WEST RIDGE RESOURCES, INC.

P.O. Box 910, East Carbon, Utah 84520 794 North "C" Canyon Rd, East Carbon, Utah 84520
Telephone (435) 888-4000 Fax (435) 888-4002

December 13, 2017

Utah Division of Oil, Gas & Mining
Utah Coal Program
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, UT 84114-5801

Attn: Daron Haddock
Permit Supervisor

Re: West Ridge Mine C/007/041
WR17-001 Seismic Monitoring

Dear Mr. Haddock,

Please find attached the amendment to change appendix 5-13 regarding Grassy Trail Seismic Monitoring and the inclusion of the final RB&G report to be incorporated into the currently approved MRP.

If you have any questions, or need any additional information regarding this submittal, please contact me directly at 435-888-4000.

Sincerely,

Karin Madsen
Engineering Tech
UtahAmerican Energy, Inc.

APPLICATION FOR PERMIT PROCESSING

Permit Change X	New Permit ☐	Renewal ☐	Transfer ☐	Exploration ☐	Bond Release ☐	Permit Number: ACT/007/41
Title of Proposal: WR 17-001 Seismic Monitoring						Mine: West Ridge
						Permittee: West Ridge Resources, Inc

Description, include reason for application and timing required to implement:

Instructions: *If you answer yes to any of the first 8 questions (gray), submit the application to the Salt Lake Office. Otherwise, you may submit it to your reclamation*

☐ Yes	☐ No	1. Change in the size of the Permit Area? _____ acres Disturbed Area? _____ acres ☐ increase ☐ decrease.
☐ Yes	☐ No	2. Is the application submitted as a result of a Division Order? DO #
☐ Yes	☐ No	3. Does application include operations outside a previously identified Cumulative Hydrologic Impact Area?
☐ Yes	☐ No	4. Does application include operations in hydrologic basins other than as currently approved?
☐ Yes	☐ No	5. Does application result from cancellation, reduction or increase of insurance or reclamation bond?
☐ Yes	☐ No	6. Does the application require or include public notice/publication?
☐ Yes	☐ No	7. Does the application require or include ownership, control, right-of-entry, or compliance information?
☐ Yes	☐ No	8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
☐ Yes	☐ No	9. Is the application submitted as a result of a Violation? NOV #
☐ Yes	☐ No	10. Is the application submitted as a result of other laws or regulations or policies? Explain: Midterm
☐ Yes	☐ No	11. Does the application affect the surface landowner or change the post mining land use?
☐ Yes	☐ No	12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2?)
☐ Yes	☐ No	13. Does the application require or include collection and reporting of any baseline information?
☐ Yes	☐ No	14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
☐ Yes	☐ No	15. Does application require or include soil removal, storage or placement?
☐ Yes	☐ No	16. Does the application require or include vegetation monitoring, removal or revegetation activities?
☐ Yes	☐ No	17. Does the application require or include construction, modification, or removal of surface facilities?
☐ Yes	☐ No	18. Does the application require or include water monitoring, sediment or drainage control measures?
☐ Yes	☐ No	19. Does the application require or include certified designs, maps, or calculations?
☐ Yes	☐ No	20. Does the application require or include subsidence control or monitoring?
☐ Yes	☐ No	21. Have reclamation costs for bonding been provided for?
☐ Yes	☐ No	22. Does application involve a perennial stream, a stream buffer zone or discharges to a stream?
☐ Yes	☐ No	23. Does the application affect permits issued by other agencies or permits issued to other entities?

X Attach 1 complete digital copy of the application.

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

/ Karin Madsen / Engineering Tech. / 12.13.17
Signed - Name - Position - Date

Subscribed and sworn to before me this 13TH day of December, 2017.

Notary Public

My Commission Expires: March 27, 2021
Attest: STATE OF Utah
COUNTY OF Carbon

LINDA KERNS
NOTARY PUBLIC
STATE OF UTAH
COMMISSION # 693708
COMM.EXP.03-27-2021

Received by Oil, Gas & Mining

ASSIGNED TRACKING NUMBER

Application for Permit Processing
Detailed Schedule of Changes to the MRP

WR 17-001 Seismic Monitoring	Permit Number: ACT/007/041
	Mine: West Ridge
	Permittee: West Ridge Resources, Inc.

Provide a detailed listing of all changes to the mining and reclamation plan which will be required as a result of this proposed permit application. Individually list all maps and drawings which are to be added, replaced, or removed from the plan. Include changes of the table of contents, section of the plan, pages, or other information as needed to specifically locate, identify and revise the existing mining and reclamation plan. **Include page, section and drawing numbers as part of the description.**

			DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 5-13 (added RB&G Report to end and edited text)
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	

Any other specific or special instructions required for insertion of this proposal into the Mining and Reclamation Plan?

WordPerfect Document Compare Summary

Original document: K:\West Ridge\2017\WR17-001 Grassy Trail Monitoring\Appendix 5-13 Edited 4-5-17.wpd
Revised document: K:\West Ridge\2017\WR17-001 Grassy Trail Monitoring\Appendix 5-13 Edited 12-13-17.wpd
Deletions are shown with the following attributes and color:
~~Strikeout~~, Blue RGB(0,0,255).
Deleted text is shown as full text.
Insertions are shown with the following attributes and color:
Double Underline, Redline, Red RGB(255,0,0).

The document was marked with 4 Deletions, 5 Insertions, 0 Moves.

GRASSY TRAIL DAM MONITORING/INSPECTION PLAN

PANEL #7 AND PANEL BLOCK #18-21

- *Prior to longwall mining of Panel No. 7 additional subsidence control monuments were established across the crest of the dam on 100' centers, across the face of the dam midway down the slope on 200' centers, and along the toe of the dam on 200' centers.*
- *Prior to longwall mining the upper hillside accelerometer was removed, recalibrated, and relocated at the dam. The dam site accelerometer was removed, recalibrated, and relocated at a new location on the hillside approximately midway between the dam and the previous upper hillside location. In 2010, the hillside accelerometer was recalibrated and relocated northwest of the reservoir in the Left Fork of Whitmore canyon.*
- *Prior to longwall mining a seepage collection system was installed at the seep area located along the east abutment of the dam. This system was designed to collect the entire flow of the seep to a common point to allow accurate measurement of the seepage flow.*
- *Prior to longwall mining a complete set of premining baseline data was established including:*
  - *-Peizometer readings.*
  - *-Accelerometer readings.*
  - *-Inclinometer readings.*
  - *-Relative elevations of all subsidence monitoring monuments located on the dam. (Absolute elevations of all monuments were surveyed before and after extraction of longwall Panel No. 7)*
  - *-Flow rates at the east abutment seep, west abutment seep, and toe drain.*
  - *-Visual inspection of the dam, seeps, and slide area.*
  - *-Electronic photographs at predetermined designated viewpoints.*

In September, 2015 mining in panel #19 was completed. This was the last panel near Grassy Trail Dam. Following that, three short panels near the portals were mined out and completed in November, 2015. The portals to the mine were then sealed in February, 2016.

Reports compiled by RB&G Engineering show Mining-Induced Seismic Activity near the Grassy Trail Dam and Reservoir between July, 2010 and ~~January~~October, 2017. RB&G's reports conclude there as been no adverse effect of mining-induced seismicity on the dam or reservoir, therefore all commitments by WEST RIDGE Resources have

been satisfied. The data concludes there is no evidence that additional monitoring would show mining related seismic events, as all mining operations within any reasonable proximity to the dam have ceased.

~~WEST RIDGE Resources and RB&G Engineering will continue to monitor for Seismic activity through September, 2017, where at that time the data will be reviewed~~As discussed by the Division of Dam Safety, Division of Oil, Gas & Mining, Bureau of Land Management, East Carbon-Sunnyside City (herein after referred to as: the designated parties)~~, and if no significant movement has been detected which can be linked to mining-induced seismicity, WEST RIDGE Resources monitoring responsibilities will cease, and any ongoing~~ in January of 2017, West Ridge Resources and RB&G Engineering continued monitoring for mining induced seismic activity through November of 2017 and Inclinometers 2 and 3 were replaced. In November of 2017 the designated parties reviewed the data and it was agreed that monitoring for mining induced seismic activity was no longer warranted based on the monitoring data provided in the RB&G report. Seismic monitoring at the Grassy Trail Dam has now ceased, and future monitoring will fall under Utah State Dam Safety Guidelines~~.~~

~~On or before the end of September, 2017 WEST RIDGE Resources agrees to the terms of arranging for the installation of two new inclinometers at the Grassy Trail Dam to replace Inclinometers 2 and 3.~~

~~Seismic Monitoring:~~

~~· *RB&G will be responsible for compiling and distributing the following monthly, and event-driven inspection and monitoring reports. These reports will be generated in an electronic format and emailed on a timely basis to all designated parties.*~~

~~· ***Monthly Basis:** After longwall mining has ceased, the following monitoring will be conducted on a monthly basis:*~~

~~-*Site reconnaissance/visual inspection (inspection will be done by the same individual to ensure consistency of visual observation interpretations).*~~

~~-*Accelerometer readings This information will be downloaded by RB&G and attached to the monthly summary.*~~

~~-*Inclinometer readings (to be taken by RB&G)*~~

~~-*Electronic photographs from predetermined viewpoints*~~

-Relative elevations of subsidence monitoring monuments located on the dam. These surveys will be conducted by a registered professional surveyor.

-Electronic reporting (emails) of the monthly measurements will be combined with the fourth weekly inspection report sent to the designated parties.

· **East Carbon-Sunnyside City Responsibilities:**

The following data will be collected by East Carbon-Sunnyside City, as agreed during a tele-conference held on January 23, 2017 with all designated parties, and will be shared with RB&G Engineering to be included in Monthly Report.

East Carbon-Sunnyside City personnel is to receive training from RB&G as to how to properly monitor and report seepage flows from the designated seepage collection points.

A member of the Utah Dam Safety will be present at this training.

-Reservoir Elevation, Piezometer readings, Seepage Collection Drains:

MonthlyBasis: When the reservoir elevation is below the 7,585-foot elevation.

Weekly Basis: When the reservoir elevation is equal to or exceeds the 7,585-foot elevation

Note: This 7,585-foot elevation is equal to 7.5-feet below the spillway.

· **Event-driven basis:** In addition to the weekly and monthly inspections the following measures will be taken on an event-driven basis:

The University of Utah seismic readings will be monitored on a daily basis, if any events are recorded greater than a magnitude 3.0 within 5 miles of the dam then, within 24 hrs of such readings, a full site reconnaissance and visual inspection will be conducted, and accelerometer readings will be taken. If the accelerometer readings

~~*show any value greater than 1.2g, then inclinometer readings, peizometer readings and drain-flow measurements (east seep, west seep, and toe drain) will be taken at that time. The results of these measurements will be emailed immediately to all designated parties.*~~

~~*· The standardized form of the inspection/monitoring reports is included in Appendix 1-17.*~~

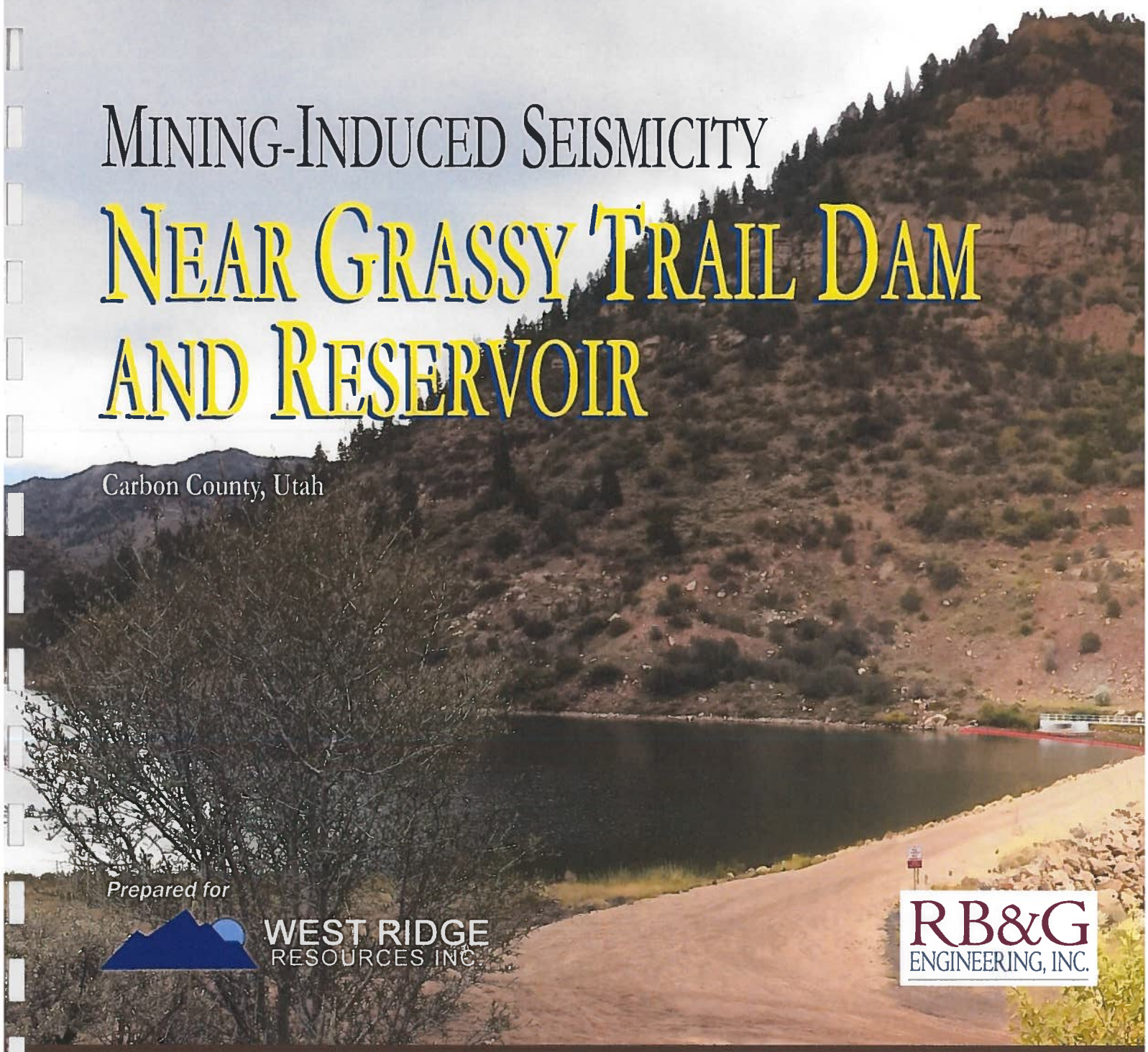
~~_____~~ and responsibility will fall to the owner (East Carbon City).

A copy of RB&G's final report has been included at the end of this appendix.

SUMMARY UPDATE REPORT

MINING-INDUCED SEISMICITY NEAR GRASSY TRAIL DAM AND RESERVOIR

Carbon County, Utah

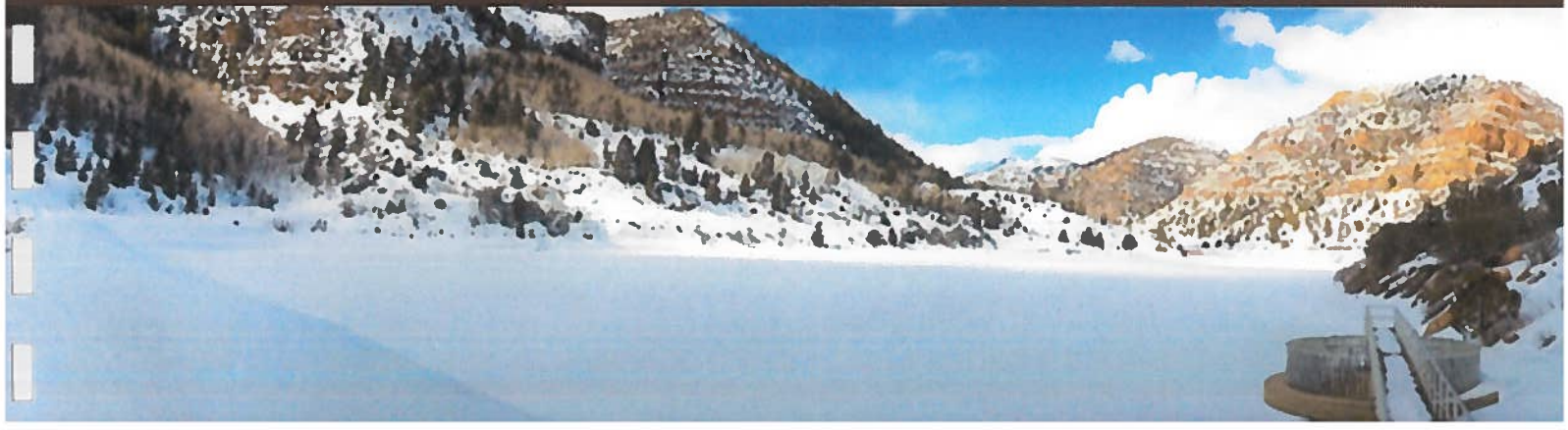


Prepared for

WEST RIDGE RESOURCES INC

RB&G ENGINEERING, INC.

OCTOBER 2016 TO OCTOBER 2017



RB&G
ENGINEERING, INC.

October 23, 2017

West Ridge Resources, Inc.
P.O. Box 910
East Carbon, UT 84520

Subject: Mining-Induced Seismicity Summary Update Report – October 2016 to October 2017
Near Grassy Trail Dam and Reservoir

Gentlemen:

A Summary Update Report has been completed for the Mining-Induced Seismicity Study at the Grassy Trail Dam and Reservoir in Carbon County, Utah.

We appreciate the opportunity of providing this service for you. If there are any questions relating to the information contained herein, please call.

Sincerely,

RB&G ENGINEERING, INC.

REGISTERED PROFESSIONAL ENGINEER
NO. 162291
BRADFORD E. PRICE
STATE OF UTAH

Bradford E. Price, P.E. 10/23/17

bep/jag

1435 WEST 820 NORTH, PROVO, UTAH 84601-1343
PROVO 801-374-5771 SALT LAKE CITY 801-521-5771 FAX 801-374-5773

Summary Update Report
October 2016 to October 2017

Mining-Induced Seismicity Near Grassy Trail Dam And Reservoir

Carbon County, Utah

Prepared for:
West Ridge Resources, Inc.

October 23, 2017

RB&G ENGINEERING, INC.

MINING-INDUCED SEISMICITY
NEAR GRASSY TRAIL DAM AND RESERVOIR
Carbon County, Utah

Summary Update Report
October 2016 to October 2017

TABLE OF CONTENTS

FIGURES & TABLES

SECTION A - GROUND MOTION MONITORING DEVICES

SECTION B - INCLINOMETERS

SECTION C – PIEZOMETER, OBSERVATION WELLS AND SEEPAGE

SECTION D – WARE SURVEYING, LLC

APPENDIX

MINING-INDUCED SEISMICITY
NEAR GRASSY TRAIL DAM AND RESERVOIR
Carbon County, Utah

RB&G ENGINEERING, INC.

Summary Update Report
October 2016 to October 2017

1 INTRODUCTION

This report is an update to the October 2016 Summary Report "Mining Induced Seismicity Near Grassy Trail Dam and Reservoir Carbon County, Utah", *RB&G Engineering, October 26, 2016*), which summarized monitoring activities between July 2010 and October 2016. The 2016 report should be referenced for details relating to the historical data. The text for the 2016 report is included in the Appendix of this report. The project area is shown on Figure 1.

The primary purpose of this study has been to monitor the effects of mining-induced seismicity on the dam and reservoir during and following the mining of Panel 7 in West Ridge Mine, and to monitor effects of mining in subsequent panels, including Panels 18, 19, and 20 near the north end of the reservoir. The locations of instrumentation used for the monitoring program are shown on Figure 2. Weekly site visits have been made to monitor the dam and Project Reports have been submitted on a monthly basis, summarizing the weekly monitoring. The text portion of the Project Reports is also included in the Appendix.

2 MONITORING DATA

At the time of this report, mining has been completed at the West Ridge Mine for approximately 23 months with operation ceasing after completion of Panel 34 in November 2015. Figure 1 shows the location of the West Ridge Mine operation relative to Grassy Trail Dam and Reservoir.

Summaries of monitoring data prepared by RB&G Engineering from seismic ground motion instruments, the University of Utah Seismograph Stations (UUSS), inclinometers, piezometers and seepage readings are included in this report. We have also included the survey data collected by Ware Surveying.

2.1 UNIVERSITY OF UTAH SEISMOGRAPH STATIONS AND GROUND MOTION MONITORING

Since October 2016 the UUSS has only reported 2 seismic events within the region of the mine. Neither of these events were recorded by the accelerometer on the dam.

Date	Magnitude	Distance from Dam
11/23/16	0.8	1.6 miles NW
2/08/17	1.7	0.56 miles NW

During the past year, the events being recorded on the accelerometer are manmade events which can be generated while opening and closing the cover and by strong winds which vibrate the solar panel. In the past year, there has only been one "real" seismic event recorded on the dam. This event was associated the 5.3 magnitude earthquake on September 2nd (about 5:58pm), which occurred near Soda Springs/Sulfur Mountain, Idaho, approximately 200 miles to the northwest. The dam accelerometer recorded a maximum PGA of 0.027g, and a maximum vertical peak practical velocity of 0.065 in/sec. For comparison, this event appears to have generated approximately the same acceleration on the dam as a 1.5-1.9 magnitude MIS event, while mining in Panel 7 adjacent to the dam.

The largest magnitude MIS event recorded during mining took place during March 2006 while mining was near the dam. The UUSS reported this event to have a magnitude of 2.6 and generated a PGA of 0.348g on the hillside, and 0.268g on the dam.

A summary of the number of events per month and the largest event each month since July 2010 is tabulated on Table A-1 in Section A – Ground Motion Monitoring Devices. It will be observed that no seismic events have been recorded on the dam between January 2010 to October 2017, with exception of the 5.3 magnitude Soda Springs, Idaho event. It should be noted that no MIS events have been recorded on the dam since 2008. With mining having been completed in November 2015, and a lack of seismicity being recorded at the dam and by the UUSS, it appears that any rock-bursts related to mining collapse have been too small to be detected.

A copy of the Accelerometer readings from the end of September 2016 to October 2017 are included in the Section A – Ground Motion Monitoring Devices.

2.2 INCLINOMETERS

There are three inclinometers on the dam crest and abutments and one located on a slide in the roadcut along the west side of the reservoir. Inclinometer I-2 experienced about 3 inches of movement during mining. I-3 likely also moved about 3 inches but has not shown accurate

readings. It is likely that this inclinometer did not extend deep enough into the bedrock to fix the tip below the slide. Based on the movement which occurred during mining, it was determined that Inclinometer I-2 should be replaced with new inclinometer casing which has not been strained, and that Inclinometer I-3 should be replaced with an inclinometer extending deeper into the bedrock.

Figure 2 shows the locations of the four old inclinometers and the two recently installed inclinometers 17-I-2 and 17-I-3.

Data from September 2016 through September 2017 for the four old inclinometers and the two new inclinometers are included in Section B - Inclinometers.

It should be noted that during July 2017 we upgraded inclinometer software and also began using a new inclinometer probe. The new probe does not take readings in the exact same location as the old probe, so there is not a direct correlation between the old and new data.

For detailed inclinometer information prior to 2016, Summary Reports from January 2008, July 2010 and October 2016 should be referenced.

2.3 PIEZOMETERS AND OBSERVATION WELLS

The dam has been instrumented with piezometers and observation wells to allow monitoring of changes in pore pressure and seepage behavior. The locations of these instruments are illustrated on Figure 2. East Carbon City is responsible for monitoring the piezometers and observation wells on a regular basis. The monitoring results are uploaded to the Utah State Dam Safety Office web site. This information is available at http://nrwrt1.nr.state.ut.us/cgi-bin/damview.exe?Modinfo=Viewdam&DAM_NUMBER=UT00126. Table C-1 and Figure C-1B in Section C–Piezometers, Observation Wells and Seepage, shows a summary of reservoir levels and piezometer readings between September 2016 and October 2017. Figure C-1A shows levels between 2005 and 2017.

The observation well identified as OW-4, installed in 1979, has shown erratic readings over the course of the current monitoring program. We examined this 2-inch diameter pipe with a video camera and observed water spraying into the pipe through one slot at a depth of about 25 feet, then cascading down to about 84 feet (approx. elevation 7518), where water was standing in the pipe. Some of the hand cut slots in the pipe appeared to be plugged. The water entering the pipe above the standing water level has been found to trigger the water level indicator, and this behavior is likely responsible for some of the erratic readings noted in OW-4. During the last

review meeting in October 2016, it was decided that this observation well should be abandoned and sealed up and no longer used. This well was abandoned on September 24, 2017, by filling the 2-inch diameter pipe from the bottom up to top with about 250 lbs of bentonite chips.

2.4 SEEPAGE MONITORING POINTS

Seepage through the dam, foundation, and abutments has been collected at four locations, including the toe drain connected to the dam's internal drainage system (D-1), a seepage collection system located on the east (left) abutment with two collection points D-2 and D-3, and a collection pipe located downstream of the west (right) abutment (S-1). The flows from the drains are measured by recording the time to fill a container of known volume with water from each collection point. The clarity of the water has also been recorded during seepage readings. Clear seepage indicates that the flow is adequately filtered and is not moving material through the dam or foundation. Cloudy seepage can be a sign of internal erosion, which could lead to a piping-related failure of the structure. No cloudy water has been noted during our site visits. D-3, which was installed in 2015, will sometimes have some sand sized particles in the container which catches the flow in between site visits. This sediment is likely derived from surficial runoff during storms.

Table C-2 and Figure C-2B in Section C shows the reservoir elevation and seepage at each monitoring location from September 2016 to October 2017. Figure C-2A shows the data from 2005 to 2017. The dates of larger seepage rates tend to coincide with higher water levels in the reservoir, with spikes occurring when the water level rises above about elevation 7590 ft.

2.5 SURVEY POINTS

West Ridge Mine has contracted with Ware Surveying, LLC to provide surveys of points on the dam and the slopes west of the reservoir at various times throughout the monitoring program. The locations of the survey points are shown on Figure C-3 of Section D – Ware Surveying LLC, followed by a copy of the readings reported to date. The survey includes GPS Survey Data, Differential Level Survey, and a Straight Line Survey. The survey data indicates no significant horizontal nor vertical movement has occurred between September 2016 and September 2017.

3 CONCLUSIONS

Monitoring of instrumentation at the Grassy Trail Dam and Reservoir has not detected horizontal or vertical movement from October 2016 through October 2017. No mining-induced seismicity (MIS) events have been recorded at the dam. The only seismic event recorded on the dam was associated with the 5.3 magnitude earthquake on September 2, 2017 near Soda Springs, Idaho, approximately 200 miles to the northwest.

