



STATE OF  
COLORADO

Musick - DNR, Jason <jason.musick@state.co.us>

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## Bowie No. 2 Mine

1 message

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**Jim Stover** <jestover@bresnan.net>

Tue, Jul 5, 2016 at 11:06 AM

Reply-To: jestover@bresnan.net

To: "Musick - DNR, Jason" <jason.musick@state.co.us>

Cc: Bill Bear <BBear@bowieresources.com>, Desty Dyer <ddyer@blm.gov>, Levi Broyles <lbroyles@fs.fed.us>

Attached is the semi-annual subsidence report for the Bowie No. 2 Mine

Jim Stover

J. E. Stover & Associates, Inc.

2352 N 7th St Unit B

Grand Junction, CO 81501

Phone [970-245-4101](tel:970-245-4101)



**2016-Subsidence-1.pdf**

138K

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**J. E. STOVER & ASSOCIATES, INC.**

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

MINE ENGINEERING  
MINE RECLAMATION

CIVIL ENGINEERING  
CONST. MANAGEMENT

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July 1, 2016

Jason Musick  
Division of Reclamation, Mining and Safety  
1313 Sherman Street, Room 215  
Denver, CO 80203

Re: Bowie Resources, LLC, Bowie No. 2 Mine  
2016 Semi-Annual Subsidence Report  
Permit No. C-1996-083

Dear Mr. Musick:

On behalf of Bowie Resources, LLC, enclosed please find Bowie's 2016 Semi-annual Subsidence Report for the Bowie No. 2 Mine.

Please contact us with any questions or concerns.

Sincerely,

*J. E. Stover*

J. E. Stover, P.E.  
Consulting Engineer

cc: Wm. A. Bear, Jr.

Electronic  
UBRA Mining Engineer  
Bureau of Land Management  
Uncompahgre Basin Resource Area  
2505 Townsend Avenue  
Montrose, CO 81401

Electronic  
USDA Forest Service  
P.O. Box 1030  
Paonia, CO 81428

**2016 Bi-Annual Subsidence Report**

**Bowie Resources LLC**

**Bowie No. 2 Mine  
Permit No. C-1996-083**

**Paonia, Colorado**

**July 01, 2016**

**Introduction**

This report is for the period from January 1, 2016 through June 30, 2016. Mine Construction of the Bowie No. 2 Mine began during May of 1997, with coal production beginning during August 1997.

The mining permit application for the Bowie No. 2 Mine requires the operator to submit the results of the subsidence monitoring programs and the results of the visual inspections of known modern and historic landslides within the permit and adjacent area for stability in June and December of each year and report these results to the Division within 30 days of the end of the reporting period.

The Operator is also required to inspect these landslides, both modern and historic, monthly for six months immediately after retreat mining occurs. This same inspection routine is applied to any spring or pond in the immediate proximity of retreat mining.

There was no mining during the reporting period.

**Visual Inspection of known historic and modern landslides.**

A visual inspection of all known historic and modern landslides was not conducted during the reporting period because no mining occurred.

**Increased Inspection activity associated with retreat mining.**

Accessible subsidence cracks are repaired during coal exploration events and are monitored by both coal exploration supervisors and hydrologic monitoring technicians. No springs or ponds were potentially impacted during the reporting period because no mining occurred. No influence to any hydrologic monitoring points was observed during this period.

**Results of Subsidence Survey Monitoring**

The Pitkin Mesa Pipeline surveys were conducted in May and June. Monitoring points PL-11 and PL-12 which are located over panel 15 showed slight upward movement. The Terror Creek and Terror Creek transmission line tower survey was performed in May and June. Monitoring results are attached. As in the past, the survey was performed by Cragg Surveying using GPS methods.

### Analysis of Subsidence Data

The following table presents an analysis of the subsidence survey data. Subsidence survey requirements are shown on PAP pages 2.05-177, 178 and 179. Following is a summary of the survey data collected during the period.

|   | Station                           | General Location                               | Result                |
|---|-----------------------------------|------------------------------------------------|-----------------------|
| √ | 37-A                              | East Side Terror Creek , South of 1 West Mains | No significant change |
| √ | 37-B                              | East Side Terror Creek, Over 1 West Mains      | No significant change |
| √ | 37-C                              | East Side Terror Creek , North of 1 West Mains | No significant change |
| √ | 37-D                              | Transmission Line Tower - Panel B-17           | No significant change |
| √ | 37-E                              | West Side Terror Creek, Over 1 West Mains      | No significant change |
| √ | 37-F                              | Transmission Line Tower, South of 1 West Mains | No significant change |
| √ | 37-G                              | Transmission Line Tower, Panels B-17 and B-18  | No significant change |
| √ | 37-H                              | Transmission Line Tower, Panels B-18 and B-19  | No significant change |
| √ | Surveyed during reporting period. |                                                |                       |

|   | Station                           | General Location                          | Result                                       |
|---|-----------------------------------|-------------------------------------------|----------------------------------------------|
|   | PL-8                              | Pitkin Mesa Pipeline                      | Destroyed by Cabin Construction              |
| √ | PL-9                              | Pitkin Mesa Pipeline                      | No significant change                        |
| √ | PL-10                             | Pitkin Mesa Pipeline + Stevens Gulch Road | No significant change                        |
| √ | PL-11                             | Pitkin Mesa Pipeline + Stevens Gulch Road | Slight change (+0.05' Period) (-0.40' Total) |
| √ | PL-12                             | Pitkin Mesa Pipeline + Stevens Gulch Road | Slight change (+0.04' Period) (-0.51 Total)  |
| √ | PL-13                             | Pitkin Mesa Pipeline + Stevens Gulch Road | No significant change                        |
| √ | PL-14                             | Pitkin Mesa Pipeline + Stevens Gulch Road | No significant change                        |
| √ | PL-15                             | Pitkin Mesa Pipeline + Stevens Gulch Road | No significant change                        |
| √ | PL-16                             | Pitkin Mesa Pipeline + Stevens Gulch Road | No significant change                        |
| √ | PL-17                             | Pitkin Mesa Pipeline + Stevens Gulch Road | No significant change                        |
| √ | Surveyed during reporting period. |                                           |                                              |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SUBSIDENCE MONITORING DATA - 2016**

