA
Wind: NW 6 mph

AMEC Personnel On Site

John Roberts	12.5	Hrs
Jessica Malone	13	Hrs
		Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0550	AK advanced CD-6 from 975 to 1090ft depth at a rate of 19.7 ft/hr. The hole was called TD at 1090ft depth.
	AK did not perform a deviation survey at 1000ft depth due to the wire-line being too slow to meet the tool's software requirements during surveying. They planned to have Elk Creek perform the survey. The survey was not performed as AK was worried their tooling might get locked down-hole by cuttings between the two stabilizers.
0350	The diatreme was fully penetrated at 1040ft depth.
0550-0715	Wait for Elk Creek to arrive for the final deviation survey. AK flushed hole.
0715-0845	Elk Creek performed a deviation survey to 1030ft depth. Deviation is 24° south (right) azimuth (136° design and 160° at 1030ft), and 8° declination (45° design and 53° at 1030ft).
0845-1500	AK tripped-out of CD-6, filled both water trucks and got drain supplies from their staging area.
1500-1615	Trip-in drain PVC, 2-inch end cap, 30lf of 0.030 slotted screen and 1060lf of sch. 80 riser pipe.
1615-1710	The PVC was tripped-in to 1046ft depth before hitting refusal. CD-6 had to experience 44ft of cave in the bottom of the hole.
1710-1940	Trip-out PVC.
1940-2220	Trip-in drill string to 1046ft depth before encountering resistance. AK began to clean the hole.
2220-2315	Cleaned hole back to TD (1090ft).

2315-2400 AK continued to clean hole through crew change before tripping-out drill string.

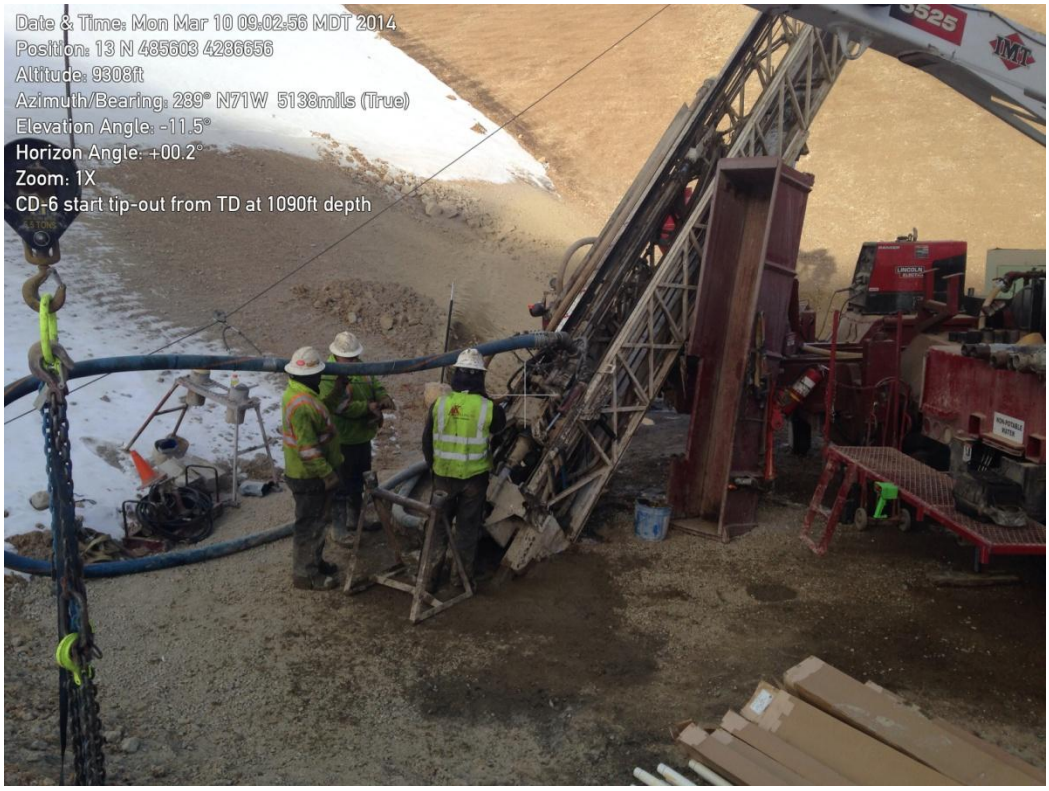
As of this morning:

At 0630 AK lost 990ft of PVC down the hole during installation due to operator error. AK is going to attempt to get a second string of PVC to TD and complete the drain. If the PVC does not reach TD, then AK will trip-out the newly installed PVC and drill-out the lost PVC.

Submitted by:
John Roberts, PG

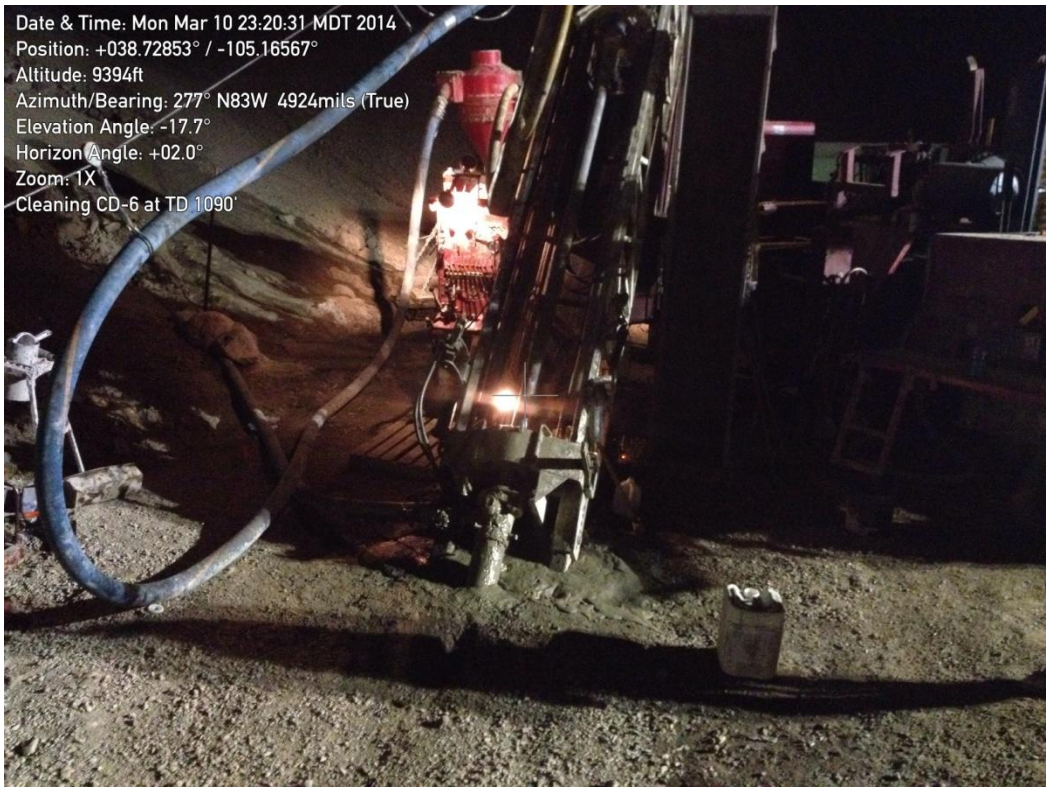
Reviewed by: X
Timothy Burkhard
Submitted: Date: 03.11.2014

Daily Progress Photos:




Date & Time: Mon Mar 10 14:20:31 MDT 2014
Position: 13 N 484959 4288412
Altitude: 9532ft
Azimuth/Bearing: 296° N64W 5262mils (True)
Elevation Angle: -17.9°
Horizon Angle: -01.4°
Zoom: 1X
finished trip-out of CD-6


Date & Time: Mon Mar 10 14:50:32 MDT 2014
Position: 13 N 485596 4286662
Altitude: 9312ft
Azimuth/Bearing: 292° N68W 5191mils (True)
Elevation Angle: -17.3°
Horizon Angle: -00.1°
Zoom: 1X
installing CD-6 drain PVC


Date & Time: Mon Mar 10 23:20:31 MDT 2014
Position: +038.72853° / -105.16567°
Altitude: 9394ft
Azimuth/Bearing: 277° N83W 4924mils (True)
Elevation Angle: -17.7°
Horizon Angle: +02.0°
Zoom: 1X
Cleaning CD-6 at TD 1090'

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.11.2014
Day: Tuesday

Temperature:
Low: 9° F
High: 32° F

Weather Conditions:
Cloud Cover: Partly Sunny to Overcast
Precipitation: <1-inch snow
Wind: W 5 to 10 mph

AMEC Personnel On Site

John Roberts	13.5	Hrs
Jessica Malone	10	Hrs
Matt Hartz	9	Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0100	AK cleaned out hole through crew change
0100-0430	Trip-out drill string.
0430-0630	Install CD-6 drain PVC.
0630-0800	AK lost 990lf of PVC down the hole due to an error while tripping-in. The decision was made by AK to attempt to get a new string of PVC beside the lost string down to TD. If the PVC does not reach TD, then AK will trip-out the newly installed PVC and drill-out the lost PVC. Jessica Malone offsite. This ends her current temporary duty of covering for Matt Hartz.
0800-1000	Trip-in new PVC drain material for CD-6.
1000-1058	Set up for hydro testing.
1058-1110	Gravity fed 1217gal of water into CD-6 before filling the borehole.
1110-1115	Attempted to perform a constant head test. The Bean pump was operating at maximum output (16gpm) and it was unsuccessful in bringing the water back to the top-of-casing.
1115-1117	Shutdown the Bean pump and opened up the valve to gravity feed water back to the top-of-casing to perform a falling head test. Once this test began (<1minute to fill the borehole) there was discussion about getting fittings to hook the flow meter up to the 2-inch line from the water truck, and conducting the constant head test by gravity feeding water to CD-6.
1117-1323	AK sourced fittings for the flow meter and hooked up the equipment for the hydro test.
13231343	Filled CD-6 with water for testing.

1343-1354	Performed constant head test no. 1. We had to abandon the test after 11 minutes due to blasting. The average gpm was 27.8 and the range was 27.5 to 28.4.
1354-1419	Left site for blast.
1419-1446	Filled CD-6 with water for testing.
1446-1459	Performed constant head test no. 2. We had to abandon the test after 13 minutes due to running out of water on the truck. AK left to get water for both trucks. The average gpm was 36.2 and the range was 35.3 to 40.8.
1459-1655	AK got water for the third constant head test and drilling CD-7.
1655-1725	Started logging the transducer and filled CD-6 for constant head test no.3.
1725-1741	Attempted to run constant head test no.3. With the 2" centrifugal pump running at 45gpm we were unable to keep the head of water at the top-of-casing. CD-6 was filled with water to run a falling head test.
1741-1845	Ran the falling head test in CD-6.
	Matt Hartz onsite.
1845-2130	Placed centralizers and shale basket (12ft bgs) on the CD-6 drain, but did not grout it in the casing. AK worked on the sump location and CD-7 area before setting the rig over CD-7 at 45°, 140°.
2130-2400	Advanced casing to 18.5ft depth.

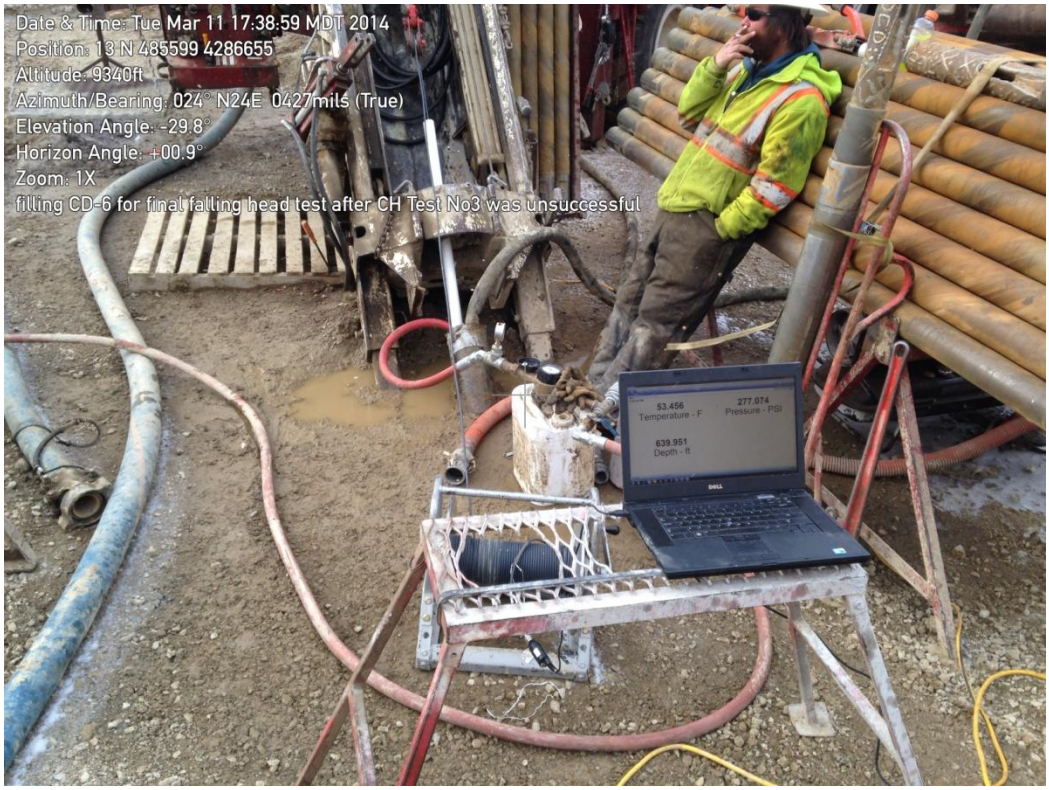
As of this morning:

The casing required a 10ft extension, and advanced to approximately 29ft depth. They are preparing to begin drilling CD-7.

Submitted by:
John Roberts, PG

Reviewed by: X
Timothy Burkhard
Submitted: Date: 03.12.2014

Daily Progress Photos:




Date & Time: Tue Mar 11 19:08:53 MDT 2014
Position: 13 N 485598 4286655
Altitude: 9433ft
Azimuth/Bearing: 003° N03E 0053mils (True)
Elevation Angle: -19.9°
Horizon Angle: -00.3°
Zoom: 1X
installing shale basket (12ft bgs) and centralizers on CD-6


Date & Time: Tue Mar 11 21:32:20 MDT 2014
Position: 13 N 485613 4286644
Altitude: 2833m
Azimuth/Bearing: 001° N01E 0018mils (True)
Elevation Angle: -18.6°
Horizon Angle: +00.5°
Zoom: 1X
CD-7 alignment

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.12.2014
Day: Wednesday

Temperature:
Low: 12° F
High: 36° F

Weather Conditions:
Cloud Cover: Sunny
Precipitation: NA
Wind: WNW 7 mph

AMEC Personnel On Site

John Roberts	12.5	Hrs
Matt Hartz	12.5	Hrs
		Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0510	AK worked on solving their lighting issues, retrieving more surface casing from their staging area, and welding the extension on to the previously advanced CD-7 casing. The final depth of casing is 28.5 ft. Bedrock was penetrated at 23ft depth.
0510-0715	AK set up equipment to begin advancing CD-7.
	AMEC crew change.
0715-0930	Advanced CD-7 from 28.5 to 55ft depth at a rate of 11.8 ft/hr.
0930-1015	AK tripped-out the drill string to replace a broken foot-valve on the bit. This valve is what makes the hammer fire, and it the reason why they had such a slow penetration rate.
	The BHA consists of the bit-hammer-interchange (7ft), a 5-inch stabilizer (5ft), 25ft of drill rods, and a second 5-inch stabilizer (5ft). The total length is 42ft.
1015-1145	Advanced CD-7 from 55 to 100ft depth at a rate of 30.0 ft/hr.
1145-1215	Down for Ames blasting and crew change.
1215-1300	AK night crew completed paperwork and prepared to survey CD-7.
1300-1400	AK performed a deviation survey to 100ft depth. Deviation is 2° south (right) azimuth (140° design and 142° at 100ft), and +1° declination (45° design and 44° at 100ft).
1400-1430	Advanced CD-7 from 100 to 140ft depth at a rate of 20.0 ft/hr.
1430-1715	The drill rig hydraulic system was down for repair; there was no power to raise the head to add rods to the drill string.
1715-1815	Advanced CD-7 from 140 to 200ft depth at a rate of 60.0 ft/hr.

1815-1845	AK performed a deviation survey to 200ft depth. Deviation is 3° south (right) azimuth (140° design and 143° at 200ft), and 1° declination (45° design and 46° at 200ft).
1845-2015	Advanced CD-7 from 200 to 300ft depth at a rate of 66.7 ft/hr.
2015-2045	AK performed a deviation survey to 300ft depth. Deviation is 4° south (right) azimuth (140° design and 144° at 300ft), and 2° declination (45° design and 47° at 300ft).
2045-2230	Advanced CD-7 from 300 to 380ft depth at a rate of 45.7 ft/hr.
2230-2400	AK tripped out of the hole to inspect the BHA as the hammer wouldn't fire. The foot-valve was replaced, and AK tested the hammer at the surface for proper function before tripping-in to bottom.

As of this morning:

At 0225 the rig broke down at 420ft depth with similar hydraulic problems as 3.12.2014. AK called their mechanic to come to site. The mechanic arrived at 0610 and began to diagnose the problem.

Submitted by:
John Roberts, PG

Reviewed by: X
Timothy Burkhard
Submitted: Date: 03.13.2014

Daily Progress Photos:


Date & Time: Thu Mar 13 04:37:29 MDT 2014
Position: 13 N 485596 4286655
Altitude: 2851m
Azimuth/Bearing: 010° N10E 0178mils (True)
Elevation Angle: -16.9°
Horizon Angle: -00.3°
Zoom: 1X
CD-7 checking hydraulic pump


Date & Time: Thu Mar 13 05:16:25 MDT 2014
Position: 13 N 485622 4286694
Altitude: 2840m
Azimuth/Bearing: 209° S29W 3716mils (True)
Elevation Angle: -52.8°
Horizon Angle: -02.9°
Zoom: 1X
CD-7 broken foot valve. 380'

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.13.2014
Day: Thursday

Temperature:
Low: 18° F
High: 43° F

Weather Conditions:
Cloud Cover: Sunny
Precipitation: NA
Wind: WNW 7 mph

AMEC Personnel On Site

John Roberts	10.5	Hrs
Matt Hartz	12	Hrs
		Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: An unknown amount of hydraulic oil was released onto the ground in several areas around the drill rig during repairs. Buckets and diapers were used to try and minimize the amount that came in contact with the ground. The drilling returns sump water has been impacted by oil running from the power pack/controls into it. The runoff from the snow on the VLF south slope is increasing the amount of impacted water in the sump that will need proper disposal.

The photos attached show the progression throughout the day of oil on the ground, diapers soaking up some product at the surface, and oil on the ground with some stained soils.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0125	AK crew change. Trip-in drill string to 380ft depth and advanced CD-7 to 400ft depth.
0125-0200	AK performed a deviation survey to 400ft depth. Deviation is 5° south (right) azimuth (140° design and 145° at 400ft), and 4° declination (45° design and 49° at 400ft).
0200-0225	AK advanced CD-7 from 400 to 420ft depth at a rate of 48 ft/hr.
0225-0610	The hydraulic system on the drill rig went out again causing the head to lose the power to lift.
0610-0710	AK's mechanic arrived onsite and began to diagnose the problem.
1030	AMEC observed an unknown volume of hydraulic oil on the ground around the drill collar, under the controls/power-pack, and running along the surface to the drilling returns sump. We mentioned to AK that this will need to be cleaned after maintenance is complete, and not to move wastes from the drilling returns sump to the "permanent sump" just up the north slope from the bottom of the PSSA.
1130	Ames (Eric Marolf & Safety) and CC&V (Jeff Gaul and Ron DiDonato) were informed about the release.

1600	AK's driller, Joe, informed AMEC that the hydraulic pump was removed from the rig, and a new one is being shipped overnight to the site. In the meantime, AK will put the old pump back on and run some tests on the rig per Tony King. AK will call AMEC if drilling resumes due to successful tests on the drill rig. The diapers placed on the ground to soak up some of the hydraulic oil were picked up. Standing hydraulic oil was observed on the ground, in the soil, and in the channel to the drill returns sump after the diapers were removed. Another release to the ground was observed under the hydraulic oil tank where the pump was removed.
1910-2100	AK advanced CD-7 from 420 to 500ft depth at a rate of 43.7 ft/hr.
2100-2125	AK performed a deviation survey to 500ft depth. Deviation is 6° south (right) azimuth (140° design and 146° at 500ft), and 5° declination (45° design and 50° at 500ft).
2145	AK moved two (2) loads of impacted water from the drill returns sump to the sump located above the PSSA north slope. The driller was to avoid moving the impacted material around by AMEC at 1555 by phone.
2125-2350	AK advanced CD-7 from 500 to 600ft depth at a rate of 41.4 ft/hr.
2350-2400	AK set up to run a survey

As of this morning:

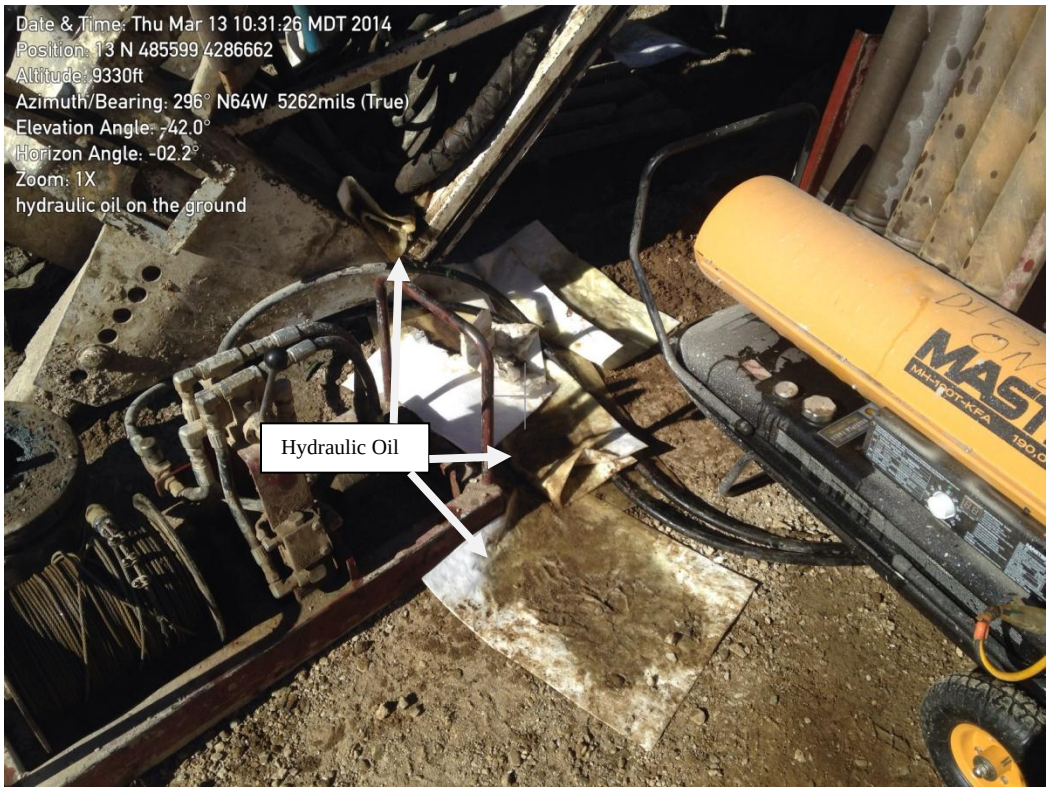
At 0400 a deviation survey was completed by AK at 700ft depth. The attitude of the borehole at depth was measured at 51°, 151°. The deviation here is 6°, 11° for declination, azimuth.

AK is currently advancing CD-7 to 800ft depth where they will perform another deviation survey.