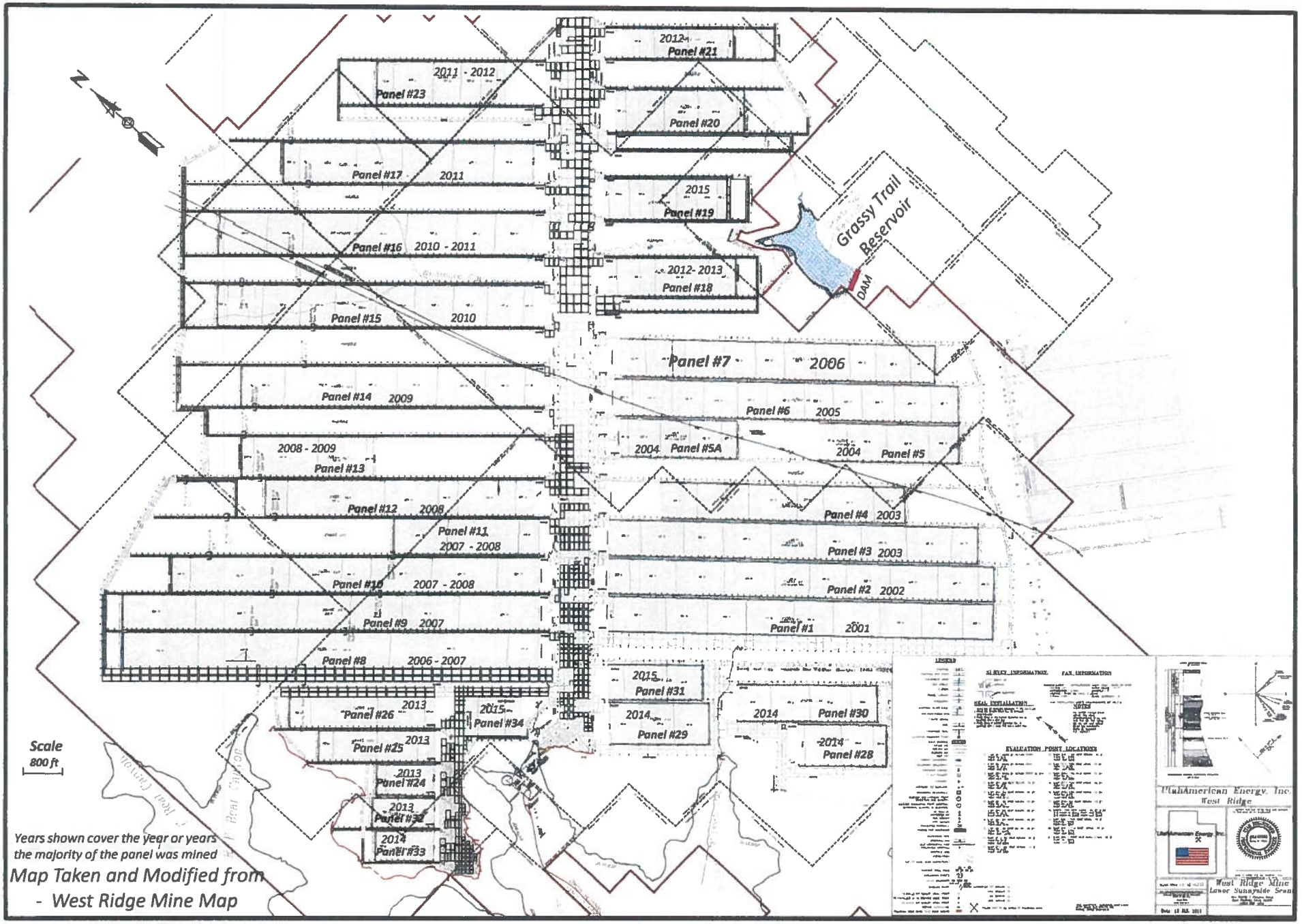
Water levels recorded in piezometers and observation wells appear to be functioning normally with respect to the elevation of the water in the reservoir. No evidence of internal erosion has been observed in seepage collected and monitored downstream of the dam and abutments. Seepage rates coincide with changes in reservoir water elevation. The highest seepage rates occur when the reservoir is near full, above elevation 7590 feet. Seepage rates in excess of 20 gallons per minute were recorded in 2007 and 2008. The highest level recorded between October 2016 and October 2017 was 15 gallons per minute.

No significant movement was observed or recorded in landslide deposits adjacent to the reservoir between October 2016 and October 2017. While these landslides currently appear to be relatively stable, it should be recognized that increases in slide movement could occur due to factors unrelated to mining, such as above average precipitation and changes in the moisture conditions in the hillside. Naturally-occurring earthquakes may also trigger new movement. If mining activities were to resume in the site vicinity, the possibility of renewed movement would increase.

Three inches of dam foundation deformation was recorded as a result of mining-induced seismicity, during mining of Panel 7 in 2006. Very small to negligible deformation was observed or recorded during mining of other panels. All mining activities terminated in November 2015. Following submittal of the MIS Summary Report in February 2016, a stake holder meeting was held to determine if MIS monitoring should be terminated, as recommended in the Summary Report. It was determined that Inclinometers 2 and 3 should be replaced and monitoring continue through September 2017.

The new inclinometers have been installed and the instrumentation monitoring during the past year has not identified any mining-induced seismicity dam safety issues. No MIS events have been recorded on the dam, inclinometer readings have shown negligible movement, and piezometers, observation wells, and seepage monitoring has been within expected ranges. It is recommended that the MIS monitoring be terminated.

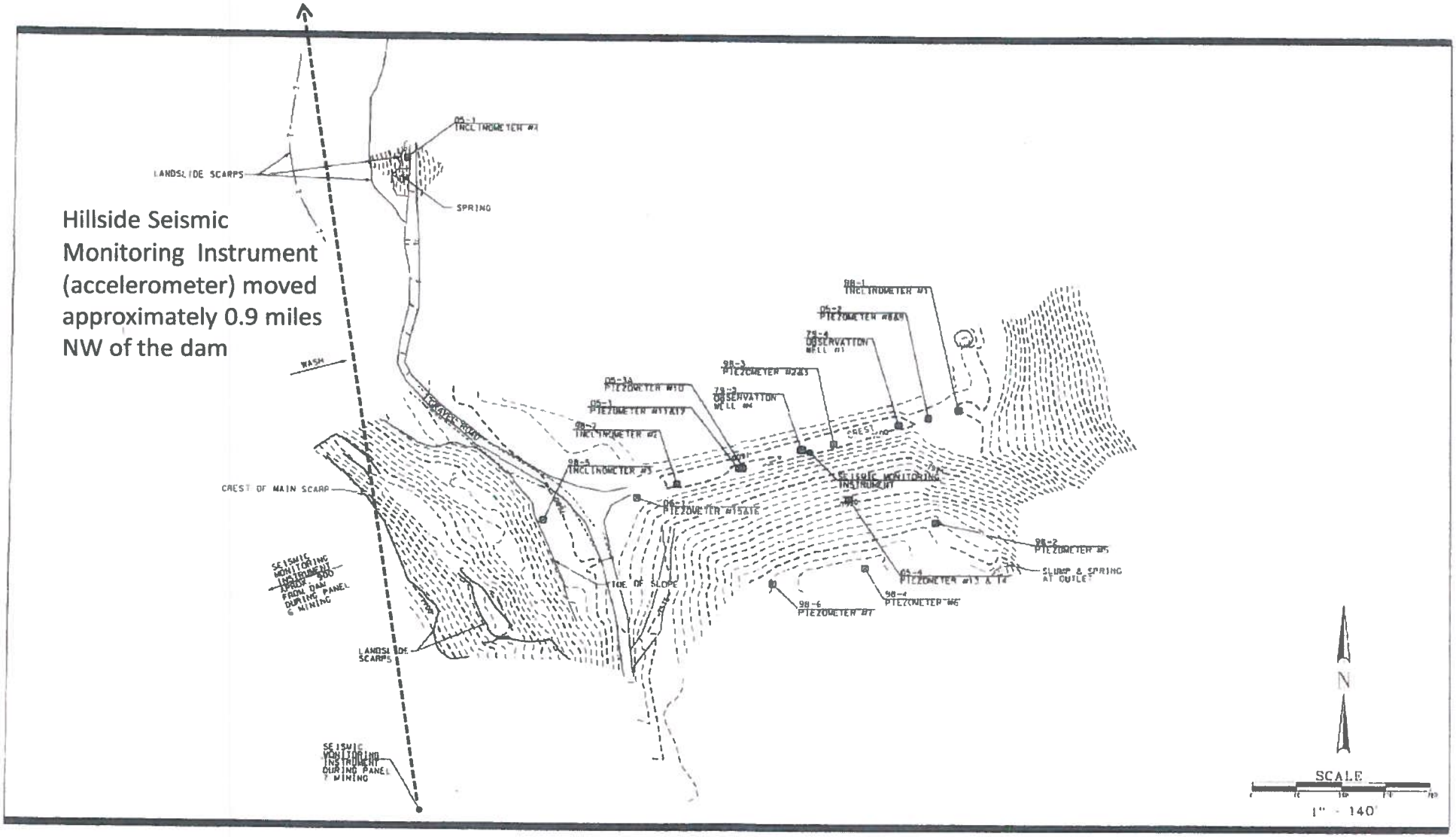
FIGURES



RB&G ENGINEERING, INC.

Figure 1
Project Location

West Ridge Mine Project Area
Grassy Trail Reservoir Mining Induced Seismicity
Near East Carbon, Carbon County, Utah



RB&G ENGINEERING, INC.

GRASSY TRAIL DAM
CARBON COUNTY, UTAH

Figure 2 Location of Instrumentation

SECTION A

Ground Motion Monitoring Devices

TABLE A-1

Monthly Summary of Ground Motions
January 2010 to October 2017
Grassy Trail Dam

	Accelerometer on Dam			UUSS Earthquakes	
Month	No. of Events	Max Per Day	Max Accel. (g)	No. of Events	Max Magnitude
Jan 2010	0			0	
Feb 2010	0			0	
Mar 2010	0			1	0.1
Apr 2010	0			0	
May 2010	0			0	
Jun 2010	0			0	
Jul 2010	0			0	
Aug 2010	0			1	1.3
Sep 2010	0			2	1.2
Oct 2010	0			2	0.9
Nov 2010	0			0	
Dec 2010	0			0	
Jan 2011	0			2	1.0
Feb 2011	0			8	0.7
Mar 2011	0			4	1.0
Apr 2011	0			0	
May 2011	0			4	1.2
Jun 2011	0			39	1.9
Jul 2011	0			31	1.9
Aug 2011	0			23	1.3
Sep 2011	0			9	1.4
Oct 2011	0			0	
Nov 2011	0			28	1.7
Dec 2011	0			44	1.9
Jan 2012	0			26	1.5
Feb 2012	0			6	1.7
Mar 2012	0			7	1.5
Apr 2012	0			5	1.6
May 2012	0			9	1.6
Jun 2012	0			10	1.7
Jul 2012	0			8	1.8
Aug 2012	0			1	0.3
Sep 2012	0			2	1.7
Oct 2012	0			11	1.4
Nov 2012	0			5	1.5
Dec 2012	0			3	1.0
Jan 2013	0			2	1.8
Feb 2013	0			0	
Mar 2013 to June 2013	no events recorded			0	
Jul 2013	0			0	
Aug 2013	0			3	1.5
Sep 2013	0			4	1.5
Oct 2013	0			1	1.3
Nov 2013	0			1	1.7
Dec 2013	0			3	1.5
Jan 2014	0			1	1.6
Feb 2014	0			5	1.9
Mar 2014	0			0	
Apr 2014	0			0	
May 2014	No Dam monitoring between May 11, 2014 t			0	
Jun 2014	na		Aug 13, 2015	0	
Jul 2014	na			0	
Aug 2014 to May 2015	na			0	
Jun 2015	na			0	
Jul 2015	na			1	0.7
Aug 2015	0			3	1.2
Sep 2015	0			0	
Oct 2015	0			0	
Nov 2015	0	Mining stopped		0	
Dec 2015	0			0	
Jan 2016 to Oct 2016	no events recorded			0	
Nov 2016	0			1	0.8
Dec 2016	0			0	
Jan 2017	0			0	
Feb 2017	0			1	1.7
Mar 2017	0			0	
April 2017 to Aug 2017	no events recorded			0	
Sep 2017	*1*	*1*	*0.027*	*0*	*5.3*
Oct 2017	0			0	

Sept 2, Soad Springs Idaho approx 200 miles NW of dam

Notes: Max. Accel. = Maximum Peak Acceleration Recorded During the Month
na = not available

Grassy Trail Dam MIS Monitoring - Accelerometer located on the Dam — Blastware (V10.72-10.74) — Event Report — Event List

Type	Serial No.	Date/Time	No. Chan	Trigger	Tran Peak (in/s)	Vert Peak (in/s)	Long Peak (in/s)	Tran Accel (g)	Vert Accel (g)	Long Accel (g)	Tran Freq. Hz.	Vert Freq. Hz.	Long Freq. Hz.	Description	Post Event Note first line
LOG	BE9690	30-Sep-16 14:11:53	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	30-Sep-16 14:11:56	3	Vert	0.03	0.065	0.025	0.027	0.08	0.027	56.89	34.13	46.55	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	30-Sep-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	30-Sep-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	1-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	1-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	2-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	2-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	3-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	3-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	4-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	4-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	5-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	5-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	6-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	6-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	7-Oct-16 8:42:00	3	Vert	0.04	0.085	0.03	0.04	0.119	0.027	46.55	46.55	73.14	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	7-Oct-16 8:42:08	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	7-Oct-16 8:56:11	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	7-Oct-16 8:56:20	3	Vert	0.155	0.34	0.1	0.159	0.411	0.106	56.89	56.89	73.14	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	7-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	7-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	8-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	8-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	9-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	9-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	10-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	10-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	11-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	11-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	12-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	12-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	13-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	13-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	14-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	14-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	15-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	15-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	16-Oct-16 11:19:44	3	Vert	0.135	0.41	0.06	0.239	0.689	0.146	>100	73.14	73.14	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	16-Oct-16 11:20:02	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	16-Oct-16 12:30:51	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	16-Oct-16 12:30:54	3	Vert	0.11	0.17	0.085	0.093	0.199	0.053	17.07	64	16.52	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	16-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	16-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	17-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	17-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	18-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	18-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	19-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	19-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	20-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	20-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	21-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	21-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	22-Oct-16 8:43:00	3	Vert	0.04	0.07	0.03	0.027	0.053	0.04	22.26	23.27	23.27	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	22-Oct-16 8:44:11	3	Tran	0.045	0.04	0.065	0.119	0.093	0.146	>100	73.14	51.2	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	22-Oct-16 8:44:24	3	Tran	0.105	0.075	0.11	0.278	0.199	0.292	56.89	85.33	64	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	22-Oct-16 8:44:30	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	22-Oct-16 9:04:35	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	22-Oct-16 9:04:56	3	Vert	0.04	0.135	0.035	0.04	0.186	0.04	73.14	73.14	85.33	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	22-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	22-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	23-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	23-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	24-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	24-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	25-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	25-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	26-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	26-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	27-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	27-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	28-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	28-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	29-Oct-16 8:17:26	3	Vert	0.08	0.12	0.045	0.04	0.093	0.053	21.33	22.26	51.2	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	29-Oct-16 8:17:35	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	29-Oct-16 9:20:40	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	29-Oct-16 9:20:56	3	Vert	0.03	0.07	0.035	0.04	0.093	0.04	46.55	39.38	64	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	29-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	29-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	30-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	30-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	31-Oct-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	31-Oct-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	1-Nov-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	1-Nov-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	2-Nov-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	2-Nov-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	3-Nov-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	3-Nov-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	4-Nov-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	4-Nov-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	5-Nov-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	5-Nov-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	6-Nov-16 10:26:27	3	Vert	0.03	0.075	0.02	0.04	0.106	0.027	42.67	56.89	73.14	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	6-Nov-16 10:26:47	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	6-Nov-16 10:37:11	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	6-Nov-16 10:37:14	3	Vert	0.06	0.195	0.04	0.119	0.464	0.093	>100	85.33	>100	GrassyTrailDam2015	*Man Made event while opening and closing cover*
LOG	BE9690	6-Nov-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	6-Nov-16 23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	7-Nov-16 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)

Grassy Trail Dam MIS Monitoring - Accelerometer located on the Dam — Blastware (V10.72-10.74) — Event Report — Event List

Type	Serial No.	Date/Time		No. Chan	Trigger	Tran Peak (in/s)	Vert Peak (in/s)	Long Peak (in/s)	Tran Accel (g)	Vert Accel (g)	Long Accel (g)	Tran Freq. Hz.	Vert Freq. Hz.	Long Freq. Hz.	Description	Post Event Note first line
LOG	BE9690	16-Dec-16	23:59:31	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
W	BE9690	17-Dec-16	14:05:09	3	Tran	0.06	0.055	0.03	0.133	0.093	0.053	>100	85.33	>100	GrassyTrailDam2015	*Man Made event while opening and closing cover*
LOG	BE9690	17-Dec-16	14:05:22	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded.
LOG	BE9690	17-Dec-16	15:02:24	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
W	BE9690	17-Dec-16	15:02:32	3	Vert	0.065	0.185	0.04	0.133	0.424	0.093	>100	85.33	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	17-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	17-Dec-16	23:59:31	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	18-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	18-Dec-16	23:59:31	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	19-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	19-Dec-16	23:59:31	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	20-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	20-Dec-16	23:59:31	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	21-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	21-Dec-16	23:59:31	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	22-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	22-Dec-16	23:59:31	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	23-Dec-16	11:22:44	3	Vert	0.075	0.205	0.04	0.159	0.424	0.08	>100	85.33	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	23-Dec-16	11:23:05	3	Vert	0.07	***	0.195	0.172	26.35	0.517	56.89	13.84	25.6	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	23-Dec-16	11:23:09	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded.
LOG	BE9690	23-Dec-16	12:35:33	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	23-Dec-16	12:35:48	3	Vert	0.05	0.16	0.03	0.133	0.411	0.093	>100	>100	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	23-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	23-Dec-16	23:59:35	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	24-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	24-Dec-16	23:59:35	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	25-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	25-Dec-16	23:59:35	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	26-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	26-Dec-16	23:59:35	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	27-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	27-Dec-16	23:59:35	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	28-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	28-Dec-16	23:59:35	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	29-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	29-Dec-16	23:59:35	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	30-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	30-Dec-16	23:59:35	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	31-Dec-16	11:45:14	3	Vert	0.035	0.14	0.035	0.08	0.305	0.066	>100	64	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	31-Dec-16	11:45:24	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded.
LOG	BE9690	31-Dec-16	12:55:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	31-Dec-16	12:55:54	3	Vert	0.06	0.18	0.035	0.08	0.186	0.053	85.33	64	73.14	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	31-Dec-16	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	31-Dec-16	23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	1-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	1-Jan-17	23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	2-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	2-Jan-17	23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	3-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	3-Jan-17	23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	4-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	4-Jan-17	23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	5-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	5-Jan-17	23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	6-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	6-Jan-17	23:59:36	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	7-Jan-17	12:07:25	3	Vert	0.125	0.31	0.085	0.186	0.451	0.133	>100	85.33	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	7-Jan-17	12:07:31	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	7-Jan-17	12:25:17	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	7-Jan-17	12:25:52	3	Vert	0.055	0.135	0.035	0.08	0.239	0.04	28.44	85.33	34.13	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	7-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	7-Jan-17	23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	8-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	8-Jan-17	23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	9-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	9-Jan-17	23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	10-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	10-Jan-17	23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	11-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	11-Jan-17	23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	12-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	12-Jan-17	23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	13-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	13-Jan-17	23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	14-Jan-17	15:11:28	3	Vert	0.02	0.055	0.01	0.027	0.093	0.027	51.2	73.14	>100	GrassyTrailDam2015	*Man Made event, cover, snow removal*
W	BE9690	14-Jan-17	15:15:41	3	Vert	0.2	0.445	0.11	0.278	0.583	0.199	64	34.13	32	GrassyTrailDam2015	*Man Made event, cover, snow removal*
W	BE9690	14-Jan-17	15:21:49	3	Vert	0.05	0.12	0.02	0.093	0.239	0.053	85.33	23.27	>100	GrassyTrailDam2015	*Man Made event, cover, snow removal*
LOG	BE9690	14-Jan-17	15:21:59	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	14-Jan-17	15:52:56	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	14-Jan-17	15:53:43	3	Vert	0.025	0.05	0.015	0.013	0.04	0.013	13.47	12.19	30.12	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	14-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	14-Jan-17	23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	15-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	15-Jan-17	23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	16-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	16-Jan-17	23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	17-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	17-Jan-17	23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	18-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	18-Jan-17	23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	19-Jan-17	23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	19-Jan-17	23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	20-Jan-17	10:12:08	3	Vert	0.06	0.135	0.035	0.08	0.199	0.053	19.69	85.33	22.26	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	20-Jan-17	10:12:44	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	20-Jan-17	10:59:02	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring

Grassy Trail Dam MIS Monitoring - Accelerometer located on the Dam — Blastware (V10.72-10.74) — Event Report — Event List

Type	Serial No.	Date/Time	No. Chan	Trigger	Tran Peak (in/s)	Vert Peak (in/s)	Long Peak (in/s)	Tran Accel (g)	Vert Accel (g)	Long Accel (g)	Tran Freq. Hz.	Vert Freq. Hz.	Long Freq. Hz.	Description	Post Event Note first line
W	BE9690	24-Feb-17 13:38:35	3	Vert	0.015	0.03	0.01	0.027	0.053	0.027	>100	>100	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	24-Feb-17 13:38:40	3	Vert	0.01	0.05	0.015	0.027	0.146	0.04	>100	85.33	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	24-Feb-17 13:38:53	3	Vert	0.1	0.065	0.045	0.066	0.066	0.027	16	12.8	17.07	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	24-Feb-17 13:38:59	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	24-Feb-17 14:24:02	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	24-Feb-17 14:24:22	3	Vert	0.01	0.055	0.015	0.027	0.172	0.066	>100	>100	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	24-Feb-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	24-Feb-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	25-Feb-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	25-Feb-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	26-Feb-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	26-Feb-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	27-Feb-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	27-Feb-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	28-Feb-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	28-Feb-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	1-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	1-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	2-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	2-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	3-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	3-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	4-Mar-17 14:51:52	3	Vert	0.05	0.05	0.005	0.04	0.027	0.013	26.95	28.44	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	4-Mar-17 14:52:06	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	4-Mar-17 16:00:01	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	4-Mar-17 16:00:06	3	Tran	0.02	0.02	0.005	0.027	0.027	0.027	>100	64	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	4-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	4-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	5-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	5-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	6-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	6-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	7-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	7-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	8-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	8-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	9-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	9-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	10-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	10-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	11-Mar-17 10:34:33	3	Vert	0.325	0.045	0.14	0.133	0.053	0.066	9.481	14.22	13.13	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	11-Mar-17 10:34:54	3	Tran	0.035	0.065	0.025	0.04	0.106	0.04	36.57	56.89	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	11-Mar-17 10:35:03	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	11-Mar-17 12:15:27	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	11-Mar-17 12:16:03	3	Tran	0.03	0.085	0.015	0.04	0.08	0.027	56.89	42.67	>100	GrassyTrailDam2015	*** Daylight Saving Time Start (1 hr ahead)
LOG	BE9690	11-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	11-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	12-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	12-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	13-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	13-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	14-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	14-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	15-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	15-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	16-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	16-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	17-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	17-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	18-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	18-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	19-Mar-17 13:19:15	3	Long	0.175	0.125	0.175	0.159	0.106	0.133	56.89	56.89	42.67	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	19-Mar-17 13:19:23	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	19-Mar-17 14:12:31	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	19-Mar-17 14:12:50	3	Vert	0.035	0.04	0.02	0.027	0.04	0.027	51.2	42.67	73.14	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	19-Mar-17 14:12:58	3	Tran	0.045	0.01	0.015	0.066	0.027	0.027	85.33	>100	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	19-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	19-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	20-Mar-17 12:48:03	3	Tran	0.02	0.01	0.01	0.013	0.013	0.027	56.89	>100	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	20-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	20-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	21-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	21-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	22-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	22-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	23-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	23-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	24-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	24-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	25-Mar-17 6:07:42	3	Vert	0.32	0.165	0.085	0.199	0.106	0.053	5.333	7.758	18.29	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	25-Mar-17 6:08:10	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	25-Mar-17 7:13:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	25-Mar-17 7:13:37	3	Long	0.02	0.05	0.075	0.027	0.066	0.106	56.89	64	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	25-Mar-17 7:14:00	3	Long	0.01	0.015	0.02	0.027	0.027	0.04	>100	73.14	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	25-Mar-17 7:14:05	3	Vert	0.025	0.04	0.015	0.053	0.066	0.027	>100	64	85.33	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	25-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	25-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	26-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	26-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	27-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	27-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	28-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	28-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	29-Mar-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	29-Mar-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)

Grassy Trail Dam MIS Monitoring - Accelerometer located on the Dam — Blastware (V10.72-10.74) — Event Report — Event List

Type	Serial No.	Date/Time	No. Chan	Trigger	Tran Peak (in/s)	Vert Peak (in/s)	Long Peak (in/s)	Tran Accel (g)	Vert Accel (g)	Long Accel (g)	Tran Freq. Hz.	Vert Freq. Hz.	Long Freq. Hz.	Description	Post Event Note first line
LOG	BE9690	30-Apr-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	30-Apr-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	1-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	1-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	2-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	2-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	3-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	3-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	4-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	4-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	5-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	5-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	6-May-17 3:47:22	3	Vert	0.19	0.1	0.085	0.278	0.199	0.108	85.33	85.33	85.33	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	6-May-17 3:47:38	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	6-May-17 5:06:56	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	6-May-17 5:07:30	3	Long	0.055	0.03	0.045	0.08	0.053	0.08	>100	>100	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	6-May-17 5:08:00	3	Long	0.01	0.01	0.035	0.013	0.027	0.04	>100	>100	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	6-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	6-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	7-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	7-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	8-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	8-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	9-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	9-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	10-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	10-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	11-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	11-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	12-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	12-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	13-May-17 3:56:36	3	Tran	0.235	0.16	0.095	0.464	0.159	0.212	>100	56.89	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	13-May-17 3:56:53	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	13-May-17 5:02:14	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	13-May-17 5:02:21	3	Vert	0.045	0.055	0.01	0.04	0.053	0.027	56.89	56.89	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	13-May-17 5:02:45	3	Tran	0.055	0.055	0.05	0.093	0.106	0.08	>100	64	73.14	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	13-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	13-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	14-May-17 11:10:32	3	Vert	0.01	0.02	0.015	0.013	0.013	0.027	>100	73.14	>100	GrassyTrailDam2015	*Man Made even*
LOG	BE9690	14-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	14-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	15-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	15-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	16-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	16-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	17-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	17-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	18-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	18-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	19-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	19-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	20-May-17 6:02:35	3	Vert	0.095	0.095	0.02	0.093	0.106	0.04	51.2	64	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	20-May-17 6:02:43	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	20-May-17 7:09:32	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	20-May-17 7:09:57	3	Tran	0.06	0.065	0.085	0.093	0.08	0.119	85.33	85.33	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	20-May-17 7:10:03	3	Vert	0.045	0.05	0.04	0.08	0.093	0.066	>100	73.14	85.33	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	20-May-17 7:10:08	3	Tran	0.03	0.01	0.02	0.053	0.027	0.04	>100	>100	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	20-May-17 7:10:15	3	Long	0.01	0.005	0.02	0.013	0.013	0.027	>100	>100	85.33	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	20-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	20-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	21-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	21-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	22-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	22-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	23-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	23-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	24-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	24-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	25-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	25-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	26-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	26-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	27-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	27-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	28-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	28-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	29-May-17 6:17:39	3	Tran	0.04	0.04	0.01	0.04	0.04	0.027	30.12	26.95	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	29-May-17 6:17:44	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	29-May-17 7:22:00	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	29-May-17 7:22:03	3	Vert	0.045	0.045	0.015	0.053	0.066	0.027	73.14	73.14	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	29-May-17 7:22:07	3	Vert	0.01	0.025	0.025	0.013	0.053	0.04	>100	73.14	73.14	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	29-May-17 7:22:16	3	Long	0.01	0.015	0.02	0.027	0.027	0.027	>100	>100	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	29-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	29-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	30-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	30-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	31-May-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	31-May-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	1-Jun-17 11:58:37	3	Vert	0.045	0.065	0.05	0.053	0.106	0.08	64	28.44	51.2	GrassyTrailDam2015	*Likely Man Made event*
LOG	BE9690	1-Jun-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	1-Jun-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	2-Jun-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	2-Jun-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	3-Jun-17 6:24:17	3	Vert	0.095	0.03	0.05	0.159	0.053	0.08	85.33	85.33	85.33	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	3-Jun-17 6:24:30	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)

Grassy Trail Dam MIS Monitoring - Accelerometer located on the Dam — Blastware (V10.72-10.74) — Event Report — Event List