STATION : 37-A

### Rebar + Cap

| DATE       | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|------------|----------|----------|-----------|-----------|
| 5/17/2010  | 25640.42 | 25738.27 | 7207.36   | 0.00      |
| 9/7/2010   | 25640.42 | 25738.31 | 7207.25   | -0.11     |
| 11/3/2010  | 25640.42 | 25738.29 | 7207.28   | 0.03      |
| 5/23/2011  | 25640.39 | 25738.20 | 7207.45   | 0.17      |
| 8/24/2011  | 25640.38 | 25738.30 | 7207.20   | -0.25     |
| 11/22/2011 | 25640.41 | 25738.26 | 7207.32   | 0.12      |
| 5/15/2012  | 25640.41 | 25738.23 | 7207.44   | 0.12      |
| 7/6/2012   | 25640.39 | 25738.28 | 7207.22   | -0.22     |
| 10/3/2012  | 25640.39 | 25738.22 | 7207.32   | 0.10      |
| 6/15/2013  | 25640.37 | 25738.20 | 7207.37   | 0.05      |
| 8/22/2013  | 25640.40 | 25738.26 | 7207.41   | 0.04      |
| 11/15/2013 | 25640.39 | 25738.26 | 7207.36   | -0.05     |
| 6/16/2014  | 25640.42 | 25738.21 | 7207.36   | 0.00      |
| 9/19/2014  | 25640.40 | 25738.28 | 7207.36   | 0.00      |
| 10/24/2014 | 25640.43 | 25738.27 | 7207.35   | -0.01     |
| 6/8/2015   | 25640.44 | 25738.18 | 7207.42   | 0.07      |
| 5/12/2016  | 25640.42 | 25738.21 | 7207.40   | -0.02     |
| 6/27/2016  | 25640.42 | 25738.20 | 7207.36   | -0.04     |
|            |          |          |           |           |

|          |          |          |         |       |
|----------|----------|----------|---------|-------|
| MAXIMUM  | 25640.44 | 25738.31 | 7207.45 | 0.17  |
| MINIMUM  | 25640.37 | 25738.18 | 7207.20 | -0.25 |
| MOVEMENT | 0.07     | 0.13     | 0.00    |       |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SUBSIDENCE MONITORING DATA - 2016**

STATION : 37-B

### Rebar + Cap

| DATE       | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|------------|----------|----------|-----------|-----------|
| 5/17/2010  | 26136.20 | 25808.41 | 7219.01   | 0.00      |
| 9/7/2010   | 26136.17 | 25808.43 | 7218.88   | -0.13     |
| 11/3/2010  | 26136.22 | 25808.43 | 7218.97   | 0.09      |
| 5/23/2011  | 26136.24 | 25808.38 | 7219.11   | 0.14      |
| 8/24/2011  | 26136.21 | 25808.44 | 7218.90   | -0.21     |
| 11/22/2011 | 26136.22 | 25808.39 | 7219.00   | 0.10      |
| 5/15/2012  | 26136.21 | 25808.42 | 7219.07   | 0.07      |
| 7/6/2012   | 26136.21 | 25808.38 | 7218.93   | -0.14     |
| 10/3/2012  | 26136.16 | 25808.37 | 7218.97   | 0.04      |
| 6/15/2013  | 26136.19 | 25808.34 | 7219.15   | 0.18      |
| 8/22/2013  | 26136.18 | 25808.38 | 7219.16   | 0.01      |
| 11/15/2013 | 26136.18 | 25808.41 | 7219.04   | -0.12     |
| 6/16/2014  | 26136.27 | 25808.40 | 7219.08   | 0.04      |
| 9/19/2014  | 26136.20 | 25808.41 | 7219.03   | -0.05     |
| 10/24/2014 | 26136.21 | 25808.40 | 7219.05   | 0.02      |
| 6/8/2015   | 26136.25 | 25808.40 | 7219.09   | 0.04      |
| 5/12/2016  | 26136.32 | 25808.40 | 7219.14   | 0.05      |
| 6/27/2016  | 26136.24 | 25808.41 | 7219.08   | -0.06     |
|            |          |          |           |           |

|          |          |          |         |       |
|----------|----------|----------|---------|-------|
| MAXIMUM  | 26136.32 | 25808.44 | 7219.16 | 0.18  |
| MINIMUM  | 26136.16 | 25808.34 | 7218.88 | -0.21 |
| MOVEMENT | 0.16     | 0.10     | 0.07    |       |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SUBSIDENCE MONITORING DATA - 2016**

STATION : 37-C

### Rebar + Cap

| DATE       | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|------------|----------|----------|-----------|-----------|
| 5/17/2010  | 26636.42 | 25772.28 | 7227.06   | 0.00      |
| 9/7/2010   | 26636.41 | 25772.27 | 7226.95   | -0.11     |
| 11/3/2010  | 26636.47 | 25772.23 | 7226.93   | -0.02     |
| 5/23/2011  | 26636.39 | 25772.27 | 7227.15   | 0.22      |
| 8/24/2011  | 26636.45 | 25772.26 | 7226.97   | -0.18     |
| 11/22/2011 | 26636.43 | 25772.27 | 7227.01   | 0.04      |
| 5/15/2012  | 26636.43 | 25772.27 | 7227.09   | 0.08      |
| 7/6/2012   | 26636.43 | 25772.29 | 7226.94   | -0.15     |
| 10/3/2012  | 26636.43 | 25772.26 | 7226.97   | 0.03      |
| 6/15/2013  | 26636.40 | 25772.25 | 7227.15   | 0.18      |
| 8/22/2013  | 26636.46 | 25772.29 | 7227.16   | 0.01      |
| 11/15/2013 | 26636.42 | 25772.27 | 7227.07   | -0.09     |
| 6/16/2014  | 26636.46 | 25772.27 | 7227.09   | 0.02      |
| 9/19/2014  | 26636.45 | 25772.30 | 7227.08   | -0.01     |
| 10/24/2014 | 26636.46 | 25772.30 | 7227.05   | -0.03     |
| 6/8/2015   | 26636.41 | 25772.26 | 7227.11   | 0.06      |
| 5/12/2016  | 26636.40 | 25772.25 | 7227.16   | 0.05      |
| 6/27/2016  | 26636.42 | 25772.29 | 7227.15   | -0.01     |
|            |          |          |           |           |