Submitted by:
John Roberts, PG

Reviewed by: X _____
Timothy Burkhard
Submitted: Date: 03.14.2014

Daily Progress Photos:




Date & Time: Thu Mar 13 10:32:31 MDT 2014
Position: 13 N 485592 4286665
Altitude: 9347ft
Azimuth/Bearing: 339° N21W 6027mils (True)
Elevation Angle: -37.7°
Horizon Angle: -04.2°
Zoom: 1X
hydraulic oil on the ground running into the sump
Hydraulic Oil


Date & Time: Thu Mar 13 13:12:20 MDT 2014
Position: 13 N 485600 4286662
Altitude: 9240ft
Azimuth/Bearing: 214° S34W 3804mils (True)
Elevation Angle: -58.2°
Horizon Angle: -06.5°
Zoom: 1X
hydraulic oil on the ground running into the sump


Hydraulic Oil
Date & Time: Thu Mar 13 13:12:38 MDT 2014
Position: 13 N 485591 4286664
Altitude: 9343ft
Azimuth/Bearing: 216° S36W 3840mils (True)
Elevation Angle: -80.1°
Horizon Angle: -87.1°
Zoom: 1X
hydraulic oil


Date & Time: Thu Mar 13 13:13:04 MDT 2014
Position: 13 N 485594 4286663
Altitude: 9334ft
Azimuth/Bearing: 105° S75E 1867mils (True)
Elevation Angle: -42.3°
Horizon Angle: -12.7°
Zoom: 1X
hydraulic oil
Hydraulic Oil


Date & Time: Thu Mar 13 13:13:13 MDT 2014
Position: 13 N 485594 4286663
Altitude: 9334ft
Azimuth/Bearing: 081° N81E 1440mils (True)
Elevation Angle: -32.2°
Horizon Angle: -06.9°
Zoom: 1X
hydraulic oil
Hydraulic Oil


Date & Time: Thu Mar 13 15:37:43 MDT 2014
Position: 13 N 485596 4286660
Altitude: 9390ft
Azimuth/Bearing: 027° N27E 0480mils (True)
Elevation Angle: -52.4°
Horizon Angle: +00.3°
Zoom: 1X
hydraulic oil on the ground under the mast
Standing hydraulic oil

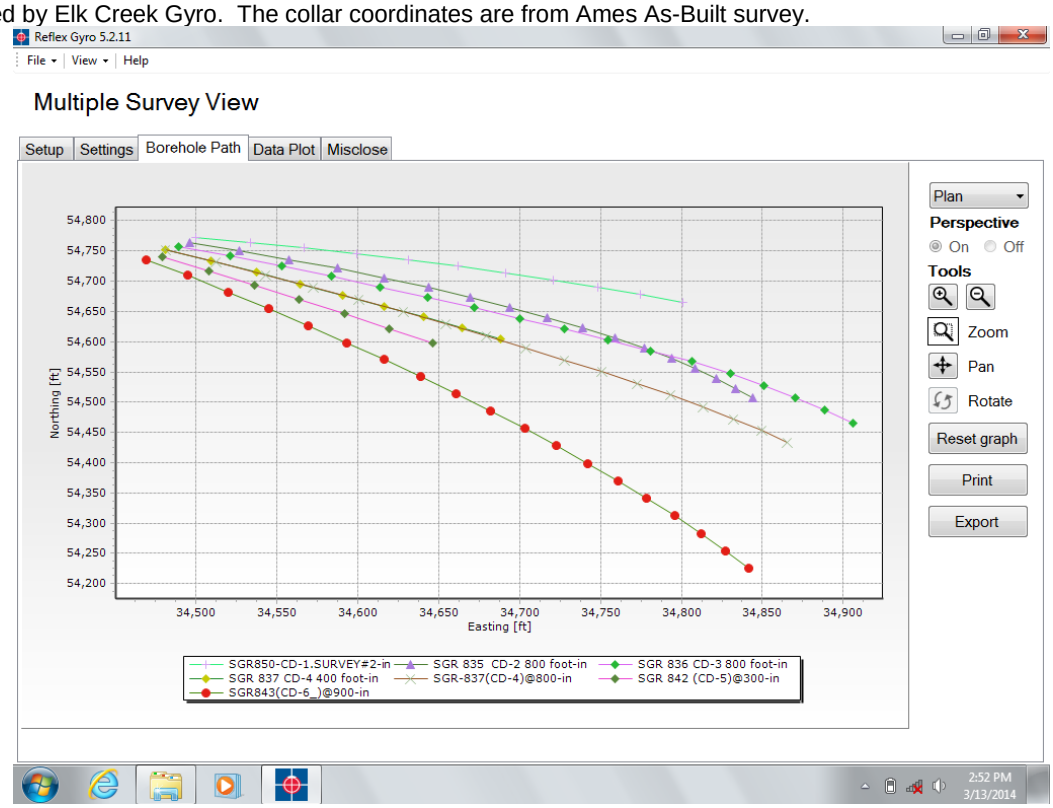

Date & Time: Thu Mar 13 15:38:10 MDT 2014
Position: 13 N 485591 4286665
Altitude: 9372ft
Azimuth/Bearing: 083° N83E 1476mils (True)
Elevation Angle: -41.0°
Horizon Angle: -02.1°
Zoom: 1X
hydraulic oil on the ground under the mast
Hydraulic Oil

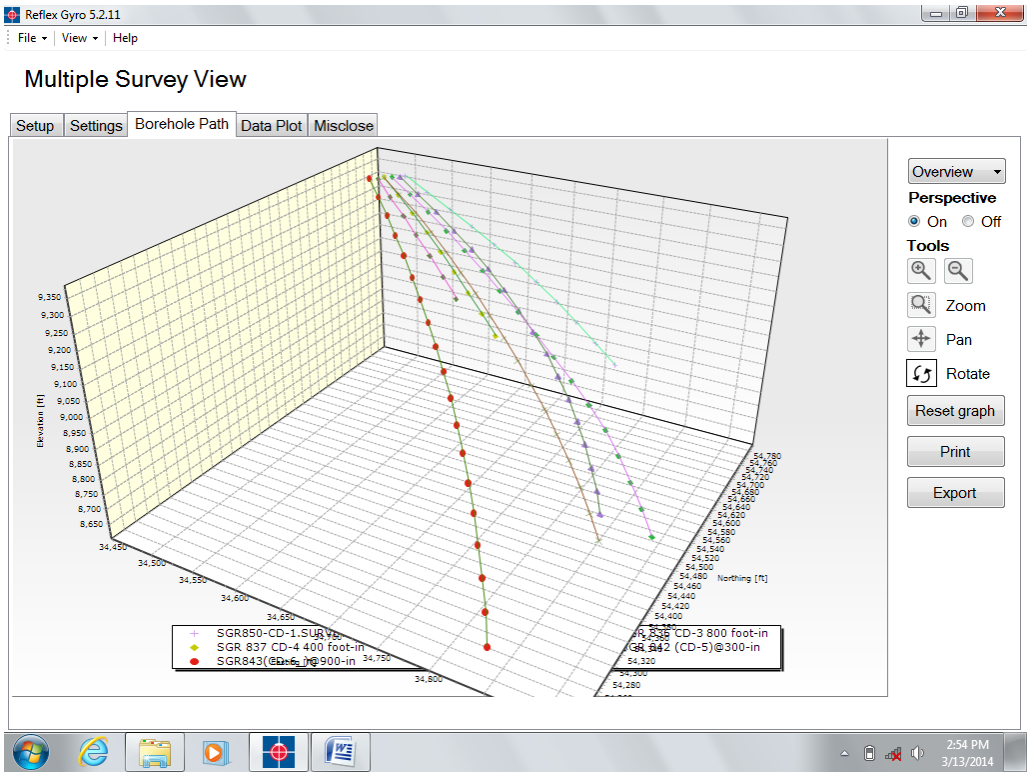

Date & Time: Thu Mar 13 15:38:47 MDT 2014
Position: 13 N 485592 4286666
Altitude: 9363ft
Azimuth/Bearing: 095° S85E 1689mils (True)
Elevation Angle: -35.3°
Horizon Angle: +00.4°
Zoom: 1X
hydraulic oil on the ground in path to sump
Standing hydraulic oil

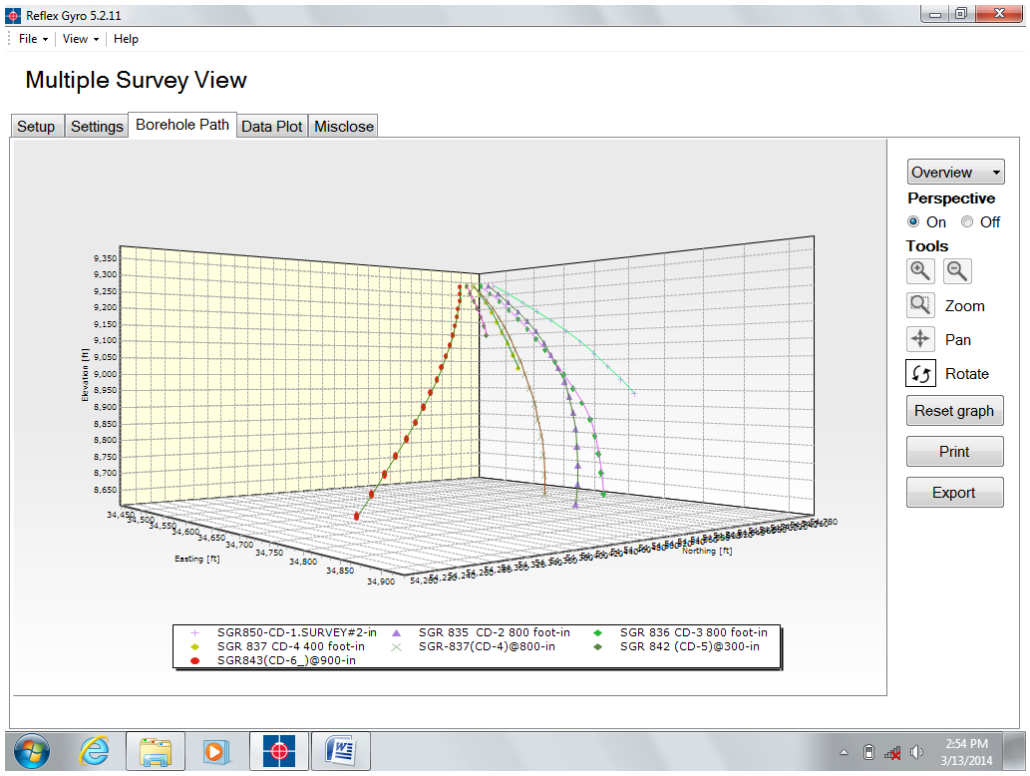

Date & Time: Thu Mar 13 15:39:56 MDT 2014
Position: 13 N 485592 4286665
Altitude: 9369ft
Azimuth/Bearing: 105° S75E 1867mils (True)
Elevation Angle: -41.8°
Horizon Angle: -04.0°
Zoom: 1X
hydraulic oil on the ground under the controls
Hydraulic oil

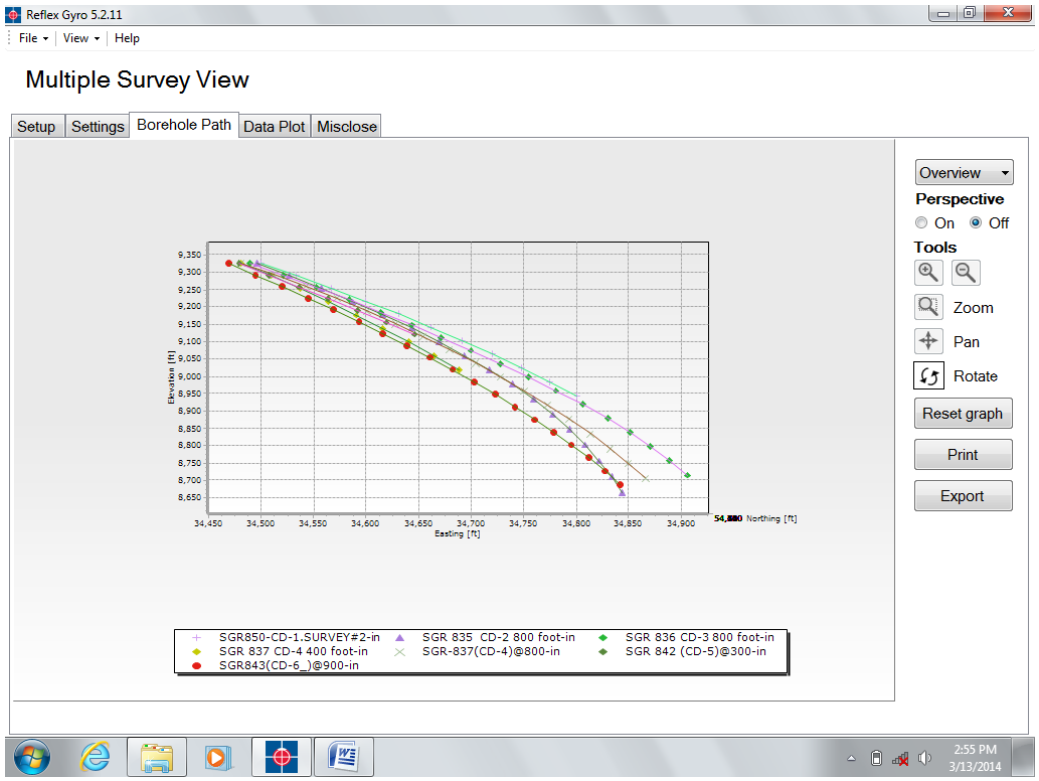

Date & Time: Thu Mar 13 15:41:08 MDT 2014
Position: 13 N 485595 4286674
Altitude: 9353ft
Azimuth/Bearing: 101° S79E 1796mils (True)
Elevation Angle: -46.5°
Horizon Angle: -00.5°
Zoom: 1X
hydraulic oil on the ground under the tank
Hydraulic oil

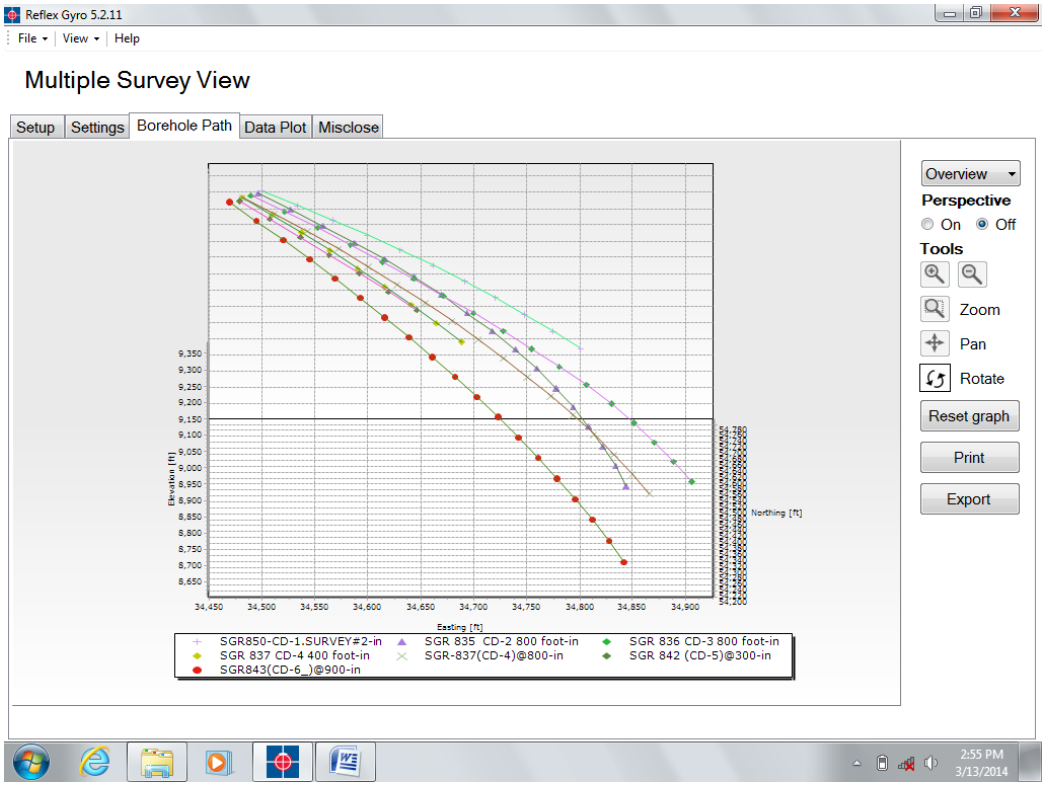
Reflex software showing borehole deviation paths for CD-1, 2, 3, 4, 4a, 5, and 6. This is from AK's final survey and is for information purposes only. They to no show TD of the boreholes and do not represent the AS-Built surveys completed by Elk Creek Gyro. The collar coordinates are from Ames As-Built survey.




Reflex Gyro 5.2.11
File
View
Help
Multiple Survey View
Setup
Settings
Borehole Path
Data Plot
Misclose
Overview
Perspective
On
Off
Tools
Zoom
Pan
Rotate
Reset graph
Print
Export
Elevation [ft]
Northing [ft]
SGR850-CD-1.SURVEY#2-in
SGR 837 CD-4 400 foot-in
SGR843(CD-6_)@900-in
SGR 835 CD-2 800 foot-in
SGR-837(CD-4)@800-in
SGR 836 CD-3 800 foot-in
SGR 842 (CD-5)@300-in
2:54 PM
3/13/2014


Reflex Gyro 5.2.11
File
View
Help
Multiple Survey View
Setup
Settings
Borehole Path
Data Plot
Misclose
Overview
Perspective
On
Off
Tools
Zoom
Pan
Rotate
Reset graph
Print
Export
Elevation [ft]
Easting [ft]
Northing [ft]
SGR850-CD-1.SURVEY#2-in
SGR 837 CD-4 400 foot-in
SGR843(CD-6_)@900-in
SGR 835 CD-2 800 foot-in
SGR-837(CD-4)@800-in
SGR 836 CD-3 800 foot-in
SGR 842 (CD-5)@300-in
2:54 PM
3/13/2014


Reflex Gyro 5.2.11
File
View
Help
Multiple Survey View
Setup
Settings
Borehole Path
Data Plot
Misclose
Overview
Perspective
On
Off
Tools
Zoom
Pan
Rotate
Reset graph
Print
Export
Elevation [ft]
Easting [ft]
Northing [ft]
SGR850-CD-1.SURVEY#2-in
SGR 835 CD-2 800 foot-in
SGR 836 CD-3 800 foot-in
SGR 837 CD-4 400 foot-in
SGR-837(CD-4)@800-in
SGR 842 (CD-5)@300-in
SGR843(CD-6_)@900-in
2:55 PM
3/13/2014


Reflex Gyro 5.2.11
File
View
Help
Multiple Survey View
Setup
Settings
Borehole Path
Data Plot
Misclose
Overview
Perspective
On
Off
Tools
Zoom
Pan
Rotate
Reset graph
Print
Export
Elevation [ft]
Easting [ft]
Northing [ft]
SGR850-CD-1.SURVEY#2-in
SGR 835 CD-2 800 foot-in
SGR 836 CD-3 800 foot-in
SGR 837 CD-4 400 foot-in
SGR-837(CD-4)@800-in
SGR 842 (CD-5)@300-in
SGR843(CD-6_)@900-in
2:55 PM
3/13/2014

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.14.2014
Day: Friday

Temperature:
Low: 21° F
High: 41° F

Weather Conditions:
Cloud Cover: Partly Cloudy
Precipitation: NA
Wind: WNW 3 mph

AMEC Personnel On Site

John Roberts	12.5	Hrs
Matt Hartz	15.5	Hrs
		Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: AK has moved a total of 16 (two in the evening of 3.13.2014) bucket loads (loader bucket) of their back-hoe of the potentially impacted material in the drill returns sump and moved it to the "permanent" sump just up the north slope from the drill.

Detailed logging of the Closure Drain holes was completed by CC&V's exploration geologist, Allie Stern. Her classification of the rock types has drain CD-3 terminated in Precambrian quartz monzonite. Diatreme breccia was encountered from 780 to 785ft depth.

Scott McAnally (CC&V's exploration geologist) and AMEC observed traces of the breccia at 790ft depth and believed to have been fully penetrated in the diatreme at 825ft depth (AMEC Daily Report 2.25.2014). Scott commended Allie's knowledge of the formations and mineral assemblages and completely trusts her classification.

Beginning on 3.15.2014, AK Drilling will be working single shifts from noon to midnight. On 3.21.2014 work will return to a 24/7 schedule.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0015	AK crew change. Day crew completed the 600ft depth deviation survey. Deviation is 10° south (right) azimuth (140° design and 150° at 600ft), and 5° declination (45° design and 50° at 600ft).
0015-0315	AK advanced CD-7 from 600 to 700ft depth at a rate of 33.3 ft/hr. Driller indicated fractures from 610 to 620ft depth.
0315-0400	AK performed a deviation survey to 700ft depth. Deviation is 11° south (right) azimuth (140° design and 151° at 700ft), and 6° declination (45° design and 51° at 700ft).
0400-0745	AK advanced CD-7 from 700 to 800ft depth at a rate of 26.7 ft/hr.
0745-0820	AK performed a deviation survey to 800ft depth. Deviation is 14° south (right) azimuth (140° design and 154° at 800ft), and 9° declination (45° design and 54° at 800ft).

0820	AK moved three (3) buckets of potentially impacted material from the drill returns sump to the “permanent” sump.
0820-0930	AK advanced CD-7 from 800 to 840ft depth at a rate of 34.3 ft/hr.
0930-1030	AK was out of water and drilling was down waiting for the truck to return.
1030-1140	AK advanced CD-7 from 840 to 880ft depth at a rate of 34.3 ft/hr.
1140-1430	AK crew change. The night crew performed rig maintenance before resuming drilling activities from 880ft depth. The day crew has left site for days off, and will return to work on 3.21.2014.
1430-1500	Conditioned hole before drilling again.
1500-1530	AK advanced CD-7 from 880 to 900ft depth at a rate of 10.0 ft/hr.
1530-1630	AK performed a deviation survey to 900ft depth. Deviation is 16° south (right) azimuth (140° design and 156° at 900ft), and 11° declination (45° design and 56° at 900ft).
1630-2130	AK advanced CD-7 from 900 to 980ft depth at a rate of 16.0 ft/hr. AK was down for approximately 30min to clear cuttings from their air-bypass line.
1830	AK moved five (5) loads of cuttings and drill returns from the drill sump to the “permanent” sump. Hydraulic oil was observed on the ground in the immediate area of the sump.
2100	AK moved six (6) loads of cuttings and drill returns from the drill sump to the “permanent” sump.
2130-2215	AK stopped drilling to tighten up their swivel and grease it to try and prevent leakage.
2215-2325	AK advanced CD-7 from 980 to 1000ft depth at a rate of 17.1 ft/hr.
2325-0010	AK performed a deviation survey to 950ft depth. Deviation is 21° south (right) azimuth (140° design and 161° at 950ft), and 12° declination (45° design and 57° at 950ft). AK is unable to perform deviation surveys below 950ft depth at this time as they are limited by the length of wire-line cable onsite. Elk Creek will be called in to perform any further deviation surveys until sufficient cable length becomes available.

As of this morning:

After the deviation survey, AK tripped out 100ft of rods before shutting down for the night at 0030. Drilling activities will continue at noon on 3.15.2014.