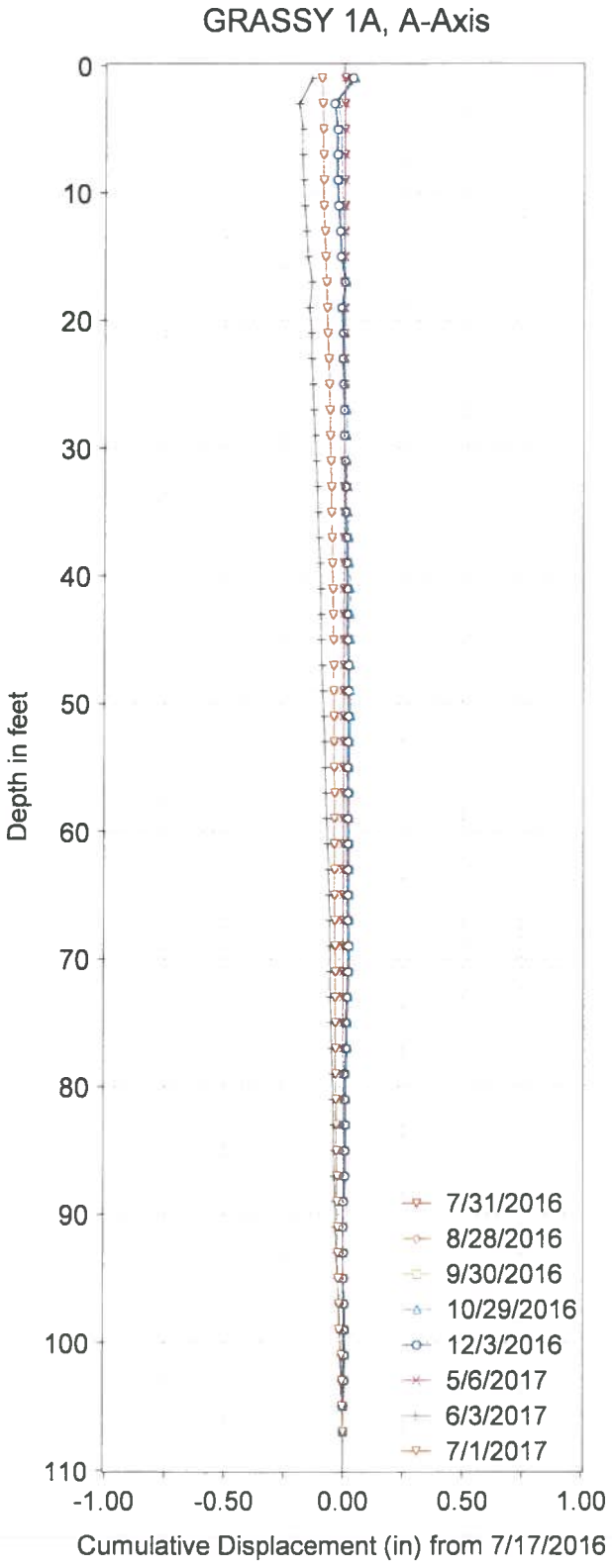
Type	Serial No.	Date/Time	No. Chan	Trigger	Tran Peak (in/s)	Vert Peak (in/s)	Long Peak (in/s)	Tran Accel (g)	Vert Accel (g)	Long Accel (g)	Tran Freq. Hz.	Vert Freq. Hz.	Long Freq. Hz.	Description	Post Event Note first line
W	BE9690	8-Jul-17 10:14:53	3	Tran	0.03	0.025	0.01	0.027	0.027	0.013	32	28.44	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	8-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	8-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	9-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	9-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	10-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	10-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	11-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	11-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	12-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	12-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	13-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	13-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	14-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	14-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	15-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	15-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	16-Jul-17 13:39:55	3	Vert	0.115	0.115	0.02	0.146	0.093	0.04	73.14	42.67	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	16-Jul-17 13:40:02	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	16-Jul-17 14:35:13	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	16-Jul-17 14:35:14	3	Vert	0.04	0.025	0.015	0.066	0.04	0.04	>100	85.33	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	16-Jul-17 14:35:29	3	Long	0.02	0.025	0.025	0.04	0.04	0.04	85.33	>100	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	16-Jul-17 20:20:12	3	Vert	0.025	0.05	0.02	0.053	0.08	0.053	>100	>100	>100	GrassyTrailDam2015	*Man Made event*
LOG	BE9690	16-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	16-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	17-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	17-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	18-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	18-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	19-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	19-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	20-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	20-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	21-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	21-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	22-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	22-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	23-Jul-17 9:24:21	3	Vert	0.06	0.065	0.015	0.066	0.053	0.027	64	46.55	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	23-Jul-17 9:24:28	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	23-Jul-17 11:09:12	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	23-Jul-17 11:09:14	3	Vert	0.03	0.045	0.01	0.04	0.04	0.027	64	51.2	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	23-Jul-17 11:10:11	3	Tran	0.02	0.01	0.005	0.027	0.027	0.013	>100	>100	***	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	23-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	23-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	24-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	24-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	25-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	25-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	26-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	26-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	27-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	27-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	28-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	28-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	29-Jul-17 8:04:57	3	Tran	0.1	0.04	0.04	0.186	0.066	0.08	85.33	85.33	85.33	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	29-Jul-17 8:05:08	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	29-Jul-17 9:17:21	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	29-Jul-17 9:17:25	3	Vert	0.04	0.045	0.015	0.04	0.053	0.027	32	30.12	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	29-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	29-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	30-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	30-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	31-Jul-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	31-Jul-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	1-Aug-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	5-Aug-17 9:53:28	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	5-Aug-17 9:53:31	3	Vert	0.11	0.095	0.01	0.106	0.08	0.027	36.57	36.57	85.33	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	5-Aug-17 9:53:43	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	5-Aug-17 11:08:42	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	5-Aug-17 11:08:45	3	Tran	0.18	0.11	0.02	0.106	0.066	0.027	42.67	34.13	85.33	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	5-Aug-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	5-Aug-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	6-Aug-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	6-Aug-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	7-Aug-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	7-Aug-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	8-Aug-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	8-Aug-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	9-Aug-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	9-Aug-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	10-Aug-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	10-Aug-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	11-Aug-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	11-Aug-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	12-Aug-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	12-Aug-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	13-Aug-17 17:16:00	3	Vert	0.27	0.215	0.07	0.265	0.292	0.08	28.44	56.89	85.33	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	13-Aug-17 17:16:07	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	13-Aug-17 18:22:53	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	13-Aug-17 18:22:55	3	Tran	0.035	0.015	0.02	0.08	0.027	0.053	>100	85.33	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	13-Aug-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	13-Aug-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	14-Aug-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	14-Aug-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	15-Aug-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)

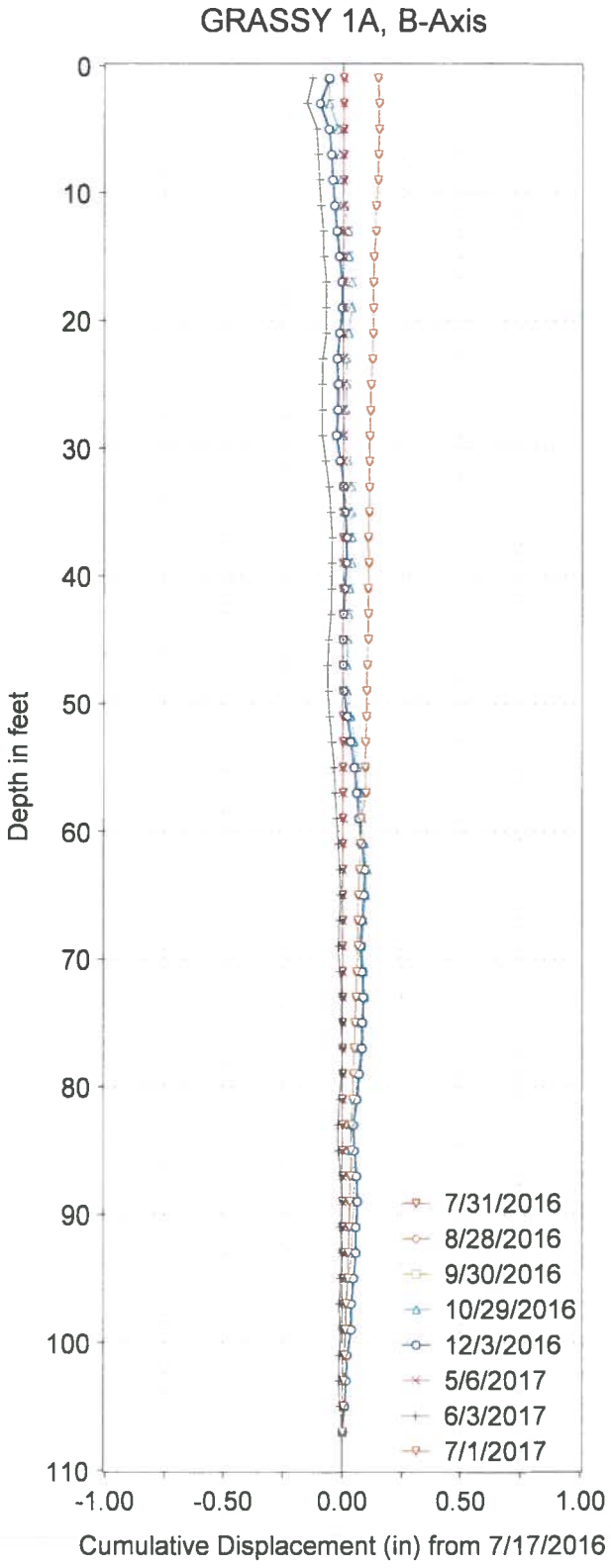
Grassy Trail Dam MIS Monitoring - Accelerometer located on the Dam Blastware (V10.72-10.74) Event Report Event List

Type	Serial No.	Date/Time	No. Chan	Trigger	Tran Peak (in/s)	Vert Peak (in/s)	Long Peak (in/s)	Tran Accel (g)	Vert Accel (g)	Long Accel (g)	Tran Freq. Hz.	Vert Freq. Hz.	Long Freq. Hz.	Description	Post Event Note first line
LOG	BE9690	18-Sep-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	18-Sep-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
LOG	BE9690	19-Sep-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	19-Sep-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
LOG	BE9690	20-Sep-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	20-Sep-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	21-Sep-17 9:21:17	3	Tran	0.02	0.01	0.01	0.027	0.013	0.013	73.14	>100	>100	GrassyTrailDam2015	extremly windy vibrating Solar Panel
W	BE9690	21-Sep-17 10:36:00	3	Tran	0.02	0.015	0.01	0.027	0.027	0.013	85.33	>100	>100	GrassyTrailDam2015	extremly windy vibrating Solar Panel
W	BE9690	21-Sep-17 15:21:34	3	Tran	0.02	0.015	0.01	0.04	0.027	0.027	73.14	>100	>100	GrassyTrailDam2015	extremly windy vibrating Solar Panel
W	BE9690	21-Sep-17 22:05:44	3	Tran	0.025	0.015	0.01	0.027	0.027	0.013	64	85.33	>100	GrassyTrailDam2015	extremly windy vibrating Solar Panel
LOG	BE9690	21-Sep-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	21-Sep-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	22-Sep-17 0:30:06	3	Tran	0.02	0.01	0.01	0.027	0.013	0.013	73.14	>100	>100	GrassyTrailDam2015	extremly windy vibrating Solar Panel
W	BE9690	22-Sep-17 0:38:37	3	Tran	0.02	0.01	0.01	0.027	0.027	0.027	73.14	>100	>100	GrassyTrailDam2015	extremly windy vibrating Solar Panel
W	BE9690	22-Sep-17 16:35:31	3	Tran	0.02	0.01	0.01	0.027	0.027	0.027	73.14	>100	>100	GrassyTrailDam2015	extremly windy vibrating Solar Panel
LOG	BE9690	22-Sep-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	22-Sep-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	23-Sep-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	23-Sep-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	24-Sep-17 6:18:27	3	Tran	0.15	0.125	0.03	0.172	0.106	0.04	64	64	64	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	24-Sep-17 6:18:40	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	24-Sep-17 7:13:13	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	24-Sep-17 7:13:15	3	Vert	0.045	0.05	0.025	0.04	0.053	0.027	48.55	51.2	85.33	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	24-Sep-17 7:13:41	3	Tran	0.025	0.005	0.015	0.04	0.013	0.04	>100	>100	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	24-Sep-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	24-Sep-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	25-Sep-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	25-Sep-17 23:59:37	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
LOG	BE9690	26-Sep-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	27-Sep-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	28-Sep-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	29-Sep-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
W	BE9690	30-Sep-17 8:27:15	3	Vert	0.03	0.055	0.08	0.066	0.133	0.093	>100	>100	56.89	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	30-Sep-17 8:27:23	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)
LOG	BE9690	30-Sep-17 13:12:49	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	30-Sep-17 13:13:08	3	Tran	0.155	0.135	0.025	0.265	0.278	0.027	85.33	56.89	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
W	BE9690	30-Sep-17 13:13:12	3	Vert	0.035	0.04	0.025	0.053	0.08	0.04	73.14	>100	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	30-Sep-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	30-Sep-17 23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	1-Oct-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	1-Oct-17 23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	2-Oct-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	2-Oct-17 23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	3-Oct-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	3-Oct-17 23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	4-Oct-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	4-Oct-17 23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	5-Oct-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	5-Oct-17 23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	No events recorded. (Daily Self Check Exit)
LOG	BE9690	6-Oct-17 23:59:28	***	***	***	***	***	***	***	***	***	***	***	Daily Check Stop	No events recorded. (Daily Self Check Exit)
LOG	BE9690	6-Oct-17 23:59:29	***	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9690	7-Oct-17 9:00:11	3	Tran	0.16	0.11	0.04	0.159	0.159	0.066	42.67	64	>100	GrassyTrailDam2015	*Man Made event while opening or closing cover*
LOG	BE9690	7-Oct-17 9:00:18	***	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	No events recorded. (Keyboard Exit)

SECTION B

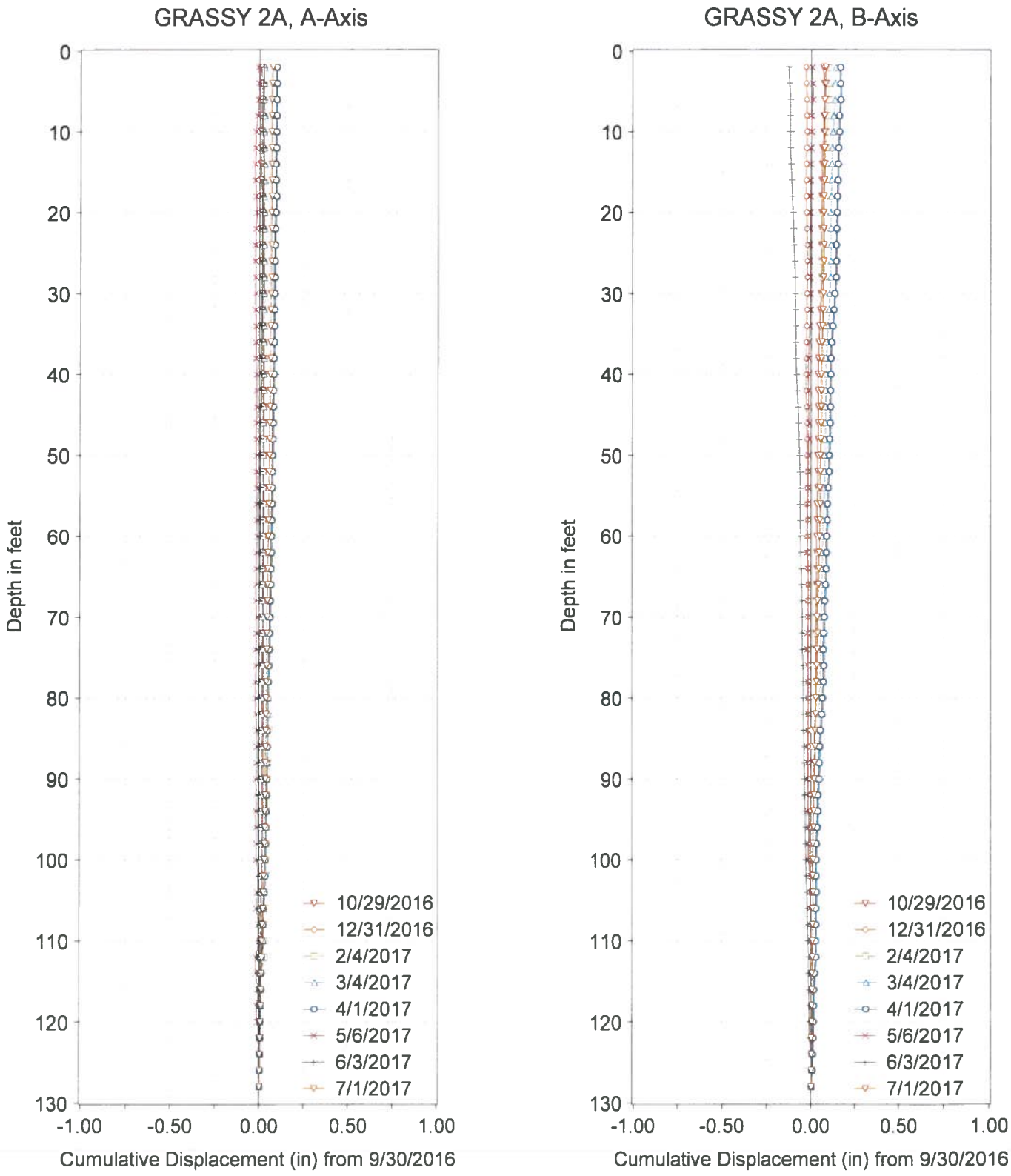
Inclinometers





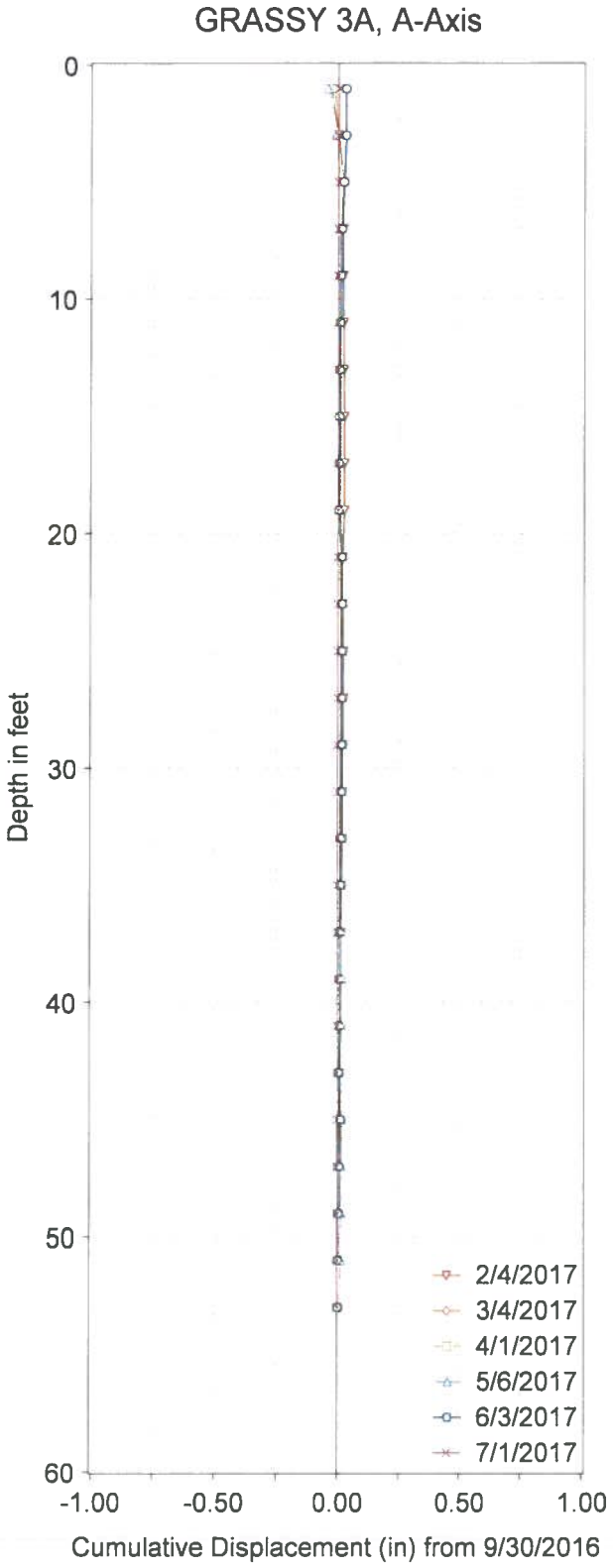
No significant movement observed

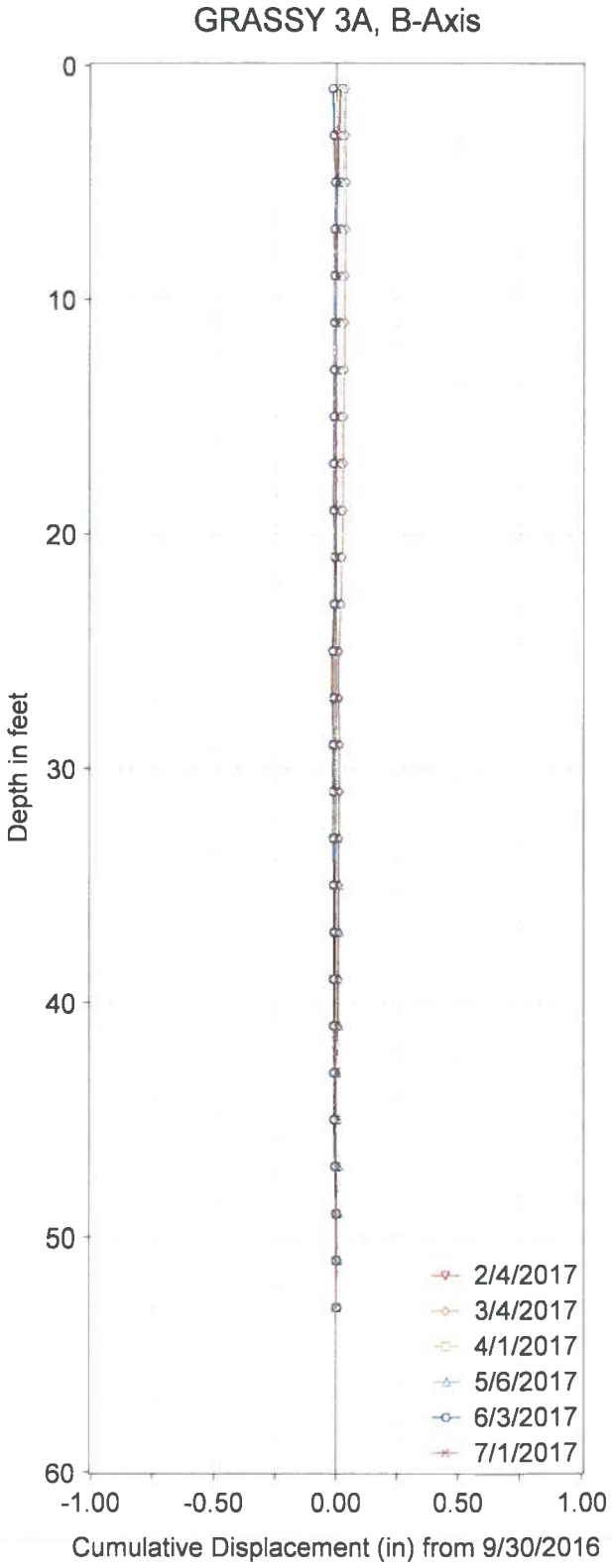
Figure B-1
Inclinometer 1 -Deflection Profiles
Grassy Trail Dam, Carbon County, Utah



-15 dergree skew
Bias-shift correction

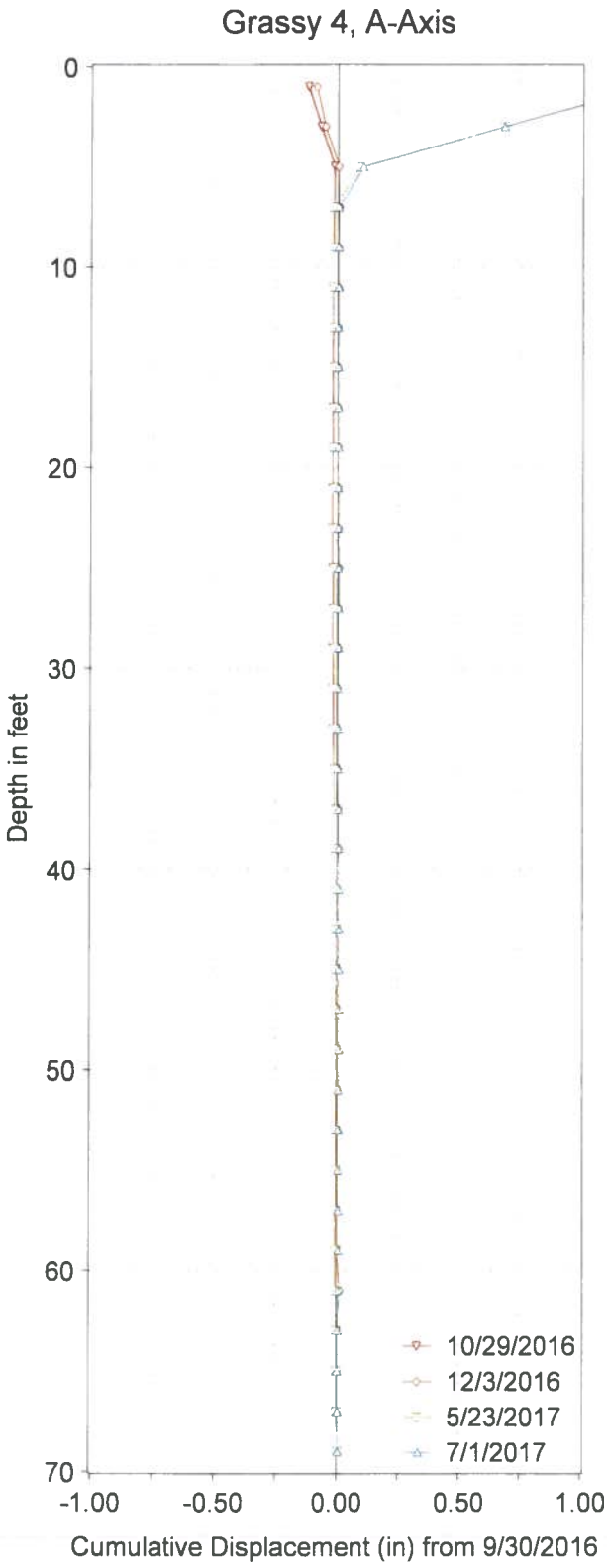
Figure B2
Inclinometer 2 - Deflection Profile
Grassy Trail Dam, Carbon County, Utah

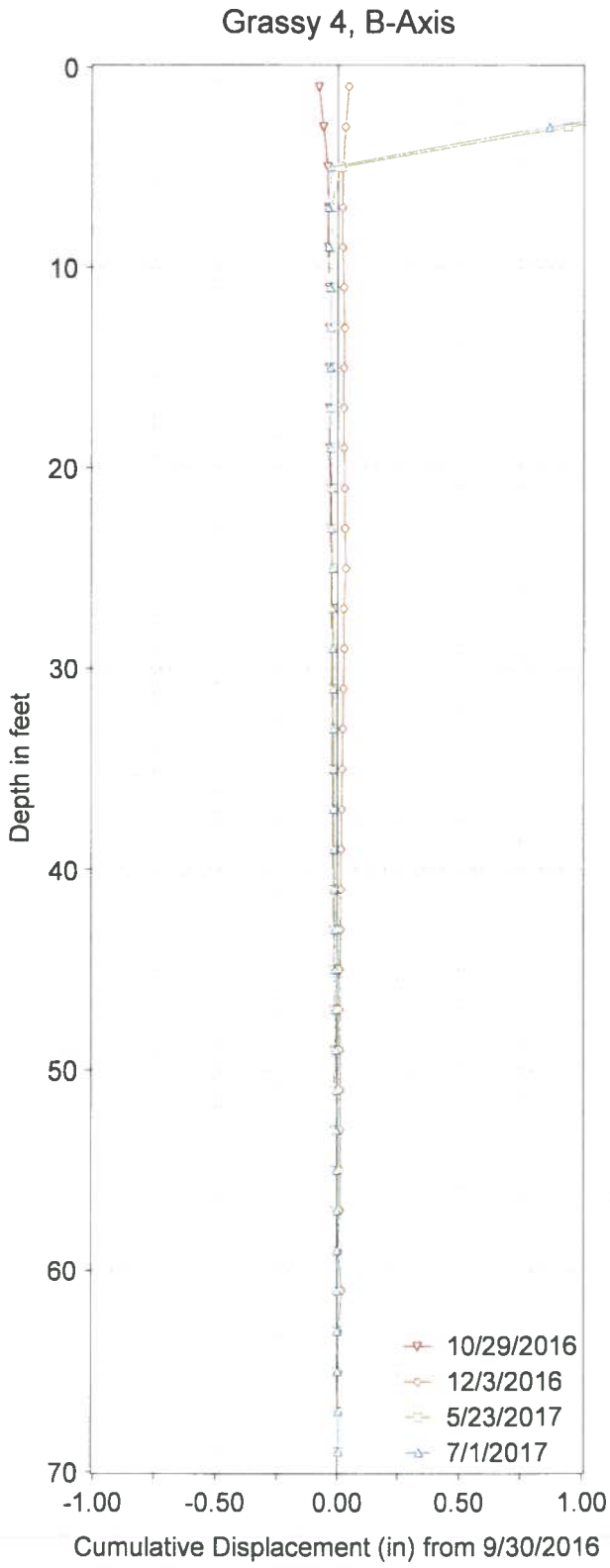




-30 degree skew

Figure B-3
Inclinometer 3 - Deflection Profile
Grassy Trail Dam, Carbon County, Utah