|          |          |          |         |       |
|----------|----------|----------|---------|-------|
| MAXIMUM  | 26636.47 | 25772.30 | 7227.16 | 0.22  |
| MINIMUM  | 26636.39 | 25772.23 | 7226.93 | -0.18 |
| MOVEMENT | 0.08     | 0.07     | 0.09    |       |



**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SUBSIDENCE MONITORING DATA - 2016**

STATION : 37-D

### Rebar + Cap

| DATE       | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|------------|----------|----------|-----------|-----------|
| 5/17/2010  | 25987.33 | 24629.22 | 7160.52   | 0.00      |
| 9/7/2010   | 25987.30 | 24629.18 | 7160.50   | -0.02     |
| 11/3/2010  | 25987.31 | 24629.21 | 7160.47   | -0.03     |
| 5/23/2011  | 25987.27 | 24629.22 | 7160.57   | 0.10      |
| 8/24/2011  | 25987.35 | 24629.20 | 7160.42   | -0.15     |
| 11/22/2011 | 25987.29 | 24629.17 | 7160.51   | 0.09      |
| 5/15/2012  | 25987.31 | 24629.20 | 7160.56   | 0.05      |
| 7/6/2012   | 25987.31 | 24629.19 | 7160.42   | -0.14     |
| 10/3/2012  | 25987.32 | 24629.15 | 7160.51   | 0.09      |
| 6/15/2013  | 25987.26 | 24629.16 | 7160.65   | 0.14      |
| 8/22/2013  | 25987.27 | 24629.20 | 7160.67   | 0.02      |
| 11/15/2013 | 25987.27 | 24629.19 | 7160.65   | -0.02     |
| 6/16/2014  | 25987.27 | 24629.17 | 7160.55   | -0.10     |
| 9/19/2014  | 25987.29 | 24629.20 | 7160.61   | 0.06      |
| 10/24/2014 | 25987.28 | 24629.19 | 7160.62   | 0.01      |
| 6/8/2015   | 25987.28 | 24629.21 | 7160.59   | -0.03     |
| 5/12/2016  | 25987.28 | 24629.20 | 7160.62   | 0.03      |
| 6/27/2016  | 25987.26 | 24629.22 | 7160.62   | 0.00      |
|            |          |          |           |           |

|          |          |          |         |       |
|----------|----------|----------|---------|-------|
| MAXIMUM  | 25987.35 | 24629.22 | 7160.67 | 0.14  |
| MINIMUM  | 25987.26 | 24629.15 | 7160.42 | -0.15 |
| MOVEMENT | 0.09     | 0.07     | 0.10    |       |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SUBSIDENCE MONITORING DATA - 2016**

STATION : 37-E

### Rebar + Cap

| DATE       | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|------------|----------|----------|-----------|-----------|
| 5/17/2010  | 25181.83 | 24470.56 | 7079.14   | 0.00      |
| 9/7/2010   | 25181.83 | 24470.54 | 7079.10   | -0.04     |
| 11/3/2010  | 25181.81 | 24470.54 | 7079.07   | -0.03     |
| 5/23/2011  | 25181.82 | 24470.55 | 7079.15   | 0.08      |
| 8/24/2011  | 25181.86 | 24470.51 | 7079.03   | -0.12     |
| 11/22/2011 | 25181.81 | 24470.53 | 7079.10   | 0.07      |
| 5/15/2012  | 25181.80 | 24470.53 | 7079.16   | 0.06      |
| 7/6/2012   | 25181.81 | 24470.52 | 7079.01   | -0.15     |
| 10/5/2012  | 25181.81 | 24470.49 | 7079.10   | 0.09      |
| 6/15/2013  | 25181.78 | 24470.51 | 7079.18   | 0.08      |
| 8/22/2013  | 25181.77 | 24470.52 | 7079.20   | 0.02      |
| 11/15/2013 | 25181.77 | 24470.54 | 7079.12   | -0.08     |
| 6/16/2014  | 25181.80 | 24470.52 | 7079.13   | 0.01      |
| 9/19/2014  | 25181.78 | 24470.53 | 7079.15   | 0.02      |
| 10/24/2014 | 25181.78 | 24470.51 | 7079.10   | -0.05     |
| 6/8/2015   | 25181.81 | 24470.51 | 7079.14   | 0.04      |
| 5/12/2016  | 25181.83 | 24470.56 | 7079.16   | 0.02      |
| 6/27/2016  | 25181.80 | 24470.56 | 7079.11   | -0.05     |
|            |          |          |           |           |

|          |          |          |         |       |
|----------|----------|----------|---------|-------|
| MAXIMUM  | 25181.86 | 24470.56 | 7079.20 | 0.09  |
| MINIMUM  | 25181.77 | 24470.49 | 7079.01 | -0.15 |
| MOVEMENT | 0.09     | 0.07     | -0.03   |       |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SUBSIDENCE MONITORING DATA - 2016**