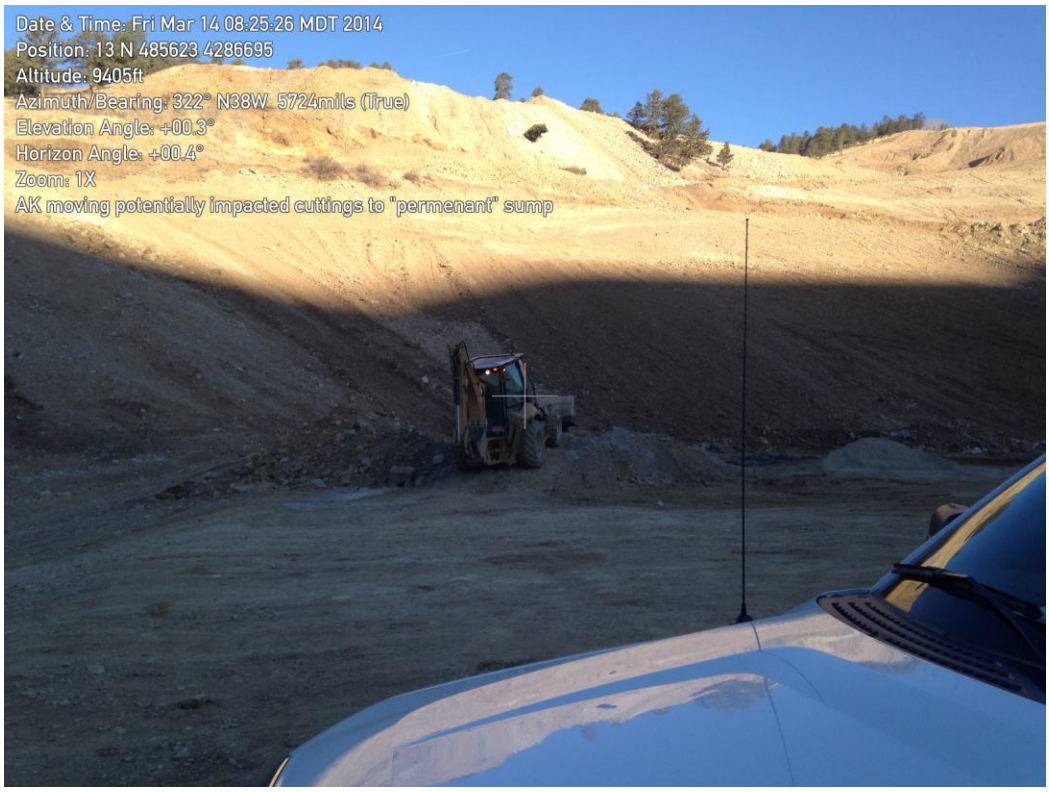
AK will be working in single shifts running from noon to midnight through Friday, 3.21.2014. Work will resume on a 24/7 schedule on Saturday, 3.22.2014 at midnight.

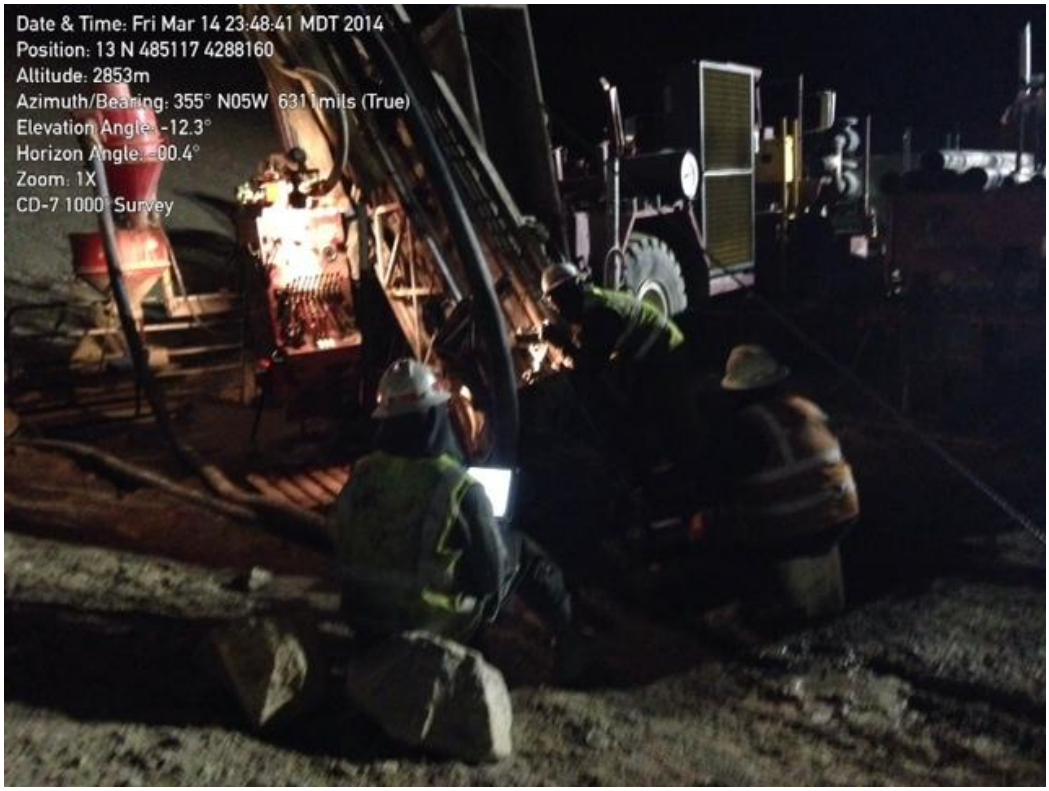
At 0100, Matt Hartz left site for Denver, and will return on 3.21.2014 to monitor activities nightshift when 24/7 operations continue. Matt’s hours at the top of this report reflect his time onsite until 0100 and his travel back to Denver.

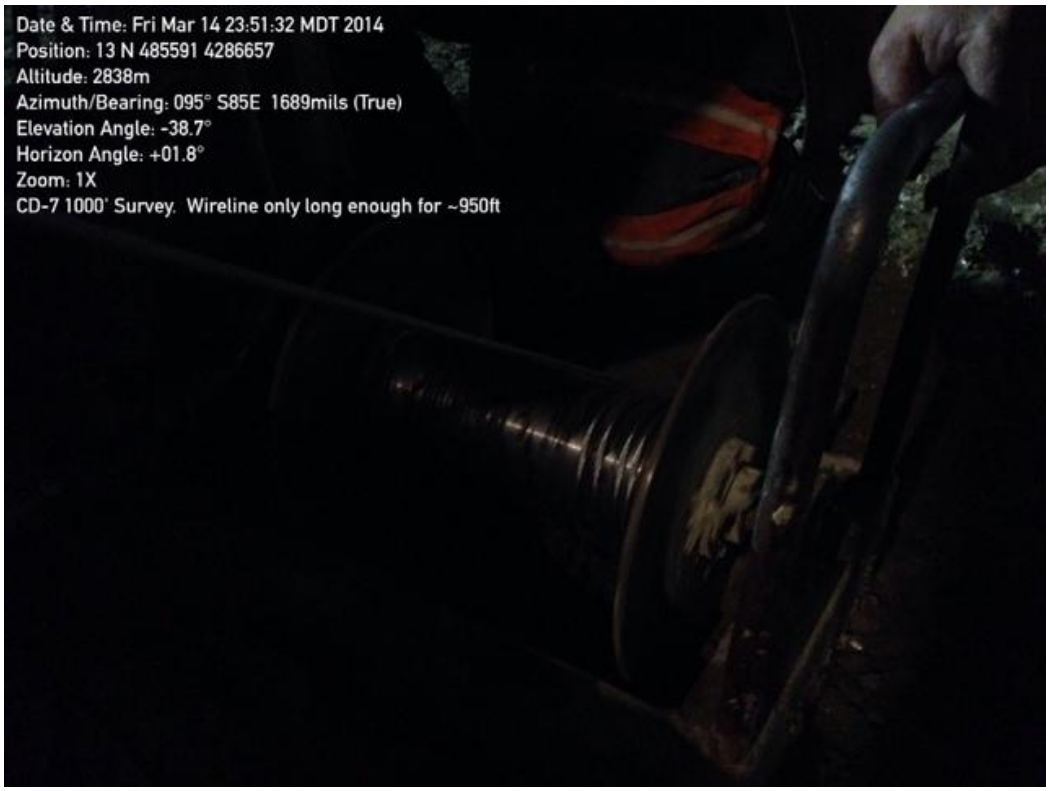
Submitted by:
John Roberts, PG

Reviewed by: X
Timothy Burkhard
Submitted: Date: 03.15.2014

Daily Progress Photos:




Date & Time: Fri Mar 14 23:48:41 MDT 2014
Position: 13 N 485117 4288160
Altitude: 2853m
Azimuth/Bearing: 355° N05W 6311mils (True)
Elevation Angle: -12.3°
Horizon Angle: -00.4°
Zoom: 1X
CD-7 1000' Survey


Date & Time: Fri Mar 14 23:51:32 MDT 2014
Position: 13 N 485591 4286657
Altitude: 2838m
Azimuth/Bearing: 095° S85E 1689mils (True)
Elevation Angle: -38.7°
Horizon Angle: +01.8°
Zoom: 1X
CD-7 1000' Survey. Wireline only long enough for ~950ft


Date & Time: Sat Mar 15 00:27:03 MDT 2014
Position: 13 N 485030 4288419
Altitude: 2850m
Azimuth/Bearing: 316° N44W 5618mils (True)
Elevation Angle: -11.3°
Horizon Angle: +03.4°
Zoom: 1X
CD-7 final trip count: 100' of rods on deck

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.15.2014
Day: Saturday

Temperature:
Low: 12° F
High: 29° F

Weather Conditions:
Cloud Cover: Overcast
Precipitation: <1-inch Snow
Wind: E 5 to 20 mph

AMEC Personnel On Site

John Roberts	14	Hrs
		Hrs
		Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0030	Tripped-out 100ft of rods and shutdown for the night.
0030-1150	End of shift. AK offsite for rest.
1150-1220	AK onsite and warming up equipment.
1220-1255	Trip-in rods to 1000ft depth and clean the hole.
1255-2200	AK advanced CD-7 from 1000 to 1110ft depth at a rate of 12.1 ft/hr.
2200-2335	AK tripped-out 620ft of drill string. At 1110ft depth the drill string was at risk of becoming locked in the hole. The bit being used is the original for CD-7, and there is concern that it might be wore out.
2345	AK offsite.

At the start of the next shift (noon):

AK will complete the trip-out of the drill string, put a new bit on the hammer, trip-in and continue drilling. The bit size used at the start of CD-7 was 5 1/8-inch. AK will measure the OD of the used bit before deciding what size bit to complete the hole. If the need to reduce the bit size to 4 ¾-inch, it will force them to continue to drill without the stabilizers, but will reduce the risk of losing the bit down-hole similar to CD-4a.

At this depth there is very low risk of encountering CD-6 or other drains. Therefore, a deviation survey is not planned until 1200ft depth or TD, whichever is reached first. This will increase the drill time. The 1200ft depth will be surveyed to monitor the declination and assist in the assessment of the likelihood of diatreme penetration should it not have been encountered prior to that depth.

Submitted by:
John Roberts, PG

Reviewed by: X
Timothy Burkhard
Submitted: Date: 03.16.2014

Daily Progress Photos:


Date & Time: Sat Mar 15 12:02:30 MDT 2014
Position: 13 N 485615 4286632
Altitude: 9345ft
Azimuth/Bearing: 328° N32W 5831mils (True)
Elevation Angle: -15.7°
Horizon Angle: -00.0°
Zoom: 1X
warming up equipment to begin drilling CD-7 from 1000ft depth

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****

Date: 03.16.2014

Day: Sunday

Temperature:
Low: 23° F
High: 41° F

Weather Conditions:
Cloud Cover: Sunny
Precipitation: NA
Wind: ENE 12 to 21 mph

AMEC Personnel On Site

John Roberts	14	Hrs
		Hrs
		Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: Potential for CD-7 not to penetrate the diatreme breccia due to deviation in azimuth and declination, and limits of the drill rig (1200ft – Nick, AK Supervisor says they're ok for another hundred feet [1300ft]). AMEC will take the survey data from Ames as-built coordinates and Elk Creek's 1200ft deviation survey, and the chips to Scott McAnally (CC&V Geologist) on 3.17.2014 for analysis prior to drilling. Please note the screenshot-photos of borehole paths from AK's Reflex deviation surveys in this report. These paths are for information only and are not considered as-built surveys of the boreholes.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-1145	End of shift. AK offsite for rest.
1145-1345	AK arrived onsite and began to trip-out the remaining drill string for a bit change.
1345-1615	Trip-out complete. AK reconfigured their tooling for a 4 ¾-inch hole from 1110ft to TD. The new tools for CD-7 consists of a 4 ¾-inch bit, hammer, interchange and a homemade 10ft stabilizer (10ft rod with 4 welded beads approximately 1.5ft long at each end of the rod).
1615-1840	Trip-in to bottom, 1110ft depth. The hole was clean all the way down.
1840-2300	AK advanced CD-7 from 1110 to 1200 ft depth at a rate of 20.8 ft/hr.
2315-0030	Elk Creek performed a deviation survey to 1200ft depth. Deviation is 27° south (right) azimuth (140° design and 167° at 1200ft), and 16° declination (45° design and 61° at 1200ft).
0030-0010	AK tripped out 120ft of drill rods before shutting down equipment for the end of the shift.

At the start of the next shift (noon):

AMEC will take the chips and survey data to Scott McAnally (CC&V Geologist) to attempt a prediction of diatreme breccia penetration prior to drilling activities.

AK will arrive onsite, trip-in to bottom (1200ft depth) and resume drilling activities.

Submitted by:
John Roberts, PG

Daily Progress Photos:


Date & Time: Sun Mar 16 14:00:57 MDT 2014
Position: 13 N 485582 4286645
Altitude: 9391ft
Azimuth/Bearing: 044° N44E 0782mils (True)
Elevation Angle: -17.8°
Horizon Angle: -00.5°
Zoom: 1X
tripped-out of CD-7


Date & Time: Sun Mar 16 14:02:51 MDT 2014
Position: 13 N 485596 4286656
Altitude: 9258ft
Azimuth/Bearing: 211° S31W 3751mils (True)
Elevation Angle: -65.4°
Horizon Angle: -04.0°
Zoom: 1X
5 1/8" bit worn out at 1110ft depth in CD-7
Lufkin

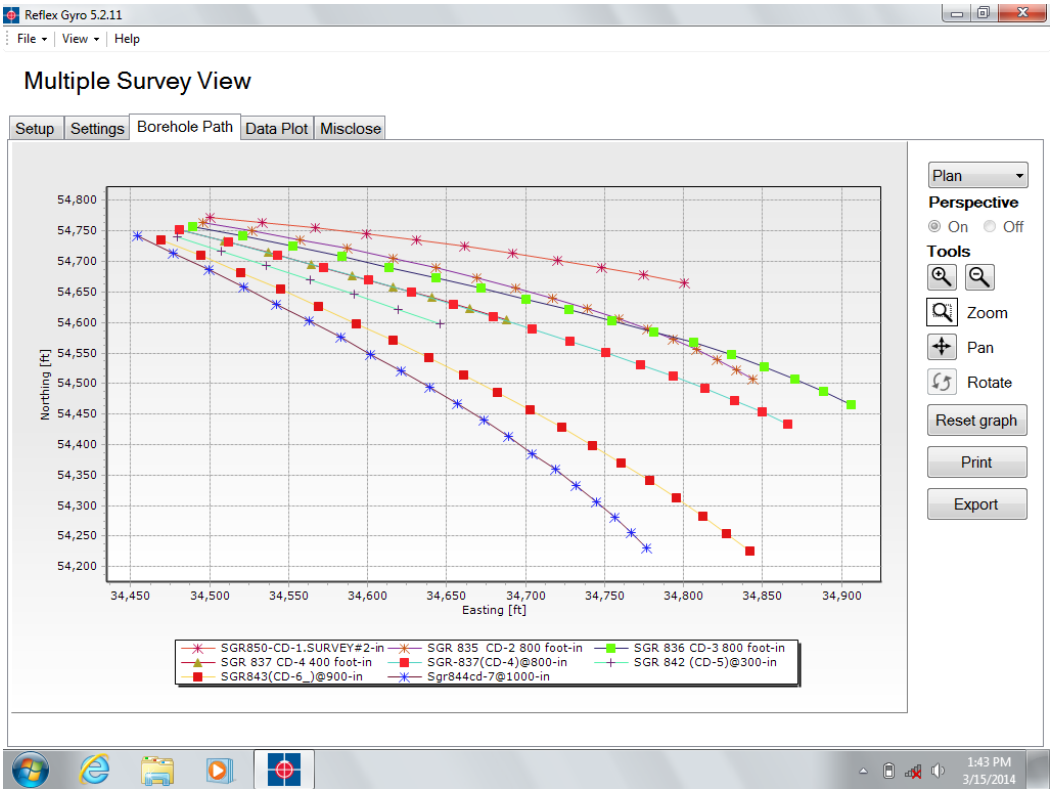

Date & Time: Sun Mar 16 14:35:49 MDT 2014
Position: 13 N 485591 4286655
Altitude: 9397ft
Azimuth/Bearing: 074° N74E 1316mils (True)
Elevation Angle: -10.5°
Horizon Angle: -03.7°
Zoom: 1X
CD-7 from 1110ft 4 3/4 bit, hammer, interchange and 10ft "homemade" stabilizer

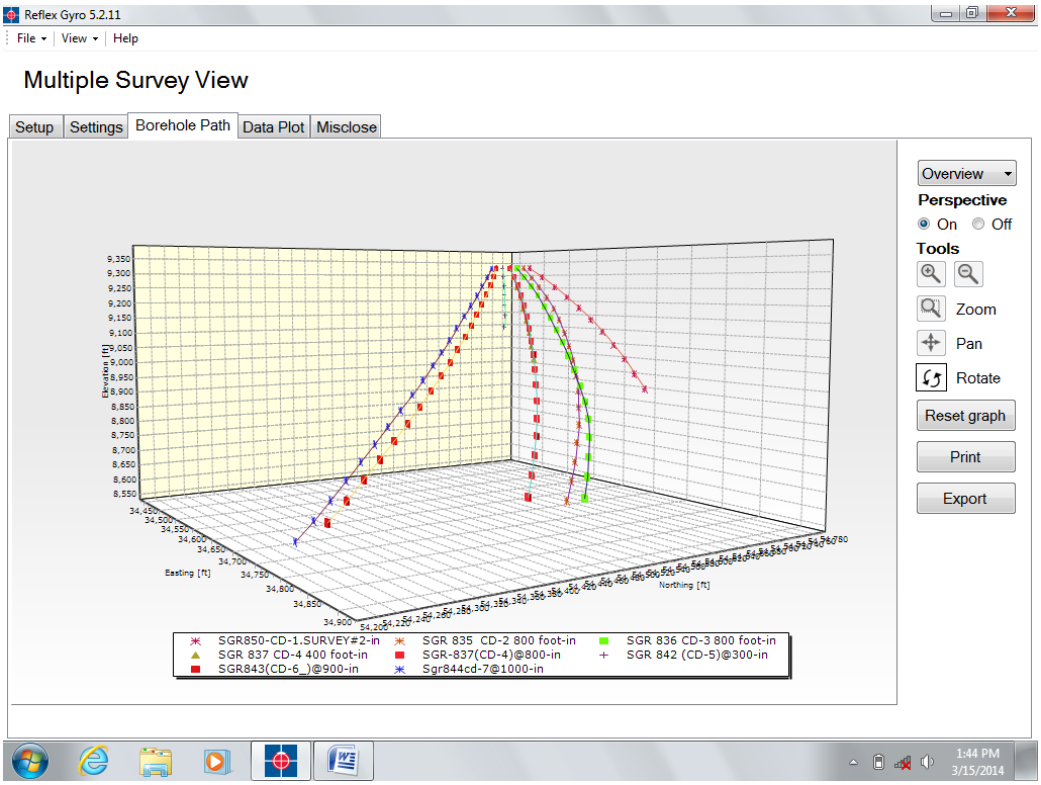

Date & Time: Sun Mar 16 19:10:37 MDT 2014
Position: 13 N 485601 4286658
Altitude: 9339ft
Azimuth/Bearing: 290° N70W 5156mils (True)
Elevation Angle: -07.8°
Horizon Angle: -00.2°
Zoom: 1X
CD-7 drilling to 1140ft depth

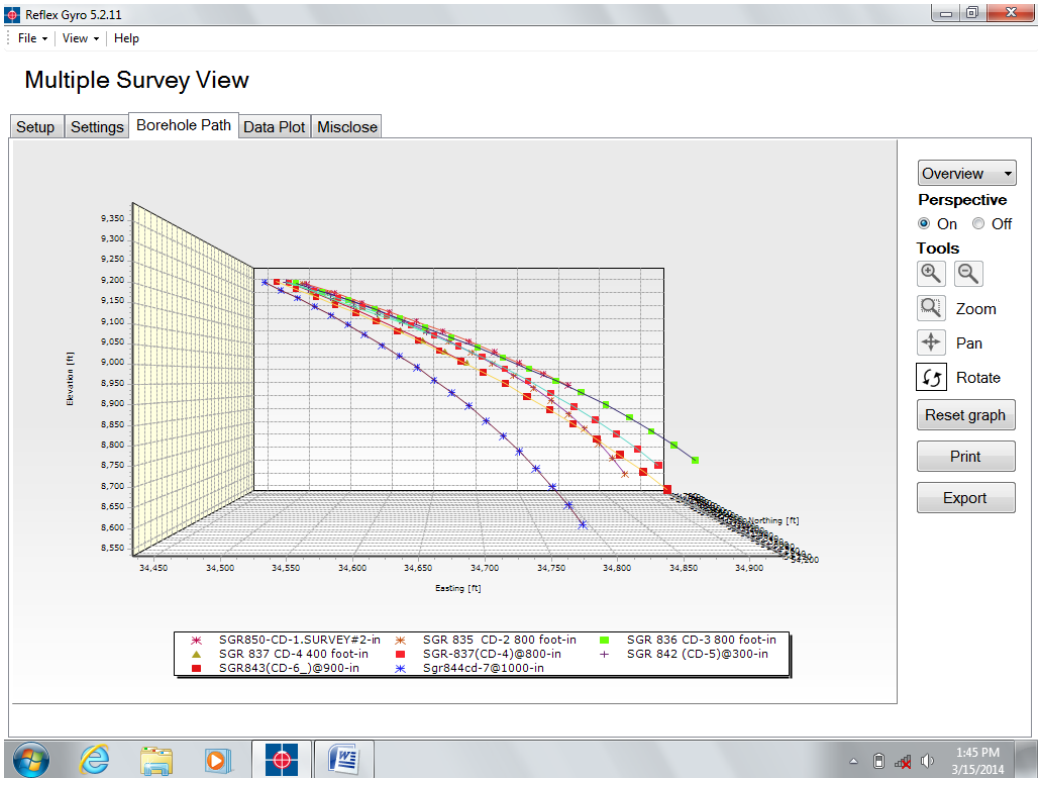

Date & Time: Sun Mar 16 21:33:27 MDT 2014
Position: 13 N 485590 4286644
Altitude: 9304ft
Azimuth/Bearing: 011° N11E 0196mils (True)
Elevation Angle: -12.7°
Horizon Angle: -00.5°
Zoom: 1X
CD-7 drilling to 1180ft depth