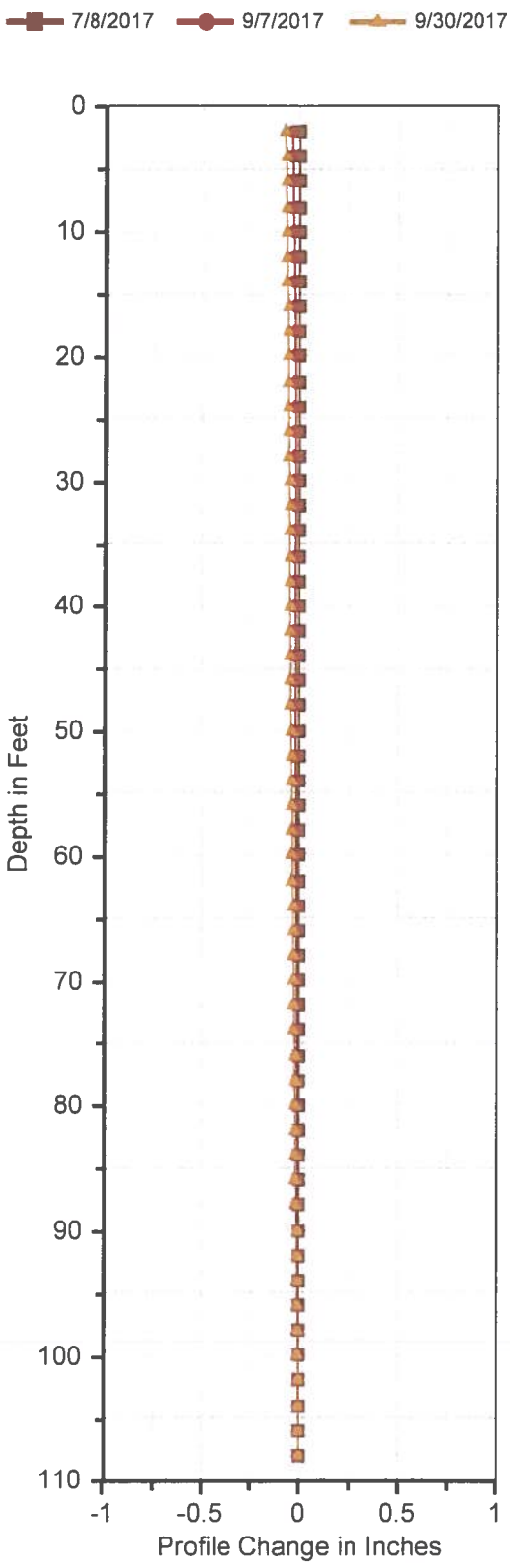


Repairs made 5/26/10 new survey
may not match true with old surveys

Top few feet of pipe were loose

Figure B-4
Inclinometer 4 - Deflection Profile
Grassy Trail Dam, Carbon County, Utah

Figure B-5 GrassyTrail I-1 A



GrassyTrail I-1 B

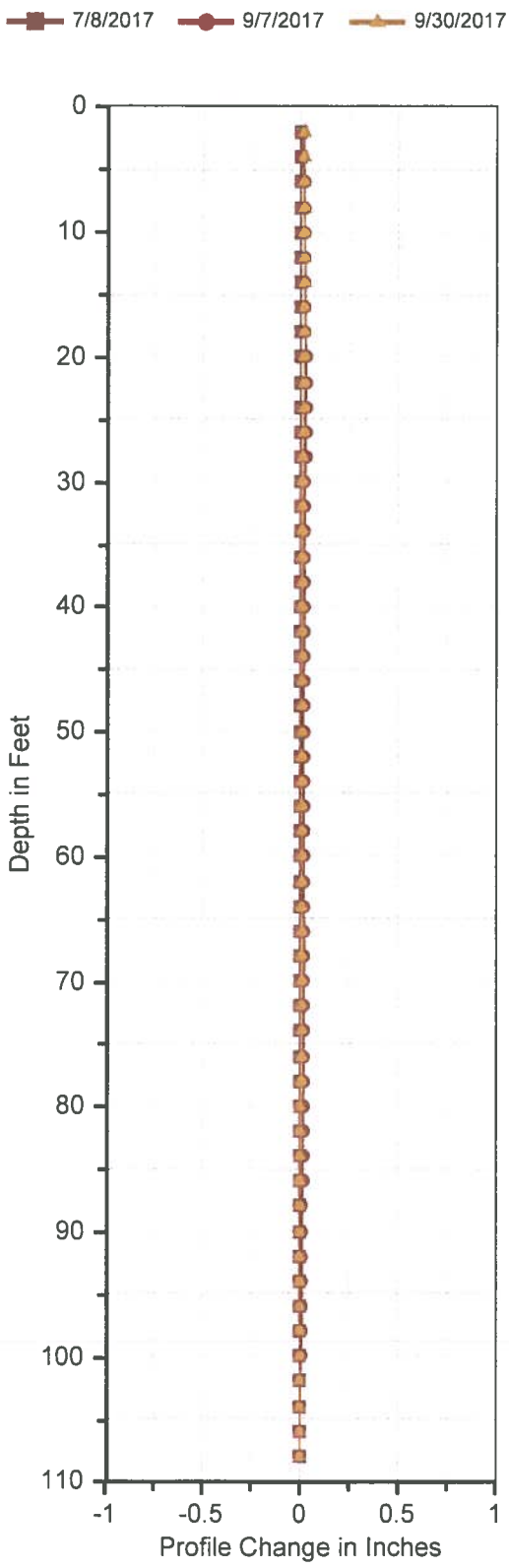
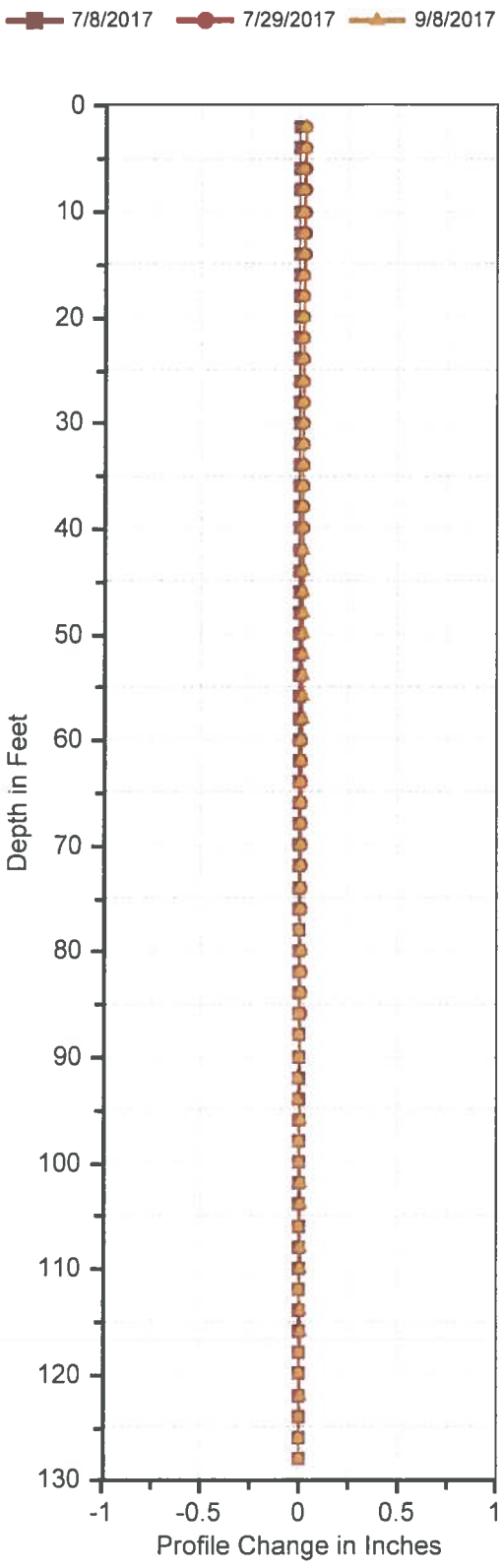


Figure B-6 GrassyTrail old I-2 A



GrassyTrail old I-2 B

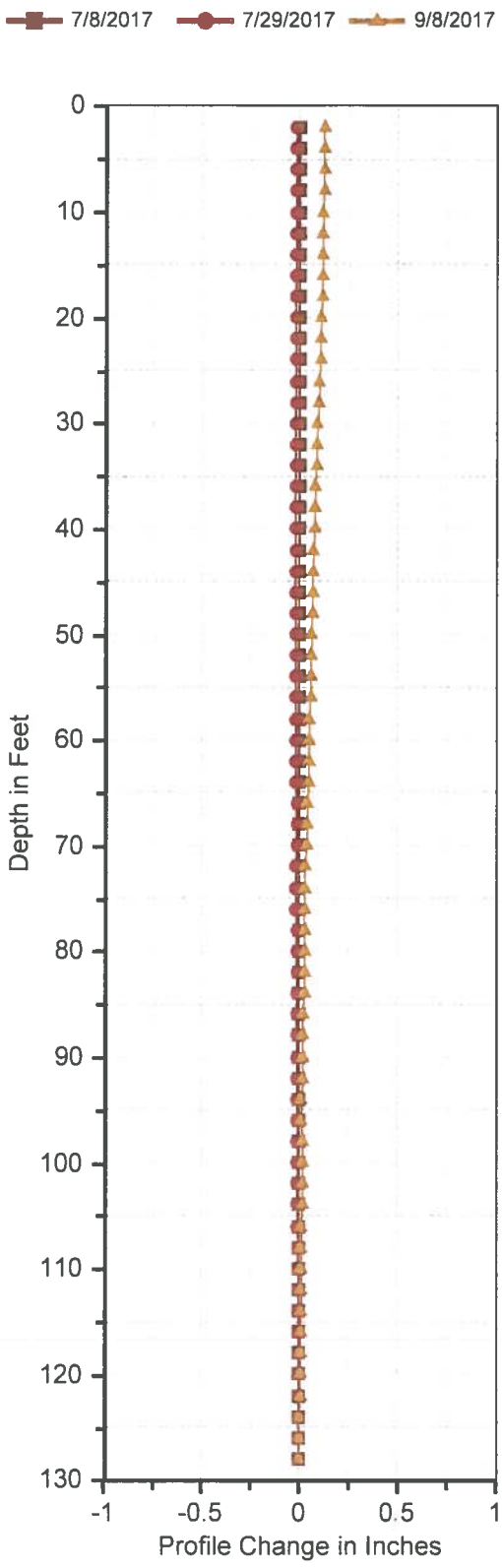
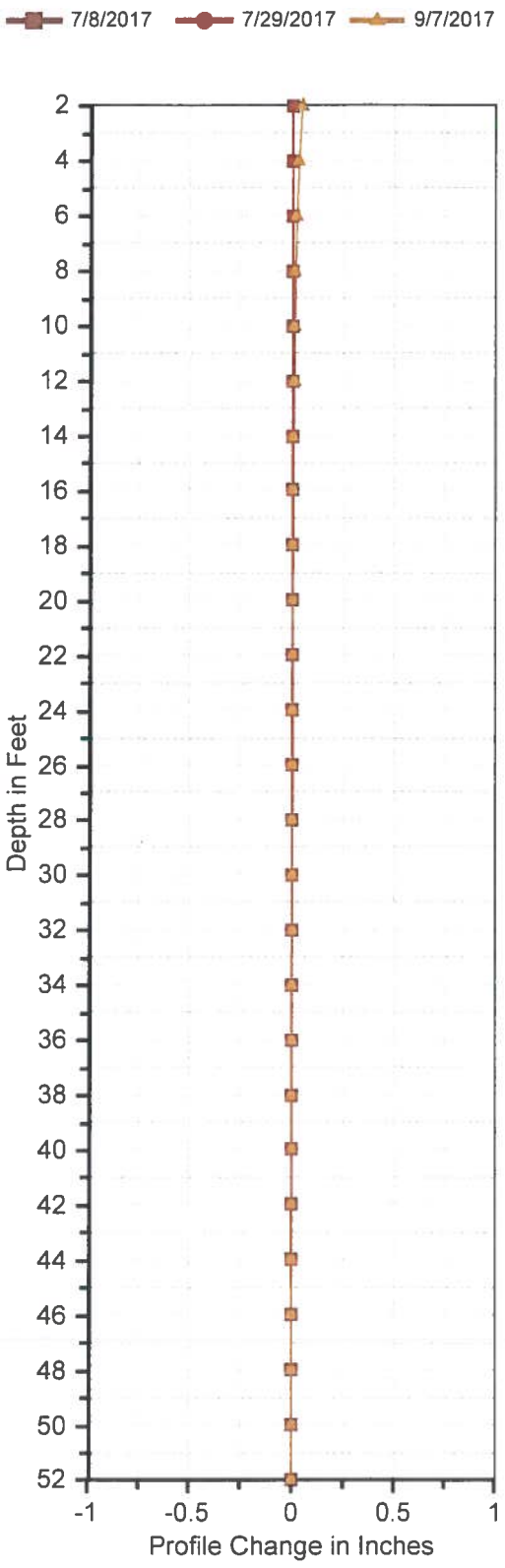


Figure B-7 GrassyTrail old I-3 A



GrassyTrail old I-3 B

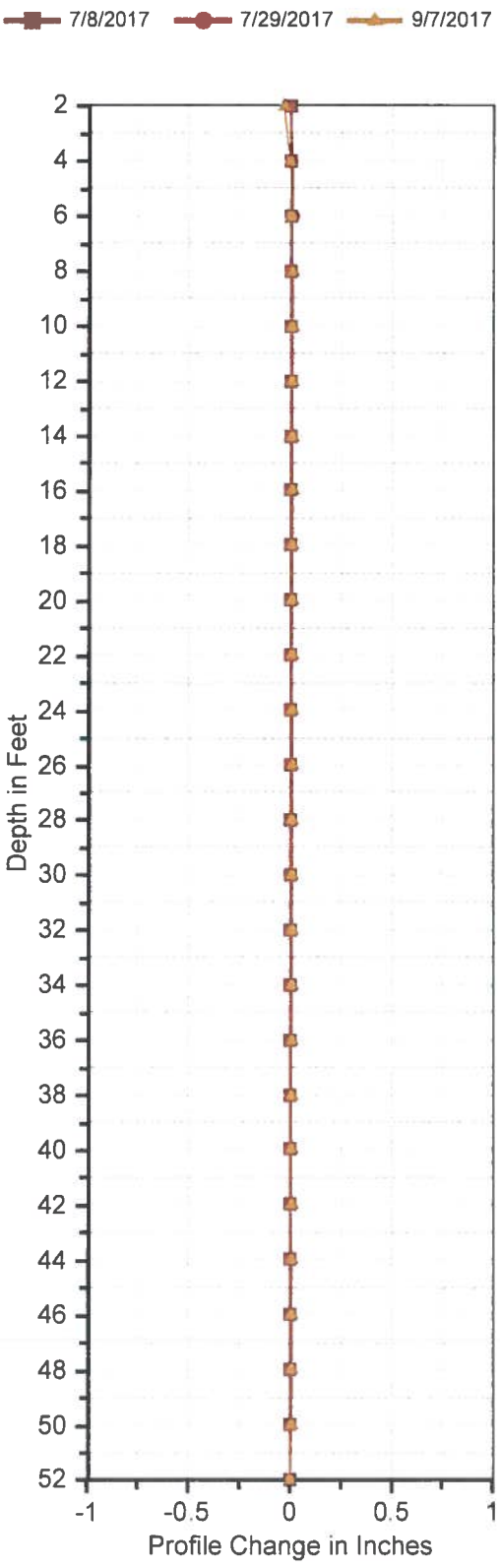
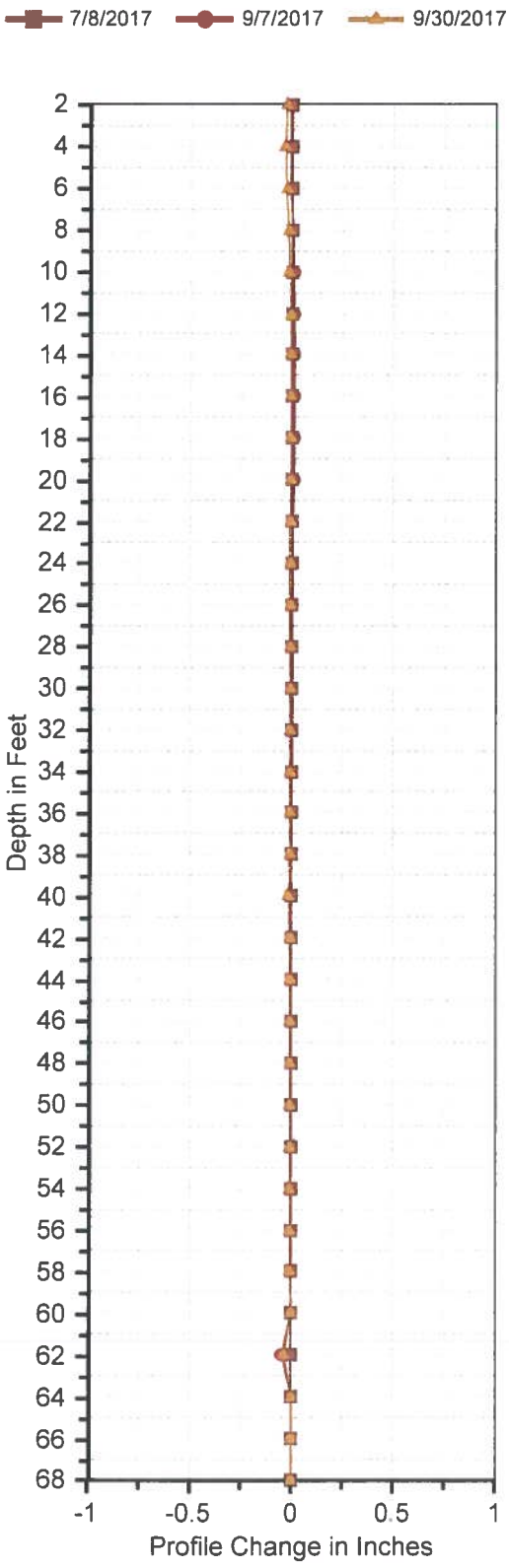


Figure B-8 GrassyTrail I-4 A



GrassyTrail I-4 B

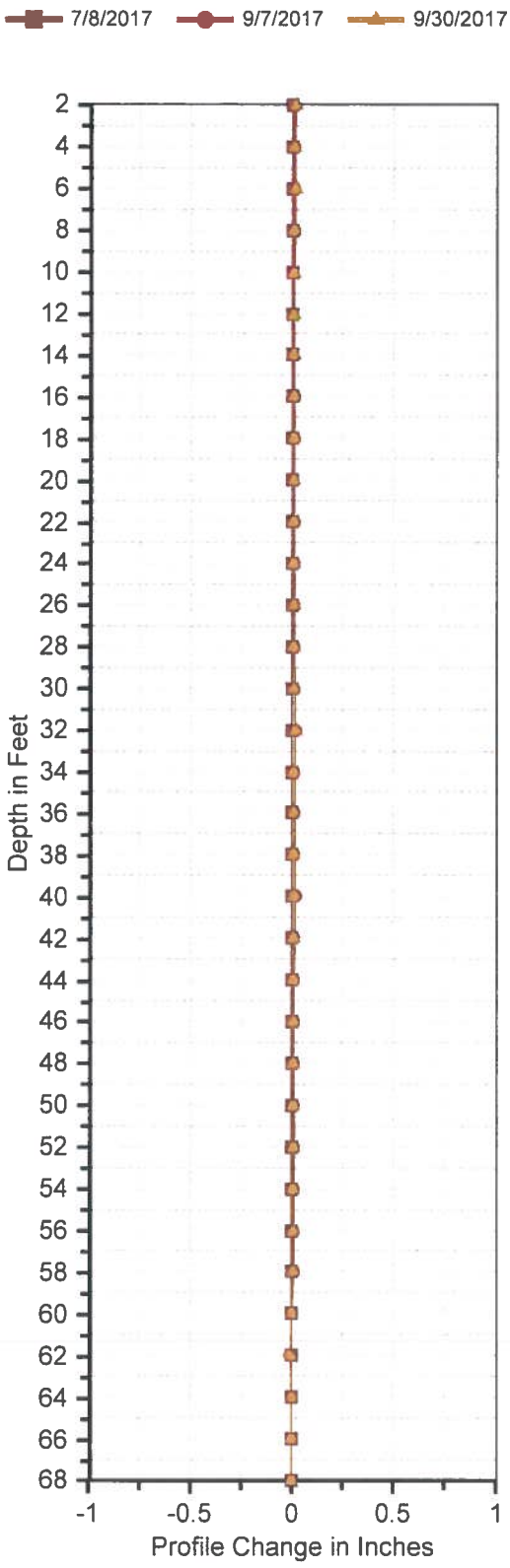
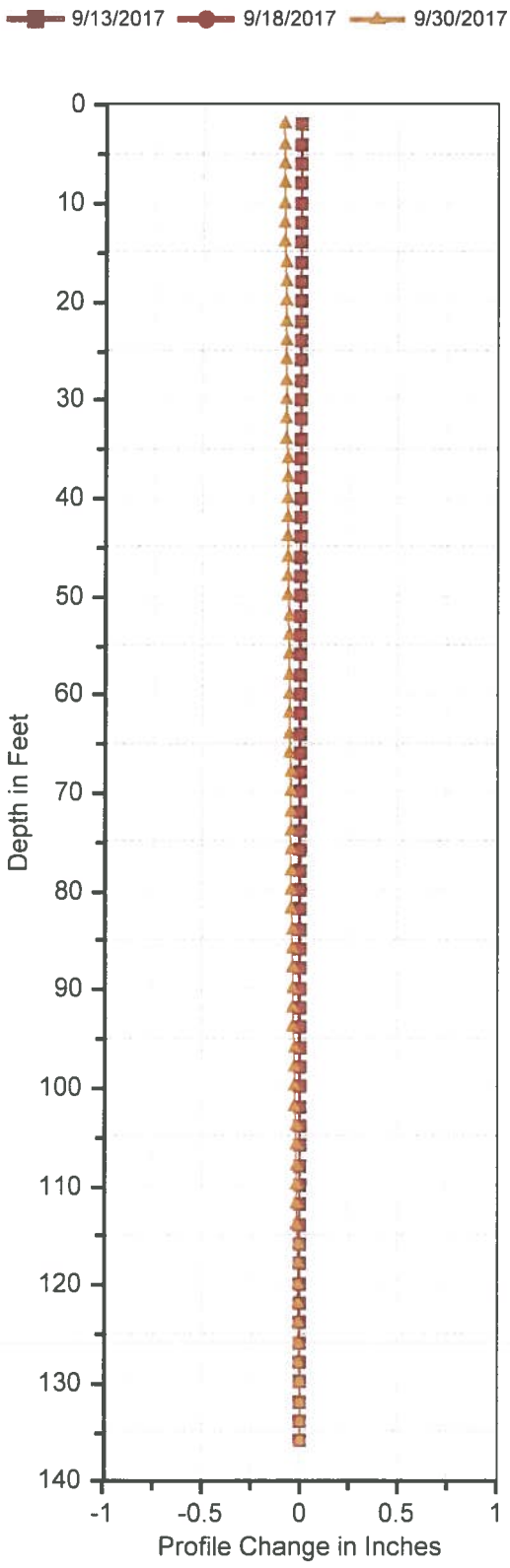


Figure B-9 GrassyTrail 17-I-2 A



GrassyTrail 17-I-2 B

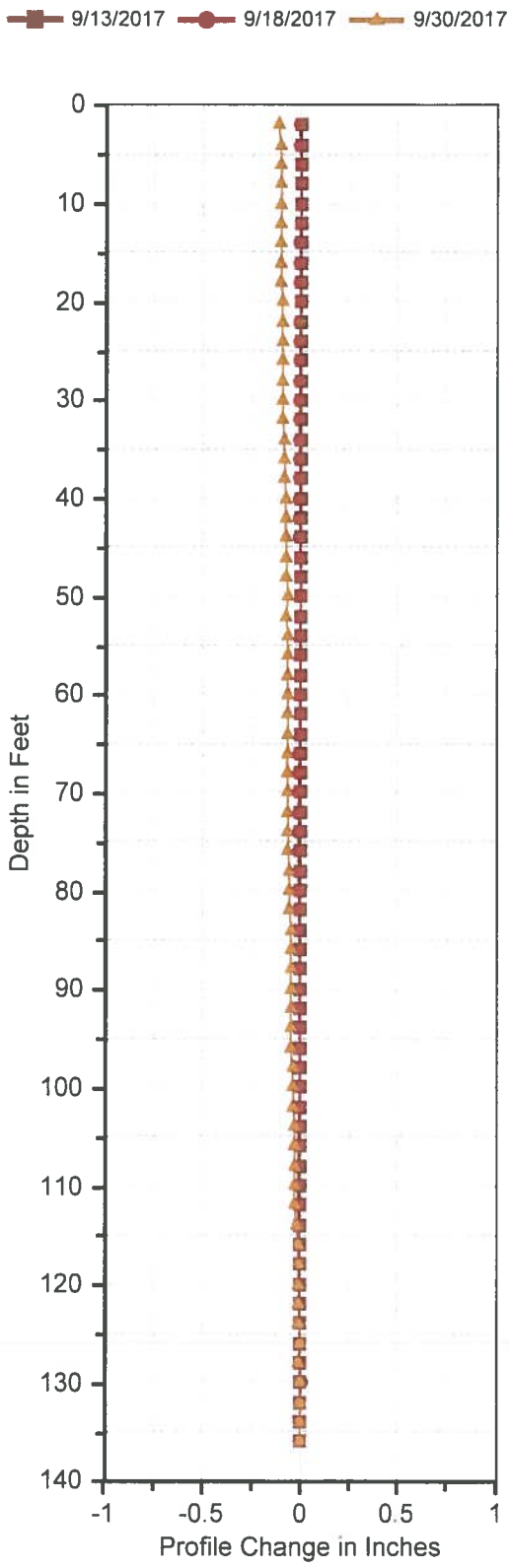
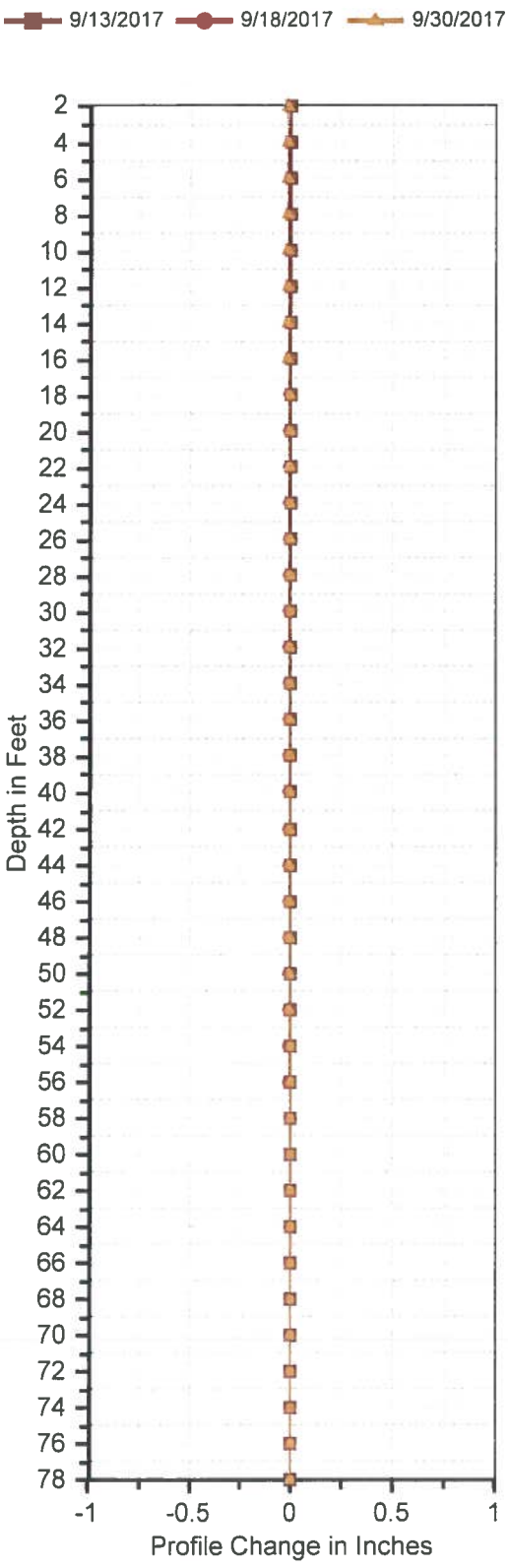
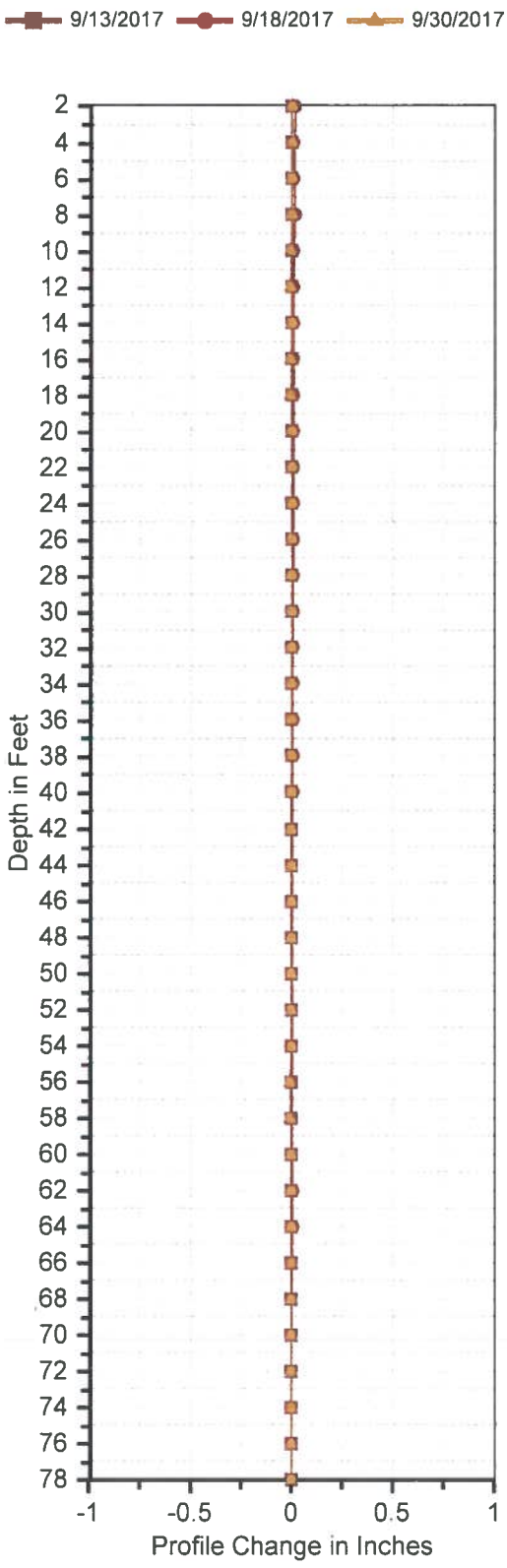