STATION : 37-F

### Rebar + Cap

| DATE       | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|------------|----------|----------|-----------|-----------|
| 5/17/2010  | 24706.83 | 24633.27 | 7094.65   | 0.00      |
| 9/7/2010   | 24706.83 | 24633.25 | 7094.57   | -0.08     |
| 11/3/2010  | 24706.83 | 24633.26 | 7094.63   | 0.06      |
| 5/23/2011  | 24706.84 | 24633.26 | 7094.72   | 0.09      |
| 8/24/2011  | 24706.83 | 24633.24 | 7094.54   | -0.18     |
| 11/22/2011 | 24706.82 | 24633.25 | 7094.66   | 0.12      |
| 5/15/2012  | 24706.81 | 24633.23 | 7094.67   | 0.01      |
| 7/6/2012   | 24706.77 | 24633.21 | 7094.57   | -0.10     |
| 10/3/2012  | 24706.78 | 24633.19 | 7094.62   | 0.05      |
| 6/15/2013  | 24706.78 | 24633.22 | 7094.72   | 0.10      |
| 8/22/2013  | 24706.78 | 24633.24 | 7094.70   | -0.02     |
| 11/15/2013 | 24706.81 | 24633.24 | 7094.65   | -0.05     |
| 6/16/2014  | 24706.83 | 24633.24 | 7094.67   | 0.02      |
| 9/19/2014  | 24706.82 | 24633.26 | 7094.68   | 0.01      |
| 10/24/2014 | 24706.82 | 24633.25 | 7094.59   | -0.09     |
| 6/8/2015   | 24706.83 | 24633.23 | 7094.71   | 0.12      |
| 5/12/2016  | 24706.82 | 24633.25 | 7094.72   | 0.01      |
| 6/27/2016  | 24706.83 | 24633.27 | 7094.62   | -0.10     |
|            |          |          |           |           |

|          |          |          |         |       |
|----------|----------|----------|---------|-------|
| MAXIMUM  | 24706.84 | 24633.27 | 7094.72 | 0.12  |
| MINIMUM  | 24706.77 | 24633.19 | 7094.54 | -0.18 |
| MOVEMENT | 0.07     | 0.08     | -0.03   |       |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SUBSIDENCE MONITORING DATA - 2016**

**STATION :        37-G                                Rebar**

| DATE      | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|-----------|----------|----------|-----------|-----------|
| 8/1/2014  | 26847.71 | 24528.84 | 7264.50   | 0.00      |
| 9/1/2014  | 26847.66 | 24528.82 | 7264.58   | 0.08      |
| 10/1/2014 | 26847.65 | 24528.83 | 7264.55   | -0.03     |
| 6/8/2015  | 26847.63 | 24528.84 | 7264.63   | 0.08      |
| 5/12/2016 | 26847.65 | 24528.83 | 7264.64   | 0.01      |
| 6/27/2016 | 26847.63 | 24528.85 | 7264.59   | -0.05     |
|           |          |          |           |           |
|           |          |          |           |           |
| MAXIMUM   | 26847.71 | 24528.85 | 7264.64   | 0.08      |
| MINIMUM   | 26847.63 | 24528.82 | 7264.50   | -0.05     |
| MOVEMENT  | 0.08     | 0.03     | 0.09      |           |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SUBSIDENCE MONITORING DATA - 2016**

**STATION :        37-H                                  Rebar**

| DATE      | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|-----------|----------|----------|-----------|-----------|
| 8/1/2014  | 27650.23 | 24475.60 | 7220.00   | 0.00      |
| 9/1/2014  | 27650.20 | 24475.61 | 7220.08   | 0.08      |
| 10/1/2014 | 27650.27 | 24475.59 | 7219.94   | -0.14     |
| 6/8/2015  | 27650.23 | 24475.65 | 7220.10   | 0.16      |
| 5/12/2016 | 27650.23 | 24475.61 | 7220.19   | 0.09      |
| 6/27/2016 | 27650.20 | 24475.66 | 7220.11   | -0.08     |
|           |          |          |           |           |
|           |          |          |           |           |
| MAXIMUM   | 27650.27 | 24475.66 | 7220.19   | 0.16      |
| MINIMUM   | 27650.20 | 24475.59 | 7219.94   | -0.14     |
| MOVEMENT  | 0.07     | 0.07     | 0.11      |           |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SETTLEMENT MONITORING DATA - 2016**

**STATION :            PL-08                            Rebar**

| DATE               | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|--------------------|----------|----------|-----------|-----------|
| Jul-12             | 22414.83 | 13505.82 | 7809.33   |           |
| Nov-12             | 22414.79 | 13505.81 | 7809.36   | 0.03      |
| Jun-13             | 22414.83 | 13505.80 | 7809.40   | 0.04      |
| Nov-13             | 22414.82 | 13505.84 | 7809.34   | -0.06     |
| Jan-14             | 22414.83 | 13505.89 | 7809.35   | 0.01      |
| Mar-14             | 22414.80 | 13505.86 | 7809.48   | 0.13      |
| New Survey Control |          |          |           |           |
| Jan-14             | 22414.11 | 13507.61 | 7810.18   |           |
| March 26, 2014     | 22414.14 | 13507.61 | 7810.22   | 0.04      |
| March 28, 2014     | 22414.15 | 13507.62 | 7810.21   | -0.01     |
| April 15, 2014     | 22414.16 | 13507.6  | 7810.19   | -0.02     |
| April 25, 2014     | 22414.15 | 13507.62 | 7810.19   | 0.00      |
| May 9, 2014        | 22414.21 | 13507.64 | 7810.18   | -0.01     |
| May 19, 2014       | 22414.16 | 13507.63 | 7810.17   | -0.01     |
| June 16, 2014      | 22414.19 | 13507.70 | 7810.23   | 0.06      |
| July 24, 2014      | 22414.18 | 13507.67 | 7810.2    | -0.03     |
| Sept 24, 2014      | 22414.18 | 13507.67 | 7810.21   | 0.01      |
| October 30, 2014   | 22414.20 | 13507.67 | 7810.19   | -0.02     |
| June 2, 2015       | 22414.26 | 13507.67 | 7810.22   | 0.03      |
| June 30, 2015      | 22414.21 | 13507.66 | 7810.23   | 0.01      |
| Sept. 11, 2015     | 22414.21 | 13507.64 | 7810.20   | -0.03     |
| Destroyed          |          |          |           |           |
|                    |          |          |           |           |
| MAXIMUM            | 22414.26 | 13507.70 | 7810.23   | 0.06      |
| MINIMUM            | 22414.11 | 13507.60 | 7810.17   | -0.03     |
| MOVEMENT           | 0.15     | 0.10     | 0.02      |           |

Note: Station PL-8 is gone. A new cabin has been built West of PL-8 and the surrounding pasture has been mowed.

