

J. E. STOVER & ASSOCIATES, INC.

2352 NORTH 7TH STREET, UNIT B
GRAND JUNCTION, COLORADO 81501
PHONE: (970) 245-4101, FAX: (970) 242-7908

MINE ENGINEERING
MINE RECLAMATION

CIVIL ENGINEERING
CONST. MANAGEMENT

Via Electronic Transmittal

April 14, 2020

Rob Zuber
Division of Reclamation, Mining & Safety
1313 Sherman St., Room 215
Denver, CO 80203

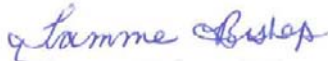
Re: Bowie Resources, LLC, Bowie No. 2 Mine
Coal Mine Waste Banks & Instrumentation Monitoring
Pond Quarterly Inspections
Permit C-1996-083

Dear Mr. Zuber:

Enclosed please find the referenced reports for the 1st quarter of 2020, *not including* the coal mine waste bank inspection or pond quarterly inspection reports. Due to the COVID-19 virus and the state of Colorado Stay at Home order, a complete gob pile and pond inspection were not performed during the 1Q of 2020. Once the order is lifted, a complete inspection will be performed by JE Stover & Associates and then it will then be submitted to DRMS as soon as possible.

Please call if you have any questions.

Sincerely,



Tamme Bishop, P.E.
Project Engineer

cc: Basil Bear



Huddleston-Berry
Engineering & Testing, LLC

2789 Riverside Parkway
Grand Junction, Colorado 81501
Phone: 970-255-8005
Info@huddlestonberry.com

April 14, 2020
Project#01349-0001

Bowie Resources, LLC
43659 Bowie Road
Paonia, Colorado 81428

Attention: Mr. Basil Bear

Subject: Summary of Instrumentation Monitoring
1st Quarter 2020
Bowie Coal Waste Disposal Area No. 2
Paonia, Colorado

Reference: *Summary of Instrumentation Monitoring, 4th Quarter 2019, Bowie Coal Waste Disposal Area No. 2, Paonia, Colorado* by Huddleston-Berry Engineering & Testing, LLC for Bowie Resources, LLC, January 16, 2020.

Stability Evaluation, Technical Revision #85, Gob Pile #2 Drying Area, Bowie No. 2 Mine by Huddleston-Berry Engineering & Testing, LLC for Bowie Resources, LLC, June 3, 2014.

Dear Mr. Bear,

At the request of the Colorado Division of Reclamation, Mining and Safety (DRMS), Huddleston-Berry Engineering & Testing, LLC (HBET) prepared this letter regarding quarterly monitoring of vibrating wire piezometers and inclinometers at Coal Waste Disposal Area No. 2 (CWDA No. 2) at the Bowie mine near Paonia, Colorado. The intent of the monitoring was to detect significant changes in the pore water pressures or significant displacements within the coal waste which may impact the stability of the waste pile.

Inclinometers

In 2005, three inclinometers, designated BG05-04, BG05-05, and BG05-07, were installed at CWDA No. 2 through the coal refuse and into the native foundation soils. The inclinometers have been monitored quarterly since August 2005. The 1st Quarter 2020 monitoring was completed by DOWL on March 25th and 27th, 2020. The monitoring report prepared by DOWL includes a site plan showing the locations of the inclinometers and cumulative displacement curves relative to the baseline readings in 2005. Axis "A" reflects deformation with depth in the direction of anticipated movement perpendicular to the face of the gob. Axis "B" reflects deformation with depth parallel to the face of the gob.

Discussion of Inclinometer Monitoring

The latest inclinometer readings indicate no major movements since the last quarterly reading. In general, the 1st Quarter 2020 monitoring data does not provide any indication of instability in CWDA No. 2.

Vibrating Wire Piezometers

Between 2005 and 2012, a total of ten vibrating wire piezometers were installed in CWDA No. 2. However, several of the piezometers have been damaged or have otherwise ceased to function. Currently, five of the piezometers are functional.

Monitoring of the functioning piezometers was completed by DOWL March 25th, 2020. The attached monitoring report prepared by DOWL includes the piezometer monitoring data and the data is summarized in the following table.

VWP ID	Initial Pore Pressure (psi)	12/12/19 Pore Pressure (psi)	03/25/20 Pore Pressure (psi)	Difference Since Installation (psi)	Difference Since Last Reading (psi)
VWP-05	6.8	2.0	1.5	-5.3	-0.5
VWP-06	11.3	12.0	11.8	+0.5	-0.2
VWP-08	8.2	8.8	8.6	+0.4	-0.2
VWP-09	2.8	2.9	2.8	0.0	-0.1
VWP-10	-1.9	-1.7	-1.8	+0.1	-0.1

Discussion of Vibrating Wire Piezometers

VWP-05

VWP-05 was installed on August 3, 2005 near the toe of CWDA No. 2 adjacent to the access road/bench. The pore pressures recorded at VWP-05 have shown some seasonal fluctuations; however, the range of pore pressure changes is fairly small. In general, HBET does not believe that the pore pressures in VWP-05 are cause for concern regarding stability of the gob pile.

VWP-06

VWP-06 was installed on June 5, 2009 near the existing top of CWDA No. 2. The pore pressures recorded at VWP-06 have fluctuated since installation. In general, the fluctuations have been seasonal and reflect the level of coal mine waste placement activity on top of CWDA No. 2. In general, HBET does not believe that the measured pore pressures are an indication of any instability in CWDA No. 2.

VWP-08

VWP-08 was installed on June 5, 2009 at a slightly lower elevation than VWP-06. The pore pressures recorded at VWP-08 have fluctuated since installation. However, the fluctuations have generally been within a narrow range of values. The measured pore pressures are generally consistent with the level of coal mine waste placement activity at CWDA No. 2.

As indicated in the referenced *Stability Evaluation* report, the stability of CWDA No. 2 is sensitive to increases in pore pressures in VWP-08. An increase in the pore pressure of 7 psi in VWP-08 would result in a reduction of the Factor of Safety to below 1.5.