Figure B-10 GrassyTrail 17-I-3 A



GrassyTrail 17-I-3 B



SECTION C

Piezometer, Observation Wells and Seepage

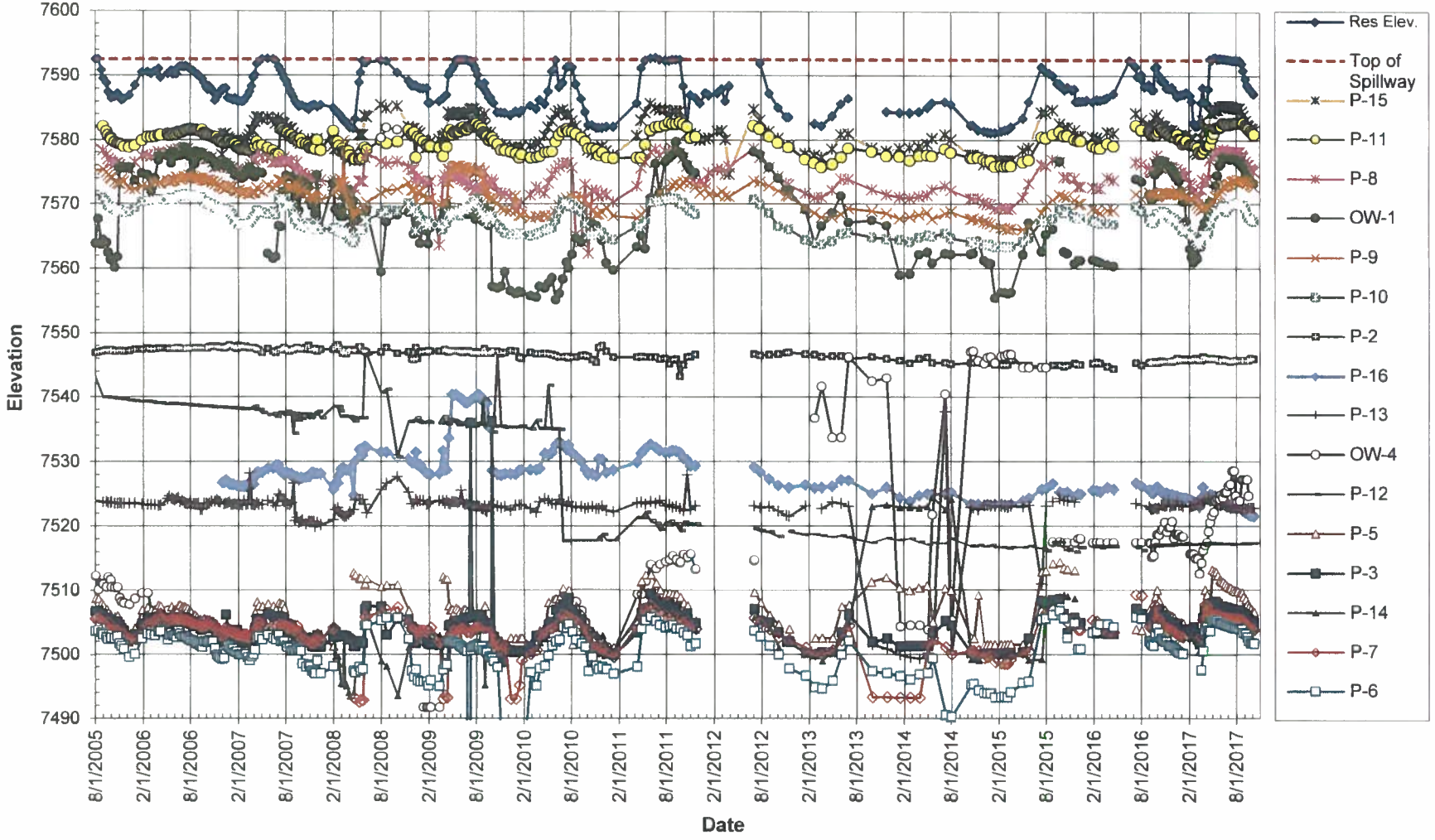
TABLE C-1

GRASSY TRAIL DAM PIEZOMETER & OBSERVATION WELL READINGS

TAKE READINGS AT RIM ELEV		05-2		79-4	98-3		05-4		79-3	05-3A	05-3		98-2	98-4	98-6	06-1	06-1
		5+62		5+15	4+14		-4+14		3+63	2+77	2+71						
Dam Crest Elev	7600 0	PIEZ	PIEZ	O W	PIEZ		PIEZ		O W	PIEZ	PIEZ	PIEZ	PIEZ	PIEZ	PIEZ	PIEZ	PIEZ
Spillway Elev	7592 5	8	9	1	2	3	13	14	4	10	11	12	5	6	7	15	16
Rim Elev (ft)		7601 5		7601 8	7601 7		7558 9	7558 9	7601 7	7601 8	7601 7	7601 7	7528 8	7512 0	7519 5	7601 5	7601 5
Tip Elev (ft (actual)		7554 5	7535 1	7491 8	7525 4	7491 0	7521 0	7490 5	7491 7	7550 8	7572 0	7526 9	7501 5	7479 5	7493 0		
Piezometer Location		CREST	CREST	CREST	CREST	CREST	D S SLOPE	D S SLOPE	CREST	CREST	CREST	CREST	TOE	TOE	TOE	CREST	CREST
		EMBANK		EMBANK/FOUND	MBANK	OUND	MBANK	FOUND	EMBANK/FOUND	EMBANK	MBANK	FOUND	FOUND	FOUND	FOUND	FOUND	BED ROCK
Date	Initials	Reservoir Elevation	45 75' (47')	65' (68 4')	110'	76 2' (79 3')	110 7'	36 5 (37 5')	58 8 (59 4')	110'	49 5 (51')	28 5 (29 7')	84 0' (72 2')	27 3'	32 5'	26 5	35 5'	100 0'
01/03/16	MH	7586 35																
01/17/16	MH	7586 26																
01/27/16	ECC	7586 083	7572 7	7569 3	7561 4	7545 3	7503 5			7517 4	7567 4	7579 1	7516 8	7504	7503.4	7505.3	7580 5	7525 7
01/31/16	MH	7586 25																
02/11/16	ECC	7586 417	7572.5	7569.1	7561 2	7545 5	7503 3			7517.4	7567.2	7578.8	7516 8	7503.8	7503.6	7505.1	7580 4	7525 6
02/13/16	MH	7586.30																
02/25/16	ECC	7586.30	7572.5	7567	7561	7545 3	7503 3			7517.4	7567	7578.7	7516 7	7503.3	7504.7	7503.7	7580 2	7525 4
02/27/16	MH	7586.30																
03/12/16	MH	7586 50																
03/21/16	MH	7586.70																
03/23/16	ECC	7586.75	7574.2	7567	7560.6	7544.8	7503.2			7517.4	7567	7579.5	7516.8	7503.1	7504.7	7503.5	7581.3	7526.1
04/16/16	ECC	7587.33	7573.8	7566.9	7560.4	7544.5	7503.2			7517.4	7566.9	7579.1	7516.8	7503.1	7504.3	7503.4	7581.1	7525.8
06/16/16	MH	***7592.52***																
07/03/16	ECC	7591.90																
07/11/16	ECC	7591.50	7576.6	7569.7	7574	7545.4	7507.1	7523.5	7505.8	7517.4	7569.7	7582.3	7516.7	7503.9	7505.8	7509.3	7584.2	7526.8
07/17/16	MH	7590.00																
07/31/16	MH	7589.65																
08/01/16	ECC	7590.33	7576.3	7569	7573.6	7545	7506.3	7523.2	7505.5	7517.4	7569	7581.6	7516.1	7503.7	7505.6	7509.1	7583.2	7526.3
08/14/16	MH	7588.46																
08/28/16	MH	7588.6																
08/31/16	EEC	7588.75	7575.7	7571.9	7571.6	7545.4	7505.7	7523	7504.7	7517.4	7567.8	7581.4	7516.8	7506.9	7502.1	7504.4	7582.4	7525.7
09/05/16	MH	7588.40	7575.4	7571.9	7571.0	7545.5	7505.2	7522.7	7504.3	7515.2	7567.6	7581.2	7516.9	7506.5	7501.8	7504.1	7582.1	7525.5
09/09/16	MH/KM	7588.05	7575.1	7571.6	7570.7	7545.4	7505.3	7522.6	7504.2	7515.1	7567.2	7580.9	7516.8	7506.3	7501.6	7504.0	7581.7	7525.3
09/16/16	MH	7587.95	7575.2	7571.5	7571.0	7545.5	7505.2	7522.7	7504.1	7515.3	7567.1	7580.8	7517.0	7506.1	7501.4	7503.8	7581.6	7525.3
09/23/16	MH	7591.40	7576.5	7571.7	7574.8	7545.6	7505.9	7522.9	7504.6	7517.4	7567.5	7580.9	7516.9	7509.0	7503.4	7507.6	7583.5	7525.6
09/30/16	MH	7591.55	7577.6	7571.3	7576.6	7545.4	7506.9	7522.7	7506.0	7518.7	7568.5	7581.0	7516.8	7510.0	7504.2	7505.8	7584.0	7526.2
10/07/16	MH	7590.20	7576.8	7571.5	7575.3	7545.5	7506.7	7522.8	7505.6	7518.5	7568.5	7581.4	7517.0	7508.3	7503.4	7505.5	7582.9	7525.8
10/16/16	MH	7589 38	7576.7	7572.0	7576.9	7545.7	7506.1	7523.3	7505.0	7519.3	7568.9	7581.8	7517.0	7507.2	7502.5	7504.8	7582.4	7525.5
10/22/16	MH	7589.30	7576.6	7571.9	7576.8	7545.6	7505.9	7523.2	7504.7	7519.6	7568.7	7581.5	7517.0	7507.0	7502.3	7504.5	7582.3	7525.3
10/29/16	MH	7589.20	7576.5	7571.9	7576.7	7545.6	7505.7	7523.1	7504.5	7520.6	7568.7	7581.4	7516.9	7506.9	7502.1	7504.3	7582.2	7524.9
11/06/16	MH	7588.25	7576.0	7571.9	7576.2	7545.6	7505.5	7523.2	7504.4	7519.0	7568.5	7581.2	7516.9	7506.5	7502.0	7504.3	7581.7	7525.2
11/13/16	MH	7588.25	7575.9	7571.8	7576.0	7545.6	7505.2	7524.1	7504.2	7519.7	7568.2	7581.0	7517.0	7506.2	7501.5	7503.9	7581.7	7525.0
11/19/16	MH	7588.20	7575.8	7571.8	7575.8	7545.6	7505.0	7523.0	7503.9	7519.9	7567.9	7580.8	7517.0	7506.0	7501.4	7503.7	7581.5	7524.9
11/26/16	MH	7588.35	7575.8	7571.8	7575.4	7545.6	7504.9	7523.2	7503.8	7520.7	7568.0	7580.7	7517.0	7506.0	7501.4	7503.8	7581.6	7525.0
12/03/16	MH	7587.80	7575.6	7571.8	7574.9	7545.8	7504.5	7523.3	7503.7	7518.0	7567.8	7580.7	7517.1	7505.7	7501.1	7503.6	7581.3	7524.8
12/10/16	MH	7587.50	7575.3	7571.8	7574.3	7545.8	7504.5	7523.3	7503.4	7518.7	7567.2	7580.5	7517.1	7505.2	7500.8	7503.3	7581.0	7524.7
12/17/16	MH	7586.90	7575.5	7572.2	7574.3	7546.1	7504.4	7523.8	7503.2	7518.5	7567.4	7580.9	7517.1	7505.1	7500.5	7503.1	7580.8	7524.8
12/23/16	MH	7587.10	7575.0	7571.7	7573.7	7545.8	7503.9	7523.3	7502.9	7518.7	7566.7	7580.2	7517.1	7504.9	7500.3	7502.9	7580.8	7524.5
12/31/16	MH	7587.20	7575.0	7571.6	7572.2	7545.8	7503.9	7523.3	7502.8	7518.3	7566.6	7580.1	7517.1	7504.9	7500.2	7502.9	7580.8	7524.6
01/07/17	MH	7587.30	7574.5	7571.2	7570.5	7545.9	7503.9	7523.1	7502.7	7518.3	7565.9	7579.5	7517.1	7504.8	7500.1	7502.7	7580.7	7524.4
01/14/17	MH	7587.30	7574.5	7571.4	7570.5	7546.0	7503.9				7566.1	7579.7	7517.2				7580.8	7524.4
01/20/17	MH	7587.60	7574.6	7571.6	7567.4	7546.0	7503.9	Covered with snow			7566.2	7579.9	7517.3	Covered with snow			7580.9	7524.5
01/27/17	MH		unable to make it to dam due to snow, got stuck															
02/04/17	MH	7587.10	7573.4	7570.9	7563.1	7545.8	7503.5	7523.0	7502.5	7515.6	7565.4	7579.4	7517.1				7580.4	7524.2
02/10/17	MH	7588.15	7573.1	7570.8	7561.9	7545.9	7503.5	7523.1	7502.5	7515.6	7565.3	7579.4	7517.1				7580.1	7524.0
02/17/17	MH	7582.80	7572.1	7570.8	7561.0	7545.9	7504.2	7523.2	7503.4	7515.5	7565.1	7579.2	7517.2				7579.4	7523.9
02/24/17	MH	7582.30	7571.4	7570.5	7562.5	7546.1	7503.4	7523.4	7502.1	7514.9	7564.4	7579.2	7517.2				7578.2	7523.4
03/04/17	MH	7582.30	7571.2	7570.1	7561.6	7545.9	7502.5	7523.4	7501.4	7514.8	7564.1	7578.9	7517.2	Dry @			7577.9	7523.4
03/11/17	MH	7582.70	7571.1	7569.6	7563.9	7545.8	7501.9	7523.4	7500.6	7512.5	7563.7	7578.2	7517.2	7502.3	7497.6	7502.8	7578.1	7523.1
03/19/17	MH	7585.95	7572.4	7569.3	7563.5	7545.8	7503.4	7523.5	7502.7	7514.2	7564.2	7577.9	7517.1	7506.1	7500.6	7505.4	7580.4	7524.5
03/25/17	MH	7588.30	7573.9	7569.4	7566.2	7546.4	7505.7	7523.8	7505.2	7516.1	7565.3	7578.2	7517.2	7510.0	7503.8	7507.7	7583.1	7526.2
04/01/17	MH	7585.90	7573.6	7569.6	7567.2	7546.2	7506.8	7524.0	7506.0	7517.0	7565.3	7578.7	7517.2	7509.2	7504.2	7507.7	7581 9	7525.0
04/09/17	MH	7585.85	7573.6	7569.7	7567.6	7546.0	7507.0	7524.2	7505.8	7517.4	7565.3	7579.2	7517.2	7508.0	7503.8	7506.8	7581.1	7524.7
04/15/17	MH	7588.08	7574.2	7569.6	7568.4	7546.1	7506.7	7524.2	7505.6	7519.2	7565.7	7579.2	7517.3	7508.2	7503.7	7506.1	7581.5	7524.6
04/22/17	MH	***7592.70***	7577.0	7569.6	7570.5	7546.0	7507.5	7523.9	7506.7	7520.6	7566.9	7579.3	7517.2	7513.1	7505.2	7506.1	7584.3	7525.0
04/29/17	MH	***7592.60***	7577.4	7570.2	7570.1	7546.1	7508.0	7524.0	7507.0	7521.6	7567.9	7580.4	7517.4	7512.9	7505.3	7506.2	7584.4	7524.9
05/06/17	MH	***7592.95***	7577.6	7570.7	7568.8	7546.0	7508.2	7523.9	7507.1	7522.2	7568.5	7581.1	7517.2	7512.8	7505.4	7506.2	7584.7	7524.7
05/13/17	MH	***7593.00***	7578.1	7571.3	7573.0	7546.0	7508.2	7523.9	7507.1	7523.9	7569.0	7581.9	7517.3	7512.2	7505.3	7506.2	7584.9	7524.8
05/20/17	MH	***7592.70***	7578.1	7571.5	7574.6	7546.0	7507.9	7523.5	7506.8	7524.2	7569.0	7582.0	7517.3	7511.6	7505.0	7506.0	7584.8	7524.4
05/28/17	MH	***7592.85***	7578.3	7571.6	7576.1	7545.7	7507.4	7523.3	7506.6	7524.2	7569.5	7582.1	7517.2	7511.3	7504.8	7505.8	7585.2	7524.1
06/03/17	MH	***7592.85***	7578.4	7572.3	7576.3	7545.7	7507.5	7523.2	7506.6	7524.8	7569.7	7582.2	7517.2	7511.2	7504.8	7505.8	7585.2	7524.0
06/10/17	MH	***7592.80***	7578.6	7572.9	7577.4	7545.9	7507.5	7523.4	7506.6	7524.4	7569.8	7582.7	7517.2	7510.9	7504.6	7505.8	7585.4	7524.0
06/17/17	MH	***7592.75***	7578.4	7573.0	7577.2	7545.8	7507.3	7523.2	7506.5	7525.2	7569.6	7582.6	7517.2	7510.6	7504.5	7505.7	7585.4	7524.0
06/24/17	MH	***7592.73***	7578.4	7573.1	7577.1	7545.7	7507.3	7523.0	7506.4	7525.3	7568.9	7582.5	7517.2	7510.4	7504.4	7505.6	7585.4	7523.8
07/01/17	MH	***7592.67***	7578.4	7573.3	7577.2	7545.7	7507.2	7523.0	7506.3	7526.2	7569.5	7582.6	7517.3	7510.3	7504.3	7505.6	7585.4	7523.8
07/08/17	MH	***7592.62***	7578.2	7573.3	7577.0	7545.6	7507.1	7522.8	7506.2	7526.5	7569.7	7582.5	7517.1	7510.1	7504.2	7505.5	7585.3	7523.2
07/16/17	MH	***7592.56***	7578.3	7573.6	7577.3	7545.7	7507.1	7522.9	7506.1	7528.6	7570.1	7582.7	7517.2	7509.9	7504.1	7505.5	7585.3	7523.1
07/23/17	MH	***7592.54***	7578.3	7573.7	7577.2	7545.7	7506.9	7522.8	7506.1	7528.6	7570.1	7582.7	7517.2	7509.8	7504.1	7505.5	7585.1	7523.1
07/29/17	MH	***7592.54***	7578.2	7573.7	7577.2	7545.7	7506.9	7522.8	7506.1	7524.7	7570.1	7582.7	7517.2	7509.8	7504.1	7505.5	7585.1	7523.0
08/05/17	MH	***7592.51***	7578.2	7573.9	7576.7	7545.8	7506.9	7522.8	7506.0	7523.9	7570.3	7582.8	7517.2	7509.6	7504.0	7505.5	7585.0	7523.1
08/13/17	MH	***7592.52***	7578.2	7573.9	7576.7	7545.8	7506.9	7522.8	7506.0	7523.9	7570.3	7582.8	7517.2	7509.6	7504.0	7505.5	7585.0	7523.1
08/21/17	MH	7592.00	7577.7	7573.8	7576.1	7545.8	7506.5	7522.7	7505.7	7527.2	7569.8	7582.7	7517.3	7509.0	7503.4	7505.2	7584.5	7522.6
08/27/17	MH	7590.95	7577.4	7573.8	7575.8	7545.8	7506.4	7522.7	7505.4	7527.2	7569.8	7582.6	7517.3	7508.6	7503.2	7504.9	7583.9	7522.5
09/05/17	MH	7589.65	7576.7	7573.7	7575.1	7545.8	7506.1	7522.7	7505.2	7527.2	7569.4	7582.3	7517.2	7507.8	7502.7	7504.7	7583.1	7522.2
09/11/17	MH	7588.70	7576.2	7573.5	7574.4	7545.8	7505.8	7522.7	7504.9	7527.2	7568.5	7582.1	7517.3	7507.3	7502.1	7504.5	7582.5	7522.1
09/16/17	MH	7588.35	7576.2	7573.5	7574.2	7545.8	7505.5	7522.8	7504.6	7524.7	7568.0	7581.8	7517.3	7507.1	7501.8	7504.2	7582.3	7521.9
09/24/17	MH	7587.90	7575.6	7573.3	7573.8	7546.1	7505.3	7522.8	7504.4	Abandoned	7567.8	7581.5	7517.3	7506.7	7501.8	7504.0	7581.9	7521.8
09/30/17	MH	7587.70	7575.4	7573.1	7573.6	7546.0	7505.1	7522.8	7504.2		7567.7	7581.2	7517.3	7506.6	7501.7	7503.8	7581.8	7521.8
10/07/17	MH	7587.30	7575.2	7572.8	7573.3	7546.0	7504.9	7522.8	7504.0		7567.4	7581.0	7517.4	7506.2	7501.5	7503.7	7581.5	7521.7

Bold values indicates reservoir was overtopping

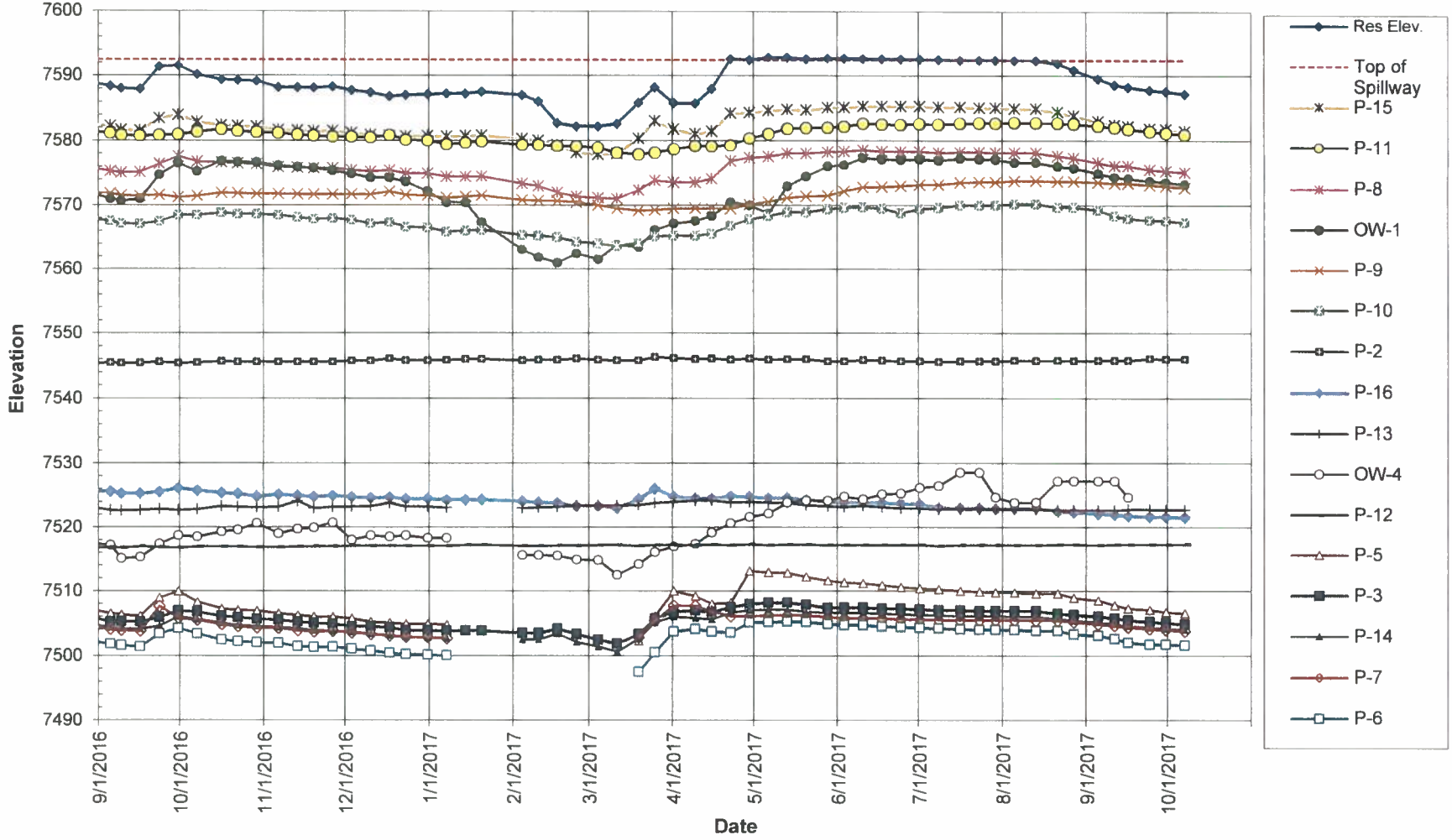
FIGURE C-1



RB&G ENGINEERING, INC.

Figure C-1A Reservoir Elevation and Piezometer Readings
August 2005 to Oct 7, 2017

Grassy Trail Dam and Reservoir



RB&G ENGINEERING, INC.