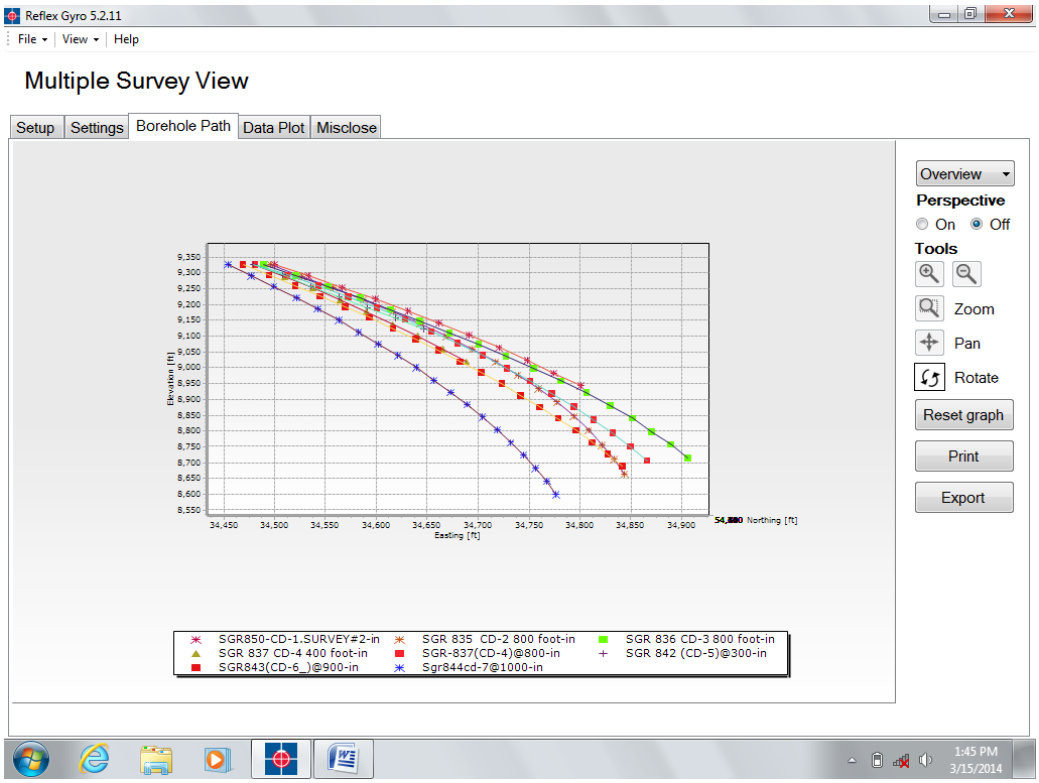

Date & Time: Mon Mar 17 00:51:10 MDT 2014
Position: 13 N 485601 4286672
Altitude: 9381ft
Azimuth/Bearing: 311° N49W 5529mils (True)
Elevation Angle: -08.7°
Horizon Angle: -01.5°
Zoom: 1X
CD-7 end of shift 1200ft depth tripped-out 120ft

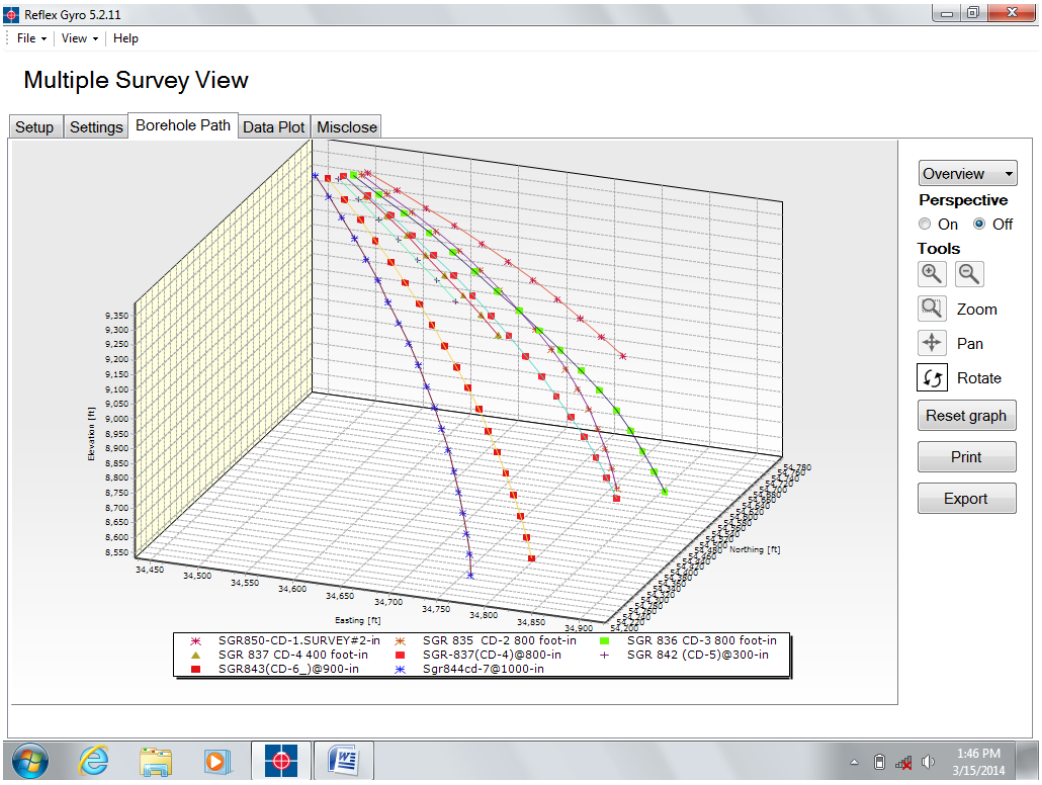
Reflex software showing borehole deviation paths for CD-1, 2, 3, 4, 4a, 5, 6, and 7. This is from AK's final surveys and is for information purposes only; the CD-7 survey depth was 950ft. They to no show TD of the boreholes and do not represent the AS-Built surveys completed by Elk Creek Gyro. The collar coordinates are from Ames As-Built survey.




Reflex Gyro 5.2.11
File
View
Help
Multiple Survey View
Setup
Settings
Borehole Path
Data Plot
Misclose
Overview
Perspective
On
Off
Tools
Zoom
Pan
Rotate
Reset graph
Print
Export
Elevation [ft]
Easting [ft]
Northing [ft]
SGR850-CD-1.SURVEY#2-in
SGR 835 CD-2 800 foot-in
SGR 836 CD-3 800 foot-in
SGR 837 CD-4 400 foot-in
SGR-837(CD-4)@800-in
SGR 842 (CD-5)@300-in
SGR843(CD-6_)@900-in
Sgr844cd-7@1000-in
1:44 PM
3/15/2014


Reflex Gyro 5.2.11
File
View
Help
Multiple Survey View
Setup
Settings
Borehole Path
Data Plot
Misclose
Overview
Perspective
On
Off
Tools
Zoom
Pan
Rotate
Reset graph
Print
Export
Elevation [ft]
Easting [ft]
Northing [ft]
SGR850-CD-1.SURVEY#2-in
SGR 835 CD-2 800 foot-in
SGR 836 CD-3 800 foot-in
SGR 837 CD-4 400 foot-in
SGR-837(CD-4)@800-in
SGR 842 (CD-5)@300-in
SGR843(CD-6_)@900-in
Sgr844cd-7@1000-in
1:45 PM
3/15/2014


Reflex Gyro 5.2.11
File
View
Help
Multiple Survey View
Setup
Settings
Borehole Path
Data Plot
Misclose
Overview
Perspective
On
Off
Tools
Zoom
Pan
Rotate
Reset graph
Print
Export
Elevation [ft]
Easting [ft]
Northing [ft]
SGR850-CD-1.SURVEY#2-in
SGR 835 CD-2 800 foot-in
SGR 836 CD-3 800 foot-in
SGR 837 CD-4 400 foot-in
SGR-837(CD-4)@800-in
SGR 842 (CD-5)@300-in
SGR843(CD-6_)@900-in
Sgr844cd-7@1000-in
1:45 PM
3/15/2014


Reflex Gyro 5.2.11
File
View
Help
Multiple Survey View
Setup
Settings
Borehole Path
Data Plot
Misclose
Overview
Perspective
On
Off
Tools
Zoom
Pan
Rotate
Reset graph
Print
Export
Elevation [ft]
Easting [ft]
Northing [ft]
SGR850-CD-1.SURVEY#2-in
SGR 835 CD-2 800 foot-in
SGR 836 CD-3 800 foot-in
SGR 837 CD-4 400 foot-in
SGR-837(CD-4)@800-in
SGR 842 (CD-5)@300-in
SGR843(CD-6_)@900-in
Sgr844cd-7@1000-in
1:46 PM
3/15/2014

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.17.2014
Day: Monday

Temperature:
Low: 23° F
High: 39° F

Weather Conditions:
Cloud Cover: Partly Cloudy
Precipitation: NA
Wind: ENE 12 to 42 mph

AMEC Personnel On Site

John Roberts	15	Hrs
		Hrs
		Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

1000-1145	AMEC went to Scott McAnally's (CC&V's Geologist) office to look at the As-Built data for CD-7 in Vulcan, and the chips to 1200ft depth. It is hard to predict where the diatreme will be fully penetrated due to the lack of data in the area. The chips show trace to some breccia material from 1100 to 1200ft depth indicating that CD-7 is within the transition zone from the country rock to completely in the breccia. Scott
1145-1230	Ames closed the site for blasting.
1230-1300	AK arrived onsite and began to trip-in and prepare to resume drilling from 1200ft depth. AK management will allow the drill to advance to 1260ft before calling TD due to the design of the rig itself (rated for 1200ft).
1300-1340	Problems getting return.
1340-1540	Advanced CD-7 from 1200 to 1240ft depth at a rate of 20 ft/hr. CD-7 encountered dominantly the Tertiary diatreme breccia material at 1205ft depth.
1540-1620	AK made a trip to their staging area for more drill rods.
1620-1730	Advanced CD-7 from 1240 to 1260ft depth at a rate of 24.1 ft/hr. The borehole was called TD at 1260ft depth. Elk Creek was not called to resurvey the hole for an additional 60ft of borehole length.
1730-1920	CD-7 was conditioned/cleaned thoroughly to ensure that most of the cuttings have been purged from the borehole.
1920-2100	AK tripped-out 670ft of drill string before

2100-2150 AK was down due to a hydraulic hose that blew on the head. They made a trip to the yard for a new one.

2150-2400 AK tripped-out the remaining drill string from CD-7.

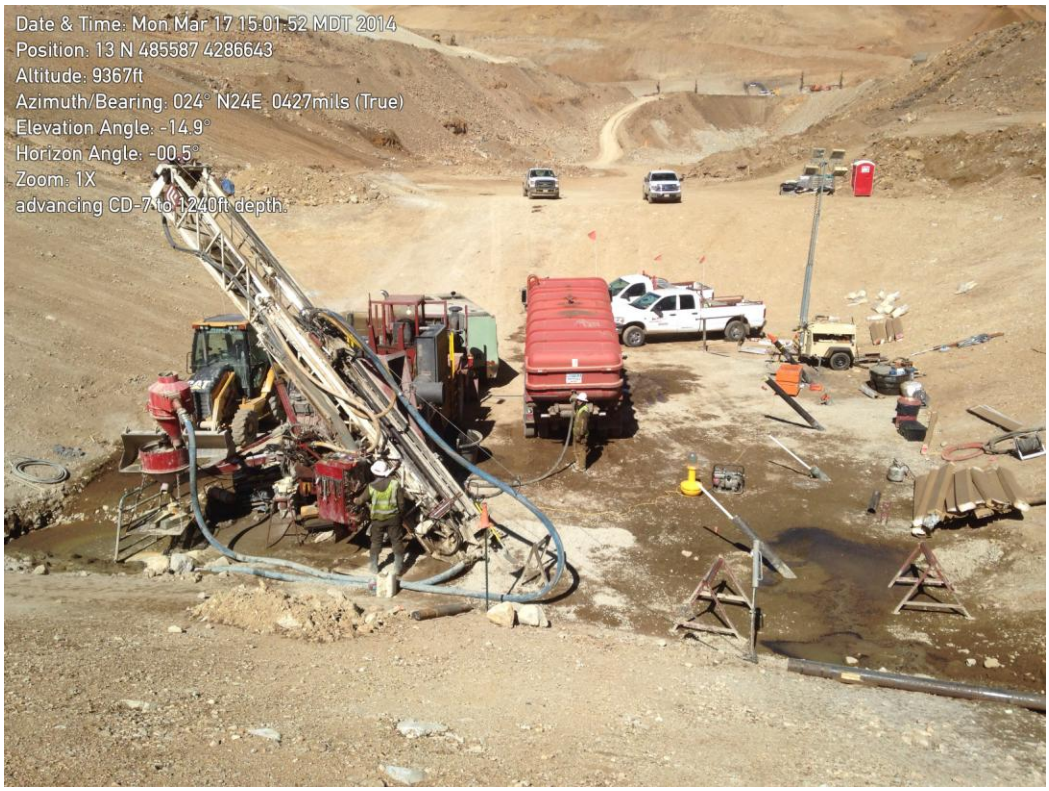
2400-0010 The equipment was shutdown and all workers left the site.

At the start of the next shift (noon):

Tomorrow AK will deploy the drain PVC to 1260ft depth and get a load of water before Ames blast at 1400. After the blast, AMEC will attempt a constant head and complete a falling head test in CD-7. Upon completion of the hydro testing, AK will cement the drain inside the casing and move on the next task, abandoning CD-4a.

Submitted by:
John Roberts, PG

Daily Progress Photos:




Date & Time: Mon Mar 17 19:19:48 MDT 2014
Position: 13 N 485592 4286647
Altitude: 9387ft
Azimuth/Bearing: 280° N80W 4978mils (True)
Elevation Angle: -08.1°
Horizon Angle: -00.6°
Zoom: 1X
CD-7 trip-out from TD (1260ft depth)


1240
1235
1230
1225
1220
1215
1210
1205

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.18.2014
Day: Tuesday

Temperature:
Low: 12° F
High: 28° F

Weather Conditions:
Cloud Cover: Partly Cloudy
Precipitation: 2-inches Snow
Wind: W 14 to 40 mph

AMEC Personnel On Site

John Roberts	16.5	Hrs
		Hrs
		Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

1100-1150	AMEC went to Scott McAnally's (CC&V's Geologist) office to look at the final chips for CD-7 under the microscope. It appears that CD-7 was terminated in the transition zone from the Precambrian country rock to the diatreme breccia. Traces of the breccia material were observed from 1100ft depth. The breccia material percentages increases to approximately 40% at 1165ft depth before decreasing again downhole.
1150-1230	At the rig waiting for AK to arrive.
1230-1440	AK arrived onsite, and began to deploy CD-7 drain PVC: 2-inch end cap, 30lf of 0.030 slotted screen, and 1230lf of sch. 80 riser pipe to 1253ft depth.
	Ames onsite to layout CD-9.
1440-1630	AK left to fill the 4000gal water truck for hydro-testing.
	Transducers were deployed into CD-6 and CD-7.
1630-1705	AK went to the yard to get a fitting for the flow meter manifold and finished the set-up for the hydraulic testing.
1705-1731	Began the test by gravity feeding water into CD-7. The transducer was placed 906ft bgs.
1712	The water level reached the transducer.
1725	The water column began to lose head, and was not going to recover.
1727	The valve from the water truck was shut and monitoring for a falling head test began.
1731	The water level in the borehole fell below the transducer. The test was over.

	The CD-7 hole volume is 1230.4gal (164.5ft3) to top-of-casing. The flow rate of injection (measured at the end of injection) was 64.4gpm. The total volume of water injected into CD-7 was 1428.6gal (191.0ft3), or 1.16 volumes in 22:11.4 (MM:SS).
1731-1830	Pulled the transducer from CD-7; the transducer in CD-6 is still logging. AK prepared equipment to complete CD-7.
1830-2030	AK set the centralizers and shale basket (11ft bgs) on CD-7.
2030-2245	AK set the rig over CD-4a and tripped-out the PVC. The screen was removed and 300lf was tripped-in as tremmie pipe before the clamp slipped and it was lost down the hole. A second string of tremmie pipe was set to 300ft depth.
2245-2315	Mixed a 300gal batch of grout (neat cement – there is no bentonite gel onsite) consisting of 120gal water and 24 bags (92.4lbs) of Type I/II Portland cement. Approximately 10 gallons was used to complete CD-7, and the remaining volume was pumped in CD-4a from 300ft depth. Only one batch of grout was placed in CD-4a at this time. There is concern that grouting the entire hole at once will force excess amounts into the formation under head pressure. The abandonment approach will be in lifts.
2315-2340	The grouting equipment was cleaned and AK left the site.

At the start of the next shift (noon):

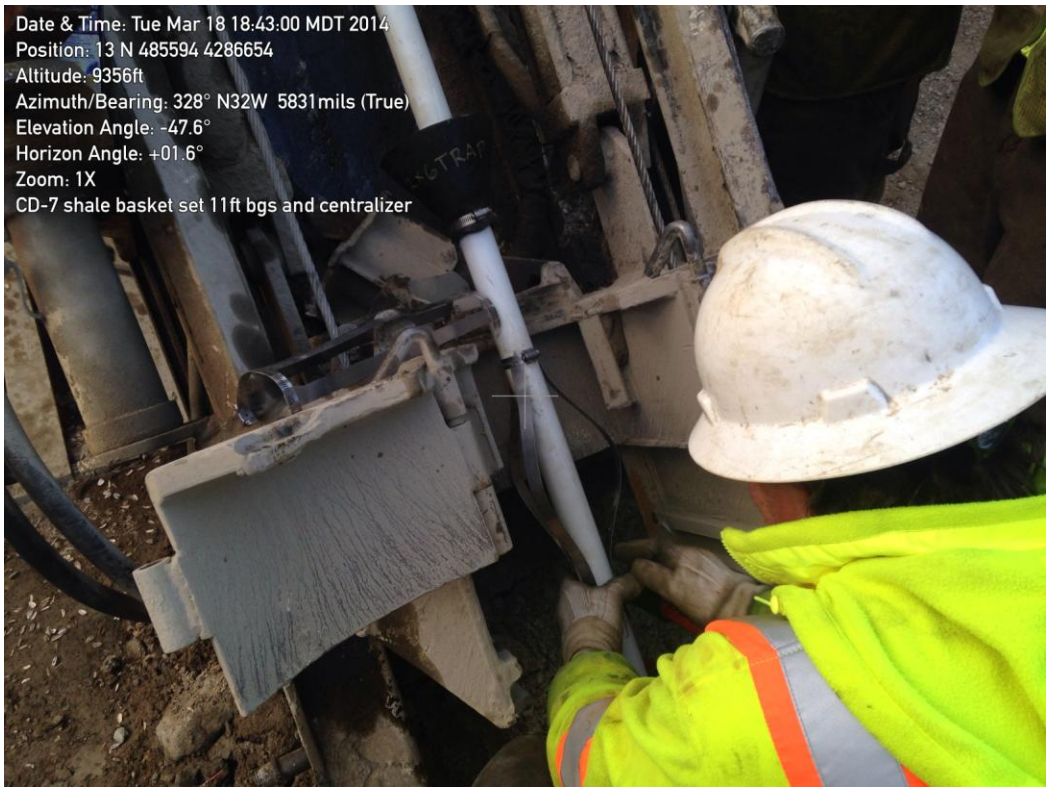
Tomorrow AK will mix a second batch of grout and pump into CD-4a. They will set the rig over CD-9, set casing, and begin to drill.

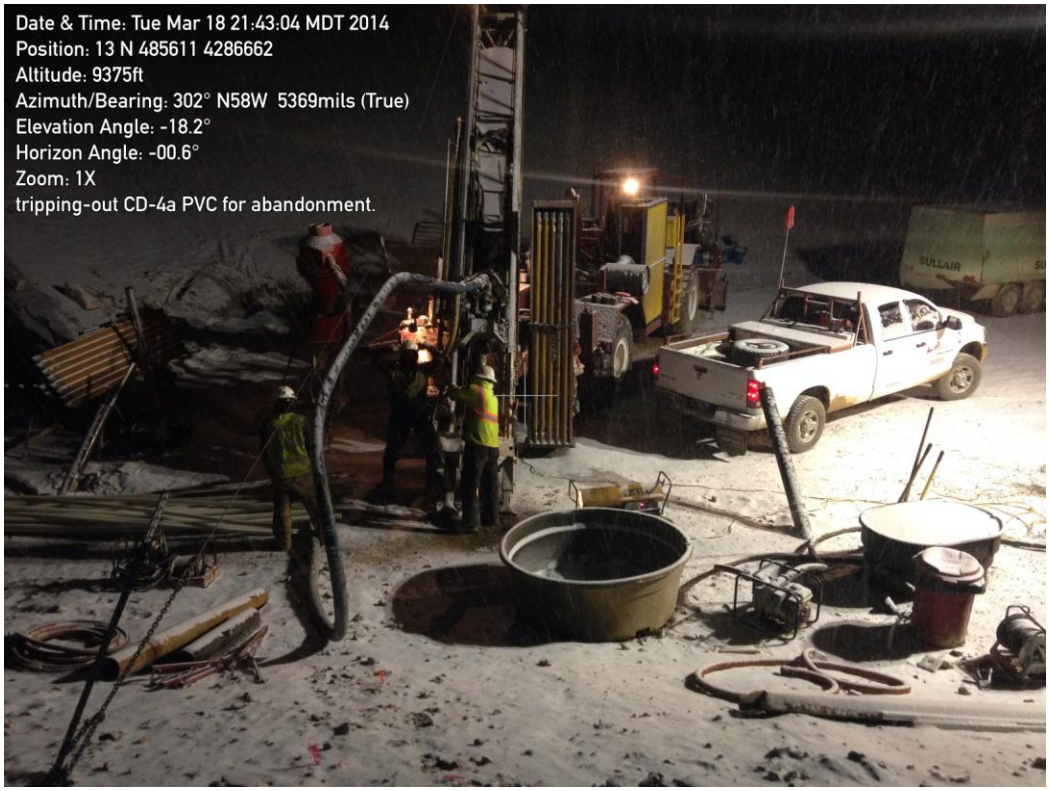
Jessica Malone will be onsite to cover for John Roberts from 3.19.2014 through 3.23.2014. The hours above reflect the shift work and John's travel back to Denver (2.5hrs).

Submitted by:
John Roberts, PG

Daily Progress Photos:


Date & Time: Tue Mar 18 17:16:23 MDT 2014
Position: 13 N 485596 4286655
Altitude: 9347ft
Azimuth/Bearing: 090° N90E 1600mils (True)
Elevation Angle: -34.4°
Horizon Angle: -02.1°
Zoom: 1X
CD-7 hydro testing


Date & Time: Tue Mar 18 18:43:00 MDT 2014
Position: 13 N 485594 4286654
Altitude: 9356ft
Azimuth/Bearing: 328° N32W 5831mils (True)
Elevation Angle: -47.6°
Horizon Angle: +01.6°
Zoom: 1X
CD-7 shale basket set 11ft bgs and centralizer


Date & Time: Tue Mar 18 21:43:04 MDT 2014
Position: 13 N 485611 4286662
Altitude: 9375ft
Azimuth/Bearing: 302° N58W 5369mils (True)
Elevation Angle: -18.2°
Horizon Angle: -00.6°
Zoom: 1X
tripping-out CD-4a PVC for abandonment.