The current pore pressure reflects a piezometric surface elevation of approximately 6096 feet which is much less than the critical elevation of 6113 feet. As a result, HBET does not believe that the measured pore pressures in VWP-08 are any indication of instability in CWDA No. 2.

VWP-09

VWP-09 was installed on May 18, 2012 near the toe of CWDA No. 2. The pore pressures recorded at VWP-09 have been fairly steady since installation. This suggests that dewatering of the gob in this area is likely nearly complete. It is anticipated that the pore pressures at VWP-09 will remain fairly steady over time.

VWP-10

VWP-10 was installed on May 18, 2014 near the toe of CWDA No. 2. The pore pressures recorded at VWP-10 have been fairly steady since installation. This suggests that dewatering of the gob in this area is likely nearly complete. It is anticipated that the pore pressures at VWP-10 will remain fairly steady over time.

General

In general, based upon the results of the recent VWP and inclinometer monitoring data, HBET does not believe that there is any reduction in the stability of CWDA No. 2. Due to the limited activity at the mine, HBET recommends that the monitoring frequency be reduced to semi-annually.

We are pleased to be of service to your project. Please contact us if you have any questions or comments regarding the contents of this report.

Respectfully Submitted:

Huddlestone-Berry Engineering and Testing, LLC



Michael A. Berry, P.E.
Vice President of Engineering

ATTACHMENTS

April 9, 2020

Mr. Mike Berry, PE
Huddleston-Berry Engineering and Testing, LLC
2789 Riverside Parkway
Grand Junction, CO 81501

SUBJECT: Summary Report, 1st Quarter 2020, Inclinator and Active Vibrating Wire Piezometer Data January – March 2020, Bowie Mine #2 Coal Waste Disposal Area (CWDA) #2

Greetings Mr. Berry:

DOWL conducted quarterly monitoring of inclinometers and vibrating wire piezometers (VWP) at Coal Waste Disposal Area #2 (CWDA #2), Bowie Resources, LLC Bowie Mine #2. This report is intended to cover the period of January through March 2020. Inclinator data was recorded on 3/25/20 and 3/27/20 and VWP data was recorded on 3/25/20. Per Colorado Division of Reclamation, Mining & Safety (CDRMS) and your instructions, vibrating wire piezometer and inclinometer readings for all active instruments are taken quarterly.

Vibrating Wire Piezometers

The physical locations of the piezometers are shown on the attached Instrumentation Site Plan (Map 1). As seen on this map, five of the original VWP's were damaged and some were replaced. Currently, there are five active VWP's, and three of them are adjacent to inclinometers. The graph of historical data from 5/16/05 through 5/21/14 is presented for reference as Figure 1. A graph of measured pore pressures of active piezometers is presented on the attached Figure 2 and is presented numerically in Table 1 below.

Table 1. Summary of VWP Pore Pressure Readings

VWP ID #	Measured Pore Pressures (psi)				Pore Pressure Difference (psi)		
	Installation	Last Year 3/28/19	Last Quarter 12/12/19	Current 3/25/2020	Since Installation	Last Year	Last Quarter
VWP-05	6.8	1.7	2.0	1.5	-5.3	-0.2	-0.5
VWP-06	11.3	12.6	12.0	11.8	0.5	-0.8	-0.2
VWP-08	8.2	9.3	8.8	8.6	0.4	-0.7	-0.2
VWP-09	2.8	2.8	2.9	2.8	0.0	0.0	-0.1
VWP-10	-1.9	-1.8	-1.7	-1.8	0.1	0.0	0.1

As seen on Figure 2, the VWP readings and trends are consistent either with previous recent or historic readings. Pore pressure readings went down in four of the piezometers when compared to the Q4 readings. The fifth piezometer (VWP-10) went up slightly (0.1 psi) since Q4, but the pressure was the same as a year ago.

Inclinometers

Three inclinometers, designated BG05-4, BG05-5, and BG05-7, were installed at CWDA #2 in August 2005. The inclinometers were installed through the coal refuse and approximately 20 feet into the native foundation soils. The physical locations of the inclinometers are shown on the attached Instrumentation Site Plan (Map 1). Baseline readings were taken on 8/10/05 and subsequent readings have generally been taken quarterly since that time. Displacement curves for each of the three inclinometers for the current and the prior three readings are presented as attachments to this letter in Figure 3. Axis "A" reflects deformation with depth in the direction of anticipated movement (downslope), while Axis "B" is orthogonal to Axis A.

As described in previous reports, historic displacements indicated on the plots for the approximate upper ten feet of the inclinometers since installation in 2005 are due to placement of cover soil on the face of the waste pile during revegetation operations in late 2006/early 2007 (as documented in a report by Buckhorn Geotech dated September 22, 2008 to Bowie Resources called *Revised Stability Evaluations for Coal Mine Waste Disposal Area No. 2, Bowie No. 2 Mine*).

Based on the current inclinometer readings, there hasn't been downslope movement (Axis A) in any of the inclinometers and they are generally consistent with previous readings. As we mentioned in our October 2019 (Q3) report, there appeared to have been some displacement in the orthogonal direction (Axis B) for inclinometer BG05-5B in the 3rd quarter. However, in March 2020 (Q1) the displacement graph appeared to be very similar to the March 2019 (Q1), June 2019 (Q2), and December 2019 (Q4) readings. Based on the three consistent readings listed above, we conclude that the displacement calculated in October 2019 (Q3) reading was due to a recording error near 42 feet and should be disregarded. We will continue to track this to confirm whether there is additional movement.

It should be noted that water was standing in the BGI05-04 inclinometer pipe at a depth of about 5 feet below grade and there is always water at about this depth according to our technician. Our previous report for December 2019 Q4, we mistakenly indicated it was BGI05-05 not BGI05-04 that had the shallow water at 4 feet. There was no standing water in inclinometer BGI05-05 or BGI05-07 in our March 2020 readings and there has not been significant downslope displacement of any of the three inclinometers since 2007.

If you have any questions regarding this letter or the instrumentation monitoring at CWDA #2, please contact me at (970) 497-8821 or LBrandt@dowl.com.