Figure C-1B

Reservoir Elevation and Piezometer Readings
Sept 2016 to Oct, 2017 (taken by RB&G Eng)

Grassy Trail Dam and Reservoir

TABLE C-2

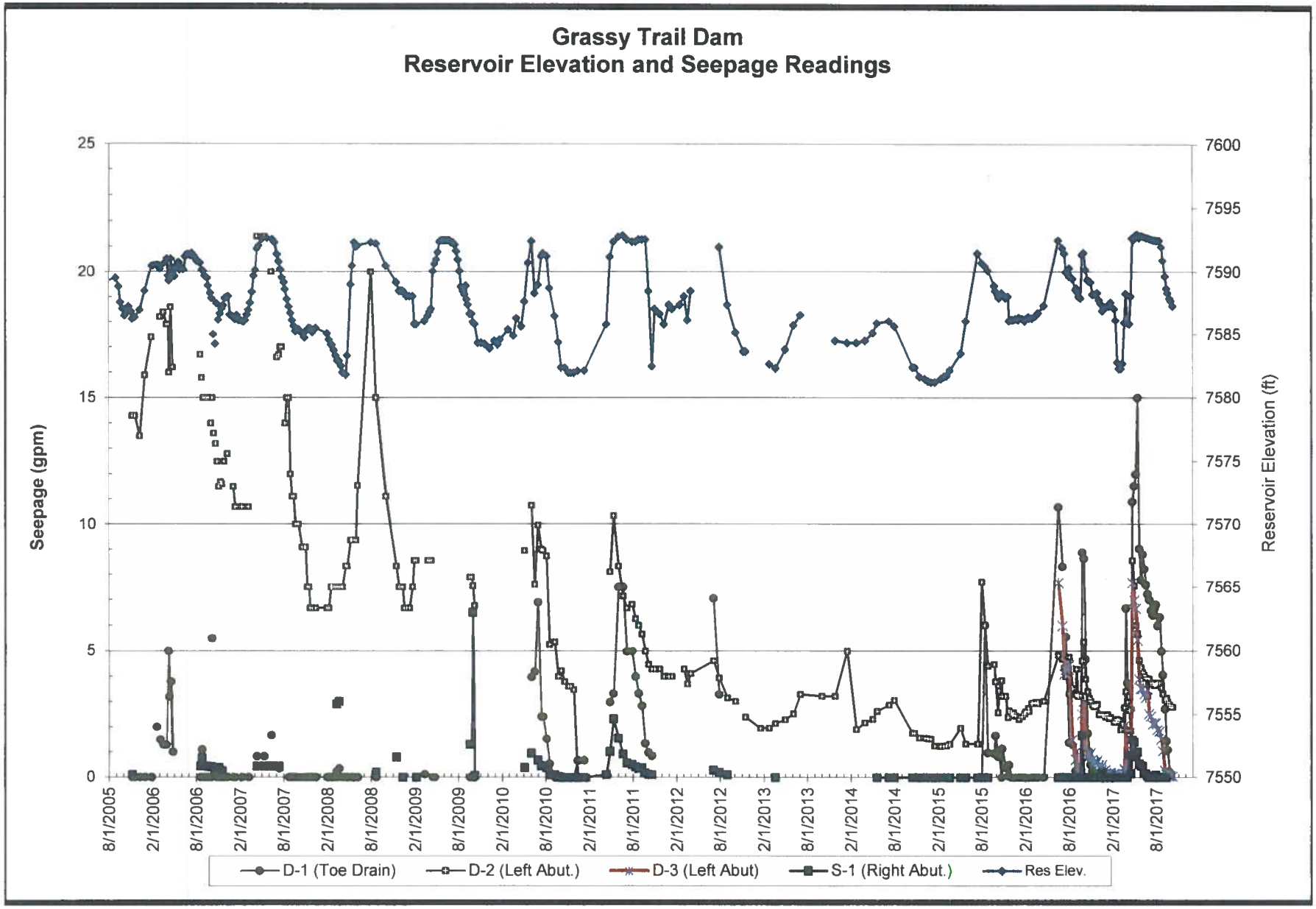
GRASSY TRAIL DAM SEEPAGE READINGS

Dam Crest Elev(ft) 7600.0 Spillway Elev (ft) 7592.5 Seep Location:				Drain1:Toe Drain		Drain 2: Left Abutment (East Seep)		Drain 3: Left Abutment (East Additional collection)		Seep 4: Right Abutment (West Seep)	
Date	Initials	Reservoir Elev.	Reservoir Characteristics	GAL/MIN	Water Characteristics	GAL/MIN	Water Characteristics	add spring 2016		GAL/MIN	Water Characteristics
1/3/16	MH	7586.35	frozen	Dry		2.33				NM	ice
1/17/16	MH	7586.26	frozen	Dry		2.43				NM	ice
1/27/16	ECC	7586.083	frozen	Dry		2.54				NM	ice
1/31/16	MH	7586.25	frozen	Dry		2.61	*trace sediment			NM	ice
2/11/16	ECC	7586.417	frozen	Dry		2.75				NM	ice
2/13/16	MH	7586.3	frozen	Dry		2.64	*trace sediment			NM	ice
2/25/16	ECC	7586.3	frozen	Dry		2.94				NM	ice
2/27/16	MH	7586.3	frozen	Dry		2.95				NM	ice
3/12/16	MH	7586.5	frozen	Dry		2.98				NM	ice
3/21/16	MH	7586.7	frozen	Dry		2.99				NM	ice
3/23/16	ECC	7586.75	frozen	Dry		2.94					
4/18/16	ECC	7587.33		Dry		3.03					
6/16/16	MH	7592.52	slighty over spillway	10.70		4.84		GAL/MIN	Characteristics	0.002	
7/3/16	MH	7591.9		8.33		4.69		6.00		0.02	
7/11/16	ECC	7591.5				4.35		4.11			
7/17/16	MH	7590		5.56		4.00		4.29		0.001	
7/31/16	MH	7589.65		1.40		3.33		4.30		dry	
8/1/16	ECC	7590.33				4.76		4.48			
8/14/16	MH	7588.46		1.32		3.53		1.53		dry	
8/28/16	MH	7588.6		0.28		3.30		0.73		dry	
8/31/16	ECC	7588.75				4.29		1.07			
9/5/16	MH	7588.4		0.04	clear	3.26	clear	0.46	clear	dry	
9/9/16	MH	7588.05		dry		3.23	clear	0.23	clear	dry	
9/16/16	MH	7587.95		dry		3.26		0.17		dry	
9/23/16	MH	7591.4		8.89		4.62		2.54		1.69	
9/30/16	MH	7591.6		8.65		5.36		3.06		drip	
10/7/16	MH	7590.2		4.69		3.90		1.23		dry	
10/16/16	MH	7589.4		1.76		3.41		0.79		Dry	
10/22/16	MH	7589.3		1.06		3.16		0.90		Dry	
10/29/16	MH	7589.2		0.53		3.03		1.00		Dry	
11/4/17	MH	7588.3		0.26		0.29		0.00		Dry	
11/13/16	MH	7588.3		0.194		2.82		0.63		Dry	
11/19/16	MH	7588.3		Dry		2.86		0.57		Dry	
11/26/16	MH	7588.4		Dry		2.91		0.67		Dry	
12/3/16	MH	7587.8	some ice	Dry		2.52		0.50		Dry	
12/10/16	MH	7587.5	Frozen all ice	Dry		2.5		0.4	some sed	Dry	
12/17/16	MH	7586.9	Frozen	drip		2.5		0.52	some sed	0.17	Very wet snow melt
12/23/16	MH	7587.1	Frozen	Dry		2.5		0.27	some sed	Dry	Ice
12/31/16	MH	7587.2	Frozen	Dry		2.4		0.33	some sed	Dry	Ice
01/07/17	MH	7587.3	Frozen	Dry		2.5		Drip		Dry	ice
01/14/17	MH	7587.2	Frozen	Dry		2.36		0.19		Dry	ice
01/20/17	MH	7587.6	Frozen	Dry		2.4		0.21		Dry	ice
01/27/17	MH		unable to make it to dam due to snow, got stuck								
02/04/17	MH	7587.1	Frozen	Dry		2.22		0.17		Dry	ice
02/10/17	MH	7586.2	Frozen	Dry		2.21		0.17		Dry	ice
02/17/17	MH	7582.8	Frozen	snow covered		2.33		0.16		Dry	ice
02/24/17	MH	7582.3	Frozen	snow covered		2.29		0.08		Dry	ice
03/04/17	MH	7582.3	Frozen	snow covered		1.91		0.07		Dry	ice
03/11/17	MH	7582.70	Frozen	snow covered		2.16		0.11		trickle	snow covered
03/19/17	MH	7585.95	Frozen	snow covered		2.78		0.36		trickle	snow covered
03/25/17	MH	7588.30	Frozen	6.67		3.41		2.14		trickle	snow covered
04/01/17	MH	7585.90	Frozen	3.75		3.00		0.54		trickle	snow covered
04/09/17	MH	7585.85	mostly frozen	3.53		2.68		0.17		0.89	
04/15/17	MH	7588.08	mostly melted	2.73		1.86		0.19		0.16	
04/22/17	MH	7592.70	Ice Melted/flow over top	10.91		8.57		7.69	some sediment	1.50	
04/29/17	MH	7592.60	over top spillway	11.54		7.55		6.99	some sediment	1.42	
05/06/17	MH	7592.95	over top spillway	12.00	stream backed	6.00		6.67	some sediment	0.83	
05/13/17	MH	7593.00	over top spillway	15.00	up to pipe	5.70		5.45	some sediment	1.02	
05/20/17	MH	7592.70	over top spillway	9.04		4.64		3.92	some sediment	0.56	
05/28/17	MH	7592.85	over top spillway	7.79		4.35		3.55	some sediment	0.48	
06/03/17	MH	7592.85	over top spillway	8.82		4.17		3.53	less sediment	0.47	
06/10/17	MH	7592.80	over top spillway	8.22		4.05		3.33	less sediment	0.17	
06/17/17	MH	7592.75	over top spillway	7.59		3.94		3.19		0.16	
06/24/17	MH	7592.73	over top spillway	7.23		3.23		3.51		0.07	
07/01/17	MH	7592.67	over top spillway	7.01		3.91		2.56		wet	
07/08/17	MH	7592.62	over top spillway	6.58		3.75		2.46		0.07	
07/16/17	MH	7592.56	over top spillway	6.40		3.75		2.14		wet	
07/23/17	MH	7592.54	over top spillway	6.67		3.65		2.21		0.04	
07/29/17	MH	7592.54	over top spillway	6.82		3.70		2.19		0.11	
08/05/17	MH	7592.51	over top spillway	6.00		3.75		1.92		0.03	
08/13/17	MH	7592.52	over top spillway	6.3		3.75		1.86		0.01	
08/21/17	MH	7592.0	beow spillway	5.00		3.57		1.54		DRY	
08/27/17	MH	7591.0		4.07		3.33		0.31		DRY	
09/05/17	MH	7589.65		2.73		3.09		0.15		DRY	
09/11/17	MH	7588.7		3.16		3.16		0.15		DRY	
09/16/17	MH	7587.35		1.11		3.00		0.16		DRY	
09/24/17	MH	7587.9		0.25		2.88		0.08		DRY	
09/30/17	MH	7587.7		0.10		2.80		0.09		DRY	
10/07/17	MH	7587.3		DRY		2.80		0.06		DRY	

* notes MH = Michael Hansen RB&G Engineering
ECC= East Carbon City / Sunnyside

Left abut drain D-3 has been added, 2016, to collect more seepage

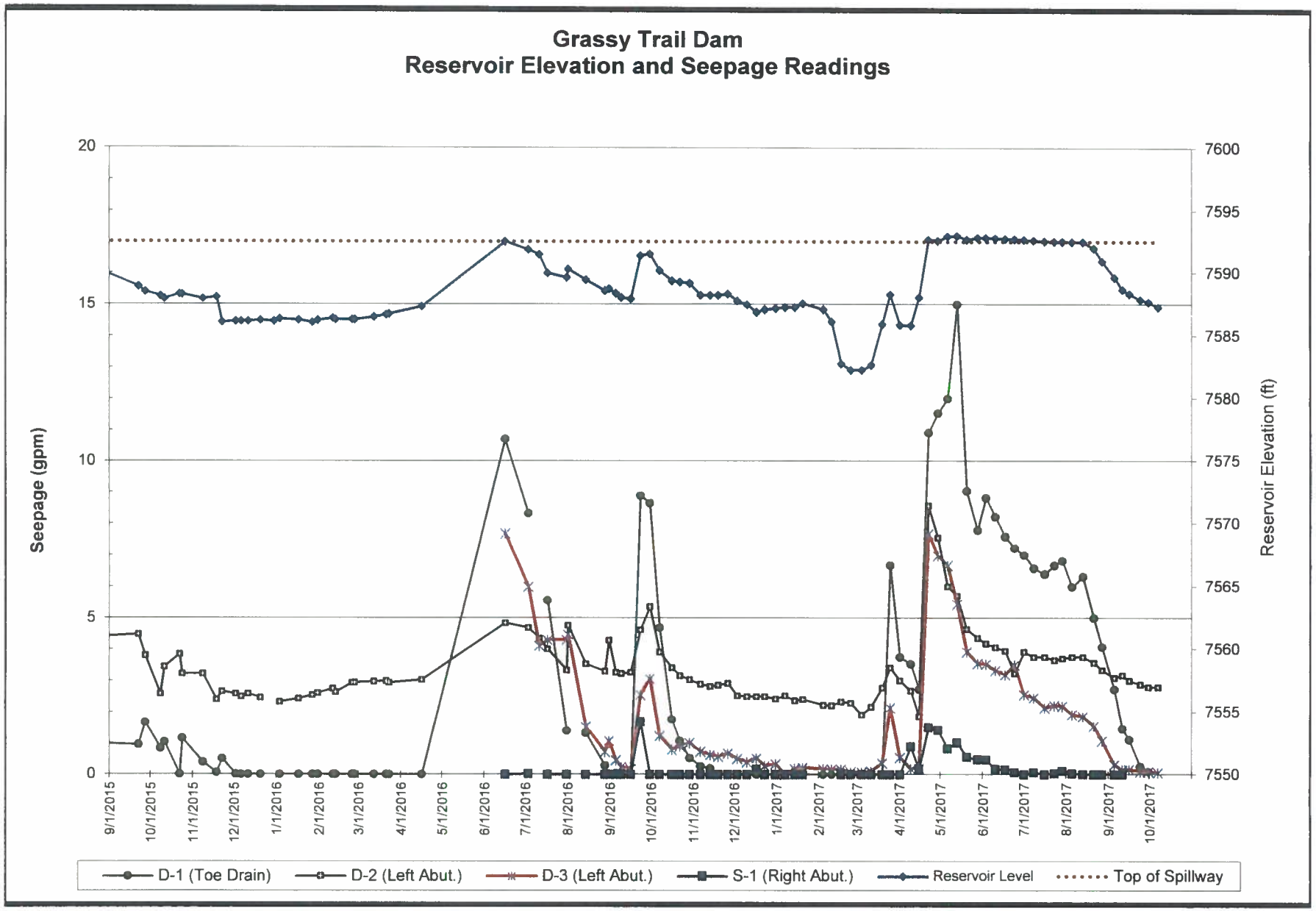
FIGURE C-2



RB&G ENGINEERING, INC.

Figure C-2A

Reservoir Elevation and Seepage Readings
August 2005 toOctober 7, 2017
Some additonal readings by RB&G Eng
Grassy Trail Dam and Reservoir

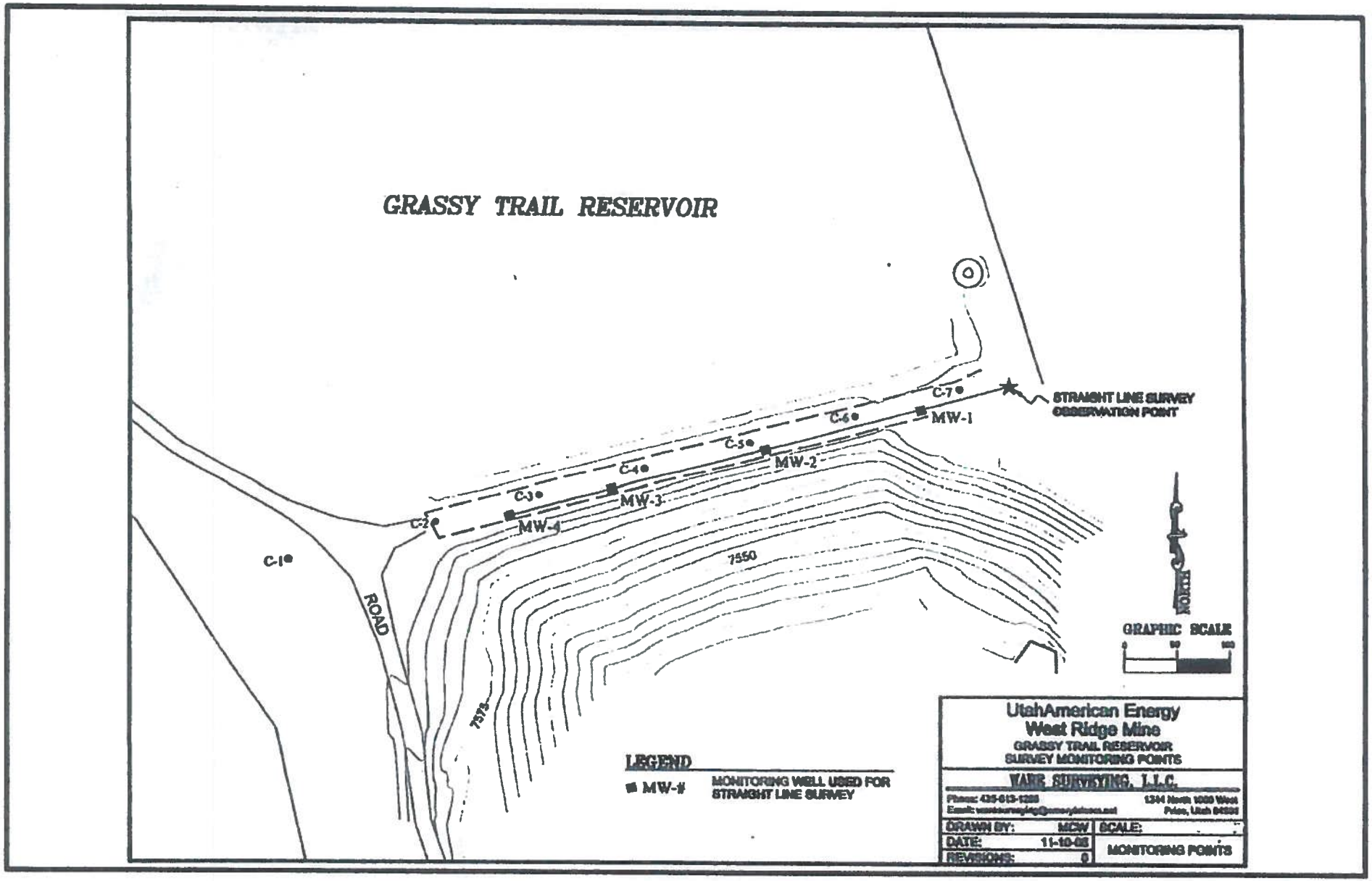


RB&G ENGINEERING, INC.

Figure C-2B Reservoir Elevation and Seepage Readings
September 2016 to October, 2017
readings taken by RB&G Eng
Grassy Trail Dam and Reservoir

SECTION D

Ware Surveying, LLC



RB&G ENGINEERING, INC.

Figure C-3 *Locations of Survey Points on Dam Crest*
Project *Grassy Trail Reservoir Mining Induced Seismicity*
Location *Carbon County, Utah*

UtahAmerican Energy
West Ridge Mine
Grassy Trail Reservoir
GPS Survey Data
Anticipated vertical accuracy ~ 0.08'+/-

10/4/2017

STATION	12	13	14	MID	TOE
NORTHING	38,509.85	38,555.42	38,610.87	38,828.21	38,719.59
EASTING	37,047.46	37,064.56	37,099.85	37,580.00	37,664.94
GPS survey date.					
September 2004	7789.87	7771.43	7739.26		
November 2004	7789.84	7771.39	7739.21		
August 2005	7789.75	7771.30	7739.13		
April 2006	7789.46	7771.02	7738.83		
October 2006	7789.39	7770.95	7738.66		
May 2007	7789.45	7771.00	7738.77		
October 2007	7789.45	7771.01	7738.76		
May 2008	7789.57	7771.10	7738.78	7565.52	7515.69
7/13/2008	7789.54	7771.12	7738.82	7565.54	7515.68
8/29/2008	7789.51	7771.08	7738.75	7565.51	7515.63
9/27/2008	7789.49	7771.05	7738.79	7565.52	7515.66
11/24/2008	7789.52	7771.09	7738.76	7565.54	7515.67
3/31/2009	7789.52	7771.07	7738.74	7565.55	7515.65
4/27/2009	7789.50	7771.05	7738.71	7565.53	7515.64
5/29/2009	7789.39	7771.01	7738.72	7565.48	7515.62
6/28/2009	7789.44	7771.08	7738.71	7565.50	7515.63
8/6/2009	7789.49	7771.12	7738.68	7565.49	7515.64
9/9/2009	7789.50	7771.10	7738.67	7565.51	7515.66
10/25/2009	7789.48	7771.11	7738.70	7565.50	7515.67
11/20/2009	7789.49	7771.10	7738.69	7565.49	7515.65
4/15/2010	7789.35	7770.99	7738.80	7565.49	7515.66
5/26/2010	7789.32	7770.91	7738.84	7565.50	7515.66
6/24/2010	7789.36	7770.96	7738.74	7565.46	7515.64
7/22/2010	7789.33	7770.93	7738.75	7565.48	7515.64
9/2/2010	7789.32	7770.91	7738.75	7565.47	7515.64
10/15/2010	7789.34	7770.93	7738.76	7565.49	7515.66
11/18/2010	7789.33	7770.92	7738.73	7565.49	7515.65
5/5/2011	7789.44	7770.93	7738.70	7565.46	7515.62
6/3/2011	7789.46	7770.99	7738.72	7565.50	7515.61
7/21/2011	7789.40	7770.96	7738.75	7565.47	7515.64
8/29/2011	7789.36	7770.96	7738.74	7565.49	7515.62
10/4/2011	7789.33	7770.95	7738.78	7565.48	7515.65
11/7/2011	7789.38	7770.92	7738.77	7565.48	7515.63
10/5/2012	7789.35	7770.91	7738.78	7565.47	7515.62
10/22/2013	7789.37	7770.95	7738.79	7565.47	7515.65
11/19/2014	7789.36	7770.92	7738.78	7565.49	7515.63
9/10/2015	7789.63	7771.15	7739.08	7565.52	7515.65
9/24/2016	7789.54	7771.10	7738.91	7565.51	7515.62
11/29/2016	7789.50	7771.02	7738.97	7565.48	7515.63
5/31/2017	7789.54	7771.07	7738.96	7565.50	7515.65
6/24/2017	7789.49	7771.05	7738.99	7565.47	7515.65
7/30/2017	7789.56	7771.08	7739.03	7565.49	7515.64
8/18/2017	7789.54	7771.10	7739.01	7565.49	7515.66
9/29/2017	7789.48	7771.02	7738.90	7565.50	7515.68
Difference	0.06	0.08	0.11	-0.01	-0.02

WARE SURVEYING, L.L.C.

1344 North 1000 West – Price, UT 84501
Office: 435-820-4335
Email: waresurveying@emerytelcom.net

UtahAmerican Energy
West Ridge Mine
Grassy Trail Reservoir
Differential Level survey data

10/4/2017

STATION	C-1	C-2	C-3	C-4	C-5	C-6	C-7
NORTHING	38,830.55	38,865.88	38,892.13	38,917.88	38,943.74	38,969.37	38,996.01
EASTING	37,333.20	37,471.64	37,570.28	37,668.82	37,767.40	37,866.16	37,964.74
	C-1	C-2	C-3	C-4	C-5	C-6	
07/30/2002 Elevation	7593.49	7590.63	7590.29	7590.67	7590.44	7590.08	7590.08
08/29/2003 Elevation	7593.50	7590.65	7590.31	7590.69	7590.46	7590.08	7590.08
10/27/2004 Elevation	7593.50	7590.62	7590.30	7590.68	7590.45	7590.08	7590.08
08/12/2005 Elevation	7593.52	7590.66	7590.32	7590.69	7590.46	7590.09	7590.08
03/21/2006 Elevation	7593.50	7590.70	7590.30	7590.68	7590.45	7590.09	7590.08
04/14/2006 Elevation	7593.53	7590.73	7590.31	7590.67	7590.44	7590.08	7590.08
05/4/2006 Elevation	7593.54	7590.75	7590.31	7590.66	7590.43	7590.08	7590.08
05/30/2006 Elevation	7593.55	7590.78	7590.31	7590.65	7590.43	7590.07	7590.08
08/11/2006 Elevation	7593.49	7590.79	7590.31	7590.64	7590.43	7590.07	7590.08
09/18/2006 Elevation	7593.51	7590.82	7590.33	7590.66	7590.43	7590.08	7590.08
10/09/2007 Elevation	7593.54	7590.83	7590.33	7590.67	7590.44	7590.08	7590.08
04/28/2008 Elevation	7593.59	7590.84	7590.34	7590.69	7590.45	7590.09	7590.08
05/30/2008 Elevation	7593.56	7590.82	7590.32	7590.65	7590.44	7590.09	7590.08
07/13/2008 Elevation	7593.56	7590.84	7590.33	7590.66	7590.44	7590.08	7590.08
08/29/2008 Elevation	7593.57	7590.83	7590.33	7590.67	7590.44	7590.08	7590.08
09/27/2008 Elevation	7593.56	7590.84	7590.34	7590.68	7590.45	7590.09	7590.08
11/24/2008 Elevation	7593.55	7590.82	7590.32	7590.66	7590.44	7590.08	7590.08
02/23/2009 Elevation	7593.57	7590.83	7590.33	7590.67	7590.45	7590.08	7590.08
03/31/2009 Elevation	7593.57	7590.83	7590.32	7590.67	7590.44	7590.08	7590.08
04/27/2009 Elevation	7593.58	7590.83	7590.33	7590.68	7590.45	7590.08	7590.08
05/29/2009 Elevation	7593.59	7590.84	7590.33	7590.67	7590.44	7590.08	7590.08
06/28/2009 Elevation	7593.57	7590.83	7590.33	7590.67	7590.44	7590.08	7590.08
08/6/2009 Elevation	7593.57	7590.84	7590.33	7590.68	7590.45	7590.08	7590.08
09/9/2009 Elevation	7593.58	7590.84	7590.33	7590.68	7590.45	7590.08	7590.08
10/25/2009 Elevation	7593.56	7590.84	7590.33	7590.68	7590.44	7590.08	7590.08
11/20/2009 Elevation	7593.56	7590.83	7590.32	7590.67	7590.44	7590.08	7590.08
03/05/2010 Elevation	7593.58	7590.84	7590.33	7590.67	7590.45	7590.08	7590.08
04/15/2010 Elevation	7593.60	7590.84	7590.34	7590.68	7590.46	7590.08	7590.08
05/17/2010 Elevation	7593.59	7590.84	7590.33	7590.67	7590.45	7590.08	7590.08
06/24/2010 Elevation	7593.58	7590.84	7590.34	7590.68	7590.45	7590.08	7590.08
07/27/2010 Elevation	7593.56	7590.83	7590.32	7590.68	7590.45	7590.08	7590.08
09/02/2010 Elevation	7593.56	7590.84	7590.33	7590.69	7590.46	7590.08	7590.08
10/15/2010 Elevation	7593.56	7590.84	7590.33	7590.69	7590.46	7590.08	7590.08
11/18/2010 Elevation	7593.56	7590.83	7590.33	7590.67	7590.48	7590.08	7590.08
05/05/2011 Elevation	7593.58	7590.84	7590.33	7590.68	7590.45	7590.08	7590.08
06/03/2011 Elevation	7593.59	7590.84	7590.34	7590.68	7590.46	7590.08	7590.08
07/21/2011 Elevation	7593.58	7590.84	7590.33	7590.68	7590.45	7590.08	7590.08
08/29/2011 Elevation	7593.58	7590.83	7590.34	7590.67	7590.46	7590.08	7590.08
10/4/2011 Elevation	7593.57	7590.83	7590.33	7590.67	7590.45	7590.08	7590.08
11/7/2011 Elevation	7593.58	7590.84	7590.34	7590.67	7590.46	7590.08	7590.08
10/05/2012 Elevation	7593.58	7590.83	7590.33	7590.66	7590.44	7590.08	7590.08
10/22/2013 Elevation	7593.58	7590.84	7590.33	7590.66	7590.44	7590.08	7590.08
11/19/2014 Elevation	7593.59	7590.84	7590.33	7590.67	7590.44	7590.08	7590.08
09/10/2015 Elevation	7593.61	7590.85	7590.34	7590.69	7590.45	7590.08	DESTROYED?
09/24/2016 Elevation	7593.62	7590.85	7590.34	7590.68	7590.44	7590.08	DESTROYED?
11/29/2016 Elevation	7593.61	7590.84	7590.33	7590.68	7590.44	7590.08	DESTROYED?
05/31/2017 Elevation	7593.63	7590.86	7590.35	7590.70	7590.46	7590.08	DESTROYED?
06/24/2017 Elevation	7593.62	7590.87	7590.36	7590.70	7590.46	7590.08	DESTROYED?
07/30/2017 Elevation	7593.60	7590.86	7590.35	7590.69	7590.45	7590.08	DESTROYED?
08/18/2017 Elevation	7593.62	7590.86	7590.35	7590.69	7590.45	7590.08	DESTROYED?
09/29/2017 Elevation	7593.61	7590.86	7590.35	7590.68	7590.45	7590.08	uncovered but not usable
Difference	0.01	0.00	0.00	0.01	0.00	0.00	

WARE SURVEYING, L.L.C.