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SETTLEMENT MONITORING DATA - 2016**

**STATION : PL-09**

## Rebar

| DATE               | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|--------------------|----------|----------|-----------|-----------|
| Jul-12             | 22908.95 | 13852.17 | 7852.03   |           |
| Nov-12             | 22908.89 | 13852.16 | 7852.10   | 0.07      |
| Jun-13             | 22908.98 | 13852.16 | 7852.21   | 0.11      |
| Nov-13             | 22908.97 | 13852.18 | 7852.11   | -0.10     |
| Jan-14             | 22909.02 | 13852.19 | 7852.06   | -0.05     |
| Mar-14             | 22908.99 | 13852.24 | 7852.13   | 0.07      |
| New Survey Control |          |          |           |           |
| Jan-14             | 22908.28 | 13853.90 | 7852.98   |           |
| March 26, 2014     | 22908.28 | 13853.95 | 7852.96   | -0.02     |
| March 28, 2014     | 22908.30 | 13853.94 | 7853.01   | 0.05      |
| April 15, 2014     | 22908.31 | 13853.95 | 7852.97   | -0.04     |
| April 25, 2014     | 22908.29 | 13853.96 | 7852.96   | -0.01     |
| May 9, 2014        | 22908.31 | 13854.00 | 7852.96   | 0.00      |
| May 19, 2014       | 22908.30 | 13854.04 | 7852.95   | -0.01     |
| June 16, 2014      | 22908.33 | 13854.09 | 7852.91   | -0.04     |
| July 24, 2014      | 22908.29 | 13854.01 | 7852.95   | 0.04      |
| Sept 24, 2014      | 22908.34 | 13854.03 | 7852.91   | -0.04     |
| October 30, 2014   | 22908.33 | 13854.02 | 7852.89   | -0.02     |
| June 2, 2015       | 22908.4  | 13854.13 | 7852.94   | 0.05      |
| June 30, 2015      | 22908.37 | 13854.09 | 7852.96   | 0.02      |
| Sept. 11, 2015     | 22908.4  | 13854.09 | 7852.9    | -0.06     |
| November 2, 2015   | 22908.41 | 13854.08 | 7852.91   | 0.01      |
| May 11, 2016       | 22908.42 | 13854.15 | 7852.89   | -0.02     |
| June 15, 2002      | 22908.39 | 13854.12 | 7852.94   | 0.05      |
|                    |          |          |           |           |
| MAXIMUM            | 22908.42 | 13854.15 | 7853.01   | 0.05      |
| MINIMUM            | 22908.28 | 13853.90 | 7852.89   | -0.06     |
| MOVEMENT           | 0.14     | 0.25     | -0.04     |           |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SETTLEMENT MONITORING DATA - 2016**

STATION : PL-10

## Rebar

| DATE                               | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|------------------------------------|----------|----------|-----------|-----------|
| Jul-12                             | 23401.33 | 14103.34 | 7900.27   |           |
| Nov-12                             | 23401.31 | 14103.33 | 7900.33   | 0.06      |
| Jun-13                             | 23401.35 | 14103.32 | 7900.37   | 0.04      |
| Nov-13                             | 23401.33 | 14103.41 | 7900.30   | -0.07     |
| Jan-14                             | 23401.36 | 14103.41 | 7900.34   | 0.04      |
| Destroyed by Pipeline Construction |          |          |           |           |
| March 31, 2014                     | 23400.77 | 14093.08 | 7904.85   |           |
| March 31, 2014                     | 23400.84 | 14093.03 | 7904.91   | 0.06      |
| April 15, 2014                     | 23400.83 | 14093.03 | 7904.86   | -0.05     |
| April 25, 2014                     | 23400.79 | 14093.08 | 7904.88   | 0.02      |
| May 9, 2014                        | 23400.8  | 14093.07 | 7904.84   | -0.04     |
| May 19, 2014                       | 23400.82 | 14093.11 | 7904.81   | -0.03     |
| June 16, 2014                      | 23400.84 | 14093.2  | 7904.90   | 0.09      |
| July 24, 2014                      | 23400.81 | 14093.11 | 7904.88   | -0.02     |
| Sept 24, 2014                      | 23400.81 | 14093.11 | 7904.85   | -0.03     |
| October 30, 2014                   | 23400.82 | 14093.13 | 7904.73   | -0.12     |
| June 2, 2015                       | 23400.95 | 14093.3  | 7904.78   | 0.05      |
| June 30, 2015                      | 23400.96 | 14093.25 | 7904.78   | 0.00      |
| Sept. 11, 2015                     | 23400.88 | 14093.3  | 7904.76   | -0.02     |
| November 2, 2015                   | 23400.92 | 14093.2  | 7904.70   | -0.06     |
| May 11, 2016                       | 23401.00 | 14093.31 | 7904.70   | 0.00      |
| June 15, 2002                      | 23400.96 | 14093.32 | 7904.88   | 0.18      |
|                                    |          |          |           |           |
| MAXIMUM                            | 23401.00 | 14093.32 | 7904.91   | 0.18      |
| MINIMUM                            | 23400.77 | 14093.03 | 7904.70   | -0.12     |
| MOVEMENT                           | 0.23     | 0.29     | 0.03      |           |