Respectfully Submitted,
DOWL



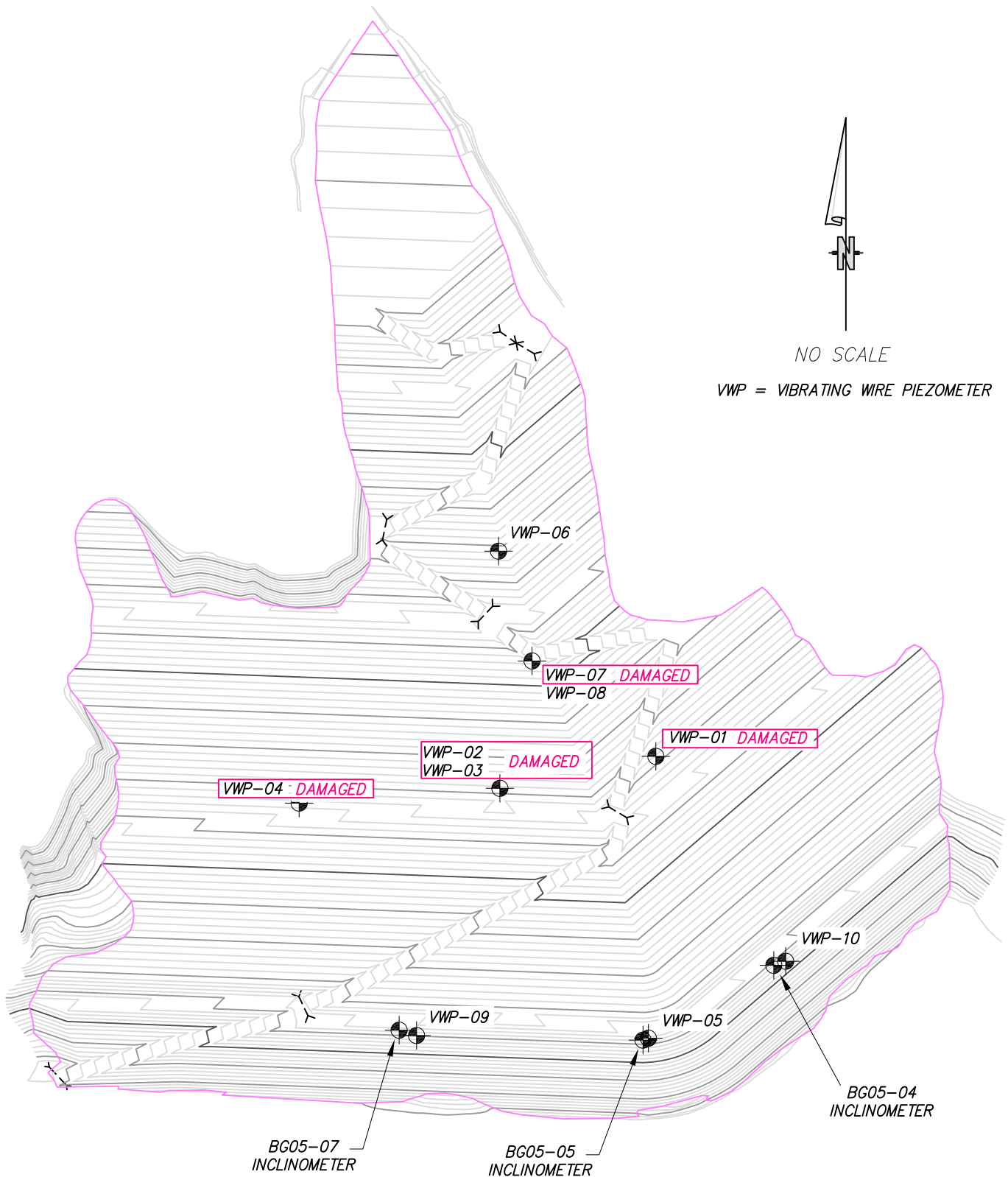
Laurie Brandt, CPG
Professional Geologist



Dennis A. Russell, P.E.
Geotechnical Engineer

Enclosures: Map 1 – Instrumentation Location Plan
 Figure 1 – Active and Damaged Piezometer Data Graph (2005-2014)
 Figure 2 – Active Vibrating Wire Piezometer Data Graph (installation to present)
 Figure 3 – Inclinator Displacement Curves

INSTRUMENTATION SITE PLAN



Map

1

OF 1

DATE

2017

JOB NO.

7131.74699.01

Huddleston-Berry

BOWIE #2 GOB PILE

DELTA COUNTY, COLORADO



WWW.DOWL.COM

222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

Figure 1 - Bowie Mine #2 - CWDA #2
Active and Damaged Vibrating Wire Piezometer Data