1344 North 1000 West – Price, UT 84501
Office: 435-820-4335
Email: waresurveying@emerytelcom.net

UtahAmerican Energy
West Ridge Mine
Grassy Trail Reservoir
"Straight line" survey data

10/4/2017

Distance from control point to face of Monitoring Well (MW) in feet									
Date of survey	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	West Mon.	Straight Line Movement
12/14/2006	94.21	141.49	245.90	295.13	394.71	493.96	556.71	na	No
1/31/2007	94.21	141.49	245.90	295.13	394.71	493.96	556.71	na	No
3/1/2007	94.21	141.49	245.90	295.13	394.71	493.96	556.71	na	No
3/29/2007	94.21	141.49	245.90	295.13	394.71	493.95	556.70	na	No
5/30/2007	94.20	141.49	245.89	295.12	394.70	493.94	556.70	na	No
6/5/2007	94.20	141.49	245.89	295.12	394.69	493.94	556.68	na	No
7/2/2007	94.20	141.49	245.89	295.12	394.69	493.94	556.69	na	No
10/9/2007	94.21	141.50	245.90	295.13	394.71	493.95	556.70	na	No
11/10/2007	94.22	141.50	245.90	295.13	394.70	493.95	556.70	na	No
12/27/2007	94.21	141.50	245.91	295.13	394.71	493.95	na	710.95	No
4/28/2008	94.20	141.49	245.90	295.12	394.70	493.95	556.69	710.95	No
5/30/2008	94.20	141.49	245.90	295.12	394.70	493.94	556.69	710.94	No
7/13/2008	94.20	141.49	245.90	295.12	394.70	493.95	556.69	710.94	No
8/29/2008	94.21	141.50	245.90	295.14	394.71	493.96	556.70	710.95	No
9/27/2008	94.21	141.50	245.91	295.14	394.71	493.96	556.70	710.95	No
11/24/2008	94.21	141.51	245.91	295.14	394.71	493.96	556.70	710.95	No
1/26/2009	94.20	141.50	245.91	295.13	394.71	493.96	556.70	710.94	No
2/23/2009	94.20	141.49	245.90	295.13	394.70	493.96	556.69	710.94	No
3/31/2009	94.20	141.50	245.90	295.13	394.71	493.96	556.70	710.95	No
4/27/2009	94.21	141.50	245.90	295.13	394.70	493.95	556.70	710.95	No
5/29/2009	94.20	141.49	245.90	295.12	394.70	493.95	556.69	710.95	No
6/28/2009	94.21	141.51	245.91	295.13	394.71	493.96	556.70	710.95	No
8/6/2009	94.21	141.51	245.91	295.14	394.70	493.96	556.70	710.96	No
9/9/2009	94.22	141.51	245.91	295.14	394.71	493.96	556.70	710.96	No
10/25/2009	94.21	141.51	245.91	295.14	394.71	493.96	556.70	710.96	No
11/20/2009	94.21	141.50	245.90	295.13	394.70	493.95	556.69	710.95	No
3/5/2010	94.21	141.50	245.90	295.13	394.70	493.95	556.69	710.95	No
4/15/2010	94.21	141.50	245.90	295.13	394.70	493.94	556.69	710.94	No
5/17/2010	94.21	141.50	245.90	295.13	394.70	493.95	556.69	710.95	No
6/24/2010	94.21	141.50	245.90	295.13	394.70	493.95	556.69	710.95	No
7/22/2010	94.21	141.50	245.90	295.13	394.70	493.95	556.70	710.95	No
9/2/2010	94.21	141.50	245.90	295.13	394.70	493.95	556.69	710.94	No
10/15/2010	94.21	141.50	245.90	295.13	394.70	493.95	556.69	710.94	No
11/18/2010	94.20	141.49	245.89	295.12	394.70	493.95	556.68	710.94	No
5/5/2011	94.21	141.49	245.89	295.12	394.69	493.94	556.68	710.94	No
6/3/2011	94.20	141.49	245.90	295.12	394.69	493.93	556.68	710.93	No
7/21/2011	94.21	141.50	245.90	295.13	394.69	493.94	556.68	710.94	No
8/29/2011	94.20	141.49	245.89	295.12	394.70	493.94	556.69	710.93	No
10/4/2011	94.21	141.49	245.90	295.13	394.70	493.95	556.69	710.93	No
11/7/2011	94.21	141.49	245.90	295.13	394.70	493.94	556.69	710.93	No
12/5/2011	94.21	141.50	245.90	295.13	394.70	493.94	556.69	710.94	No
1/2/2012	94.21	141.50	245.90	295.14	394.70	493.95	556.69	710.94	No
10/5/2012	94.21	141.49	245.89	295.12	394.68	493.93	556.67	710.91	No
10/22/2013	94.21	141.49	245.89	295.13	394.69	493.93	556.67	710.91	No
11/19/2014	94.22	*141.69*	245.90	295.13	394.69	493.93	556.67	710.92	No*
9/10/2015	94.21	141.69	245.89	295.12	394.68	493.92	556.66	710.90	No
9/24/2016	94.21	141.68	245.89	295.12	394.68	493.92	556.65	710.90	No
11/29/2016	94.20	141.67	245.89	295.12	394.68	493.92	556.65	710.90	No
12/22/2016	94.20	141.67	245.89	295.12	394.68	493.92	556.65	710.90	No
5/31/2017	94.19	141.66	245.88	295.10	394.66	493.91	556.64	710.89	No
6/24/2017	94.20	141.67	245.89	295.11	394.67	493.91	556.65	710.89	No
7/30/2017	94.19	141.67	245.88	295.10	394.66	493.91	556.64	710.88	No
8/18/2017	94.20	141.66	245.88	295.11	394.66	493.91	556.64	710.88	No
9/29/2017	94.20	141.67	245.88	295.11	394.67	493.91	556.64	710.88	No
Difference	0.00	-0.01	0.00	0.00	-0.01	0.00	0.00	0.00	No
Notes	*MW-2 appears to have been bumped, a new distance and straight line mark was recorded								

WARE SURVEYING, L.L.C.

1344 North 1000 West – Price,
UT 84501
Office: 435-820-4335

APPENDIX

October 2016 Summary Update Report – Text Only

SUMMARY UPDATE REPORT

MINING-INDUCED SEISMICITY NEAR GRASSY TRAIL DAM AND RESERVOIR

Carbon County, Utah

Prepared for

WEST RIDGE RESOURCES INC.

RB&G ENGINEERING, INC.

JULY 2010 TO OCTOBER 2016

RB&G
ENGINEERING, INC.

October 26, 2016

West Ridge Resources, Inc.
P.O. Box 910
East Carbon, UT 84520

Subject: Mining-Induced Seismicity Summary Update Report – July 2010 to February 2016
Near Grassy Trail Dam and Reservoir

Gentlemen:

A Summary Update Report has been completed for the Mining-Induced Seismicity Study at the Grassy Trail Dam and Reservoir in Carbon County, Utah.

We appreciate the opportunity of providing this service for you. If there are any questions relating to the information contained herein, please call.

Sincerely,

RB&G ENGINEERING, INC.

10/26/16

Michael N. Hansen, P.G.

PROFESSIONAL GEOLOGIST
MICHAEL N. HANSEN
#5549531
10/26/16
STATE OF UTAH

Bradford E. Price, P.E.

REGISTERED PROFESSIONAL ENGINEER
NO. 162291
BRADFORD E. PRICE
10/26/16
STATE OF UTAH

bep/jag

1435 WEST 820 NORTH, PROVO, UTAH 84601 1343
PROVO 801-374-5771 SALT LAKE CITY 801-521-5771 FAX 801-374-5773

MINING-INDUCED SEISMICITY
NEAR GRASSY TRAIL DAM AND RESERVOIR
Carbon County, Utah

Summary Update Report July 2010 to October 2016

Table of Contents

Figures & Tables

Appendix

MINING-INDUCED SEISMICITY
NEAR GRASSY TRAIL DAM AND RESERVOIR
Carbon County, Utah

RB&G ENGINEERING, INC.

Summary Update Report July 2010 to October 2016

1. INTRODUCTION

At the time of this report, it is our understanding that mining operations have been completed at the West Ridge Mine. This report is an update summary of monitoring activities conducted at Grassy Trail Dam and Reservoir, primarily between the months of July 2010 and October 2016. The project area is shown on Figure 1. The primary purpose of this study has been to monitor the effects of mining-induced seismicity on the dam and reservoir during and following the mining of Panel 7 in West Ridge Mine, and to monitor effects of mining in subsequent panels, including Panels 18, 19, and 20 near the north end of the reservoir. The locations of instrumentation used for the monitoring program are shown on Figure 2. This report is an update to the July 2010 Summary Report (Grassy Trail Dam and Reservoir, Mining Induced Seismicity Summary Report, *RB&G Engineering, September 3, 2010*), which summarized monitoring activities between January 2008 and July 2010. This is the third Summary Update Report. The first report covered from August 2005 to January 2008. This first report included the seismic monitoring and ground movements which occurred while mining was at its closest point to the dam in Panel 7 during 2006. There was a period between July 2012 and August 2015 during which RB&G Engineering was not providing monitoring at the dam. The two accelerometers; however, continued to collect data during this period until the storage memory on the instruments was full.

1.1 Mining Timeline and Proximity to Reservoir

Figure 1 shows the location of the West Ridge Mine operation relative to Grassy Trail Dam and Reservoir. This figure shows the locations of panels 6 and 7 on the west side of the reservoir, which were mined in 2005 and 2006. The coal seam mined was approximately 1,660 feet vertically below the crest of the dam. The nearest point on panel 7 was approximately 995 feet horizontally west of the dam right abutment. Following completion

of panel 7, the mining operation moved to panel 8, located between 2.7 and 4.7 miles west northwest of the reservoir (north of the previously-mined panels) as shown on Figure 1.

Areas that were mined between July 2010 and October 2016 are also shown on Figure 1. This figure shows that for the remainder of 2010, mining gradually progressed in an easterly direction, finishing panel 15 and part of 16. During 2011, mining continued to move eastward across panels 16, 17, and most of panel 23.

In 2012, after finishing panel 23 in March, mining moved south to a row of panels closer to the north end of the reservoir, starting in panel 20, then 21 and finishing over half of 18 during 2012. Panel 18 is about 2,400 feet north of the dam, making it the second closest panel to the dam, with panel 7 being as close as about 995 feet horizontally from the dam.

Panel 18 was finished in 2013. Mining was then moved to panel 26, which is located about 2.3 miles west of the dam. This area is located on the far west side of the mine and contains numerous shorter panels. In 2013, mining was completed in panels 26, 25, 24 and 23.

In 2014, mining moved to panels 33, 28, 30, and 29. Mining in 2015 began in panel 31 and then moved in March back to the east into panel 19, located about 3,000 feet north of the dam. In September, operations moved again back to the far west, where panel 34 was mined through November of 2015. It is our understanding that mining of panel 34 marked the completion of the mining operation within the West Ridge Mine.

2. PRESENTATION OF MONITORING DATA

Summaries of monitoring data prepared by RB&G Engineering from seismic ground motion instruments, the University of Utah Seismograph Stations (UUSS), and inclinometers are included in the Figure and Table section of this report. Summaries of monitoring data collected by others, including piezometer, observation well, seepage, and ground survey measurements, are presented in the appendix of this report. This section discusses apparent correlations between the mining operations at West Ridge Mine and the data collected at Grassy Trail Dam and Reservoir.

2.1 Ground Motion Monitoring Devices

Instantel Minimate geophones (accelerometers) have provided monitoring of seismic ground motions at the site since January 2005. The instruments have been sent to the manufacturer for re-calibration several times since their installation. One device was always left in operation whenever the other was being re-calibrated.

In the middle of August 2015, RB&G Engineering was asked to resume monitoring at the dam. The accelerometers had not been calibrated from 2012 to 2015 and each was in need of calibration. The accelerometer which had been located on the hillside north of the dam also had a damaged solar panel and power supply, such that its external power source was not operational. At that time (September 2015) there was a lack of seismic activity being generated from within the mine, and the mining operations had been completed in panel 19, which was located just north of the reservoir and about 2,800 feet north of the dam. Partway through September, mining moved about 2.25 miles to the west of the dam to panel 34, which was the last panel to be mined. It was decided that, due to the great distance between mining and the dam, the accelerometer on the dam would be sufficient for monitoring seismic activity on the dam. The second accelerometer was not brought back on line.

While our monitoring report in 2012 included data up to June 9 of that year, the accelerometer on the hillside continued to collect data from June 9, 2012 until December 10, 2012 when the data storage on the instrument became full and stopped monitoring. The accelerometer on the dam continued collecting data from June 9, 2012 until May 11, 2014. Therefore, there is a gap in the data on the dam between May 11, 2014 and August 13, 2015. A summary of the number of events per month and the characteristics of the largest event each month since July 2010 is tabulated on Table A-1.

The number of seismic events recorded on the dam and hillside per day since July 2010 are plotted on Figure A-1. The number of seismic events per day reported by the UUSS is also plotted on this figure. The figure shows that the instrument on the dam has not recorded any MIS events since June 2010.The hillside seismic unit recorded the most daily events during June 2011, with 3 events in one day. Between July 2011 and July 2012 there were several

days with a maximum of 2 events per day. The number of events dropped off to zero after July 2012. No events were recorded on the dam or hillside after July 2012. As noted previously, the memory on the hillside device was full in December 2012, and was not returned to operation when monitoring resumed in 2015.

Figure A-1 also shows the maximum number of MIS earthquakes per day was 7, and occurred in August 2011. The largest number of events reported by the UUSS occurred between June 2011 and January 2013. No events were recorded by UUSS between February and July 2013, but recorded seismic activity resumed between August 2013 and February 2014. This was followed by another period of no activity, with the exception of 4 events between July and August 2015.

After a magnitude 2.1 event in February 2009, mining operations were modified to implement a panel and barrier method, leaving larger un-mined panels between mined panels. This change in mining operations coincided with a significant decrease in the number of MIS events, with only twelve events reported from March 2009 to November 2009. Between November 2009 and July 2010, only one event was reported (April, magnitude 0.1). The overall number of events also decreased, with only 1 event at magnitude 2.0 and all others through October 2016 less than 2.0, as shown on Figure A-4 and A-4 a.

It should also be noted that during mining in Panel 7 (March 2006), a 2.6 magnitude event was reported along with numerous events greater than magnitude 2.0 through February 2009. These trends are also illustrated on Figure A-2, which shows events per week rather than events per day. Figures A-1a and A-2a have been included to show all of the events over the entire monitoring period from January 2006 to October 2016.

Figure A-3 shows the number of events recorded weekly at the reservoir during 2006, as well as the approximate horizontal distance from the mining to the dam at a given time. The number of events detected at the reservoir appears to be a function of the proximity of mining. This figure shows that the maximum number of weekly events at the reservoir does not directly coincide with the closest distance to the ongoing mining. Instead, the period of most frequent events lags several weeks behind the period of nearest mining activity. This

lag time is likely caused by the tendency of the longwall ceiling to hang up for a period of time while building up stresses sufficient to collapse a portion of the roof.

The maximum weekly MIS earthquake event and Peak Ground Acceleration (PGA) values recorded at the reservoir from June 2010 to October 2016 are plotted versus time on Figure A-4. The time period during which the greatest acceleration value was recorded was in June 2012 with a PGA of 0.0795; however, the largest magnitude earthquake was a 2.0 magnitude in June 2011. For comparison, Figure A-4a shows these maximum weekly values from January 2008 to October 2016.

An overview of the seismic activity in the area showing the number of MIS earthquakes reported by the UUSS per month since June 2010 to October 2016 is shown on Figure A-5. Figure A-6 shows the earthquake magnitudes for each of these events since June 2010 to October 2016. From these figures, it is apparent that there was a significant decrease in the number of MIS events after December 2011. This corresponds with the completion of Panel 23 and then moving south to panels 20, 21 and 18.

2.2 Inclinometers

Figure 2 shows the location of each inclinometer. Data from the four inclinometers at the reservoir are compiled in the Figures and Tables section of this report. A discussion of data obtained from each inclinometer is presented below. Some data collected prior to 2008 are not included in the following sections and figures. For detailed information prior to 2008, the Grassy Trail Dam and Reservoir, Mining-Induced Seismicity, Summary Report, January 2008 should be referenced.

2.2.1 Inclinometer 1

Inclinometer 1 was installed at the easterly (left) end of the dam in 1998. This inclinometer extends through approximately 48 feet of dam embankment fill and into the foundation, with a total depth of about 107 feet. The positive "A" axis of this inclinometer pipe is oriented into the abutment toward the southeast, and the positive "B"

axis is oriented downstream to the southwest. Deflection profiles recorded by Inclinometer 1 are shown on Figure B-1. This figure shows that the uppermost 2-foot deflection interval indicates substantially greater deflections than the rest of the readings. This observation indicates only that the pipe is not rigidly confined in the soil in the upper few feet, and is not an indicator of significant ground movements.

With the exception of the uppermost point, the deflection recorded along either Inclinometer 1 axis is in the order of ¼ inch, which is near the margin of error of the instrument. As of April 2010, the magnitudes of the displacements in Inclinometer 1 were small, and did not exhibit a tendency toward instability in this area. Due to the lack of movement, no additional readings were taken on this inclinometer. Sometime after 2012, I-1 was buried beneath about 12 inches of new fill material that had been placed on the crest of the dam. In February 2016 the cover was located with the use of a metal detector and about 12 inches of frozen fill was chipped away to expose the cover. While the cover had some damage, the inclinometer was still functioning. New inclinometer readings in 2016 suggest no significant additional movement has occurred between April 2010 and October 2016.

2.2.2 Inclinometer 2

Inclinometer 2 was installed near the west (right) end of the dam in 1998. This pipe extends to a total depth of 128 feet, including approximately 120 feet of embankment fill and underlying foundation soil before penetrating about 8 feet into sandstone bedrock. This inclinometer is oriented such that positive movement on the "A" axis indicates movement into the west abutment, and positive movement on the "B" axis is upstream toward the reservoir.

Deflection profiles for the "A" and "B" axes are shown on Figure B-2. Since July 2010 the "A" axis shows about ¼ inch of movement, which is near the margin of error for the instrument. This movement is significantly less than the approximately 3.5 inches of deflection measured between 2005 and 2008. The large majority of this prior deflection occurred between December 2005 and August 2006. The profiles also show deflection of

less than ¼ inch in the negative "B" direction occurring between July 2010 and October 2016. Some of the readings actually swing back in a more positive direction. After July 2010 we do not see any new significant movement. In both cases, the profiles appear to be relatively stable since the end of 2010.

The deflected shape of Inclinometer 2 on January 26, 2008 relative to a baseline shape measured on July 20, 2004 is shown in plan view on Figure B-3. The figure shows that the measured deflections are oriented primarily along the dam axis from the west (right) abutment toward the maximum section to the east. The slight "bulging" noted on the "B" axis profile is in the upstream direction. Since no significant movement has occurred between 2010 and October 2016, this information is not included on this figure.

Figure B-4 shows deflections along the "A" axis of Inclinometer 2 plotted versus time, beginning in February 2005 up to October 2016. The dates on Figure B-4 can be compared to the dates at which mining occurred closest to the dam. Some lateral deflection (0.4 inch over the 44 to 122-foot depth interval) occurred during Panel 6 mining in 2005. Much of the 2005 deflection occurred during the first half of the year, and measurements after June appear to demonstrate a decreasing rate of deflection. By November 2005, the ongoing deflection had temporarily subsided.

As mining commenced in Panel 7, the deflections measured in Inclinometer 2 began to increase substantially, with the greatest deflections occurring during and immediately following the period of shortest distance between the mining and the dam. By August 2006, the ongoing deflections were very small. By October 2006 movement became negligible.

There appears to be a very strong correlation between the deflections measured by Inclinometer 2 and the proximity of longwall mining. The larger magnitudes of events recorded during Panel 7 mining compared to Panel 6 mining may also contribute to the larger lateral deflections observed during Panel 7 mining.

2.2.3 *Inclinometer 3*

Inclinometer 3 was installed in the dam's right (west) abutment in 1998. This pipe extends through about 7 feet of clayey overburden soil, underlain by predominantly mudstone to about 42 feet, and terminates after penetrating about 11 feet into sandstone at a total depth of 53 feet. The positive "A" axis of Inclinometer 3 is oriented predominantly away from the dam and 20 to 25 degrees upstream of the dam axis. The positive "B" axis is oriented predominantly upstream toward the reservoir.

Profiles of deflection measurements recorded at Inclinometer 3 since July 2010 are shown on Figure B-5. The deflection shape shown for the "A" axis and "B" axis shows no significant movement between July 2010 and October 2016 (less than 1/8" of deflection).

Figure B-6 is a plan view of the deflection measurements in Inclinometer 3 between 2004 and 2007 and includes the maximum defection during mining. The predominant plane of back-and-forth lateral deflection is parallel to the dam axis, but an overall movement in the upstream direction is also apparent. Since no significant movement has occurred between July 2010 and October 2016 this information is not included on this figure.

Figure B-7 shows the deflection for the various depth intervals plotted versus time. On this figure the trend is very similar to that shown for Inclinometer 2 on Figure B-4. Again, it appears that relatively small lateral ground movements occurred at the abutment during mining of Panel 6 in 2005, followed by larger deflections occurring during Panel 7 mining in 2006. As was the case with Inclinometer 2, the rate of deflection at Inclinometer 3 was very small during periods of limited or more distant mining activities, such as November-December 2005 and after August 2006.

The deflections measured at Inclinometer 3 are substantially smaller than those measured at Inclinometer 2; however, it should be noted that the bottom eight feet of Inclinometer 2 appears to be fixed in place, suggesting that the pipe may be anchored in a stationary stratum. By contrast, Inclinometer 3 shows deflections beginning at the deepest

measurement interval (51 to 53 feet). This observation suggests that the bottom of the Inclinometer 3 pipe may not be anchored as the Inclinometer 2 pipe appears to be. The 11 foot sandstone unit at the bottom of this inclinometer appears to be moving with the slide. This makes the movement recorded above the bottom only relative to the moving bottom and not to a stationary fixed point. The deflection values recorded only show relative movement between points and do not show absolute deflection values with a true measurement of total movement and direction.

2.2.4 Inclinometer 4

Inclinometer 4 was installed in February 2005 on the west rim of the reservoir upstream of the dam. This instrument is located immediately west of the roadway in the lower portion of an apparent slide mass. The pipe extends through approximately 37 feet of soil and penetrates about 30 feet into the underlying bedrock to a total depth of 67 feet. The positive "A" axis for this inclinometer is oriented in an easterly direction toward the reservoir. The positive "B" axis points downstream toward the dam.

In July of 2007 Inclinometer 4 (I-4) was run over by a large truck and broke off just below ground level. Repairs were started and put on hold while the road was being widened. The new road cut caused a surficial slide which buried I-4. At the time, I-4 was not showing signs of movement. In May 2010 the inclinometer was located and dug out, and appeared to be functional. Due to the loss of about 2 feet of pipe at the surface, new readings do not correlate exactly with the previous readings prior to 2007.

Deflection profiles for Inclinometer 4 are shown on Figure B-8. This figure shows relative movement compared to a base line reading taken in June, 2010. The larger displacements shown in the upper 4 feet indicate that the top of the pipe is loose and is moving during the readings.

Taking into account the possible reading error due to the damage, the inclinometer does not show any significant movement since 2007. Some additional repairs are advisable to secure and protect the top of the instrument.

Figure B-9 shows a plan view of the Inclinometer 4 deflection measurements between February 2005 and July 2007. Disregarding the outlying points at depths of 1 and 3 feet, the deflection is predominantly eastward down the slope and into the reservoir, as would be expected.

The deflection of Inclinometer 4 along the "A" axis is plotted versus time on Figure B-10. The same trend observed at Inclinometers 2 and 3 is also apparent at Inclinometer 4. One notable difference is that the deflections attributable to mining of Panel 7 appear to subside several months earlier (around June 2006) at Inclinometer 4, while they continue until about August with slight movement into October 2006 in the west abutment area of the dam. Overall, I-4 has indicated between ¼ inch and ½ inch of deflection, with most of this occurring between a depth of 40 to 60 feet. There doesn't appear to be any significant movement since about June 2006.

2.3 Piezometers and Observation Wells

The dam has been instrumented with piezometers and observation wells to allow monitoring of any changes in pore pressure and seepage behavior. The locations of these instruments are illustrated on Figure 2. East Carbon City is responsible for monitoring the piezometers and observation wells on a regular basis. The monitoring results are uploaded to the State Dam Safety Office web site. This information is available at http://nrwrt1.nr.state.ut.us/cgi-bin/damview.exe?Modinfo=Viewdam&DAM_NUMBER=UT00126. Figure C-1 in the appendix shows a summary of reservoir levels and piezometer readings between 2010 and 2016.

The observation well identified as P-4, installed in 1979, has shown erratic readings over the course of the current monitoring program. We have recently examined this piezometer with a video camera, and encountered water spraying into the pipe through one slot at a depth of about 25 feet, then cascading down to about 84 feet (approx. elev 7518) where the pipe is full of water. Water can also be observed trickling into the pipe above a depth of 25 feet. Some of the slots appear to be plugged. The water entering the pipe above the standing water level has been found to trigger the water level indicator, and this behavior is likely responsible for the erratic readings noted in P-4.

A review of the other piezometer readings shows an occasional spike on a single piezometer reading. These spikes appear to be errors in data entry since the next reading is back to normal. With exception of these spikes and the erratic P-4 readings discussed above, no substantial or unusual changes in water levels were observed.

2.4 Seepage Monitoring Points

Seepage through the dam, foundation, and abutments has been collected at three locations, including the toe drain connected to the dam's internal drainage system (D-1), a seepage collection system located on the east (left) abutment (D-2), and a collection pipe located on the west (right) abutment (S-1). A second collection point (D-3) was added on the left abutment sometime in late 2015 or early 2016. The flows from the drains are measured by recording the time to fill a container of known volume with water from each collection point. The clarity of the water has also been recorded during seepage readings. Clear seepage indicates that the flow is adequately filtered and is not moving material through the dam or foundation. Cloudy seepage could be a sign of internal erosion, which could lead to a piping-related failure of the structure. No cloudy water was noted during our site visits prior to 2015.

After recent modifications to the left abutment seepage collection system, significant seepage appears to have been redirected to D-3 on the left abutment. We have also observed a trace of sediment in the bottom of the 5 gallon bucket during some site visits. It is not known if the sediment is coming from the surface or if it is due to the reworking of the drain lines.

Figure C-2 in the appendix shows the reservoir elevation and seepage at each monitoring location from 2006 through October 2016. The dates of larger seepage rates tend to coincide with higher water levels in the reservoir, with spikes occurring when the water level rises above about elevation 7590 ft.

2.5 Survey Points

West Ridge Mine has contracted with Ware Surveying to provide surveys of points on the dam and the slopes west of the reservoir at various times throughout the monitoring program. The locations of the survey points are shown on Figure C-3 of the appendix, followed by a copy of the readings reported to date. The survey data indicates no significant horizontal nor vertical movement has occurred over the last year.

3. SUMMARY AND CONCLUSIONS

This section provides a brief summary of the findings of the monitoring data described in the previous sections, and presents several conclusions that may be drawn based on this data. It should be noted that mining in the West Ridge Mine stopped in November of 2015. Approximately 11 months have passed since completion of mining.

3.1 Mining-Induced Ground Motions at Grassy Trail Reservoir

The longwall mining operation performed in Panels 6 and 7 resulted in ground motions detected on the hillside west of the dam, as well as on the crest of the dam. The recorded mining-induced ground accelerations at the site were relatively small during mining of Panel 6, and increased substantially during mining of Panel 7. The increase in the number of events and the recorded acceleration levels appears to be strongly connected to the proximity of mining. There appears to be a lag of a few weeks up to several months between the time period of closest-proximity mining and the time of maximum mining-induced ground motions at the reservoir. The following table summarizes the number of MIS events recorded by th University of Utah Seismograph Station BCE starting in 2006.