Date & Time: Tue Mar 18 23:11:42 MDT 2014
Position: 13 N 485595 4286668
Altitude: 9360ft
Azimuth/Bearing: 027° N27E 0480mils (True)
Elevation Angle: -21.9°
Horizon Angle: -00.7°
Zoom: 1X
grouting CD-4a

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.19.2014
Day: Wednesday

Temperature:
Low: 18° F
High: 55° F

Weather Conditions:
Cloud Cover: Clear
Precipitation: NA
Wind: S 6 to 12 mph

AMEC Personnel On Site

Jessica Malone	15	Hrs
		Hrs
		Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

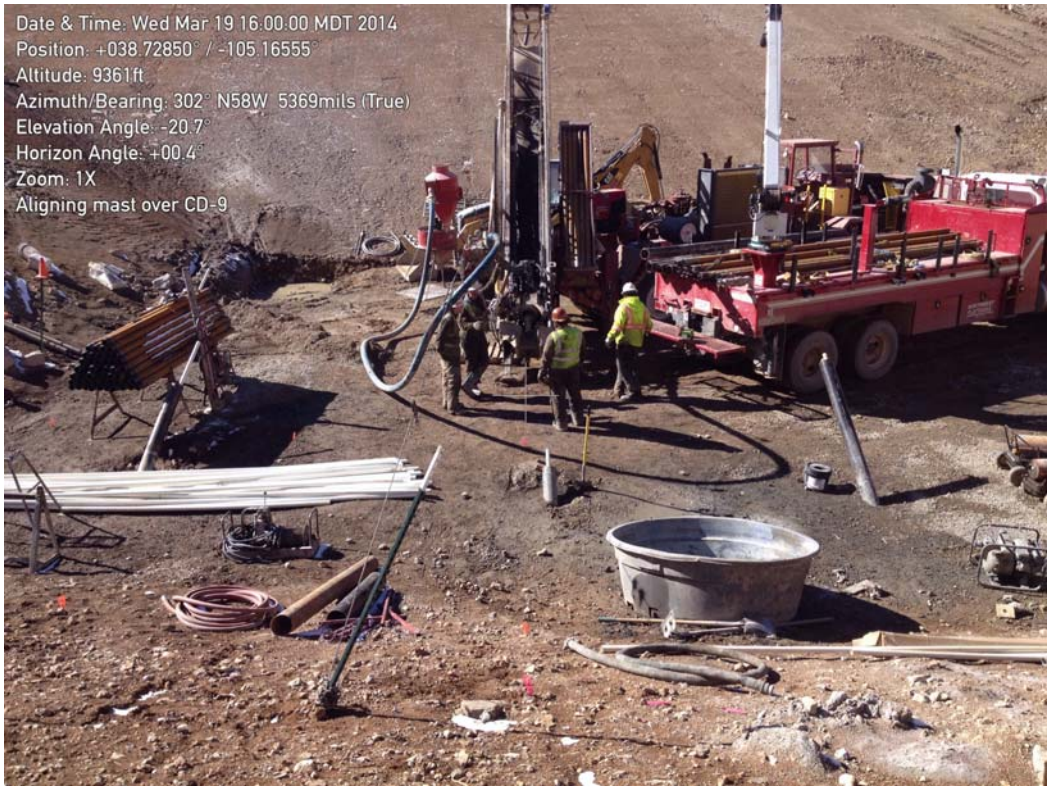
1100	Jessica Malone arrived on site from Denver. The hours above include shift work and travel time from Denver (2 hours).
1210	Arrive at rig, AK on site preparing 2nd batch of grout for abandoning CD-4a.
1230	The transducer in CD-6 was stopped and data was downloaded.
1345	2nd batch of grout pumped into CD-4a (35 bags (92.4 lbs) of Portland Type I/II cement and ~200 gallons of water)
1400	AK water truck departs to refill. AK performs general site cleanup and preparation for moving rig to CD-9.
1500	AK assists in removing transducer from CD-6.
1530	AK water truck returns.
1600	Rig set up at CD-9 at an declination of 41.5°.
1640	AK begins to drive casing for CD-9.
1715-1930	20 ft of casing installed. AK advanced CD-9 to 120 ft depth and performed deviation survey to 100 ft. Azimuth is 128° and declination is 41.5° at 100 ft.
1930-2240	AK advanced CD-9 to 220 ft depth at a rate of 32ft/hr.
2240-2255	AK performed a deviation survey to 200 ft depth. Azimuth is 130° and declination is 43° at 200 ft.
2255-2400	AK advanced CD-9 to 260 ft depth at a rate of 37ft/hr.

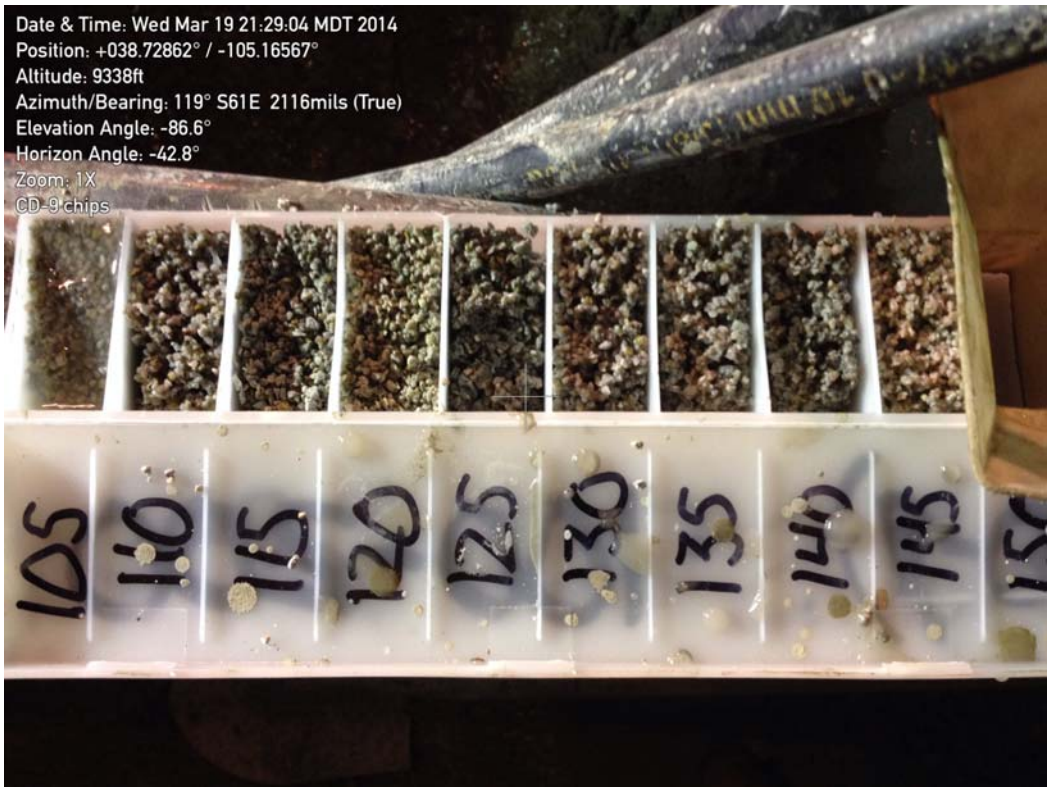
At the start of the next shift (noon):

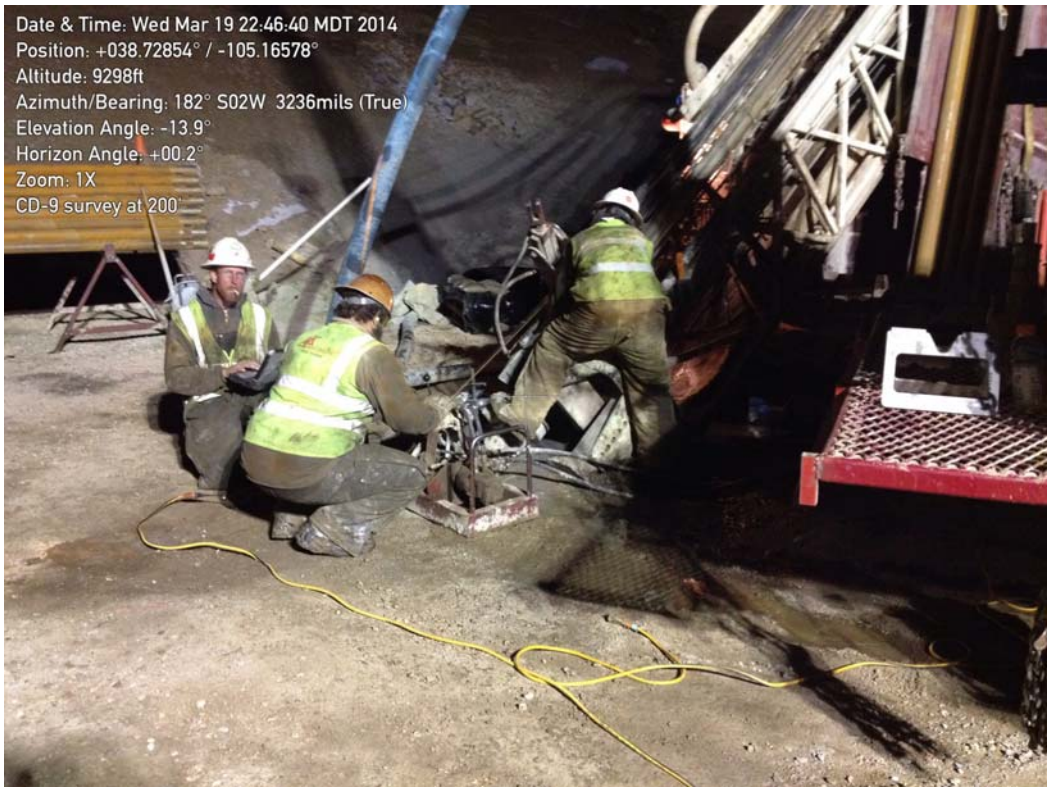
Tomorrow AK will prepare and pump 3rd batch of grout into CD-4a for abandonment and will continue to advance CD-9.

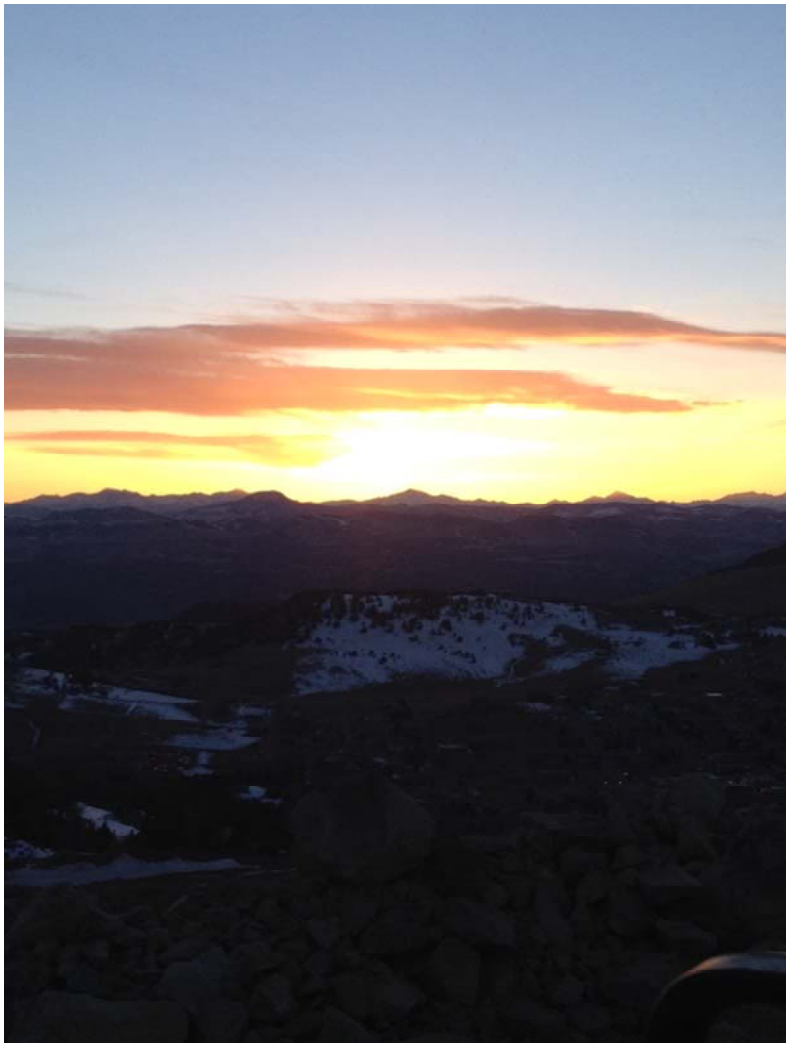
Submitted by:
Jessica L. Malone

Daily Progress Photos:




Date & Time: Wed Mar 19 21:29:04 MDT 2014
Position: +038.72862° / -105.16567°
Altitude: 9338ft
Azimuth/Bearing: 119° S61E 2116mils (True)
Elevation Angle: -86.6°
Horizon Angle: -42.8°
Zoom: 1X
CD-9 chips
105
110
115
120
125
130
135
140
145


Date & Time: Wed Mar 19 22:46:40 MDT 2014
Position: +038.72854° / -105.16578°
Altitude: 9298ft
Azimuth/Bearing: 182° S02W 3236mils (True)
Elevation Angle: -13.9°
Horizon Angle: +00.2°
Zoom: 1X
CD-9 survey at 200'



CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.20.2014
Day: Thursday

Temperature:
Low: 28° F
High: 68° F

Weather Conditions:
Cloud Cover: Partly Cloudy
Precipitation: NA
Wind: N/W at 9 mph

AMEC Personnel On Site

Jessica Malone	13.5	Hrs
		Hrs
		Hrs

		Hrs
		Hrs
		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

1200	AMEC and AK arrive on site.
1250-1415	AK advanced CD-9 to from 260 ft depth to 320 ft depth at a rate of 43 ft/hr
1300-1415	AK prepares 3rd batch of grout and pumps it into CD-4a (600 gallons total). AK completes pumping of grout into CD-4a with no sign of grout near surface. AK and AMEC decide to tag the grout depth and install tremmie pipe/shale basket system similar to that used to abandon CD-5. Due to depth of hole (915 ft) and amount/weight of PVC required, AK will use rig for this process after CD-9 is complete. Once refusal depth is determined, AMEC will evaluate data from permeability tests to decide where to place shale baskets. Note that on 3/18, 300 ft of PVC was lost down CD-4a.
1420-1435	AK performed a deviation survey to 300 ft depth. Azimuth is 131° and declination is 44° at 300 ft (design is 127° azimuth and 45° declination).
1445-1730	AK advanced CD-9 to 420 ft depth at a rate of 31 ft/hr.
1730-1750	AK performed a deviation survey to 400 ft depth. Azimuth is 134° and declination is 44° at 400 ft (design is 127° azimuth and 45° declination).
1750-2040	AK advanced CD-9 to 520 ft depth at a rate of 35 ft/hr.
2040-2130	AK performed a deviation survey to 500 ft depth. At 2130, while waiting for data to process, Reflex Gyro program timed out and 500 ft survey data was lost (the file was found on the hard drive but it contained no data). Drilling had commenced at 2110, and the decision was made to continue drilling and survey at 600 ft depth after advancing CD-9 to 620 ft depth.
2110-0000	AK advanced CD-9 to 600 ft depth at a rate of 28 ft/hr.

At the start of the next shift (noon):

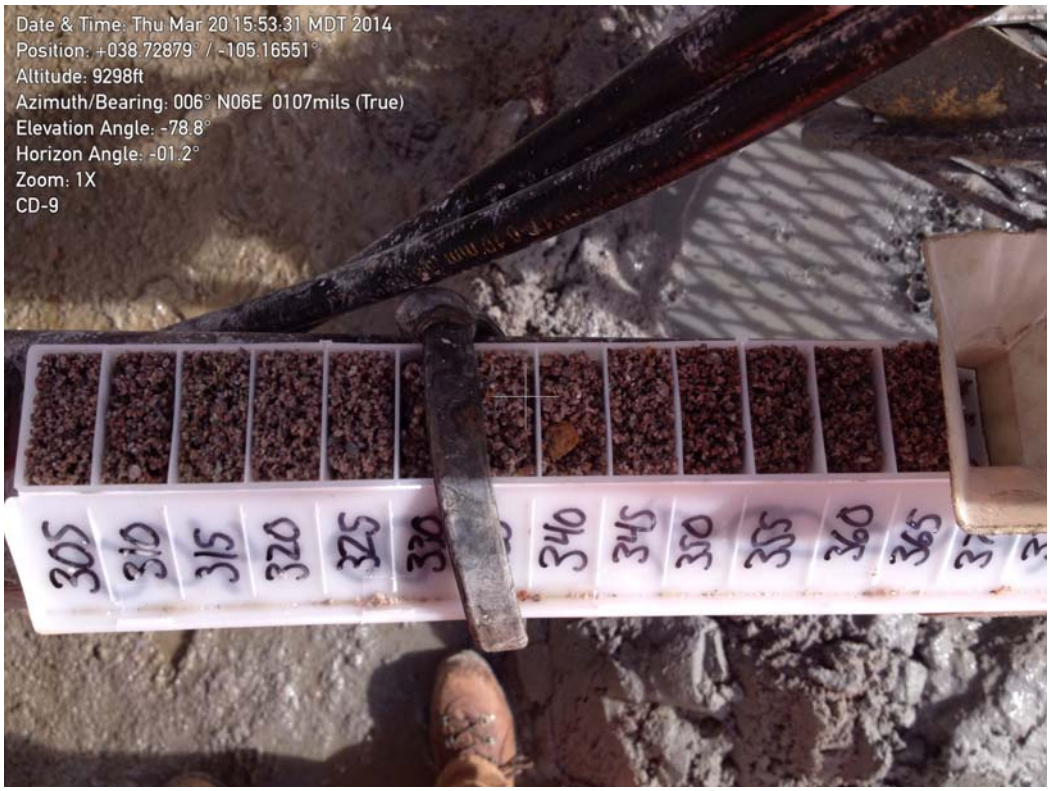
Tomorrow, AK will advance CD-9 to 620 ft depth and perform deviation survey to 600 ft depth. If software/computer problems persist, Elk Creek will be called to perform 600 ft survey.

AK will continue to advance CD-9 to diatreme. AK will return to two shifts tomorrow (AK night shift crew will arrive at 0000 on 3/22). Matthew Hartz arrives for AMEC to cover night shift.

Submitted by:
Jessica L. Malone

Daily Progress Photos:


Date & Time: Thu Mar 20 14:23:31 MDT 2014
Position: +038.73894° / -105.17072°
Altitude: 9351ft
Azimuth/Bearing: 333° N27W 5920mils (True)
Elevation Angle: -05.6°
Horizon Angle: +00.8°
Zoom: 1X
beginning CD-9 deviation survey to 300' depth


Date & Time: Thu Mar 20 15:53:31 MDT 2014
Position: +038.72879° / -105.16551°
Altitude: 9298ft
Azimuth/Bearing: 006° N06E 0107mils (True)
Elevation Angle: -78.8°
Horizon Angle: -01.2°
Zoom: 1X
CD-9
305
310
315
320
325
330
340
345
350
355
360
365

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****

Date: 03.21.2014

Day: Saturday

Temperature:
Low: 31° F
High: 48° F

Weather Conditions:
Cloud Cover: Overcast
Precipitation: None
Wind: S 0 to 9 mph

AMEC Personnel On Site

Jessica Malone	8.5	Hrs
Matt Hartz	7.5	Hrs
		Hrs

		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

1200	AMEC and AK arrive on site.
1345-1415	All personnel off-site for blast.
1530-1620	AK advanced CD-9 from 600 ft depth to 620 ft depth at a rate of 24 ft/hr.
1620-1640	AK performed a deviation survey to 600 ft depth. Azimuth is 137° and declination is 46° at 600 ft (design is 127° azimuth and 45° declination).
1645-2135	AK advanced CD-9 to 720 ft depth at a rate of 21 ft/hr.
1730-1830	Ames on site to lay out CD-12.
1830	Matthew Hartz arrived for night shift. His hours above reflect shift time and travel time from Denver (2 hours).
2135-2220	AK performed a deviation survey to 700 ft depth. Azimuth is 139° and declination is 46° at 700 ft (design is 127° azimuth and 45° declination).
2220-2400	AK continues to advance CD-9. AK night crew arrived and AK resumed 2-shift/24 hr schedule.

As of this morning:

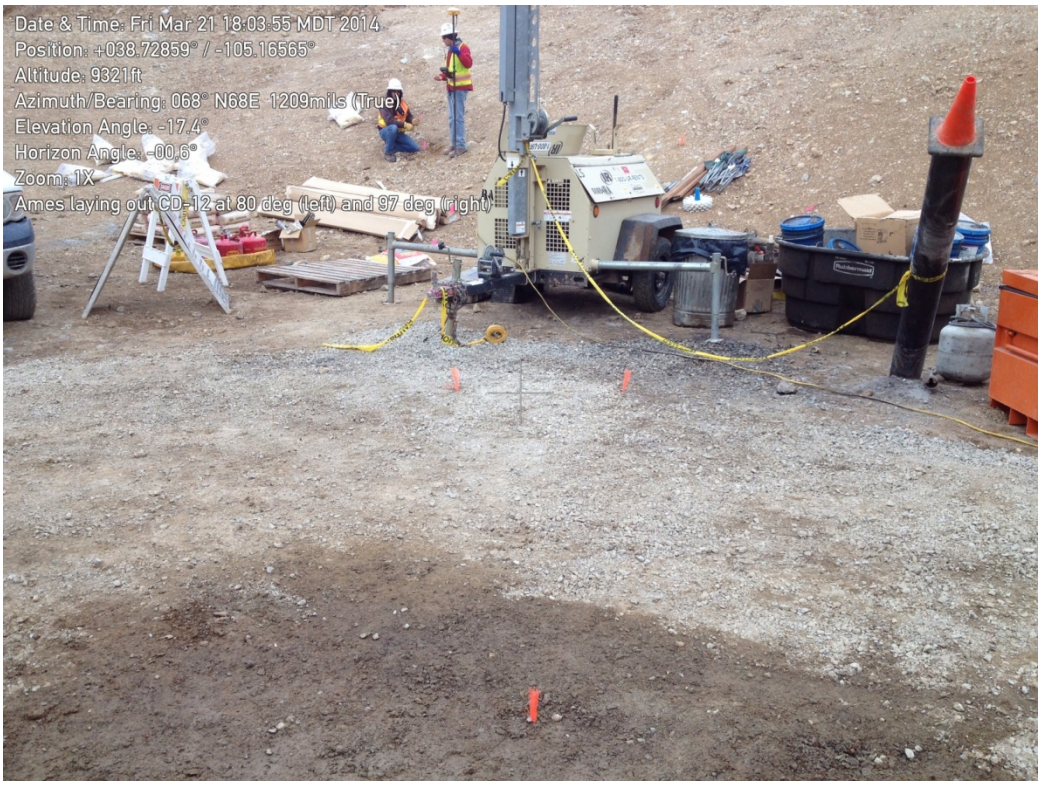
AK advanced CD-9 to 820 ft depth at a rate of 14 ft/hr. AK performed a deviation survey to 800 ft depth.

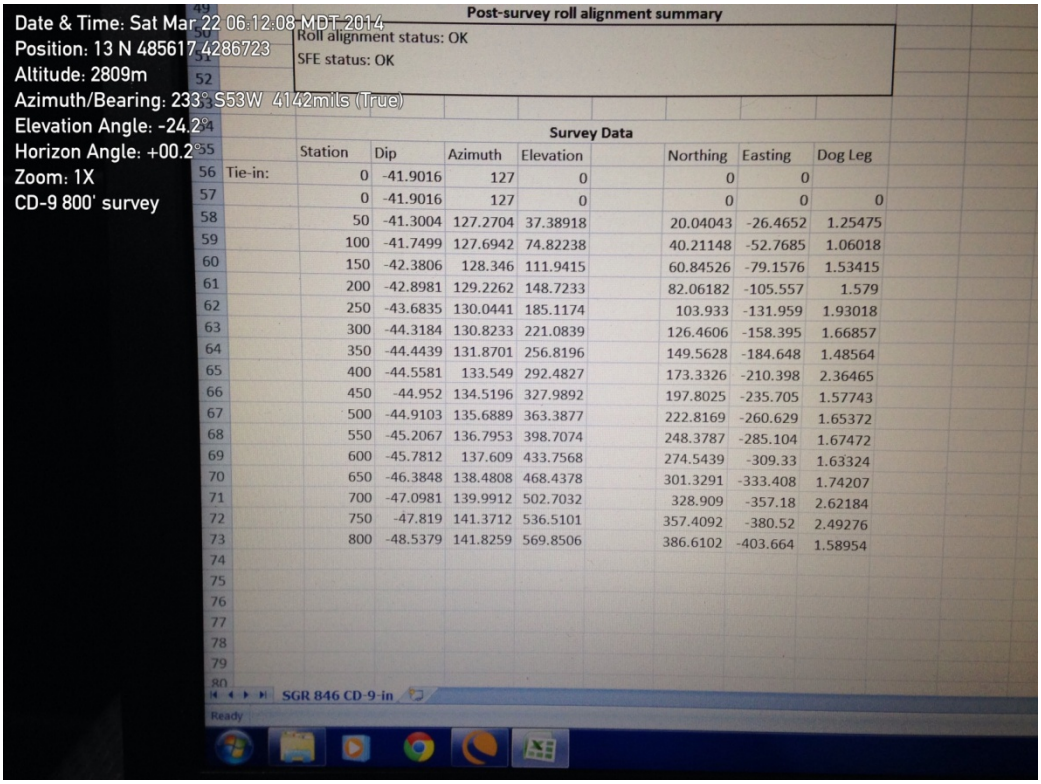
Azimuth is 142° and declination is 48.5° at 800 ft (design is 127° azimuth and 45° declination).