Inception (5/16/05) through 5/21/14

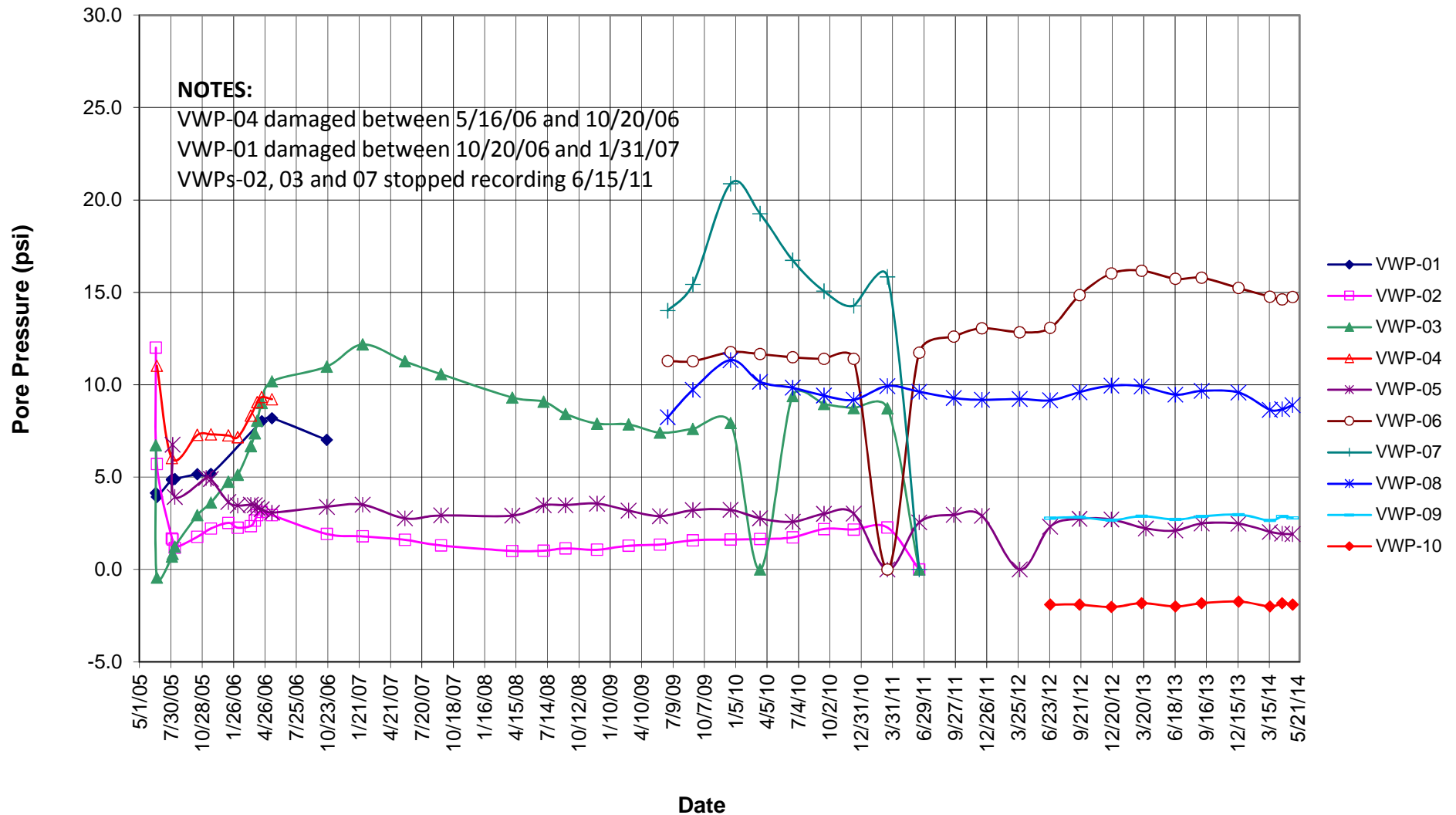


Figure 2 - Bowie Mine #2 - CWDA #2
Active Vibrating Wire Piezometer Data