**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SETTLEMENT MONITORING DATA - 2016**

STATION : PL-11

## Rebar

| DATE               | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|--------------------|----------|----------|-----------|-----------|
| Jul-12             | 23920.56 | 13929.91 | 7945.46   |           |
| Nov-12             | 23920.48 | 13929.89 | 7945.45   | -0.01     |
| Jun-13             | 23920.46 | 13929.91 | 7945.63   | 0.18      |
| Nov-13             | 23920.54 | 13929.93 | 7945.41   | -0.22     |
| Jan-14             | 23920.58 | 13929.98 | 7945.44   | 0.03      |
| Mar-14             | 23920.52 | 13929.90 | 7945.52   | 0.08      |
| New Survey Control |          |          |           |           |
| Jan-14             | 23919.80 | 13931.52 | 7946.46   |           |
| March 26, 2014     | 23919.83 | 13931.52 | 7946.51   | 0.05      |
| March 28, 2014     | 23919.81 | 13931.48 | 7946.48   | -0.03     |
| April 15, 2014     | 23919.81 | 13931.58 | 7946.47   | -0.01     |
| April 25, 2014     | 23919.76 | 13931.61 | 7946.40   | -0.07     |
| May 9, 2014        | 23919.77 | 13931.67 | 7946.27   | -0.13     |
| May 19, 2014       | 23919.74 | 13931.71 | 7946.25   | -0.02     |
| June 16, 2014      | 23919.80 | 13931.78 | 7946.19   | -0.06     |
| July 24, 2014      | 23919.76 | 13931.71 | 7946.14   | -0.05     |
| Sept 24, 2014      | 23919.75 | 13931.72 | 7946.11   | -0.03     |
| October 30, 2014   | 23919.78 | 13931.75 | 7946.09   | -0.02     |
| June 2, 2015       | 23919.87 | 13931.96 | 7945.99   | -0.10     |
| June 30, 2015      | 23919.84 | 13931.94 | 7946.06   | 0.07      |
| Sept. 11, 2015     | 23919.88 | 13931.95 | 7945.98   | -0.08     |
| November 2, 2015   | 23919.89 | 13931.96 | 7946.01   | 0.03      |
| May 11, 2016       | 23919.89 | 13931.97 | 7946.02   | 0.01      |
| June 15, 2002      | 23919.89 | 13931.94 | 7946.06   | 0.04      |
|                    |          |          |           |           |
| MAXIMUM            | 23919.89 | 13931.97 | 7946.51   | 0.07      |
| MINIMUM            | 23919.74 | 13931.48 | 7945.98   | -0.13     |
| MOVEMENT           | 0.15     | 0.49     | -0.40     |           |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SETTLEMENT MONITORING DATA - 2016**

**STATION :** PL-12 **Rebar**

| DATE               | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|--------------------|----------|----------|-----------|-----------|
| Jul-12             | 24423.55 | 14051.49 | 7964.05   |           |
| Nov-12             | 24423.51 | 14051.50 | 7964.06   | 0.01      |
| Jun-13             | 24423.51 | 14051.49 | 7964.17   | 0.11      |
| Nov-13             | 24423.51 | 14051.53 | 7963.98   | -0.19     |
| Jan-14             | 24423.58 | 14051.55 | 7964.11   | 0.13      |
| Mar-14             | 24423.54 | 14051.50 | 7964.08   | -0.03     |
| New Survey Control |          |          |           |           |
| Jan-14             | 24422.82 | 14053.07 | 7965.14   |           |
| March 26, 2014     | 24422.83 | 14053.12 | 7965.03   | -0.11     |
| March 28, 2014     | 24422.81 | 14053.10 | 7965.08   | 0.05      |
| April 15, 2014     | 24422.80 | 14053.11 | 7965.01   | -0.07     |
| April 25, 2014     | 24422.77 | 14053.11 | 7964.96   | -0.05     |
| May 9, 2014        | 24422.74 | 14053.18 | 7964.85   | -0.11     |
| May 19, 2014       | 24422.69 | 14053.19 | 7964.86   | 0.01      |
| June 16, 2014      | 24422.74 | 14053.30 | 7964.83   | -0.03     |
| July 24, 2014      | 24422.66 | 14053.25 | 7964.84   | 0.01      |
| Sept 24, 2014      | 24422.69 | 14053.25 | 7964.75   | -0.09     |
| October 30, 2014   | 24422.72 | 14053.28 | 7964.72   | -0.03     |
| June 2, 2015       | 24422.79 | 14053.48 | 7964.58   | -0.14     |
| June 30, 2015      | 24422.74 | 14053.47 | 7964.61   | 0.03      |
| Sept. 11, 2015     | 24422.79 | 14053.47 | 7964.59   | -0.02     |
| November 2, 2015   | 24422.77 | 14053.42 | 7964.59   | 0.00      |
| May 11, 2016       | 24422.80 | 14053.49 | 7964.63   | 0.04      |
| June 15, 2002      | 24422.79 | 14053.46 | 7964.63   | 0.00      |
|                    |          |          |           |           |
| MAXIMUM            | 24422.83 | 14053.49 | 7965.14   | 0.05      |
| MINIMUM            | 24422.66 | 14053.07 | 7964.58   | -0.14     |
| MOVEMENT           | 0.17     | 0.42     | -0.51     |           |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SETTLEMENT MONITORING DATA - 2016**