Year	UUSS MIS / Earthquake events/year	UUSS MIS / Earthquake average events/month
2006	463	39
2007	373	31
2008	255	21
2009 Jan thru Feb	47	24 (2 months)
2009 Feb thru Dec after change in mining	12	1.2 (10 months)
2010	6	0.5
2011	192	16
2012	93	7.8
2013	14	1.2
2014	6	0.5
2015	4	0.3
2016 thru October	0	0

As shown in the table above, the average number of events started decreasing in 2007 and continued to decrease through 2010. There was a significant decline in the number of events after the later part of February 2009, when mining operations were changed to a panel barrier configuration. The number of MIS events increased significantly in 2011 and started declining again in 2012. The reason for the increase in number of events recorded during that

period is not clear, but may be related to variations in conditions within the area of mining, such as the thickness of overburden above the seam being mined. The number of events continued to decline with, only 4 events during all of 2015 and none recorded to date in 2016.

3.1.1 Slide Areas on Hillside West of Reservoir

Grassy Trail Reservoir is located at the junction of the left and right forks of Whitmore Canyon. The dam and reservoir are located on the Colton Formation laid down during the Tertiary Period, Eocene and Paleocene Epochs, about 38 to 56 million years ago. The formation consists of dark-reddish-brown to green beds of mudstone and shaly siltstone interbedded with yellowish to grayish-orange and grayish brown, thin, fine to medium grained quartzose sandstone, with sparse limestone beds. The formation is primarily of alluvial origin with some marginal lacustrine and deltaic deposits (Weiss and others, 1990). Bedrock appears to dip gently to the northeast at an angle of about 7 to 8 degrees.

The mudstone deposits of the Colton Formations are susceptible to sliding and are associated with landslide deposits in the region. While geologic maps of the area show landslide deposits in the region, they do not show any mapped near the dam or in the area near panels 18, 19, and 20. The lack of identified slides on the map, at and near the dam, may be due to the scale of the mapping.

Inclinometers 2 and 3 have been documenting movement of the landside in the west dam abutment area. Significant movement of the west side took place shortly after the dam was constructed and long before current mining operations. Apparent MIS-related movement of this slide started in 2005. Most of the movement took place in 2006, causing about 3.5 inches of inclinometer deflection at the dam. At that time, mining came within a horizontal distance of about 1,000 feet of the dam. Subsequent displacements have been minor, and generally within the margin of error of the inclinometers.

Inclinometer 4, located upstream of the dam on the west rim of the reservoir, has suggested discrete deflections of up to 0.3 inch at a depth of about 62 feet below the

ground surface. These deflections are significantly smaller than those at the dam. Very slight deflections were measured at this depth during mining of Panel 6 in 2005, but the large majority of this deflection occurred between February and June of 2006, while mining in Panel 7 was closest to the inclinometer. Measurements recorded since June 2006 suggest that this slide area has been relatively stable since that time.

Following changes in mining practice to a "Barrier and Panel" configuration after February 2009, MIS earthquake events decreased significantly. The magnitude of the MIS earthquake events also decreased.

While these landslides currently appear to be relatively stable, it should be recognized that increases in slide movement could occur due to factors unrelated to mining, such as above average precipitation and changes in the moisture conditions in the hillside. Naturally-occurring earthquakes may also trigger new movement. If mining activities were to resume in the site vicinity, the possibility of renewed movement would increase.

4. RECOMMENDATIONS

It is apparent from the data collected that mining activities in West Ridge Mine have caused mining-induced seismic events, and that ground motions caused by these events were detected at Grassy Trail Dam and Reservoir. These ground motions have caused some measurable permanent deformations of the ground surface on the hillside west of the reservoir, as well as lateral deformations at the west end of the dam. Despite the recorded deformations, piezometer and drainage measurements appear to be unaffected, and ongoing deformations have been very small to negligible since mining of Panel 7 concluded in the fall of 2006.

Our general recommendation is that regulatory agencies consider allowing the mining-induced seismicity monitoring to end at this time, and that ongoing monitoring follow Utah State Dam Safety Guidelines. Specific recommendations include the following:

- Continued annual monitoring of inclinometers is recommended to verify that the rate of measured displacements remains small, and to help identify any renewed displacement of the site landslides.

- Inclinometer 4 was damaged and then buried by a surficial landslide. This slide was triggered by a road cut made to widen the roadway along the west side of the dam. We recommend stabilizing and protecting the top of this inclinometer. It is recommended that modifications to the existing slopes not be performed without considering hillside stability.
- We recommend that regular monitoring of piezometers and seepage collection points continue as directed by the State. All seepage from the left and right abutments should be collected and measured. The amount of sediment, if any, should be quantified and recorded.
- We recommend that consideration be given to abandoning Observation Well P-4, which has demonstrated a tendency to give false readings of the standing water level in the well.
- All instruments and monuments should be located and repaired where covered or displaced by previous grading, and future grading/maintenance of the dam crest and slopes should preserve these instruments.
- We recommend that if an earthquake with a magnitude of 3.0 or greater is reported within 5 miles of the dam, a thorough site reconnaissance and readings of inclinometers and piezometers be performed.

Project Reports

RB&G ENGINEERING, INC.
1435 West 820 North
Provo, Utah 84601-1343
801-374-5771 Provo
801-521-5771 Salt Lake City
801-374-5773 Fax

PROJECT REPORT

Project No.	201404-006		
Project	Grassy Trail – West Ridge Mine Monitoring		
Dates	Sept 16, 23, 30, Oct 7, 16, 22, 29, Nov 6, 2016		
Report By	Michael N. Hansen	**Position**	Engineering Geologist

Observations / Activities

New readings from Inclinometers I-1, I-2, 1-3 and I-4 have not shown any significant movement. Plots of the inclinometer readings taken on September 30, and October 29 are attached.

One accelerometer is located on the crest of the dam. This accelerometer has been continuously monitoring since the middle of August, 2015. The instrument has not shown any mining induced seismic (MIS) activity between August, 2015 to November 6, 2016. The "events" which have been recorded take place while removing and putting the cover back on the instrument as part of downloading and resetting the Accelerometer.

Since the last report on September 9, 2016, no seismic events have been reported within the area of the mine by the University of Utah Seismograph Stations (UUSS).

Reservoir elevation, seepage and piezometer readings have been taken weekly by RB&G since September 5. Seepage rates generally fluctuate with the changing elevations of the water in the reservoir. Plots of the reservoir elevations, piezometer and seepage readings are attached. Plots show an increase as the reservoir was rising and a decrease in the amount of seepage as the reservoir has been dropping.

From the weekend of September 23 to September 30, over 4 inches of rain brought the reservoir level up 3.7 ft. to within 0.9 ft. of the top of the spillway. During this time, several very large boulders (one up to 7 ft. diameter) were brought down off the mountain to the east, onto the road leading up to the dam. No rockfalls however were noted at the dam.

During the site visits, reconnaissance of the area found no signs of significant landslide movement on the hillsides or at the dam.

Michael Hansen P.G.
Engineering Geologist
RB&G Engineering Inc.

RB&G ENGINEERING, INC.
1435 West 820 North
Provo, Utah 84601-1343
801-374-5771 Provo
801-521-5771 Salt Lake City
801-374-5773 Fax

PROJECT REPORT

Project No.	201404-006		
Project	Grassy Trail – West Ridge Mine Monitoring		
Dates	Site Visits and readings - November 13, 19, 26, December 3, 2016		
Report By	Michael N. Hansen	**Position**	Engineering Geologist

Observations / Activities

New readings from Inclinometers I-1, I-2, 1-3 and I-4 have not shown any significant movement. Plots of the inclinometer readings taken on December 3, 2016 are attached.

One accelerometer is located on the crest of the dam. This accelerometer has been continuously monitoring since the middle of August, 2015. The instrument has not shown any mining induced seismic (MIS) activity between August, 2015 and December 3, 2016. The "events" which have been recorded take place while removing and putting the cover back on the instrument as part of downloading and resetting the Accelerometer.

Since the last report on November 6, 2016, one seismic event has been reported within the area of the mine by the University of Utah Seismograph Stations (UUSS). The event occurred on 11/23/16 at 3:14 am MST. The event was small with a magnitude of 0.8 and occurred at a depth of about 0.6 miles, with the epicenter located about 1.6 miles northwest of the dam. Because this event was relatively small, the accelerometer on the dam did not detect and record this event. It is not known if this event was naturally occurring or related to previous mining activity. This is the first seismic event reported since August 11, 2015 (magnitude 1.2). Details of this recent event are attached to this report.

Reservoir elevation, seepage and piezometer readings have been taken weekly by RB&G since September 5. Plots of the reservoir elevations, piezometer and seepage readings are attached.

During the site visits, reconnaissance of the area found no signs of significant landslide movement on the hillsides or at the dam. During site visits on November 26 and December 3, the crest of the dam has been covered with snow, and ice is beginning to form on the reservoir.

Michael Hansen P.G.
Engineering Geologist
RB&G Engineering Inc.

RB&G ENGINEERING, INC.
1435 West 820 North
Provo, Utah 84601-1343
801-374-5771 Provo
801-521-5771 Salt Lake City
801-374-5773 Fax

PROJECT REPORT

Project No.	201404-006		
Project	Grassy Trail – West Ridge Mine Monitoring		
Dates	Site Visits and readings - December 10, 17, 23, 31, 2016		
Report By	Michael N. Hansen	**Position**	Engineering Geologist

Observations / Activities

New readings from Inclinometers I-2 and 1-3 have not shown any significant movement. Plots of the inclinometer readings taken on December 31, 2016 are attached. Due to ice buildup over I-4 and frozen ground and ice at I-1 these two inclinometers could not be read.

One accelerometer is located on the crest of the dam. This accelerometer has been continuously monitoring since the middle of August, 2015. The instrument has not detected any mining induced seismic (MIS) activity between August, 2015 and December 31, 2016. The "events" which have been recorded take place while removing and putting the cover back on the instrument as part of downloading and resetting the Accelerometer.

Since the last report on December 3, 2016, no seismic events have been reported within the area of the mine by the University of Utah Seismograph Stations (UUSS). The most recent event which was mentioned in the last Monitoring Update Report for December 3, occurred on November 23, 2016 at 3:14 am MST. The event was a small micro event with a magnitude of 0.8 and occurred at a depth of about 0.6 miles, with the epicenter located about 1.6 miles northwest of the dam. This was the first seismic event reported since August 11, 2015 (magnitude 1.2). A table showing the number of seismic events reported by the UUSS since 2010 is attached.

Reservoir elevation, seepage and piezometer readings have been taken weekly by RB&G since September 5. Plots of the reservoir elevations, piezometer and seepage readings are attached. It should be noted that during the past few months while RB&G Engineering has been reading piezometers on a weekly basis, that there has been some minor up and down fluctuation in the piezometer readings which do not always appear to correlate with the elevation of the reservoir.

On December 22, 2016, Ware Surveying conducted a Straight-Line survey of 8 points across the dam. Their survey did not show any significant movement. A copy of their survey is attached.

During the site visits, reconnaissance of the area found no signs of significant landslide movement on the hillsides or at the dam. During site visits from December 3 through December 31, the crest of the dam has been covered with snow, and the reservoir is now covered with several inches of ice.

Michael Hansen P.G.
Engineering Geologist
RB&G Engineering Inc.

RB&G ENGINEERING, INC.
1435 West 820 North
Provo, Utah 84601-1343
801-374-5771 Provo
801-521-5771 Salt Lake City
801-374-5773 Fax

PROJECT REPORT

Project No.	201404-006		
Project	Grassy Trail – West Ridge Mine Monitoring		
Dates	Site Visits and readings - January 7, 14, 20, 27 and February 4, 2017		
Report By	Michael N. Hansen	**Position**	Engineering Geologist

Observations / Activities

New readings from Inclinometers I-2 and 1-3 have not shown any significant movement. Plots of the inclinometer readings taken on February 4, 2017 are attached. Due to ice buildup over I-4 and frozen ground and ice at I-1, these two inclinometers could not be read.

Due to snow and road conditions on January 27th, our vehicle became stuck and we were unable to make it up to the dam. A backhoe from the City was used to pull the truck out. Due to these conditions Inclinometers, which were to be read at the end of January, were not read until February 4.

One accelerometer is located on the crest of the dam. This accelerometer has been continuously monitoring since the middle of August, 2015. The instrument has not detected any mining induced seismic (MIS) activity between August, 2015 and February 4, 2017. The "events" which have been recorded take place while removing and putting the cover back on the instrument as part of downloading and resetting the Accelerometer.

Since the last report on December 31, 2016, one seismic event has been reported within the area of the mine by the University of Utah Seismograph Stations (UUSS). The event occurred on February 8, 2017. The event had a magnitude of 1.7, and was located about 0.56 miles northwest of the dam. A copy of the event data is attached.

Attached as a separate PDF are charts showing the locations of the seismic epicenters as reported by the University of Utah Seismograph Stations between 1962 to 2017. Mining at West Ridge began in about 2001. Various Charts also show the locations of events for various years and groups of years. It should be noted that the epicenters reported by the UUSS do not match exactly with the locations where the mining occurred. The cluster of events to the east of the reservoir would be more accurately located if shown to the west of the reservoir. A cluster of events shown to the far northwest are likely related to mining near the Dugout Canyon Mine. The area shown on the Charts is approximately 16 miles wide (east-west) and 12 miles (north-south). Also included is a chart showing the total number of events reported per year within the study area.

Reservoir elevation, seepage and piezometer readings have been taken weekly by RB&G since September 5. Plots of the reservoir elevations, piezometer and seepage readings are attached. It should be noted that during the past few months while RB&G Engineering has been reading piezometers on a weekly basis, there has been some minor up and down fluctuation in the piezometer readings which do not always appear to correlate with the elevation of the reservoir. Due to snow cover some piezometers could not be read.

Due to the depth of snow "Ware Surveying" could not conduct a survey at the dam.

During the site visits, reconnaissance of the area found no signs of significant landslide movement on the hillsides or at the dam. During site visits from January through February 4, 2017, the reservoir was covered with ice.

Michael Hansen P.G.
Engineering Geologist
RB&G Engineering Inc.

RB&G ENGINEERING, INC.
1435 West 820 North
Provo, Utah 84601-1343
801-374-5771 Provo
801-521-5771 Salt Lake City
801-374-5773 Fax

PROJECT REPORT

Project No.	201404-006		
Project	Grassy Trail – West Ridge Mine Monitoring		
Dates	Site Visits and readings - February 10, 17, 24, March 4, 2017		
Report By	Michael N. Hansen	**Position**	Engineering Geologist

Observations / Activities

New readings from Inclinometers I-2 and 1-3 have not shown any significant movement. Plots of the inclinometer readings taken on March 4, 2017 are attached. Due to ice buildup over I-4 and frozen ground and ice at I-1 these two inclinometers could not be read.

One accelerometer is located on the crest of the dam. This accelerometer has been continuously monitoring since the middle of August, 2015. The instrument has not detected any mining induced seismic (MIS) activity between August, 2015 and March 4, 2017. The "events" which have been recorded take place while removing and replacing the cover back on the instrument as part of downloading and resetting the accelerometer.

Since the last report on February 4, 2017, one seismic event has been reported within the area of the mine by the University of Utah Seismograph Stations (UUSS). The event occurred on February 8, 2017. The event had a magnitude of 1.7, and was located about 0.56 miles northwest of the dam. A copy of the event data is attached. While this event was first reported in last months report, it is being included again in this report since it took place during this monitoring period. This event was not detected by the accelerometer located on the dam.

Reservoir elevation, seepage and piezometer readings have been taken weekly by RB&G since September 5, 2016. Plots of the reservoir elevations, piezometer and seepage readings are attached. Due to snow cover, some piezometers could not be read.

For the same reasons mentioned in the previous report, we feel that Ware Surveying LLC would not be able to conduct a survey at the dam due to the depth of snow. At this time there is still about 3 feet of snow across the crest of the dam in some locations

During the site visits, reconnaissance of the area found no signs of significant landslide movement on the hillsides or at the dam. During site visits from February through March 4, 2017, the reservoir was covered with ice.

Michael Hansen P.G.
Engineering Geologist
RB&G Engineering Inc.

RB&G ENGINEERING, INC.
1435 West 820 North
Provo, Utah 84601-1343
801-374-5771 Provo
801-521-5771 Salt Lake City
801-374-5773 Fax

PROJECT REPORT

Project No.	201404-006		
Project	Grassy Trail – West Ridge Mine Monitoring		
Dates	Site Visits and readings - March 11, 19, 25, April 1, 9, 2017		
Report By	Michael N. Hansen	**Position**	Engineering Geologist

Observations / Activities

New readings from Inclinometers I-2 and 1-3 have not shown any significant movement. Plots of the inclinometer readings taken on April 1, 2017 are attached. Due to ice buildup and frozen ground I-1 and I-4 could not be read.

One accelerometer is located on the crest of the dam. This accelerometer has been continuously monitoring since the middle of August, 2015. The instrument has not detected any mining induced seismic (MIS) activity between August, 2015 and April 9, 2017. The "events" which have been recorded take place while removing and replacing the cover back on the instrument as part of downloading and resetting the Accelerometer.

Since the last report on March 4, 2017, no seismic events have been reported within the area of the mine by the University of Utah Seismograph Stations (UUSS).

Reservoir elevation, seepage and piezometer readings have been taken weekly by RB&G since September 5, 2016. Plots of the reservoir elevations, piezometer and seepage readings are attached. Due to snow cover some piezometers could not be read during early March, but were dug out and read later in the month. It should be noted that on March 11, when first dug out, Piezo # 5 was reading dry at a depth of 26.6 feet.

At this time we are not aware of any new survey data of the dam from Ware Surveying LLC. During April, the crest of the dam will become clear enough to get survey data.

During the site visits, reconnaissance of the area found no signs of significant landslide movement on the hillsides or at the dam. During site visits between March 4, to April 9 2017, the reservoir was covered with ice.

Michael Hansen P.G.
Engineering Geologist
RB&G Engineering Inc.

RB&G ENGINEERING, INC.
1435 West 820 North
Provo, Utah 84601-1343
801-374-5771 Provo
801-521-5771 Salt Lake City
801-374-5773 Fax

PROJECT REPORT

Project No.	201404-006		
Project	Grassy Trail – West Ridge Mine Monitoring		
Dates	Site Visits and readings - April 15, 22, 29, May 6,and 13, 2017		
Report By	Michael N. Hansen	**Position**	Engineering Geologist

Observations / Activities

New readings from Inclinometers I-1, I-2 and 1-3 have not shown any significant movement. Plots of the inclinometer readings taken on May 6, 2017 are attached. Work along the roadway north of the dam has damaged I-4 and it has not been read. With some additional cleaning and work, we may be able to continue using I-4. With the saturation of the slope in this area, we would like to get this inclinometer read. The condition of this slope is discussed later in this update.

One accelerometer is located on the crest of the dam. This instrument has not detected any mining induced seismic (MIS) activity between April 9, to May 13, 2017. The "events" which have been recorded take place while removing and replacing the cover back on the instrument as part of downloading and resetting the Accelerometer. Some events may be wind related.

Since the last report on April 9, 2017, no seismic events have been reported within the area of the mine by the University of Utah Seismograph Stations (UUSS). It should be noted that there were two small events located over seven miles east and south of the dam. Based on the locations of these events, they do not appear to be related to previous mining near the dam.

Ice has melted off of the reservoir and has been overtopping the spillway during the past four weeks by as much as 6 inches. Reservoir elevation, seepage and piezometer readings have been taken weekly by RB&G since September 5, 2016. Plots of the reservoir elevations, piezometer and seepage readings are attached.

At this time we are not aware of any new survey data of the dam from Ware Surveying LLC.

During the site visits, reconnaissance of the area found a small surficial slump on the hillside above the left (east) abutment. This slump is not a hazard to the dam and left a small pile of debris at the base of the slope. North of the right abutment above Inclinometer #4, the hillside is very saturated. Some newer scarps are visible at the head of the slide above the road. While there is currently no evidence of deep seated movement, it may be possible for material to come down onto the road and bury Inclinometer # 4.
No evidence of movement was noted within the hillside of the Right (west) Abutment.

Michael Hansen P.G.
Engineering Geologist
RB&G Engineering Inc.

RB&G ENGINEERING, INC.
1435 West 820 North
Provo, Utah 84601-1343
801-374-5771 Provo
801-521-5771 Salt Lake City
801-374-5773 Fax

PROJECT REPORT

Project No.	201404-006		
Project	Grassy Trail – West Ridge Mine Monitoring		
Dates	Site Visits and readings - May 20, 28, June 3, and 10, 2017		
Report By	Michael N. Hansen	**Position**	Engineering Geologist

Observations / Activities

New readings from Inclinometers I-1, I-2 and 1-3 have not shown any significant movement. Plots of the inclinometer readings taken on June 3, 2017 are attached. Work along the roadway north of the dam had damaged the top of I-4. I was able dig down and find and clean the top of the inclinometer pipe. While the top has been damaged and moved to the south (as observed on the Inclinometer plot) the inclinometer is still functioning.

One accelerometer is located on the crest of the dam. This instrument has not detected any mining induced seismic (MIS) activity between May 13 to June 10, 2017. The "events" which have been recorded take place while removing and replacing the cover back on the instrument as part of downloading and resetting the Accelerometer. Some events may be wind related.

Since the last report on May 13, 2017, no seismic events have been reported within the area of the mine by the University of Utah Seismograph Stations (UUSS). It should be noted that there were two small events located over seven miles east and south of the dam. Based on the locations of these events, they do not appear to be related to previous mining near the dam.

The reservoir and has been overtopping the spillway since the week of April 4, 2017 (8 weeks). Reservoir elevation, seepage and piezometer readings have been taken weekly by RB&G since September 5, 2016. Plots of the reservoir elevations, piezometer and seepage readings are attached. It should be noted that there has been seepage accumulating just above the concrete outlet of the emergency spillway, on the downstream slope of the dam.

At this time, we have not received any new survey data of the dam from Ware Surveying LLC.

The small surficial slump that was previously noted on the hillside above the left (east) abutment has dried out and has not shown any additional movement. Along the right side of the reservoir, the hillside above Inclinometer #4, the slope had been very saturated but has gradually been dry. While it still has some wet seeps, it is significantly drier that it was a month ago. Heavy rains this summer could re-saturate this slope which may bring material down onto the roadway and bury Inclinometer # 4.

No evidence of movement was noted within the hillside of the Right (west) Abutment.

Michael Hansen P.G.
Engineering Geologist
RB&G Engineering Inc.

RB&G ENGINEERING, INC.
1435 West 820 North
Provo, Utah 84601-1343
801-374-5771 Provo
801-521-5771 Salt Lake City
801-374-5773 Fax

PROJECT REPORT

Project No.	201404-006		
Project	Grassy Trail – West Ridge Mine Monitoring		
Dates	Site Visits and readings - June 17, 24, July 1 and July 8, 2017		
Report By	Michael N. Hansen	**Position**	Engineering Geologist

Observations / Activities

New readings from Inclinometers I-1, I-2 I-3 and 1-4 have not shown any significant movement. Plots of the inclinometer readings taken on July 1, 2017 are attached.

One accelerometer is located on the crest of the dam. This instrument has not detected any mining induced seismic (MIS) activity between May 13, 2016 to June 10, 2017. The "events" which have been recorded take place while removing and replacing the cover on the instrument as part of downloading and resetting the Accelerometer.

Since the last report on June 10, 2017, no seismic events have been reported within the area of the mine by the University of Utah Seismograph Stations (UUSS).

The reservoir and has been overtopping the spillway since the week of April 4, 2017 (12 weeks). Reservoir elevation, seepage and piezometer readings have been taken weekly by RB&G since September 5, 2016. Plots of the reservoir elevations, piezometer and seepage readings are attached. It should be noted that there has been some seepage accumulating just above the concrete outlet of the emergency spillway, on the downstream slope of the dam.

Survey data of the dam provided by Ware Surveying LLC. is included in this report. The survey data was gathered on June 24, 2017 and does not show any significant movement on the dam.

Along the right side of the reservoir, the hillside above Inclinometer #4, continues to dry out.

No evidence of movement was noted on the dam or within the hillsides of the dam abutments.

Michael Hansen P.G.
Engineering Geologist
RB&G Engineering Inc.

RB&G ENGINEERING, INC.
1435 West 820 North
Provo, Utah 84601-1343
801-374-5771 Provo
801-521-5771 Salt Lake City
801-374-5773 Fax

PROJECT REPORT

Project No.	201404-006		
Project	Grassy Trail – West Ridge Mine Monitoring		
Dates	Site Visits and readings - July 16, 23, 29, Aug 5, 13, 21, 27, and the week of September 5, 2017		
Report By	Michael N. Hansen	**Position**	Engineering Geologist

Observations / Activities

A new inclinometer probe is being used to read the inclinometers. New readings from Inclinometers I-1, I-2 I-3 and 1-4 have not shown any significant movement. Plots of the inclinometer readings taken on July 8, 29, and September 7, 2017 are attached.

One accelerometer is located on the crest of the dam. This instrument has not detected any mining induced seismic (MIS) activity between May 13, 2016 to September, 2017. The "events" which have been recorded take place while removing and replacing the cover on the instrument as part of downloading and resetting the Accelerometer.

Since the last report on August 5, 2017, no seismic events have been reported within the area of the mine by the University of Utah Seismograph Stations (UUSS).

It should be noted that on September 2, a 5.3 magnitude earthquake occurred near Soda Springs Idaho (Sulphur Peak). Movement from this event, which took place over 200 miles to the north, was recorded by the accelerometer on the dam with a recorded max PGA of 0.027g.

The reservoir and had been overtopping the spillway since the week of April 4, 2017. The reservoir had stopped overtopping the spillway before the readings on August 27. Reservoir elevation, seepage and piezometer readings have been taken weekly by RB&G since September 5, 2016. Plots of the reservoir elevations, piezometer and seepage readings are attached.

Survey data of the dam provided by Ware Surveying LLC. is included in this report. The survey data was gathered in July and on August 18, 2017, and does not show any significant movement on the dam.

During the first 2 weeks of September, two new Inclinometers were installed on the dam and right abutment to replace the older Inclinometers I-2A and I-3A.

No evidence of landslide movement was noted on the dam or within the hillsides of the dam abutments.

Michael Hansen P.G.
Engineering Geologist
RB&G Engineering Inc.

RB&G ENGINEERING, INC.
1435 West 820 North
Provo, Utah 84601-1343
801-374-5771 Provo
801-521-5771 Salt Lake City
801-374-5773 Fax

PROJECT REPORT

Project No.	201404-006		
Project	Grassy Trail – West Ridge Mine Monitoring		
Dates	Site Visits and readings - September 11, 16, 24, and 30 2017		
Report By	Michael N. Hansen	**Position**	Engineering Geologist

Observations / Activities

New readings from Inclinometers I-1, I-4, and the new 17-I-2 and 17-I-3 have not shown any significant movement. Plots of the inclinometer readings for I-1 and I-4 were taken on September 7 and 30th. The new inclinometers 17-I-2 and 17-I-3 installed at the beginning of the month to replace I-2 and I-3 were read on September 13, 18, and 30th. The extra readings were taken in order to establish a better baseline for these two new inclinometers. A copy of the readings are attached.

The small amount of movement showing less than an 1/8 inch is within the range of error for the instrument and does not currently appear to be significant. This will be watched in future readings.

New covers were placed on inclinometers I-1 and I-4 as the previous covers were damaged.

One accelerometer is located on the crest of the dam. This instrument has not detected any mining induced seismic (MIS) activity between May 13, 2016 to September 30, 2017. The "events" which have been recorded take place while removing and replacing the cover on the instrument as part of downloading and resetting the Accelerometer.

Since the last report on September 5, 2017, no seismic events have been reported within the area of the mine by the University of Utah Seismograph Stations (UUSS).

The Observation Well #OW-4 which had been prone to giving inaccurate reads has now been abandoned as requested. Reservoir elevation, seepage and piezometer readings have been taken weekly by RB&G since September 5, 2016. Plots of the reservoir elevations, piezometer and seepage readings are attached.

Survey data of the dam provided by Ware Surveying LLC. is included in this report. The survey data was gathered on September 29, 2017, and does not show any current significant movement on the dam.

No evidence of landslide movement was noted on the dam or within the hillsides of the dam abutments.

Michael Hansen P.G.
Engineering Geologist
RB&G Engineering Inc.