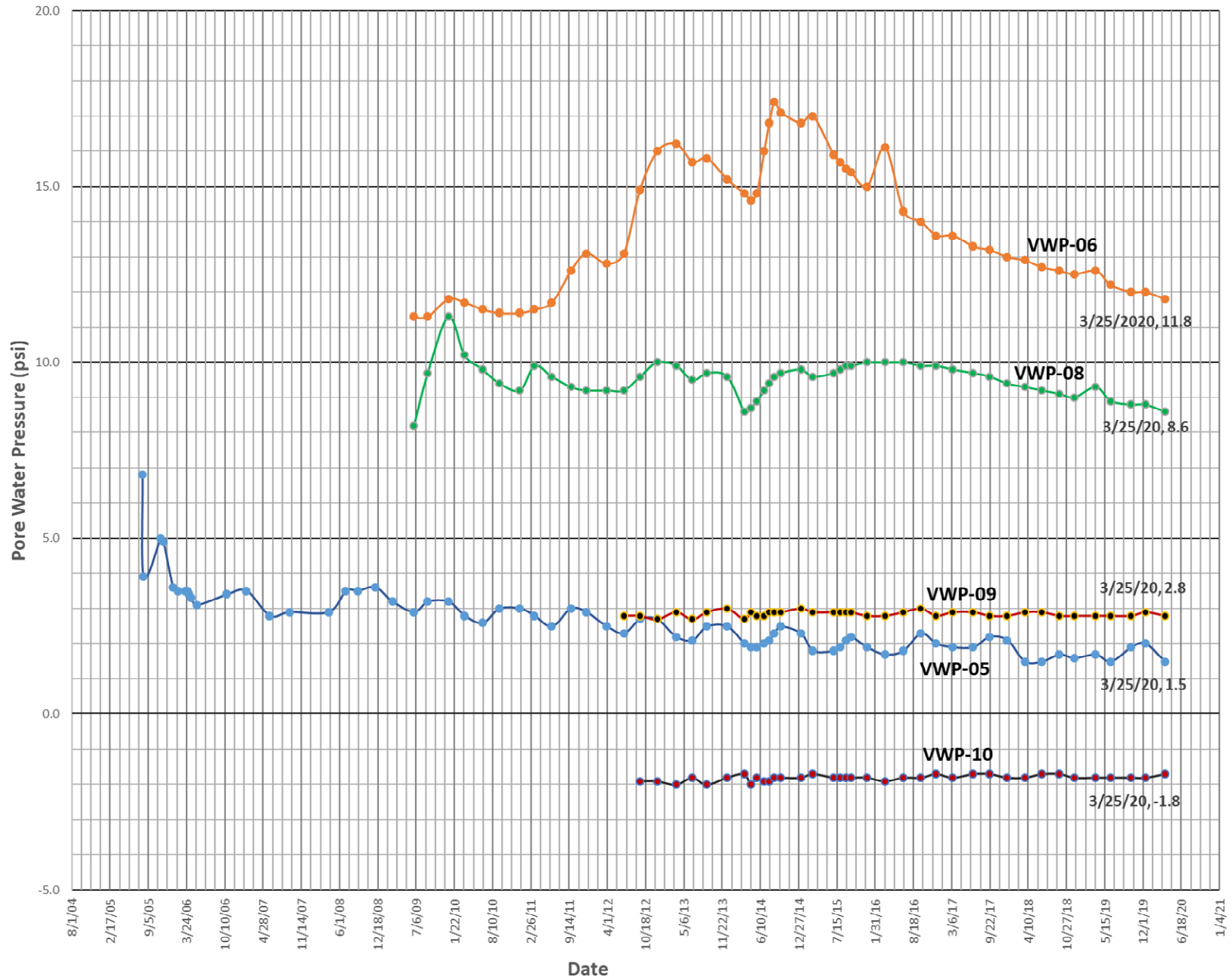
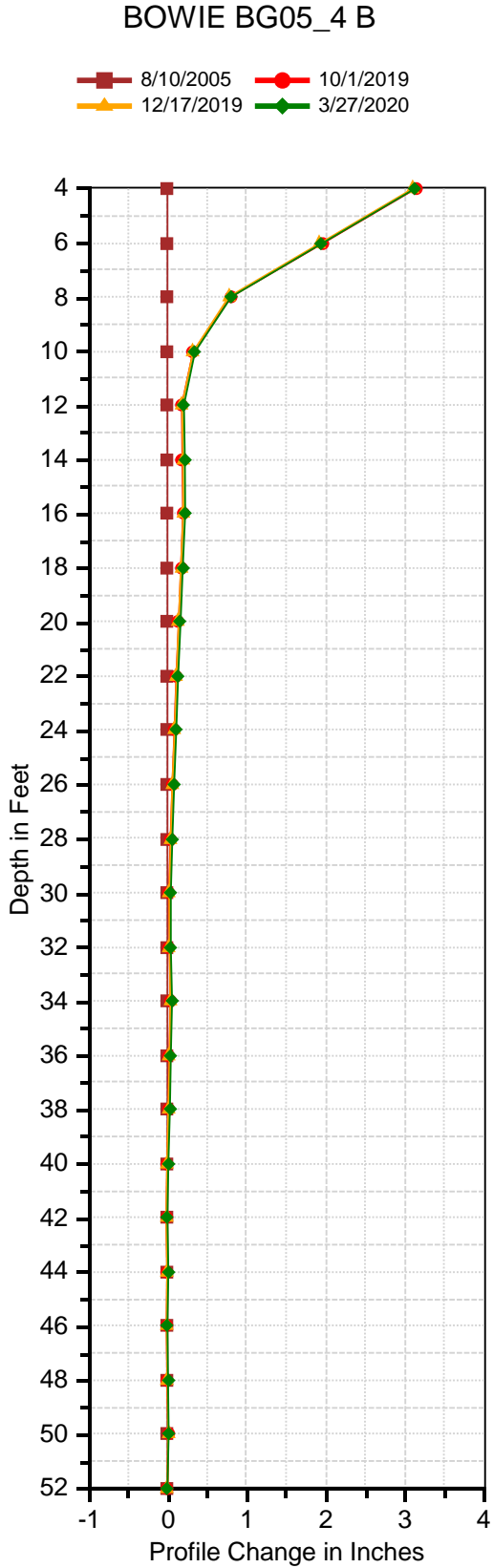
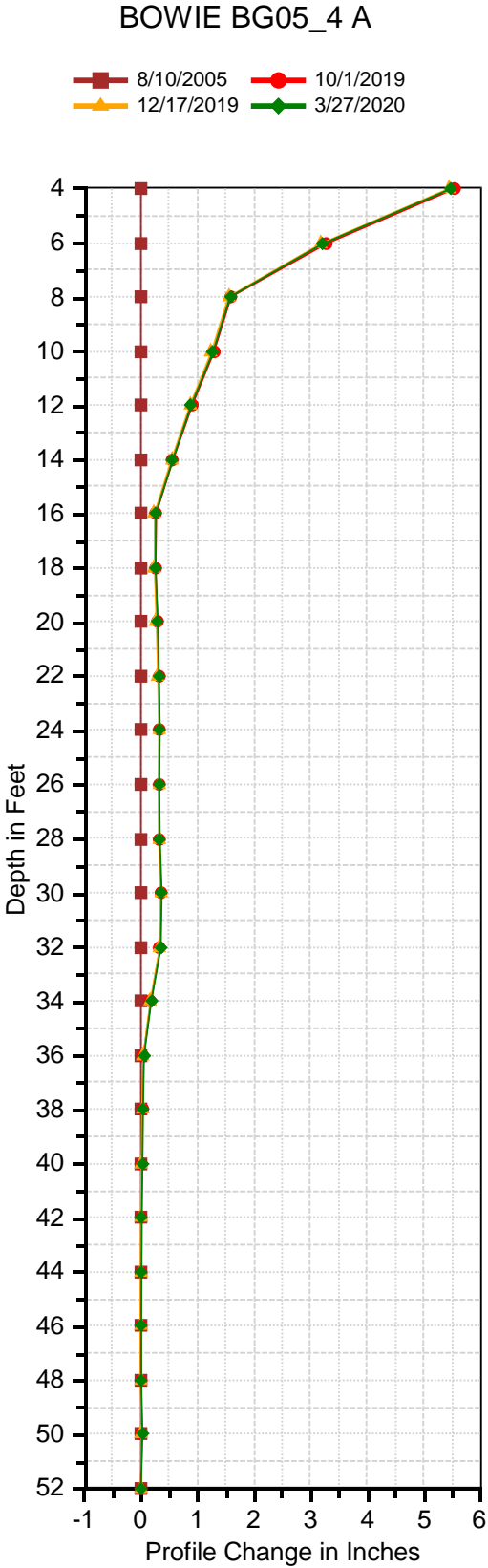
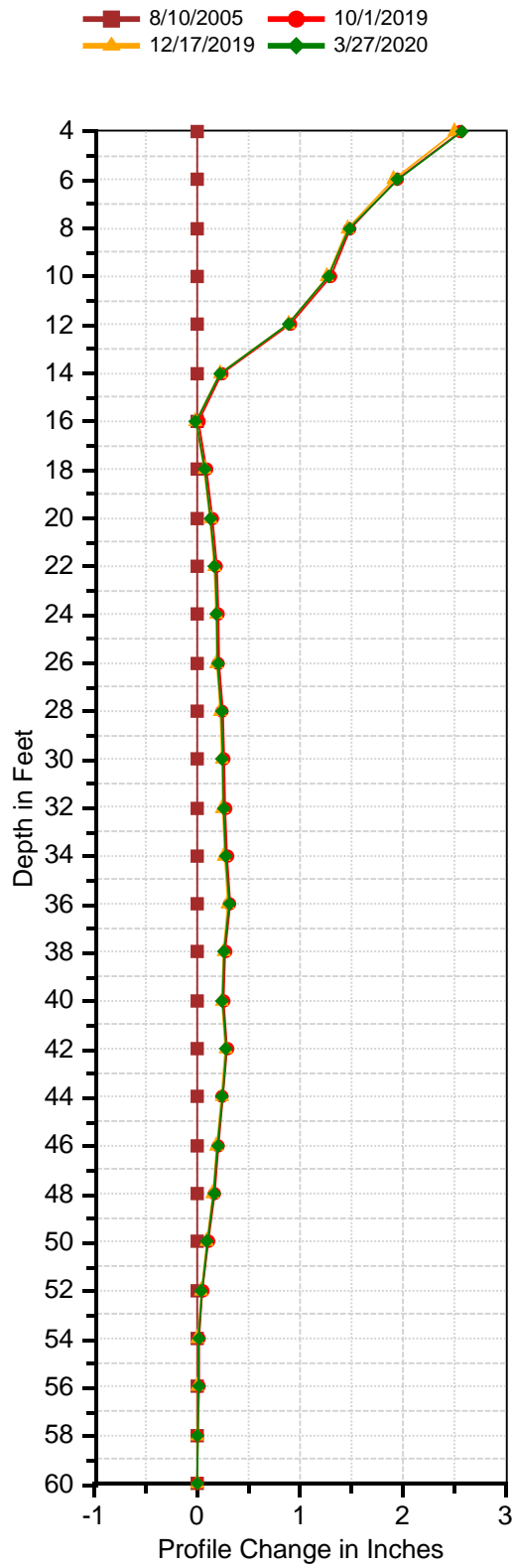