Submitted by:
Jessica L. Malone

Reviewed by: 
Timothy Burkhard
Submitted: Date: 03.21.2014

Daily Progress Photos:





Post-survey roll alignment summary

Roll alignment status: OK
SFE status: OK

Survey Data

	Station	Dip	Azimuth	Elevation	Northing	Easting	Dog Leg
Tie-in:	0	-41.9016	127	0	0	0	
	0	-41.9016	127	0	0	0	0
	50	-41.3004	127.2704	37.38918	20.04043	-26.4652	1.25475
	100	-41.7499	127.6942	74.82238	40.21148	-52.7685	1.06018
	150	-42.3806	128.346	111.9415	60.84526	-79.1576	1.53415
	200	-42.8981	129.2262	148.7233	82.06182	-105.557	1.579
	250	-43.6835	130.0441	185.1174	103.933	-131.959	1.93018
	300	-44.3184	130.8233	221.0839	126.4606	-158.395	1.66857
	350	-44.4439	131.8701	256.8196	149.5628	-184.648	1.48564
	400	-44.5581	133.549	292.4827	173.3326	-210.398	2.36465
	450	-44.952	134.5196	327.9892	197.8025	-235.705	1.57743
	500	-44.9103	135.6889	363.3877	222.8169	-260.629	1.65372
	550	-45.2067	136.7953	398.7074	248.3787	-285.104	1.67472
	600	-45.7812	137.609	433.7568	274.5439	-309.33	1.63324
	650	-46.3848	138.4808	468.4378	301.3291	-333.408	1.74207
	700	-47.0981	139.9912	502.7032	328.909	-357.18	2.62184
	750	-47.819	141.3712	536.5101	357.4092	-380.52	2.49276
	800	-48.5379	141.8259	569.8506	386.6102	-403.664	1.58954

SGR 846 CD-9-in
Ready

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.22.2014
Day: Saturday

Temperature:
Low: 21° F
High: 34° F

Weather Conditions:
Cloud Cover: Clear until ~1500
Precipitation: 2" snow from 1600-1800
Wind: S 9 to 17 mph

AMEC Personnel On Site

Jessica Malone	13	Hrs
Matt Hartz	12.5	Hrs
		Hrs

		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0525	AK advanced CD-9 to 820 ft depth at a rate of 14 ft/hr.
0525-0600	AK performed a deviation survey to 800 ft depth. Azimuth is 142° and declination is 48.5° at 800 ft (design is 127° azimuth and 45° declination).
0910	CD-9 intercepted a diatreme dike at 860 ft depth.
1010-1040	At 865 ft depth, rig begins to torque. AK advances CD-9 to 870 ft depth then begins to trip out for bit change.
1420	Trip out complete and bit changed.
1430-1720	Trip in complete.
1720-1850	AK advanced CD-9 to 920 ft depth at a rate of 30 ft/hr. At 890 ft depth, the borehole returned to a gradational zone of diatreme and PreCambrian material.
1900-1950	AK performed a deviation survey to 900 ft depth. Azimuth is 144° and declination is 49.5° at 900 ft (design is 127° azimuth and 45° declination).
2000-2145	AK to lay down yard for parts.
2200-2325	AK advanced CD-9 to 980 ft depth at a rate of 43 ft/hr. The borehole encountered the diatreme at 930 ft depth. TD is 980 ft.

As of this morning:

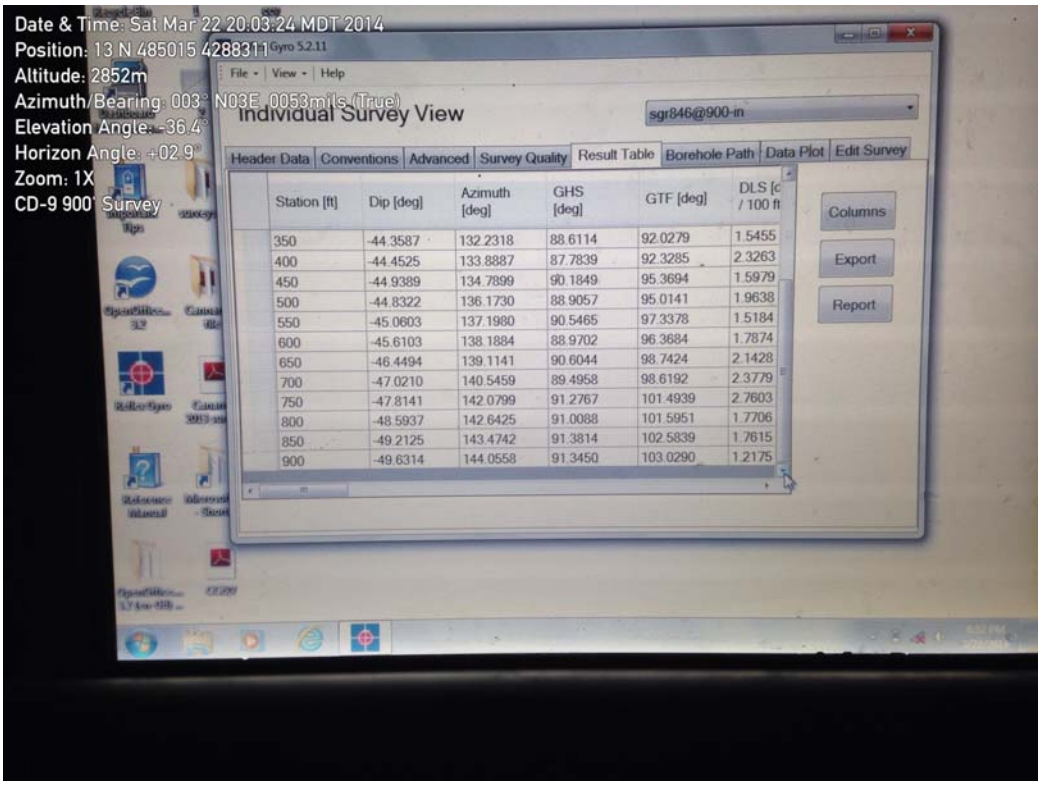
Elk Creek performed final TD survey. Final azimuth is 144° and final declination is 49.5°.

AK tripped out rods and is preparing to install PVC. Permeability tests will be conducted today.

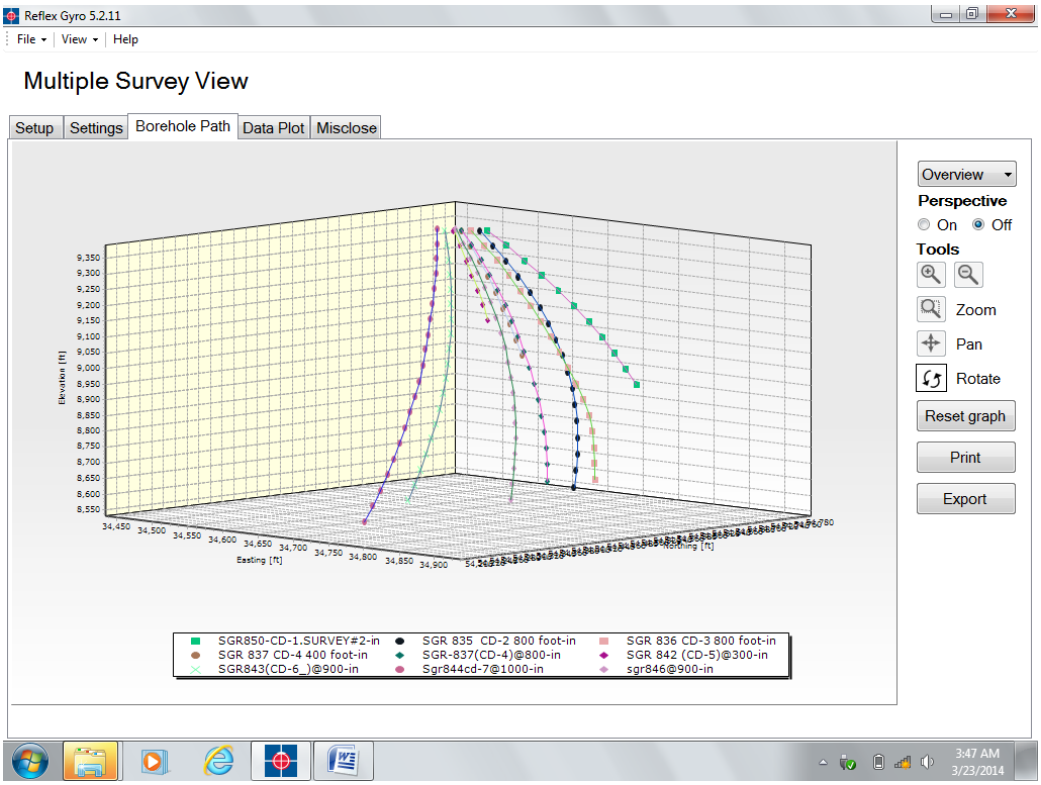
Submitted by:
Jessica L. Malone

Submitted: Date: 03.22.2014

Daily Progress Photos:


Date & Time: Sat Mar 22 20:03:24 MDT 2014
Position: 13 N 485015 4288311
Altitude: 2852m
Azimuth/Bearing: 003° N03E 0053mils (True)
Elevation Angle: -36.4°
Horizon Angle: +02.9°
Zoom: 1X
CD-9 900' Survey
Gyro 5.2.11
File | View | Help
Individual Survey View
sgr846@900-in
Header Data | Conventions | Advanced | Survey Quality | Result Table | Borehole Path | Data Plot | Edit Survey
Station [ft] | Dip [deg] | Azimuth [deg] | GHS [deg] | GTF [deg] | DLS [c / 100 ft
350 | -44.3587 | 132.2318 | 88.6114 | 92.0279 | 1.5455
400 | -44.4525 | 133.8887 | 87.7839 | 92.3285 | 2.3263
450 | -44.9389 | 134.7899 | 90.1849 | 95.3694 | 1.5979
500 | -44.8322 | 136.1730 | 88.9057 | 95.0141 | 1.9638
550 | -45.0603 | 137.1980 | 90.5465 | 97.3378 | 1.5184
600 | -45.6103 | 138.1884 | 88.9702 | 96.3684 | 1.7874
650 | -46.4494 | 139.1141 | 90.6044 | 98.7424 | 2.1428
700 | -47.0210 | 140.5459 | 89.4958 | 98.6192 | 2.3779
750 | -47.8141 | 142.0799 | 91.2767 | 101.4939 | 2.7603
800 | -48.5937 | 142.6425 | 91.0088 | 101.5951 | 1.7706
850 | -49.2125 | 143.4742 | 91.3814 | 102.5839 | 1.7615
900 | -49.6314 | 144.0558 | 91.3450 | 103.0290 | 1.2175
Columns
Export
Report


Date & Time: Sun Mar 23 02:59:01 MDT 2014
Position: 13 N 485600 4286666
Altitude: 2854m
Azimuth/Bearing: 000° N00E 0000mils (True)
Elevation Angle: +00.2°
Horizon Angle: +04.3°
Zoom: 1X
CD-9 980' TD. Rods at 920'. Elk Creek surveying to 900'



Picture 5- Plot of AK survey data (not final)

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.23.2014
Day: Sunday

Temperature:
Low: 21° F
High: 34° F

Weather Conditions:
Cloud Cover: None.
Precipitation: None.
Wind: S 9 to 17 mph

AMEC Personnel On Site

Jessica Malone	14	Hrs
Matt Hartz	13	Hrs
		Hrs

		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000	AK advanced CD-9 to TD of 980 ft depth.
0215-0355	Elk Creek on site to perform final TD survey. Azimuth is 144° and declination is 49.5° at TD (design is 127° azimuth and 45° declination).
0355-0630	AK trips out rods to prepare for PVC install.
0630-0850	AK completes PVC installation and notes that ~3 ft of cave-in occurred at bottom of borehole.
0922-0938	Falling head test performed at CD-9 with CD-3 as an observation well.
1020-1035	AK installs shale basket and centralizers on PVC. When lowering PVC, AK notes that another ~7 ft of cave-in has occurred. Final depth of PVC in CD-9 = 970 ft.
1230	AK completes grouting of CD-9 using 21 gallons of water and 3 92.6 lb bags Type I/II Portland cement.
1520	AK aligns rig for CD-12 at an azimuth of 80°.
1620-1800	AK drives in casing for CD-12 at declination of 46°. Removing odex, and setting up drill.
1800-1830	Matt Hartz arrives on site to cross shift with Jessica Malone. AK began drilling
1830	Jessica Malone departs site. Hours above include travel time to Denver (2 hrs).
1800-2120	Drillers reached 120 ft, Performed 100 ft survey (46°, 98.5°)
2340	AM drilling crew arrives on site.
2120-2400	Drilling reach 220 ft, getting ready to perform 200 ft survey (47°,99.5°, results of this survey were processed on 00:30 the following morning)

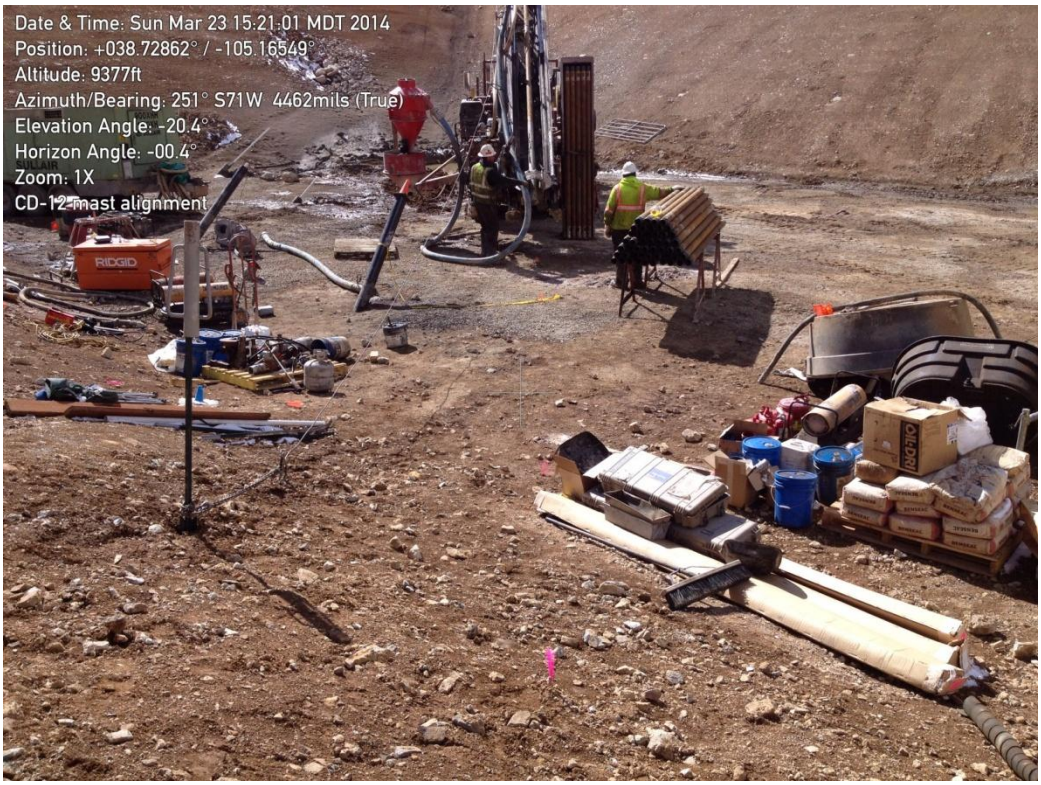
As of this morning:

AK drilling reached 420 ft at 07:20 this morning (3/24/14). Transitional features became present in returns at approximately 320 ft. John Roberts has left from Denver and is expected to arrive on site around 10:00

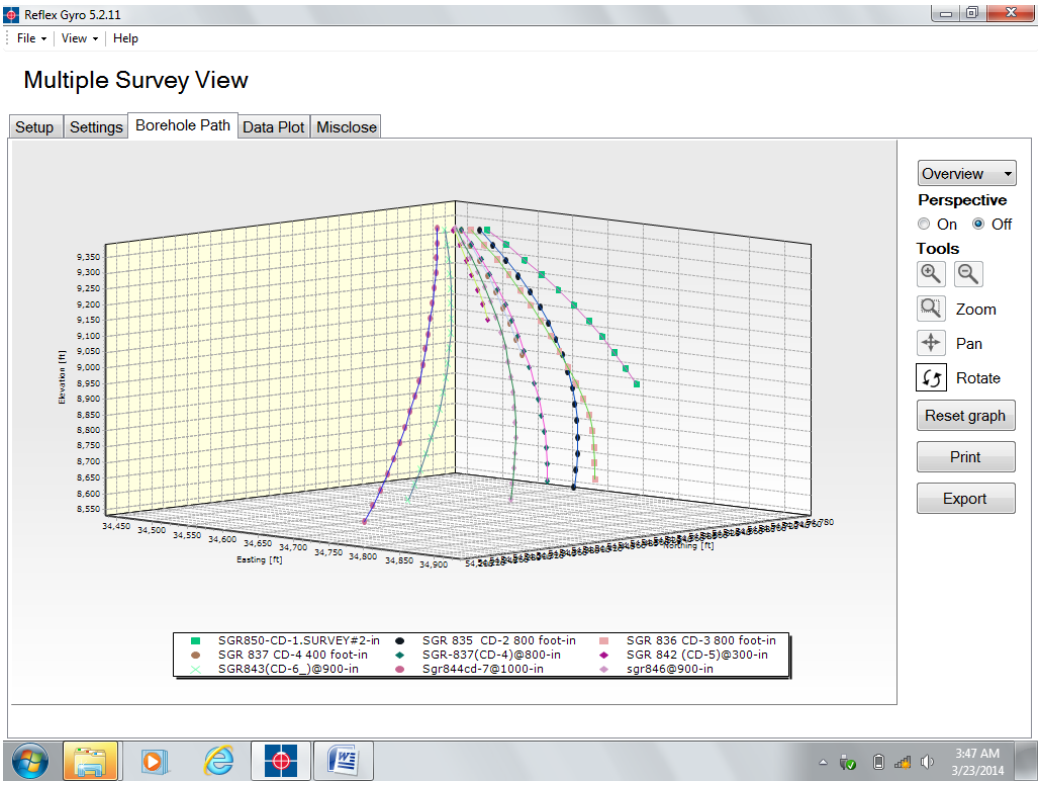
Submitted by:
Jessica L. Malone / Matthew Hartz

Submitted: Date: 03.24.2014

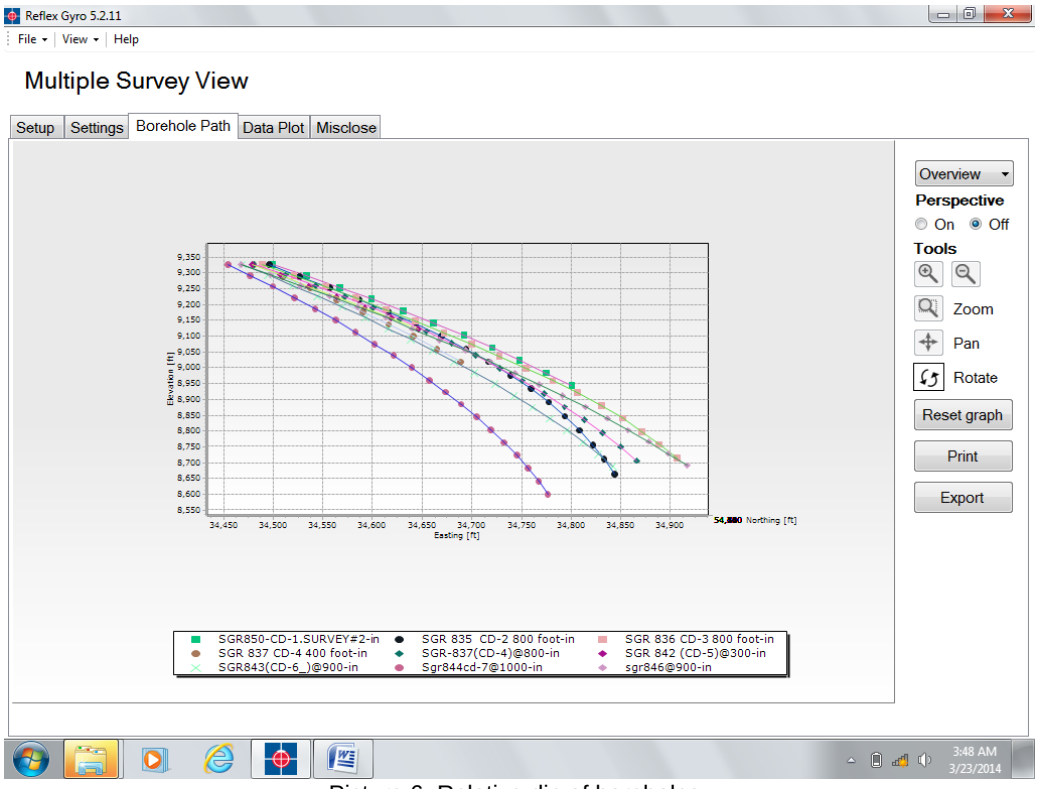
Daily Progress Photos:


Date & Time: Sun Mar 23 15:21:01 MDT 2014
Position: +038.72862° / -105.16549°
Altitude: 9377ft
Azimuth/Bearing: 251° S71W 4462mils (True)
Elevation Angle: -20.4°
Horizon Angle: -00.4°
Zoom: 1X
CD-12 mast alignment
RIDGID

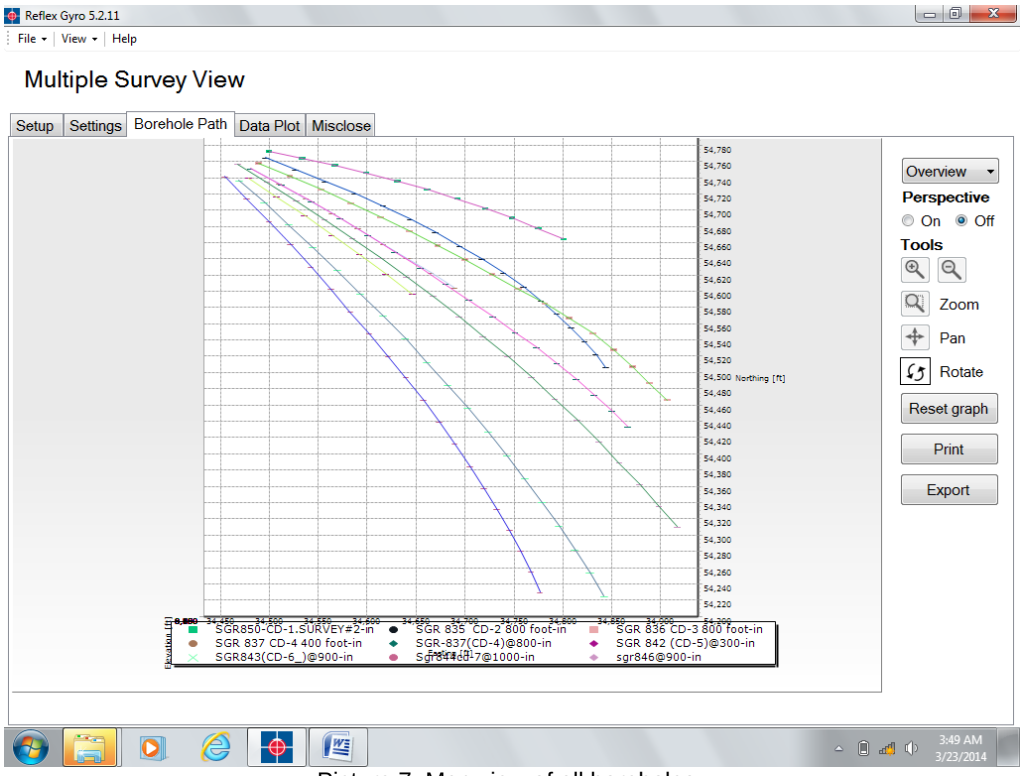

Date & Time: Sun Mar 23 02:59:01 MDT 2014
Position: 13 N 485600 4286666
Altitude: 2854m
Azimuth/Bearing: 000° N00E 0000mils (True)
Elevation Angle: +00.2°
Horizon Angle: +04.3°
Zoom: 1X
CD-9 980' TD, Rods at 920'. Elk Creek surveying to 900'



Picture 5- Plot of AK survey data (not final)



Picture 6: Relative dip of boreholes.