**STATION :** PL-13 **Rebar**

| DATE               | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|--------------------|----------|----------|-----------|-----------|
| Jul-12             | 24922.44 | 14175.16 | 7983.44   |           |
| Nov-12             | 24922.50 | 14175.19 | 7983.46   | 0.02      |
| Jun-13             | 24922.51 | 14175.18 | 7983.56   | 0.10      |
| Nov-13             | 24922.56 | 14175.25 | 7983.43   | -0.13     |
| Jan-14             | 24922.51 | 14175.26 | 7983.49   | 0.06      |
| Mar-14             | 24922.52 | 14175.25 | 7983.49   | 0.00      |
| New Survey Control |          |          |           |           |
| Jan-14             | 24921.81 | 14176.79 | 7984.58   |           |
| March 26, 2014     | 24921.82 | 14176.79 | 7984.63   | 0.05      |
| March 28, 2014     | 24921.81 | 14176.81 | 7984.66   | 0.03      |
| April 15, 2014     | 24921.77 | 14176.79 | 7984.59   | -0.07     |
| April 25, 2014     | 24921.76 | 14176.78 | 7984.53   | -0.06     |
| May 9, 2014        | 24921.74 | 14176.78 | 7984.52   | -0.01     |
| May 19, 2014       | 24921.72 | 14176.77 | 7984.55   | 0.03      |
| June 16, 2014      | 24921.73 | 14176.85 | 7984.50   | -0.05     |
| July 24, 2014      | 24921.71 | 14176.80 | 7984.53   | 0.03      |
| Sept 24, 2014      | 24921.69 | 14176.78 | 7984.53   | 0.00      |
| October 30, 2014   | 24921.69 | 14176.82 | 7984.45   | -0.08     |
| June 2, 2015       | 24921.77 | 14176.89 | 7984.60   | 0.15      |
| June 30, 2015      | 24921.79 | 14176.88 | 7984.62   | 0.02      |
| Sept. 11, 2015     | 24921.79 | 14176.87 | 7984.60   | -0.02     |
| November 2, 2015   | 24921.76 | 14176.90 | 7984.64   | 0.04      |
| May 11, 2016       | 24921.80 | 14176.90 | 7984.55   | -0.09     |
| June 15, 2002      | 24921.76 | 14176.88 | 7984.59   | 0.04      |
|                    |          |          |           |           |
| MAXIMUM            | 24921.82 | 14176.90 | 7984.66   | 0.15      |
| MINIMUM            | 24921.69 | 14176.77 | 7984.45   | -0.09     |
| MOVEMENT           | 0.13     | 0.13     | 0.01      |           |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SETTLEMENT MONITORING DATA - 2016**

STATION : PL-14

## Rebar

| DATE                               | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|------------------------------------|----------|----------|-----------|-----------|
| Jul-12                             | 25383.28 | 14329.63 | 8010.84   |           |
| Nov-12                             | 25383.26 | 14329.58 | 8010.88   | 0.04      |
| Jun-13                             | 25383.23 | 14329.60 | 8010.95   | 0.07      |
| Nov-13                             | 25383.25 | 14329.64 | 8010.81   | -0.14     |
| Jan-14                             | 25383.28 | 14329.65 | 8010.84   | 0.03      |
| Destroyed by Pipeline Construction |          |          |           |           |
| March 31, 2014                     | 25382.55 | 14309.12 | 8018.02   |           |
| March 31, 2014                     | 25382.55 | 14309.08 | 8018.00   | -0.02     |
| April 15, 2014                     | 25382.52 | 14309.09 | 8018.01   | 0.01      |
| April 25, 2014                     | 25382.50 | 14309.10 | 8018.02   | 0.01      |
| May 9, 2014                        | 25382.52 | 14309.09 | 8017.99   | -0.03     |
| May 19, 2014                       | 25382.47 | 14309.08 | 8017.95   | -0.04     |
| June 16, 2014                      | 25382.51 | 14309.20 | 8017.96   | 0.01      |
| July 24, 2014                      | 25382.42 | 14309.08 | 8018.05   | 0.09      |
| Sept 24, 2014                      | 25382.48 | 14309.05 | 8017.97   | -0.08     |
| October 30, 2014                   | 25382.44 | 14309.10 | 8017.90   | -0.07     |
| June 2, 2015                       | 25382.47 | 14309.18 | 8017.84   | -0.06     |
| June 30, 2015                      | 25382.47 | 14309.21 | 8017.89   | 0.05      |
| Sept. 11, 2015                     | 25382.47 | 14309.21 | 8017.87   | -0.02     |
| November 2, 2015                   | 25382.46 | 14309.18 | 8017.86   | -0.01     |
| May 11, 2016                       | 25382.45 | 14309.17 | 8017.80   | -0.06     |
| June 15, 2002                      | 25382.48 | 14309.18 | 8017.84   | 0.04      |
|                                    |          |          |           |           |
| MAXIMUM                            | 25382.55 | 14309.21 | 8018.05   | 0.09      |
| MINIMUM                            | 25382.42 | 14309.05 | 8017.80   | -0.08     |
| MOVEMENT                           | 0.13     | 0.16     | -0.18     |           |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SETTLEMENT MONITORING DATA - 2016**

**STATION :** PL-15 **Rebar**

| DATE                               | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|------------------------------------|----------|----------|-----------|-----------|
| Jul-12                             | 25887.47 | 14284.94 | 8038.55   |           |
| Nov-12                             | 25887.44 | 14284.95 | 8038.53   | -0.02     |
| Jun-13                             | 25887.42 | 14284.93 | 8038.63   | 0.10      |
| Nov-13                             | 25887.51 | 14284.97 | 8038.58   | -0.05     |
| Jan-14                             | 25887.49 | 14284.95 | 8038.69   | 0.11      |
| Destroyed by Pipeline Construction |          |          |           |           |
| March 31, 2014                     | 25886.64 | 14270.32 | 8041.78   |           |
| March 31, 2014                     | 25886.62 | 14270.34 | 8041.72   | -0.06     |
| April 15, 2014                     | 25886.66 | 14270.33 | 8041.77   | 0.05      |
| April 25, 2014                     | 25886.63 | 14270.36 | 8041.79   | 0.02      |
| May 9, 2014                        | 25886.66 | 14270.33 | 8041.78   | -0.01     |
| May 19, 2014                       | 25886.65 | 14270.33 | 8041.77   | -0.01     |
| June 16, 2014                      | 25886.65 | 14270.41 | 8041.75   | -0.02     |
| July 24, 2014                      | 25886.63 | 14270.27 | 8041.72   | -0.03     |
| Sept 24, 2014                      | 25886.59 | 14270.28 | 8041.75   | 0.03      |
| October 30, 2014                   | 25886.58 | 14270.29 | 8041.69   | -0.06     |
| June 2, 2015                       | 25886.61 | 14270.36 | 8041.72   | 0.03      |
| June 30, 2015                      | 25886.59 | 14270.37 | 8041.74   | 0.02      |
| Sept. 11, 2015                     | 25886.63 | 14270.33 | 8041.72   | -0.02     |
| November 2, 2015                   | 25886.62 | 14270.39 | 8041.75   | 0.03      |
| May 11, 2016                       | 25886.62 | 14270.38 | 8041.70   | -0.05     |
| June 15, 2002                      | 25886.60 | 14270.35 | 8041.73   | 0.03      |
|                                    |          |          |           |           |
| MAXIMUM                            | 25886.66 | 14270.41 | 8041.79   | 0.05      |
| MINIMUM                            | 25886.58 | 14270.27 | 8041.69   | -0.06     |
| MOVEMENT                           | 0.08     | 0.14     | -0.05     |           |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SETTLEMENT MONITORING DATA - 2016**