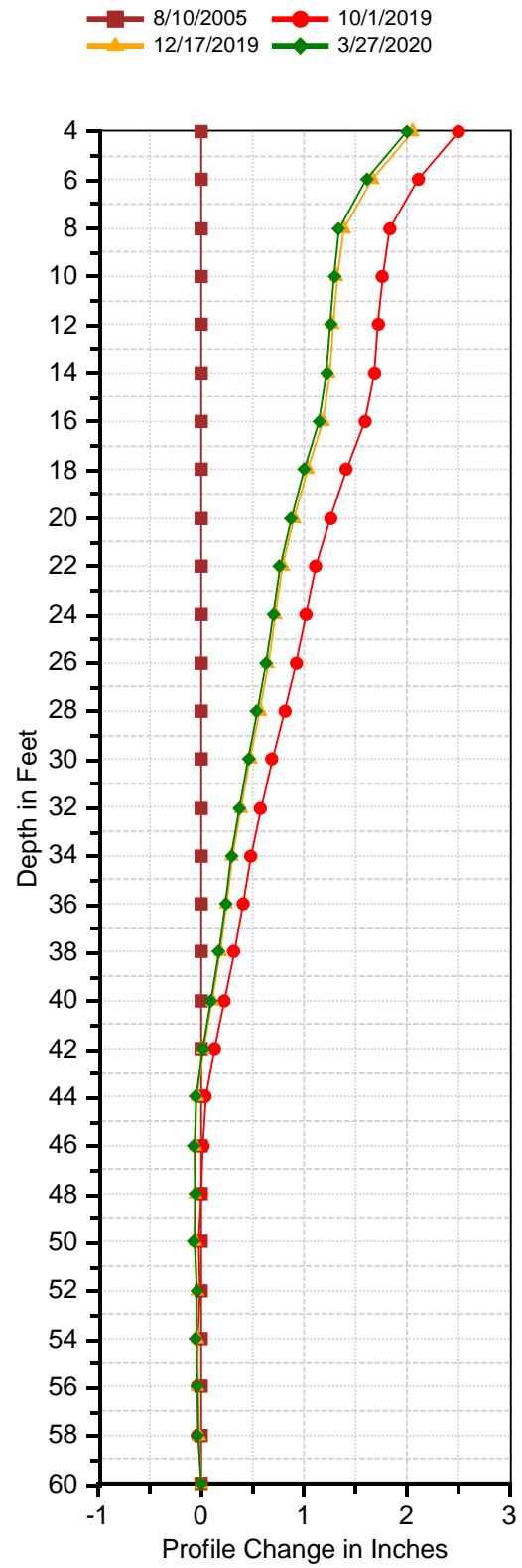
Figure 3 - Inclinometer Displacement Curves