Picture 7: Map view of all boreholes.

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.24.2014
Day: Monday

Temperature:
Low: 27° F
High: 43° F

Weather Conditions:
Cloud Cover: Partly Cloudy.
Precipitation: NA.
Wind: NNE 15 mph

AMEC Personnel On Site

John Roberts	12.5	Hrs
Matt Hartz	15	Hrs
		Hrs

		Hrs

Project Concerns: None at this time.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0030	AK performed a deviation survey to 200ft depth in CD-12. Deviation is 3° south (right) azimuth (080° layout in the field and 083° at 200ft – the design azimuth was 97°, but was adjusted in the field by AK and CC&V to increase the risk of diatreme penetration), and +1° declination (48° design and 47° at 200ft).
0030-0305	AK advanced CD-12 from 220 to 320ft depth at a rate of 41.3 ft/hr.
0305-0340	AK performed a deviation survey to 300ft depth in CD-12. Deviation is 4° south (right) azimuth (080° field and 084° at 300ft), and 2° declination (48° design and 50° at 300ft).
0340-0720	AK advanced CD-12 from 320 to 420ft depth at a rate of 27.3 ft/hr.
0720-0750	AK performed a deviation survey to 400ft depth in CD-12. Deviation is 5° south (right) azimuth (080° field and 085° at 400ft), and 3° declination (48° design and 51° at 400ft).
0750-1130	AK advanced CD-12 from 420 to 520ft depth at a rate of 27.3 ft/hr.
1130-1245	AK had their crew change and performed a deviation survey to 500ft depth in CD-12. Deviation is 6° south (right) azimuth (080° field and 086° at 500ft), and 5° declination (48° design and 53° at 500ft).
1245-1645	AK advanced CD-12 from 520 to 620ft depth at a rate of 25.0 ft/hr.
1645-1735	AK performed a deviation survey to 600ft depth in CD-12. Deviation is 6° south (right) azimuth (080° field and 086° at 600ft), and 6° declination (48° design and 54° at 600ft).
1735-2130	AK advanced CD-12 from 620 to 700ft depth at a rate of 25.5 ft/hr. The hole was called TD at 700ft depth.
2020	The diatreme breccia material was encountered at 630ft.

2130-2300 Elk Creek performed a deviation survey to 680ft depth in CD-12. Deviation is 6° south (right) azimuth (080° field and 086° at 680ft), and 8° declination (48° design and 56° at 680ft).

2300-2400 AK began to trip-out the drill string in preparation to install drain materials and perform a hydro-test.

As of this morning:

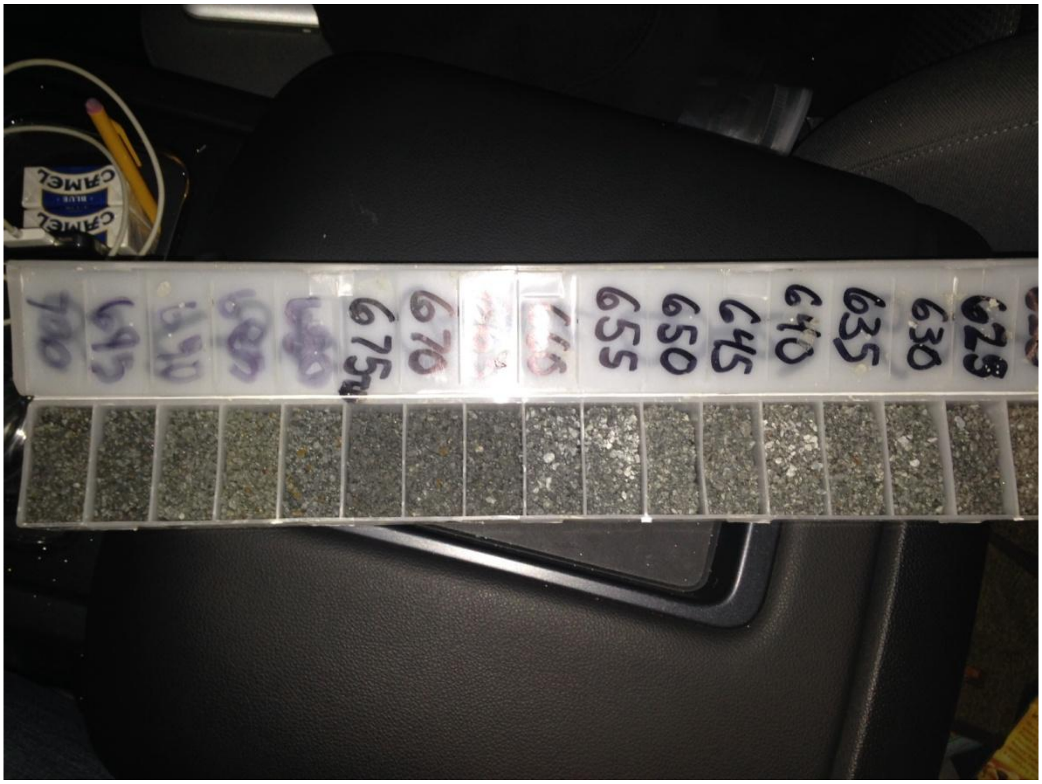
As of 0900, AMEC was able to complete a constant head test in CD-12 for 30 minutes. The average rate the hole took water was 44.6gpm, and the range was 40.0 to 44.7gpm.

AK is going to complete CD-12 and CD-2 with cement and weld the casing extensions onto the remaining drains before completing the abandonment of CD-4a.

Submitted by:
John W. Roberts, PG

Reviewed by: 
Timothy Burkhard
Submitted: Date: 03.25.2014

Daily Progress Photos:


CAMEL

CRIPPLE CREEK & VICTOR GOLD MINING Co.
Field Monitoring Daily Report

Owner: Cripple Creek & Victor Gold Mining Co.
Project: Closure Drain Installation
Location: Squaw Gulch Valley Leach Field Cripple Creek & Victor Gold Mine, Colorado
Contractor: Ames Construction / AK Drilling

Project Number: 74201125N0.****.****
Date: 03.25.2014
Day: Tuesday

Temperature:
Low: 27° F
High: 48° F

Weather Conditions:
Cloud Cover: Clear
Precipitation: NA
Wind: 0 mph

AMEC Personnel On Site

John Roberts	13.5	Hrs
Matt Hartz	10.5	Hrs
		Hrs

		Hrs

Project Concerns: Due to the nature of the drilling operations and the drilling returns management in the bottom of the PSSA, work needs to be completed before more fill can be placed in the area. There were two sumps, one in the immediate area of CD-6, and two in the opposite south corner. There were several trenches cutting across the pad area from each drain to a sump. CD-1, CD-2, and CD-3 had their returns spread at the surface to the south of each collar. CD-4, CD-4a, and CD-5 had their returns trenched to the sump around CD-6. CD-6, CD-7, CD-9 and CD-12 had their returns trenched to the southwest sump. The ground should be inspected when it is not frozen, and care should be taken during the inspection to ensure the surface is not dried-out and subgrade is saturated. Excessive ground movement of the subgrade during loading of the facility can have a negative effect on the horizontal component of the drains through deflection and possibly breaking of the schedule 80 0.025 slotted screens. If there are any minor excavations of saturated material in the area between CD-3 and CD-6, it should be known there are three (3) pieces of casing cut off below the existing grade where CD-4, CD-4a, and CD-5 were located; Ames has As-Built coordinates for these three locations.

Safety: All workers onsite were compliant with PPE and MSHA regulations. No incidents to report.

DRILLING ACTIVITIES and PROGRESS:

0000-0200	AK completed tripping-out of CD-12.
0200-0425	AK took drill rods and other equipment to their lay-down area.
0425-0535	AK tripped-in CD-12 drain materials – 2-inch end cap, 30lf of 0.030 slotted screen, and 680lf of sch. 80 PVC to 704ft depth.
0535-0613	AK left to get a full load of water for testing while AMEC prepared the transducers in CD-3 and CD-12 (TD-915ft and 703ft depth, respectively).
0613-0715	Filled CD-12 with water and moved equipment around to allow for a constant head test.
0715-0745	AMEC performed a constant head test. The hole took water at an average rate of 44.6gpm with a range of 40.0 to 44.7gpm.
0745-1145	AK completed CD-12 with a shale basket (12ft depth bgs) and centralizers, welded casing extension on CD-7, and tripped-in PVC to 165ft depth in CD-4a.

1145-1230 AK crew change. Work was halted for Ames' blast at 1200.

1230-1335 AK tripped-out the PVC in CD-4a that was used to verify depth of the grout previously pumped. The depth was 165ft bgs. The chips recovered during drilling indicate there is a facture zone from 150 to 165ft depth. AK was completely confident that they could get bentonite down from the surface.

1335-1345 AK poured 6 bags (50lbs) of $^{3}/_{8}$-inch bentonite chip from the surface. CD-4a was drill with a 4 ¾ bit. In a 5-inch nominal hole 1 bag will fill 5.1lf.

1345-1420 The bentonite in CD-4a bridged at 25ft depth. AK set the rig over the hole to drill out 21ft of bentonite (4-25ft).

1420-1600 AK tripped-in PVC to tremmie-in Ben Seal, and hit refusal at another bridge at 76ft depth. AK made the decision to grout from the surface to 76ft depth.

A void was grouted in CD-4a by setting a shale basket above a fracture zone. AK was using the bentonite chip bridge in the same manner. AMEC explained again to AK that there was some risk involved with purposely grouting a void in the hole, even though there was no groundwater and Austin Creswell, AMEC's Design Engineer, had no problem with it, and that it was AK's responsibility to verify compliance with the State of Colorado's laws and regulations.

AK staged equipment in preparation to grout CD-4a.

1600-1645 AK cut off the 6-inch casing stick-up approximately 4-inches below the existing grade before mixing two grout batches and cementing from the surface.

The first batch consisted of approximately 50gal of water and 9 bags (92.4lbs) of Type I/II Portland cement.

The second batch consisted of approximately 20gal of water and 3 bags (92.4lbs) of Type I/II Portland cement.

1645-1930 AK cleaned up the grouting equipment and began to move/pack up equipment prior to welding the last three casing extensions onto CD-2, CD-9 and CD-12.

1930 Sand was place in the annulus of CD-9, CD-9 and CD-12. AK began to weld the casing extension on CD-9. After the casing was welded on all three drains, AK finished packing up equipment, cleaning up and demobed from the site. AMEC left the site at 2000, and received no phone calls regarding problems.

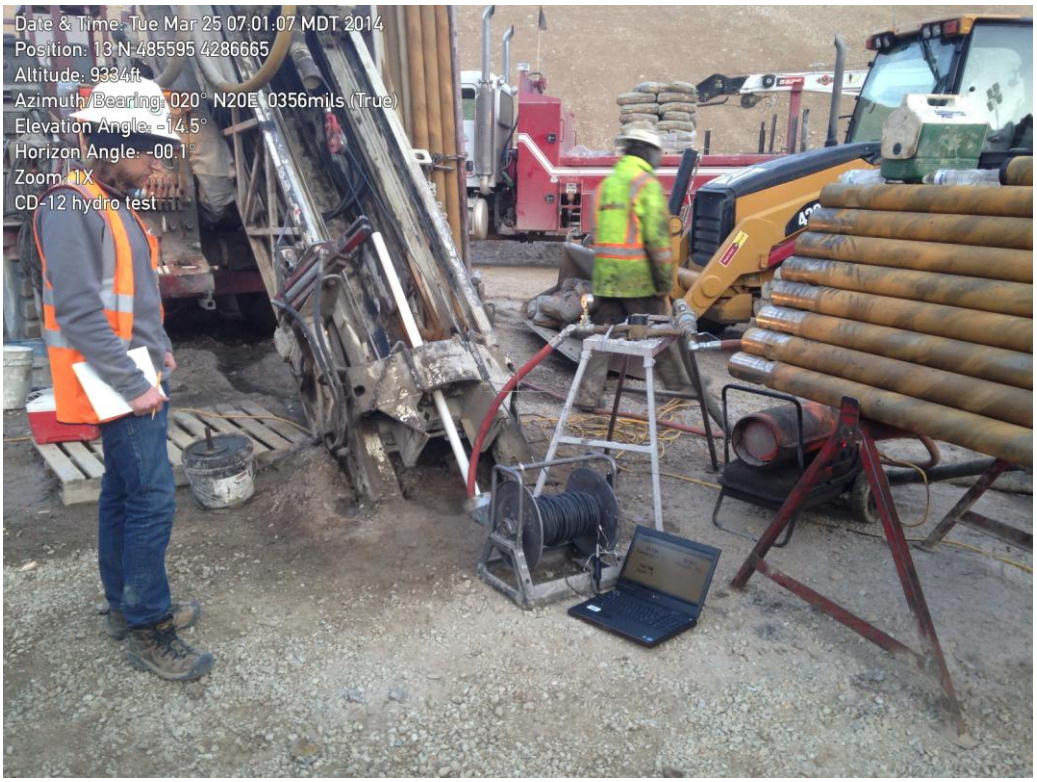
As of this morning:

At 0730 AK was completely demobed from the Squaw Gulch VLF PSSA. The sump for the drill returns is still there.

Submitted by:
John W. Roberts, PG

Reviewed by: X 
Timothy Burkhard
Submitted: Date: 03.26.2014

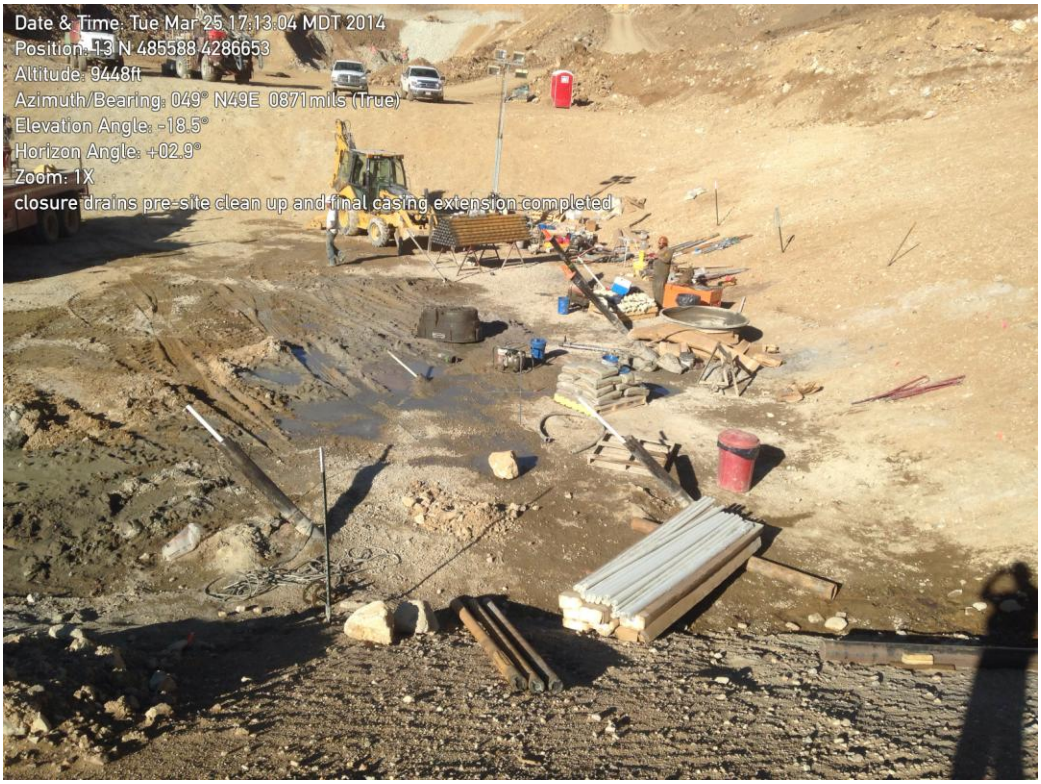
Daily Progress Photos:




Date & Time: Tue Mar 25 14:09:09 MDT 2014
Position: 13 N 485606 4286660
Altitude: 9390ft
Azimuth/Bearing: 353° N07W 6276mils (True)
Elevation Angle: -13.8°
Horizon Angle: +01.7°
Zoom: 1X
CD-4a pushing bentonite bridge out


Date & Time: Tue Mar 25 16:34:17 MDT 2014
Position: 13 N 485605 4286663
Altitude: 9332ft
Azimuth/Bearing: 012° N12E 0213mils (True)
Elevation Angle: -17.6°
Horizon Angle: +02.2°
Zoom: 1X
grouting CD-4a from surface to bentonite plug at 76ft depth


Date & Time: Tue Mar 25 17:12:17 MDT 2014
Position: 13 N 485610 4286664
Altitude: 9417ft
Azimuth/Bearing: 028° N28E 0498mils (True)
Elevation Angle: -33.2°
Horizon Angle: +01.7°
Zoom: 1X
CD-4a abandoned

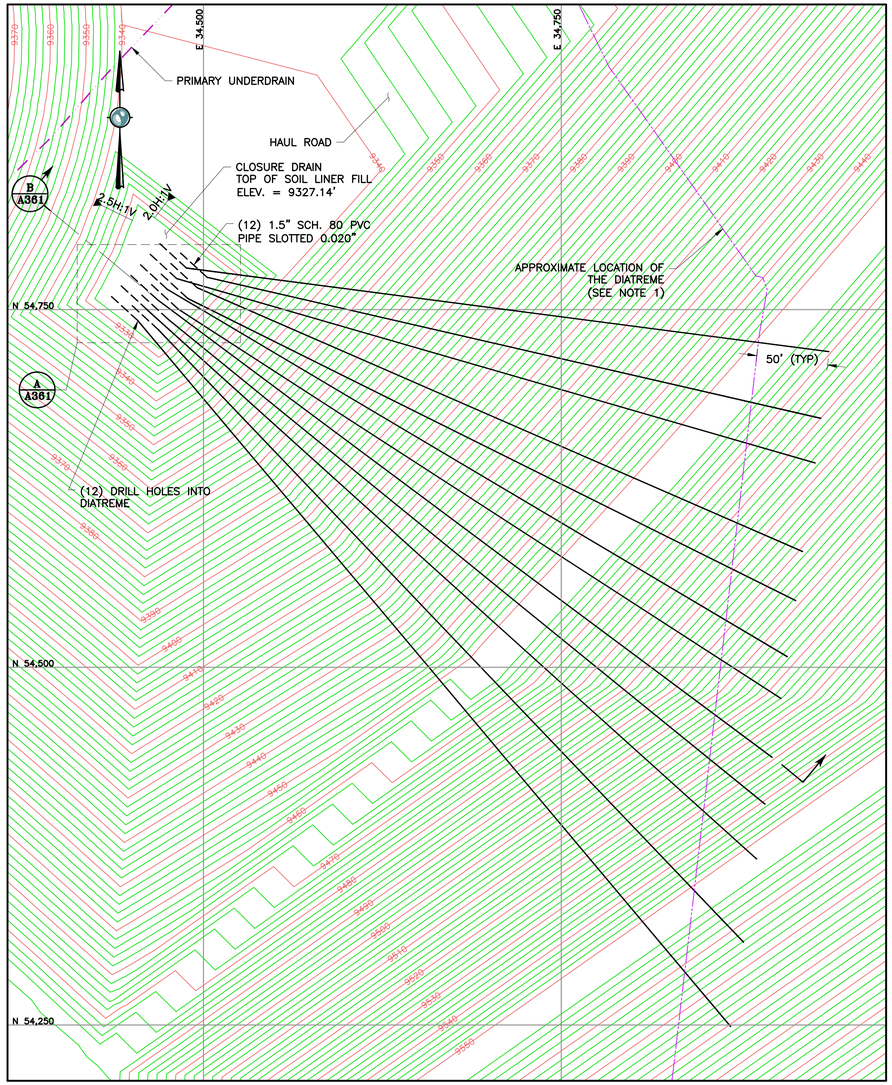

Date & Time: Tue Mar 25 17:13:04 MDT 2014
Position: 13 N 485588 4286653
Altitude: 9448ft
Azimuth/Bearing: 049° N49E 0871mils (True)
Elevation Angle: -18.5°
Horizon Angle: +02.9°
Zoom: 1X
closure drains pre-site clean up and final casing extension completed


Date & Time: Tue Mar 25 19:59:06 MDT 2014
Position: 13 N 485599 4286658
Altitude: 9391ft
Azimuth/Bearing: 293° N67W 5209mils (True)
Elevation Angle: -13.8°
Horizon Angle: +00.5°
Zoom: 1X
welding CD-9 casing extension


Date & Time: Wed Mar 26 07:39:57 MDT 2014
Position: 13 N 485579 4286649
Altitude: 9339ft
Azimuth/Bearing: 066° N66E 1173mils (True)
Elevation Angle: -18.6°
Horizon Angle: +00.5°
Zoom: 1X
Squaw Gulch VLF Closure Drains

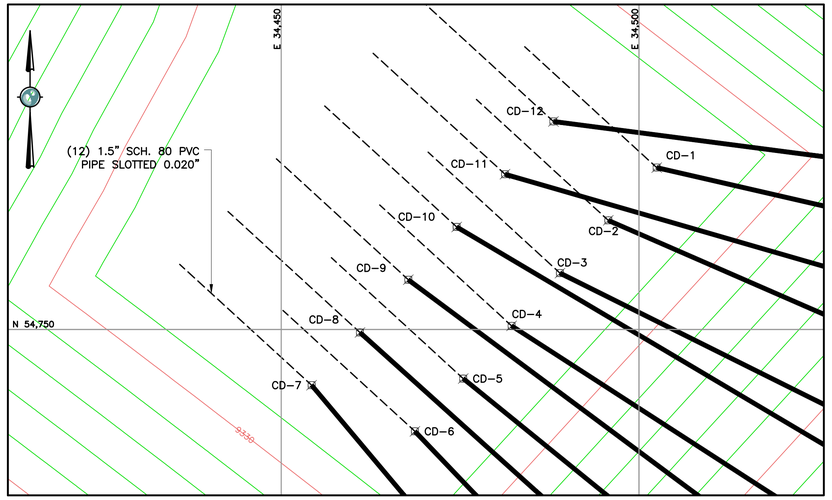
Appendix Q.4

Closure Drain Construction Drawings



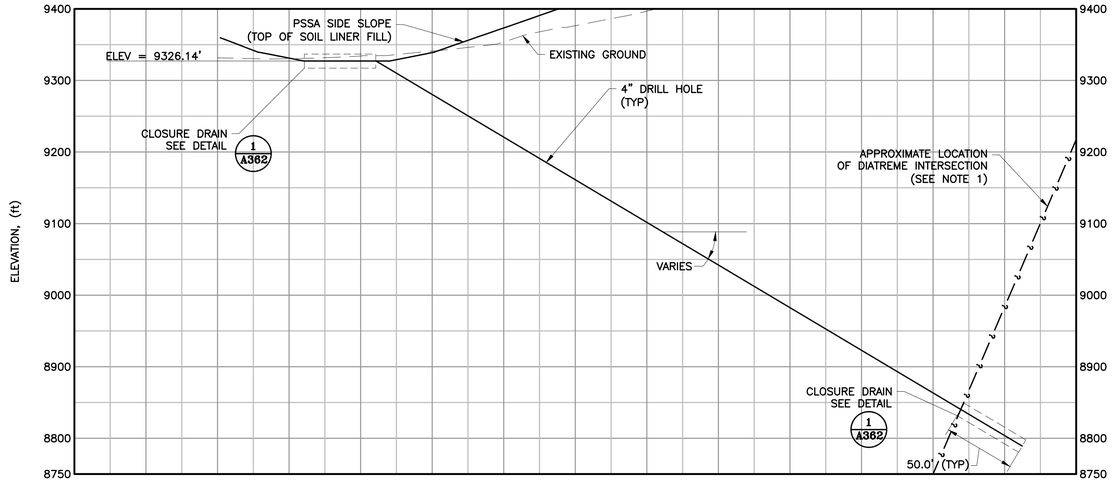
PLAN VIEW

50 0 50 100 FT



A A361 DRILL HOLE LAYOUT

10 0 10 20 FT



B A361 CLOSURE DRAIN TYPICAL SECTION

50 0 50 100 FT HORIZONTAL

100 0 100 200 FT VERTICAL

LEGEND:

- EXISTING GROUND SURFACE CONTOUR EL, FEET
- PROPOSED GROUND SURFACE CONTOUR EL, FEET
- PRIMARY UNDERDRAIN
- APPROXIMATE DIATREME
- CD-10 ⊠ DRILL HOLE LOCATION

NOTE:

1. THE DIATREME LOCATION IS APPROXIMATE. LOCATION WILL NEED TO BE FIELD VERIFIED. ONCE ENCOUNTERED DRILL OPERATOR SHALL CONTINUE TO DRILL A MINIMUM OF 50 FEET BEFORE INSTALLING 1.5 INCH SCHEDULE 80 PVC PIPE.