STATION : PL-16

## Rebar

| DATE               | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|--------------------|----------|----------|-----------|-----------|
| Jul-12             | 26415.27 | 14216.70 | 8066.23   |           |
| Nov-12             | 26415.22 | 14216.73 | 8066.40   | 0.17      |
| Jun-13             | 26415.26 | 14216.69 | 8066.43   | 0.03      |
| Nov-13             | 26415.25 | 14216.72 | 8066.41   | -0.02     |
| Jan-14             | 26415.30 | 14216.76 | 8066.47   | 0.06      |
| Mar-14             | 26415.20 | 14216.72 | 8066.47   | 0.00      |
| New Survey Control |          |          |           |           |
| Jan-14             | 26414.49 | 14218.13 | 8067.71   |           |
| March 26, 2014     | 26414.43 | 14218.15 | 8067.74   | 0.03      |
| March 28, 2014     | 26414.44 | 14218.14 | 8067.73   | -0.01     |
| April 15, 2014     | 26414.47 | 14218.14 | 8067.75   | 0.02      |
| April 25, 2014     | 26414.45 | 14218.15 | 8067.73   | -0.02     |
| May 9, 2014        | 26414.44 | 14218.13 | 8067.70   | -0.03     |
| May 19, 2014       | 26414.44 | 14218.12 | 8067.73   | 0.03      |
| June 16, 2014      | 26414.47 | 14218.16 | 8067.73   | 0.00      |
| July 24, 2014      | 26414.44 | 14218.11 | 8067.71   | -0.02     |
| Sept 24, 2014      | 26414.44 | 14218.12 | 8067.70   | -0.01     |
| October 30, 2014   | 26414.44 | 14218.13 | 8067.68   | -0.02     |
| June 2, 2015       | 26414.45 | 14218.13 | 8067.70   | 0.02      |
| June 30, 2015      | 26414.43 | 14218.14 | 8067.71   | 0.01      |
| Sept. 11, 2015     | 26414.44 | 14218.12 | 8067.70   | -0.01     |
| November 2, 2015   | 26414.44 | 14218.11 | 8067.73   | 0.03      |
| May 11, 2016       | 26414.43 | 14218.14 | 8067.70   | -0.03     |
| June 15, 2002      | 26414.44 | 14218.14 | 8067.72   | 0.02      |
|                    |          |          |           |           |
| MAXIMUM            | 26414.49 | 14218.16 | 8067.75   | 0.03      |
| MINIMUM            | 26414.43 | 14218.11 | 8067.68   | -0.03     |
| MOVEMENT           | 0.06     | 0.05     | 0.01      |           |

**BOWIE RESOURCES - BOWIE NO. 2 MINE  
SETTLEMENT MONITORING DATA - 2016**

**STATION : PL-17 Rebar**

| DATE               | NORTHING | EASTING  | ELEVATION | -DOWN/+UP |
|--------------------|----------|----------|-----------|-----------|
| Jul-12             | 26719.78 | 13927.69 | 8088.85   |           |
| Nov-12             | 26719.75 | 13927.71 | 8088.76   | -0.09     |
| Jun-13             | 26719.82 | 13927.70 | 8088.85   | 0.09      |
| Nov-13             | 26719.77 | 13927.75 | 8088.85   | 0.00      |
| Jan-14             | 26719.75 | 13927.71 | 8088.82   | -0.03     |
| Mar-14             | 26719.74 | 13927.71 | 8088.87   | 0.05      |
| New Survey Control |          |          |           |           |
| Jan-14             | 26718.94 | 13929.04 | 8090.17   |           |
| March 26, 2014     | 26718.96 | 13929.12 | 8090.18   | 0.01      |
| March 28, 2014     | 26718.94 | 13929.11 | 8090.17   | -0.01     |
| April 15, 2014     | 26718.99 | 13929.09 | 8090.20   | 0.03      |
| April 25, 2014     | 26718.98 | 13929.12 | 8090.16   | -0.04     |
| May 9, 2014        | 26718.97 | 13929.10 | 8090.15   | -0.01     |
| May 19, 2014       | 26718.97 | 13929.06 | 8090.17   | 0.02      |
| June 16, 2014      | 26719.01 | 13929.16 | 8090.16   | -0.01     |
| July 24, 2014      | 26718.92 | 13929.10 | 8090.19   | 0.03      |
| Sept 24, 2014      | 26718.97 | 13929.12 | 8090.19   | 0.00      |
| October 30, 2014   | 26718.97 | 13929.11 | 8090.18   | -0.01     |
| June 2, 2015       | 26718.95 | 13929.07 | 8090.21   | 0.03      |
| June 30, 2015      | 26718.93 | 13929.09 | 8090.25   | 0.04      |
| Sept. 11, 2015     | 26718.97 | 13929.09 | 8090.20   | -0.05     |
| November 2, 2015   | 26718.96 | 13929.07 | 8090.21   | 0.01      |
| May 11, 2016       | 26718.97 | 13929.07 | 8090.16   | -0.05     |
| June 15, 2002      | 26719.02 | 13929.07 | 8090.20   | 0.04      |
|                    |          |          |           |           |
| MAXIMUM            | 26719.02 | 13929.16 | 8090.25   | 0.04      |
| MINIMUM            | 26718.92 | 13929.04 | 8090.15   | -0.05     |
| MOVEMENT           | 0.10     | 0.12     | 0.03      |           |