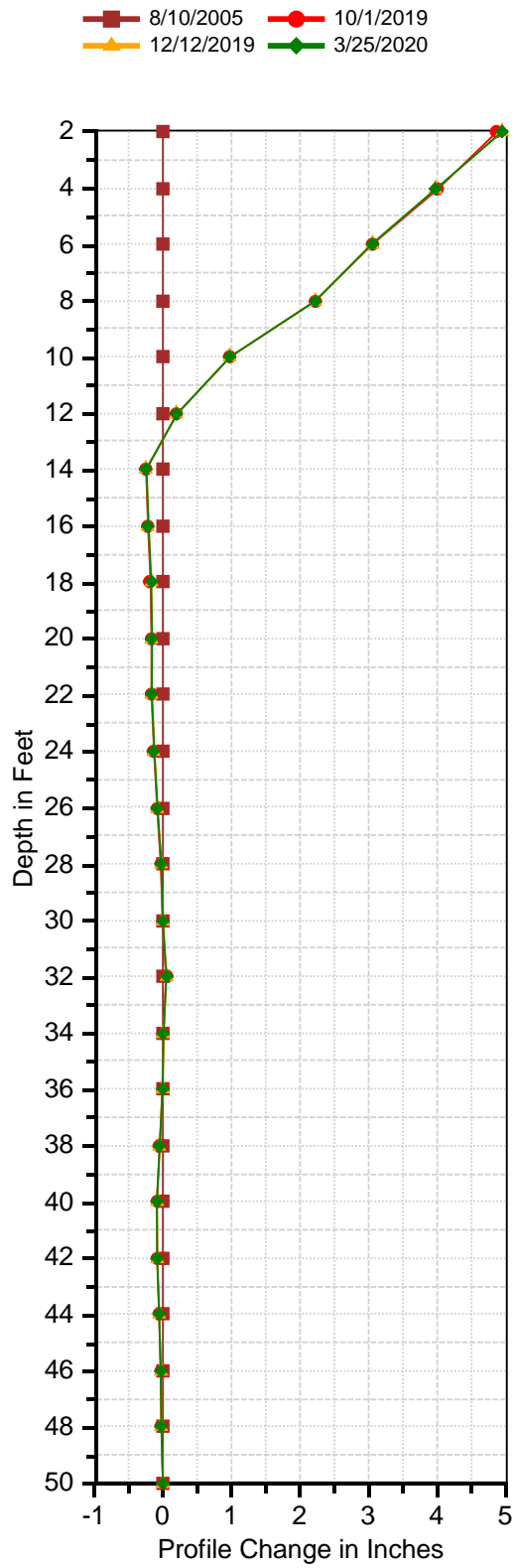
BOWIE BG05_5 A



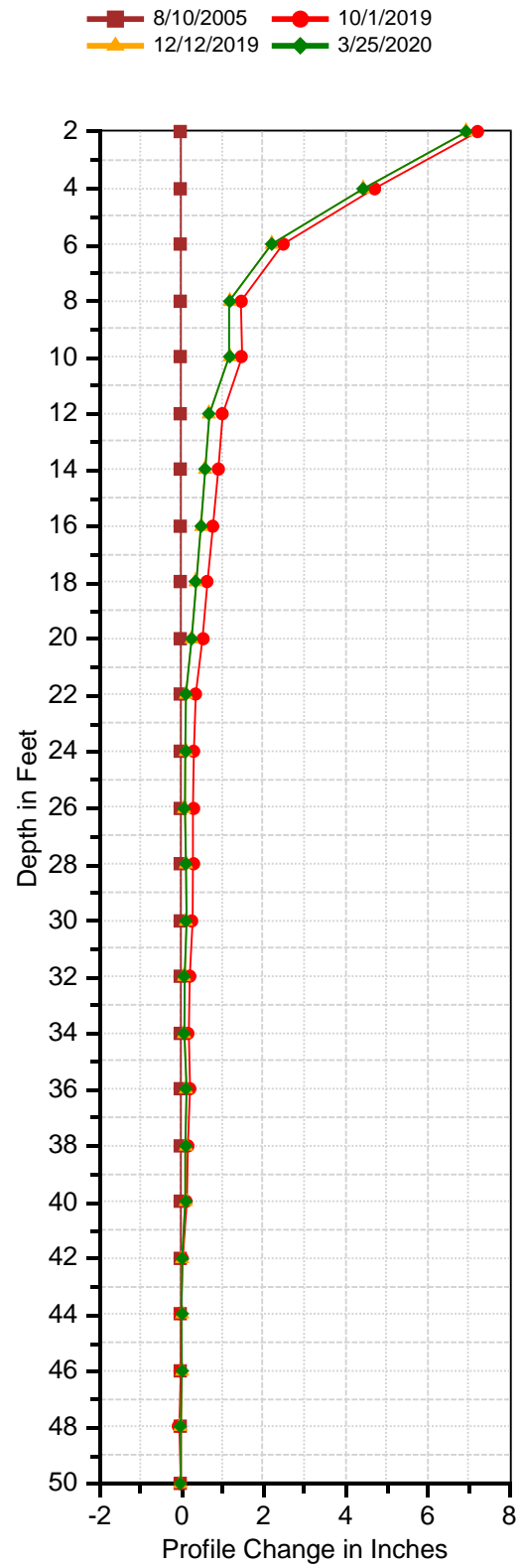
BOWIE BG05_5 B



BOWIE BG05_7 A



BOWIE BG05_7 B





Huddleston-Berry
Engineering & Testing, LLC

2789 Riverside Parkway
Grand Junction, Colorado 81501
Phone: 970-255-8005
Info@huddlestonberry.com

April 14, 2020
Project#01349-0001

Bowie Resources, LLC
43659 Bowie Road
Paonia, Colorado 81428

Attention: Mr. Basil Bear

Subject: Summary of Instrumentation Monitoring
1st Quarter 2020
Bowie Coal Waste Disposal Area No. 3
Paonia, Colorado

Reference: *Summary of Instrumentation Monitoring, 4th Quarter 2019, Bowie Coal Waste Disposal Area No. 3, Paonia, Colorado* by Huddleston-Berry Engineering & Testing, LLC for Bowie Resources, LLC, January 16, 2020.

Stability Evaluation, Gob Pile #3, Bowie No. 2 Mine by Huddleston-Berry Engineering & Testing, LLC for Bowie Resources, LLC, July 15, 2014.

Dear Mr. Bear,

At the request of the Colorado Division of Reclamation, Mining and Safety (DRMS), Huddleston-Berry Engineering & Testing, LLC (HBET) prepared this letter regarding quarterly monitoring of vibrating wire piezometers at Coal Waste Disposal Area No. 3 (CWDA No. 3) at the Bowie mine near Paonia, Colorado. The intent of the monitoring was to detect significant changes in the pore water pressures within the coal waste which may impact the stability of the waste pile.

Vibrating Wire Piezometers

Five vibrating wire piezometers were installed in CWDA No. 3 in October 2014. The piezometers were installed at three locations within the footprint of the gob pile. Monitoring of the functioning piezometers was completed by DOWL on March 25th, 2020. The attached monitoring report prepared by DOWL includes the piezometer monitoring data and the data is summarized in the following table.