REFERENCE:

EXISTING GROUND TOPOGRAPHY WAS CREATED BY COMBINING THE FOLLOWING FILES RECV FROM FORESIGHT WEST SURVEYING, INC.:
- SQUAW GULCH BASE TOPO – PHASE 1 – REVISED.DWG (RECV MARCH 14, 2010)
- SQUAW GULCH BASE TOPO – PHASE 2.DWG (RECV APRIL 24, 2010)
- SQUAW GULCH BASE TOPO – PHASE 3.DWG (RECV MAY 4, 2010)
- CCV TOPO EXPANSION 12-29-10 NORTH AREA.DWG (RECV JANUARY 13, 2011)
- CCV TOPO EXPANSION 01-28-11 SOUTH AREA.DWG (RECV JANUARY 28, 2011)
- SH67 TOPO 7-07-11.DWG (RECV JULY 11, 2011)
- VLF2 TOPO EXPANSION 8-05-11.DWG (RECV AUGUST 9, 2011)
- 09028-COMOSITE-TOPO MLE LIMITS.DWG (RECV MAY 28, 2010 FROM CC&V)

CLOSURE DRAIN DRILL HOLE INSTALLATION DATA

POINT	NORTHING	EASTING	ELEVATION (ft)	HOLE DIA. (in)	INCLINATION (deg)	AZIMUTH (deg)	APPROXIMATE BORE LENGTH (ft)
CD-1	54,772.62	34,502.47	9,326.14	4	49.0	103	666
CD-2	54,765.25	34,495.71	9,326.14	4	47.0	114	681
CD-3	54,757.88	34,488.95	9,326.14	4	47.0	116	690
CD-4	54,750.50	34,482.19	9,326.14	4	45.0	123	709
CD-5	54,743.13	34,475.44	9,326.14	4	45.0	129	734
CD-6	54,735.76	34,468.68	9,326.14	4	45.0	136	775
CD-7	54,742.21	34,454.25	9,326.14	4	45.0	140	815
CD-8	54,749.58	34,461.00	9,326.14	4	45.0	132	760
CD-9	54,756.95	34,467.76	9,326.14	4	45.0	127	737
CD-10	54,764.32	34,474.52	9,326.14	4	45.0	121	710
CD-11	54,771.70	34,481.27	9,326.14	4	47.0	106	683
CD-12	54,779.07	34,488.03	9,326.14	4	48.0	97	675

3	05/13/14	RE-ISSUED FOR CONSTRUCTION	AC / ALM
2	02/17/14	RE-ISSUED FOR CONSTRUCTION	AC / CAS
1	1/17/14	RE-ISSUED FOR CONSTRUCTION	AC / JWR
0	01/09/14	ISSUED FOR CONSTRUCTION	AC / CAS

CLIENT: CRIPPLE CREEK & VICTOR GOLD MINING COMPANY

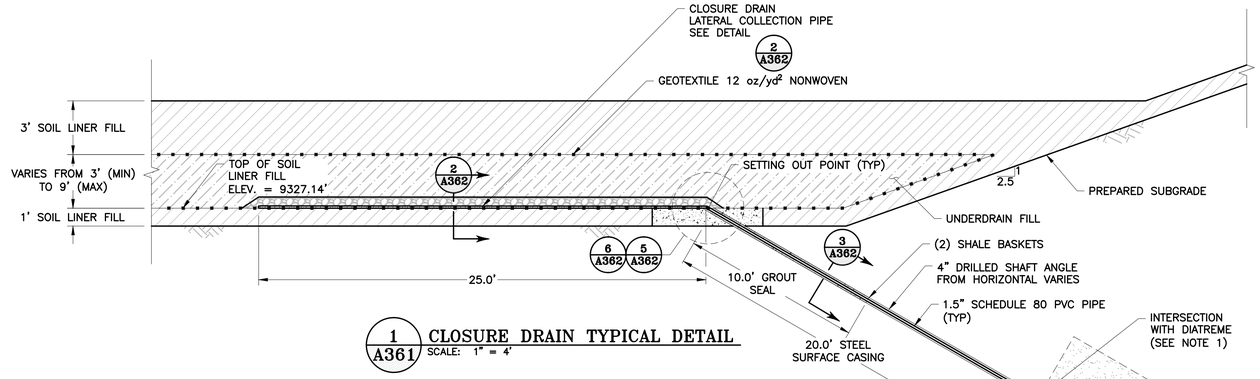
PROJECT: SQUAW GULCH VLF

TITLE: CLOSURE DRAIN PLAN

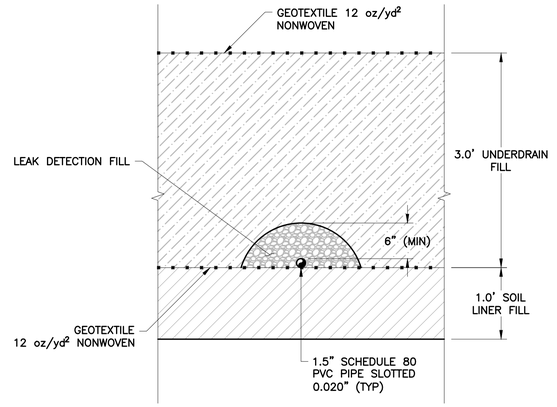
DESIGNED BY	AC	CHECKED BY	MEN
DRAWN BY	CAS	APPROVED BY	MEN

FILENAME: 1125G-A361 | DRAWING No.: A361 | REV: 3

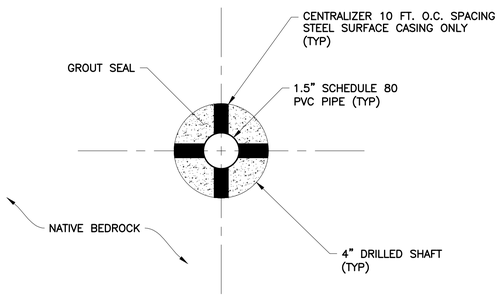
S:\CAD\1125G-Squaw VLF\cadd\CADD DRAWINGS\IFC Drawings\A361-1125G.dwg-5/13/2014 10:14 AM



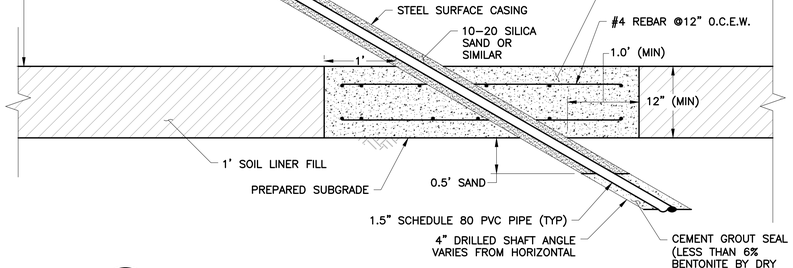
1/A361 **CLOSURE DRAIN TYPICAL DETAIL**
SCALE: 1" = 4'



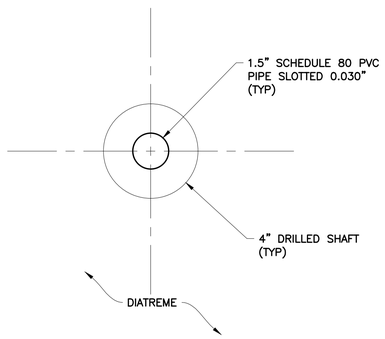
2/A362 **CLOSURE DRAIN – LATERAL COLLECTION PIPE DETAIL**
SCALE: 1" = 1'



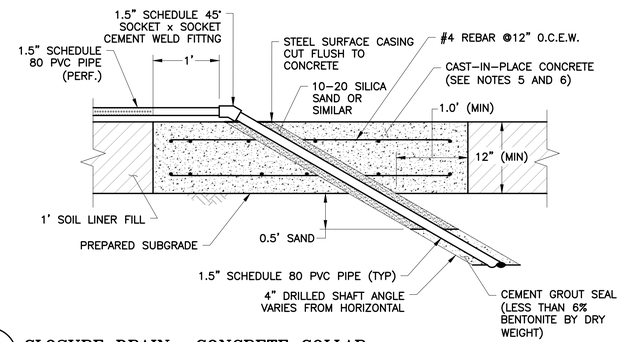
3/A362 **GROUT SEAL DETAIL**
SCALE: 1" = 0.25'



5/A362 **CLOSURE DRAIN– CONCRETE COLLAR PRE – SOIL LINER FILL PLACEMENT**



4/A362 **CLOSURE DRAIN – INCLINED DISCHARGE PIPE DETAIL**
SCALE: 1" = 0.25'



6/A362 **CLOSURE DRAIN– CONCRETE COLLAR POST – SOIL LINER FILL PLACEMENT**

NOTE:

1. THE DIATREME LOCATION IS APPROXIMATE. LOCATION WILL NEED TO BE FIELD VERIFIED. ONCE ENCOUNTERED DRILL OPERATOR SHALL CONTINUE TO DRILL A MINIMUM OF 50 FEET BEFORE INSTALLING 1.5 INCH SCHEDULE 80 PVC PIPE.
2. IF UNDERGROUND WORKINGS ARE ENCOUNTERED WITHIN THE PRECAMBRIAN, THE BOREHOLE SHALL BE SEALED AND ABANDONED. A NEW REPLACEMENT BOREHOLE WILL BE STARTED AT THE DIRECTION OF AMEC.
3. IF UNDERGROUND WORKINGS ARE ENCOUNTERED WITHIN THE DIATREME LIMITS, TERMINATE THE DRILL SHAFT AT UNDERGOUND WORKING AND SET SCREEN IN BOREHOLE JUST ABOVE THE ENCOUNTERED WORKING.
4. ALL SOIL LINER FILL WITHIN 5 FEET OF CONCRETE COLLAR SHALL BE HAND PLACED (NO HEAVY EQUIPMENT).
5. CAST–IN–PLACE CONCRETE WITH REINFORCING STEEL SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 psi.
6. CONCRETE COLLAR SHALL BE A MINIMUM 3 FEET IN LENGTH, 2 FEET WIDE, AND 1 FOOT THICK.

3	05/13/14	RE–ISSUED FOR CONSTRUCTION	AC / ALM
2	02/17/14	RE–ISSUED FOR CONSTRUCTION	AC / JWR
1	01/17/14	RE–ISSUED FOR CONSTRUCTION	AC / JWR
0	01/09/14	ISSUED FOR CONSTRUCTION	AC / CAS

CLIENT: CRIPPLE CREEK & VICTOR GOLD MINING COMPANY

PROJECT: SQUAW GULCH VLF

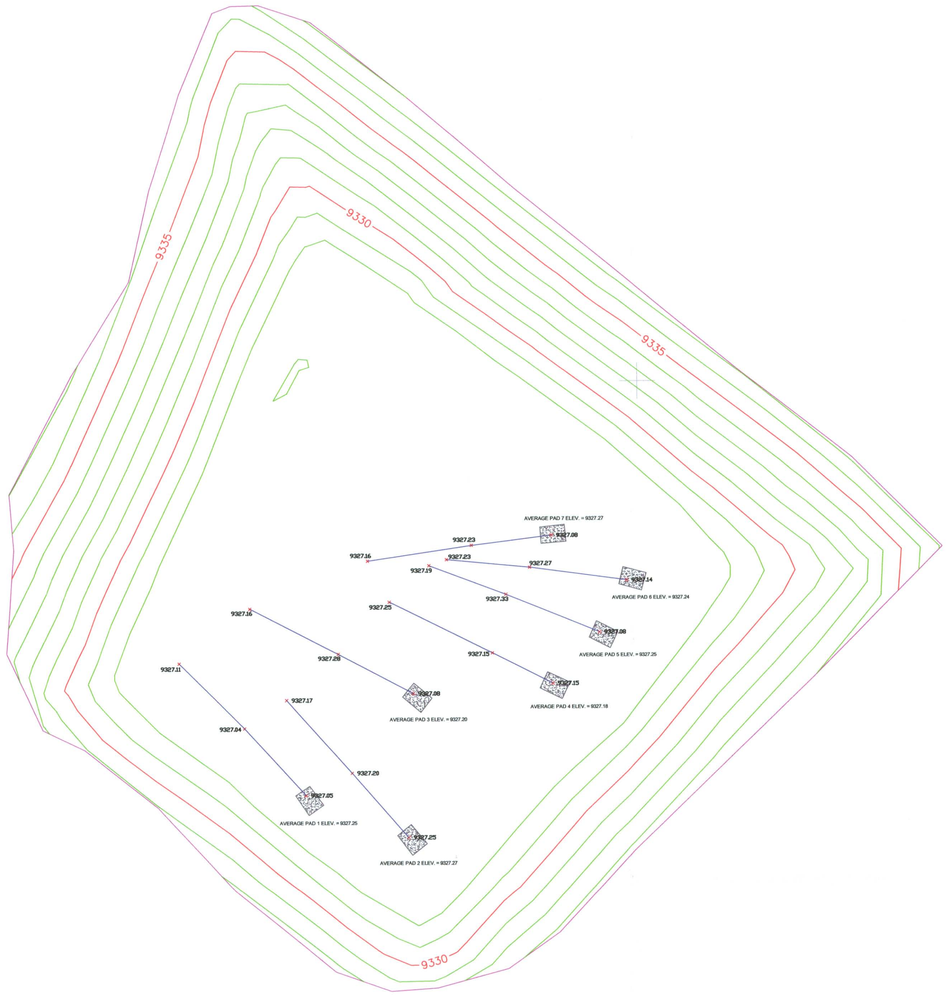
TITLE: CLOSURE DRAIN DETAILS

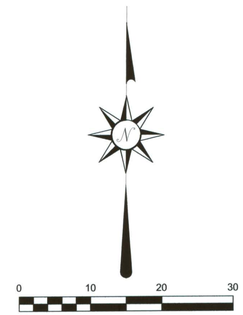
DESIGNED BY	AC	CHECKED BY	MEN
DRAWN BY	CAS	APPROVED BY	MEN

FILENAME: 1125G–A362 | DRAWING No.: A362 | REV: 3

Appendix Q.5

Closure Drain As-built Drawings





LEGEND

- MINOR CONTOUR TOP OF SLF
- MAJOR CONTOUR TOP OF SLF
- 2" PVC PIPE
- CLOSURE DRAIN SLF LIMITS
- CONCRETE
- × 9327.15 ELEVATION SHOT TAKEN AT FLOWLINE OF PIPE

NOTE: CONTOUR INTERVAL= 1 FOOT

Northing	Easting	Elevation	Description
54742.140	34454.029	9327.25	CENTER CONCRETE PAD 1
54736.678	34468.411	9327.27	CENTER CONCRETE PAD 2
54756.281	34469.102	9327.20	CENTER CONCRETE PAD 3
54757.925	34488.387	9327.18	CENTER CONCRETE PAD 4
54764.926	34495.180	9327.25	CENTER CONCRETE PAD 5
54772.644	34499.264	9327.24	CENTER CONCRETE PAD 6
54778.855	34488.110	9327.27	CENTER CONCRETE PAD 7

SURVEYOR'S CERTIFICATE:

I, Paul B. Gallagher, a Registered Professional Land Surveyor in the State of Colorado, do hereby certify only to Ames Construction Company, Inc. and Cripple Creek & Victor Gold Mining Company that from January 2013, through October 2014, as-built surveys were conducted under my supervision and the maps herein accurately represents said surveys, to the best of my knowledge.

For and on Behalf of
Ames Construction Inc.

PAUL B. GALLAGHER 16403 REGISTERED PROFESSIONAL LAND SURVEYOR STATE OF COLORADO

Paul B. Gallagher, PLS No. 16403

NOTICE: According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event, may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon.

AMES CONSTRUCTION INC.
18450 East 28th Ave.
Aurora, Colorado 80011
(303) 363-1000
PROJECT NO. 130601

DATE: 10-06-2014

SCALE: 1"=10'

DRAWN BY: BF,RS

CHK'D:

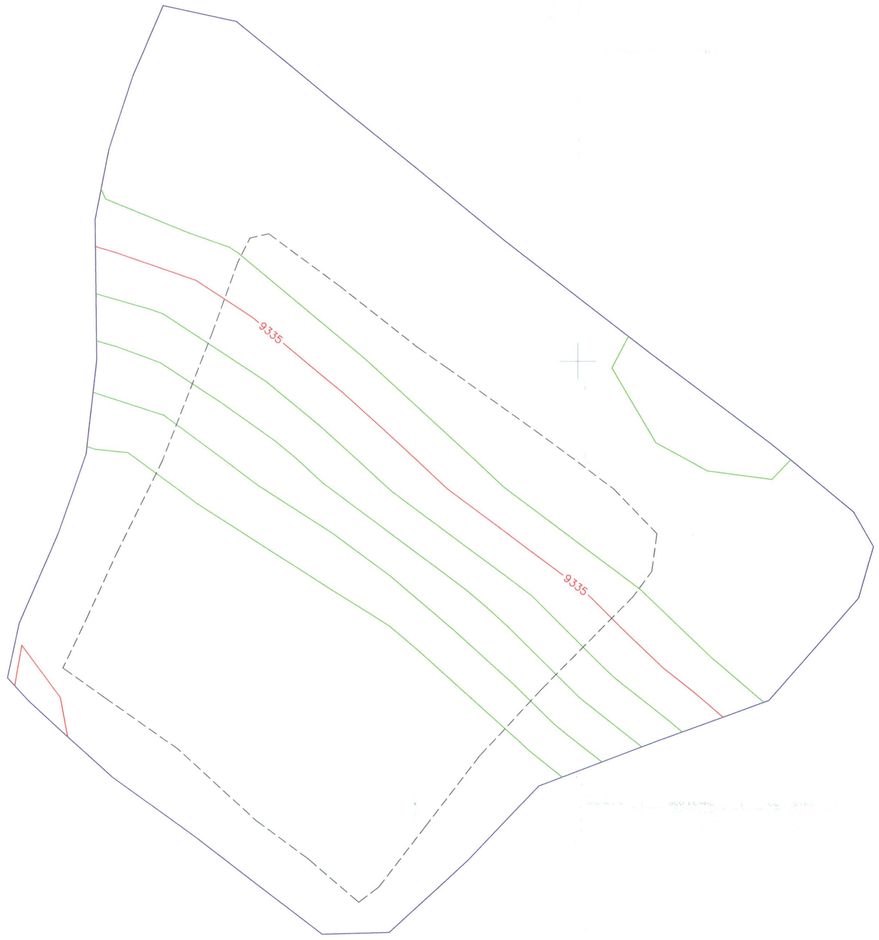
APP'D:

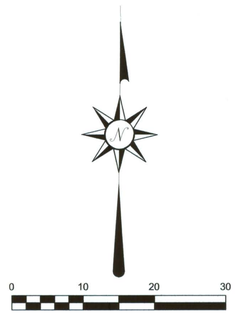
REVISIONS:

CRIPPLE CREEK & VICTOR GOLD MINING COMPANY
SQUAW GULCH VALLEY LEACH FACILITY
PREGNANT SOLUTION STORAGE AREA
CLOSURE DRAIN TOP OF SOIL LINER FILL

PROJECT NO.
130601

SHEET NO.
1-2





LEGEND

- MINOR CONTOUR TOP OF UNDERDRAIN FILL
- MAJOR CONTOUR TOP OF UNDERDRAIN FILL
- CLOSURE DRAIN UNDERDRAIN FILL TOP LIMITS
- CLOSURE DRAIN UNDERDRAIN FILL TOE LIMITS

NOTE: CONTOUR INTERVAL= 1 FOOT

UNDERDRAIN FILL LIMITS			
Northing	Easting	Elevation	Description
54757.469	34428.024	9327.79	TOE UNDERDRAIN FILL
54786.081	34441.746	9327.03	TOE UNDERDRAIN FILL
54817.266	34454.112	9327.56	TOE UNDERDRAIN FILL
54817.866	34456.710	9327.53	TOE UNDERDRAIN FILL
54798.895	34481.979	9327.21	TOE UNDERDRAIN FILL
54782.222	34505.103	9327.64	TOE UNDERDRAIN FILL
54776.047	34511.156	9327.77	TOE UNDERDRAIN FILL
54770.786	34510.454	9327.68	TOE UNDERDRAIN FILL
54745.133	34486.345	9327.43	TOE UNDERDRAIN FILL
54726.931	34472.302	9327.77	TOE UNDERDRAIN FILL
54724.772	34469.425	9327.94	TOE UNDERDRAIN FILL
54736.118	34455.071	9327.33	TOE UNDERDRAIN FILL
54746.284	34444.019	9327.43	TOE UNDERDRAIN FILL
54756.123	34420.254	9330.11	TOP UNDERDRAIN FILL
54763.687	34421.847	9330.09	TOP UNDERDRAIN FILL
54787.133	34431.098	9330.86	TOP UNDERDRAIN FILL
54800.252	34432.592	9332.60	TOP UNDERDRAIN FILL
54819.864	34432.400	9335.57	TOP UNDERDRAIN FILL
54829.536	34434.347	9336.55	TOP UNDERDRAIN FILL
54839.760	34437.648	9336.70	TOP UNDERDRAIN FILL
54849.567	34441.799	9336.17	TOP UNDERDRAIN FILL
54847.389	34452.101	9336.75	TOP UNDERDRAIN FILL
54816.834	34489.846	9336.38	TOP UNDERDRAIN FILL
54788.481	34527.054	9335.95	TOP UNDERDRAIN FILL
54779.048	34538.679	9336.16	TOP UNDERDRAIN FILL
54774.275	34541.491	9336.12	TOP UNDERDRAIN FILL
54767.123	34539.450	9336.08	TOP UNDERDRAIN FILL
54752.923	34526.920	9336.12	TOP UNDERDRAIN FILL
54740.995	34494.708	9330.42	TOP UNDERDRAIN FILL
54720.531	34473.703	9330.28	TOP UNDERDRAIN FILL
54720.292	34464.295	9330.11	TOP UNDERDRAIN FILL
54733.618	34446.840	9330.14	TOP UNDERDRAIN FILL
54742.186	34435.001	9330.25	TOP UNDERDRAIN FILL

SURVEYOR'S CERTIFICATE:

I, Paul B. Gallagher, a Registered Professional Land Surveyor in the State of Colorado, do hereby certify only to Ames Construction Company, Inc. and Cripple Creek & Victor Gold Mining Company that from January 2013, through October 2014, as-built surveys were conducted under my supervision and the maps herein accurately represents said surveys, to the best of my knowledge.

For and on Behalf of
Ames Construction Inc.

PAUL B. GALLAGHER 16403 REGISTERED PROFESSIONAL LAND SURVEYOR STATE OF COLORADO

Paul B. Gallagher, P.L.S. No. 16403

NOTICE: According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event, may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon.

AMES CONSTRUCTION INC.
18450 East 28th Ave.
Aurora, Colorado 80011
(303) 363-1000
PROJECT NO. 130601

DATE: 10-06-2014

SCALE: 1"=10'

DRAWN BY: BF,RS

CHK'D:

APP'D:

REVISIONS:

CRIPPLE CREEK & VICTOR GOLD MINING COMPANY
SQUAW GULCH VALLEY LEACH FACILITY
PREGNANT SOLUTION STORAGE AREA
CLOSURE DRAIN TOP OF UNDERDRAIN FILL

PROJECT NO.
130601

SHEET NO.
2-2