VWP ID	Initial Pore Pressure 10/31/14 (psi)	12/12/19 Pore Pressure (psi)	03/25/20 Pore Pressure (psi)	Difference Since Installation (psi)	Difference Since Last Reading (psi)
VWP-A Deep	10.4	3.7	3.0	-7.4	-0.7
VWP-A Shallow	4.7	3.1	3.0	-1.7	-0.1
VWP-B Deep	0.2	0.3	0.0	-0.2	-0.3
VWP-B Shallow	13.9	9.1	10.0	-3.9	+0.9
VWP-D	7.1	4.8	4.6	-2.5	-0.2

Discussion of Vibrating Wire Piezometers

VWP-A Deep

VWP-A Deep was installed on October 6, 2014 near the northern edge of CWDA No. 3. VWP-A Deep was installed in the foundation soil approximately eight feet below the bottom of the gob. The pore pressures recorded at VWP-A Deep generally decreased since installation until September 2015. After that, the pore pressures fluctuated within a narrow range until the 2nd and 3rd Quarters of 2019 where increases were reported. However, the recently measured pore pressure is back down. In general, HBET does not believe that the pore pressure changes in VWP-A Deep are an indication of instability in CWDA No. 3.

VWP-A Shallow

VWP-A Shallow was installed on October 6, 2014 near the northern edge of CWDA No. 3. VWP-A Shallow was installed approximately ten feet above the base of the gob. After installation, the pore pressures dropped until November 2014. Between November 2014 and September 2015, increases in the pore pressures were recorded at VWP-A Shallow. However, between September 2015 and December 2016, the pore pressures decreased. Since then, the data have fluctuated within a narrow range. In general, HBET does not believe that the pore pressure changes in VWP-A Shallow are an indication of instability in CWDA No. 3.

VWP-B Deep

VWP-B Deep was installed on October 6, 2014 in the west-central portion of CWDA No. 3. VWP-B Deep was installed in the foundation soil approximately ten feet below the bottom of the gob. Since installation, the pore pressures recorded at VWP-B Deep have fluctuated within a narrow range. However, the 3rd Quarter 2019 reading showed a significant increase in pore pressures prior to coming back down in the 4th Quarter 2019. In general, HBET does not believe that the pore pressure changes in VWP-B Deep are an indication of instability in CWDA No. 3.

VWP-B Shallow

VWP-B Shallow was installed on October 6, 2014 in the west-central portion of CWDA No. 3. VWP-B Shallow was installed approximately ten feet above the base of the gob. Since installation, the pore pressures recorded at VWP-B Shallow have fluctuated with periods of slight increase and slight decrease. In general, HBET does not believe that the pore pressure changes in VWP-B Shallow are an indication of instability in CWDA No. 3.

VWP-D

VWP-D was installed on October 7, 2014 in the east-central portion of CWDA No. 3. VWP-D was installed approximately ten feet above the base of the gob. Since installation, the pore pressures recorded at VWP-D have fluctuated. The pore pressures increase slightly during the 3rd Quarter of 2017. However, this likely reflects the activity at CWDA No. 3 during the monitoring period and the pore pressures have decreased since September 2017. In general, HBET does not believe that the pore pressure changes in VWP-D are an indication of instability in CWDA No. 3.

General

Based upon the results of the most recent VWP monitoring data, HBET does not believe that there is any reduction in the stability of CWDA No. 3.

We are pleased to be of service to your project. Please contact us if you have any questions or comments regarding the contents of this report.

Respectfully Submitted:

Huddleston-Berry Engineering and Testing, LLC



Michael A. Berry, P.E.
Vice President of Engineering

ATTACHMENTS

April 9, 2020

Mr. Mike Berry, PE
Huddleston-Berry Engineering and Testing, LLC
2789 Riverside Parkway
Grand Junction, CO 81501

**SUBJECT: Summary Report, 1st Quarter 2020, Vibrating Wire Piezometers
January – March 2020, Bowie Mine #2
Coal Waste Disposal Area (CWDA) #3**

Greetings Mr. Berry,

DOWL conducted quarterly monitoring of installed vibrating wire piezometers (VWP) at Coal Waste Disposal Area #3 (CWDA #3), Bowie Resources, LLC Bowie Mine #2. This report is intended to cover the period of January through March 2020 (1st Quarter). VWP data was recorded on 3/25/2020. Per the Colorado Division of Reclamation, Mining & Safety (CDRMS) and your instructions, vibrating wire piezometer readings for all active piezometers are taken quarterly.

We present a graph of measured pore pressures on the attached Figure 1 and numerically in Table 1 below. Table 1 is a summary of the initial, prior and current readings. In addition, we present the difference between the current pore pressures and those at the time of installation, the previous quarter, and previous year.

Table 1. Summary of Pore Pressure Readings

VWP ID #	Pore Pressure (psi)				Pressure Difference (psi)		
	10/31/2014 Installation	Last Year 3/28/2019	Last Quarter 12/12/2019	Current 3/25/2020	Since Installation	Last Year	Last Quarter
VWP-A Deep	10.4	3.8	3.7	3.0	-7.4	-0.8	-0.7
VWP-A Shallow	4.7	3.5	3.1	3.0	-1.7	-0.5	-0.1
VWP-B Deep	0.2	1.2	0.3	0.0	-0.2	-1.2	-0.3
VWP-B Shallow	13.9	10.6	9.1	10.0	-3.9	-0.6	0.9
VWP-D	7.1	5.4	4.8	4.6	-2.5	-0.8	-0.2

As seen on Figure 1, when compared with the previous quarter, three of the pore pressure readings continued a slow decreasing trend, while one (WVP-B Deep) had a slightly sharper decline and one (VWP-B Shallow) had an increase. The 1st quarter readings appear to be nearly in-line with the typical decreasing trend for 4 of the 5 WVPs. The deeper pore pressure increases should be watched carefully over the next few quarters, as their graphs have behaved more erratically than the shallow piezometers. Since CWDA #3 is located at the base of a slope in a relatively flat and low-lying area, it is possible that the water table, which rose in a wetter year like 2019 (as evidenced by the spike in two of the deep VWP's in Quarter 2 of 2019), has dropped and is more stable at this time, which has been a drier year.

If you have any questions regarding this letter or the instrumentation monitoring at CWDA #3, please contact me at (970) 497-8821 or Lbrandt@dowl.com.

Respectfully Submitted,
DOWL



Laurie Brandt, CPG
Certified Professional Geologist



Dennis A. Russell, P.E.
Senior Geotechnical Engineer

Enclosure: Figure 1 – Vibrating Wire Piezometer Data Graph

Figure 1 - Bowie Mine #2 - CWDA #3
Vibrating Wire Piezometer Data

