MBMG
Montana Bureau of Mines and Geology

Montana Bureau of Mines and Geology

May 8, 2018

Daryl Reed, Hydrogeologist
Montana Department of Environmental Quality
1225 Cedar St
P.O. Box 200901
Helena, MT 59620-0901

RE: CONTRACT NO. 415008-TO-2, BUTTE MINE FLOODING–APRIL 2018 MONTHLY REPORT, BMFOU CONSENT DECREE 02-35-BU-SEH

Dear Daryl:

Enclosed is the April 2018 monthly report for Contract No. 415008-TO-2, Butte Mine Flooding CD Monitoring. This report is in partial fulfillment of the terms contained in the Butte Mine Flooding Operable Unit Consent Decree-02-35-BU-SEH. The enclosed report briefly discusses the major activities undertaken during the month and presents data from monitoring activities.

Well BMF96-4 was vandalized during April with the direct read cable cut and transducer apparently removed; repairs were made to the flush mount well cap. A replacement cable and transducer will be ordered and the well casing will be checked using a downhole camera to make sure nothing was introduced into the casing.

Water level monitoring of the Granite Mountain Mine continues to be suspended due to an obstruction in the shaft and safety concerns around the mine headframe and shaft.

The Berkeley Pit water level was surveyed by Common Sense Engineering and Surveying on May 1, 2018 and was at an elevation of 5,346.38 feet.

Figures referenced in the report are contained on the enclosed compact disc in a PDF file format. If you have questions about the project, or the enclosed report, do not hesitate to contact me. Electronic copies of the report (text only) and water-level data have been sent to the required parties, per Appendix C of the Consent Decree.

Sincerely,

Ted Duaime

MONTANA TECH

MontanaTech
Natural Resources Building | 1300 West Park Street | Butte, MT 59701 | 406-496-4159 | www.mbmg.mtech.edu

Hydrogeologist

TD: cm
Enclosures

xc: Nikia Greene, EPA
Mark Thompson, MR
Steve Walsh, MR
Loren Burmeister, AR (elec. only)
Tim Hilmo, AR (all report - elec. only)
Irene Montero, AR (elec. only)
Jim Jonas, Copper (all report - elec. only)
Julia Crain, BSB (elec. only)
Dave Schultz, BSB Public Works (elec. only)
Eric Hassler, BSB (elec. only)
Mark Schaffer, PTS (elec. Only)
File
Chapin Storrar, CDM (elec. only)
Karen Sullivan, BSB (elec. only)
Jon Sesso, BSB Courthouse
Tom Malloy, BSB Courthouse (elec. only)
Matt Moore, BSB Metro Sewer (elec. only)
Brandon Warner, BSB (elec. only)
Rich Keeland, PTS (elec. only)
Rayelynn Brandl, CFWEP (elec. only)
Fritz Daily (elec. only)
Garrett Smith, DEQ-HRB (elec. Only)
CTEC

MBMG Butte Mine Flooding Monthly Report
BMFOU Consent Decree 02-35-BU-SEH
Remedial Action–Monitoring Program
Contract No. 415008-TO-2
April 2018

The Montana Bureau of Mines and Geology (MBMG) continued to perform monitoring and sampling activities for the Butte Mine Flooding Operable Unit (BMFOU), per the conditions of the 2002 Consent Decree as outlined in the Remedial Action Monitoring Program. Normal monthly activities include the monitoring of surface-water flows in the Horseshoe Bend (HSB) drainage, water-quality sampling of HSB, water-level monitoring, and report preparation. Additional activities included completion of 2016 annual report and providing results of March 2018 Berkeley Pit water samples. Montana Resources aided with access improvements and plowed access roads to numerous monitoring locations.

Safety concerns have led to the temporary suspension of water-level monitoring at the Granite Mountain Mine; an obstruction in the shaft at a depth of 420-ft has prevented the measurement of a water-level since July 2016. AR and MBMG personnel inspected all mine sites to identify potential future safety issues that may impact the long-term monitoring program. No immediate problems beyond the Granite Mountain site were identified.

Horseshoe Bend Monitoring

Data on surface-water flow were collected at two locations within the HSB drainage area, the HSB Falls seep and the total drainage flow just upstream of the water treatment plant. The last site is referred to as the HSB (weir) drainage. In an attempt to mitigate the iron fouling of the HSB Falls transducer, it is being changed out each month and brought back to the lab for complete cleaning. This is producing more reliable data. Flow at this site ceased on November 15th and the drainage remained dry through April.

The HSB weir was replaced with a larger rectangular weir during December 2015; as part of this upgrade the non-contact radar sensor and staff gauge were relocated. Quality assurance testing of the radar sensor was conducted during May 2016; the signal-to-noise (SNR) ratio was 47. A SNR value of 15 or above represents high quality data collection. The average SNR during April was 42.2. Based on test results and monthly readings, high quality data continues to be collected at this site.

The average flow rates for the month from the HSB sites are shown in Table 1, while a summary of average, maximum, minimum, and total flow for the HSB drainage site is attached at the end of the report (attachment 1). Graphs showing the daily average flow rates and cumulative flow rates are also attached (attachment 2).

Monitoring Site	Monthly Avg. Flow (gpm)	Change from Previous Month (gpm)
HSB Falls	0	0
HSB Drainage	2,890	244

Table 1. Monthly Average Flow Rates and Change from Previous Month for the Horseshoe Bend Sites.

MR continues to use a portion of the HSB water for the leach pads, which periodically change flows in this system. The first major use of HSB water occurred on September 20, 2012.

East Camp Alluvial System Monitoring

The East Camp alluvial groundwater monitoring system consists of the LP- and MR97-series wells located within the active mine area, plus selected AMC, GS, AMW, and BMF05-series wells. All of the wells associated with the four latter groups are located outside and to the south of the active mine area, with the exception of wells AMC-5 and AMC-15, which are within the active mine area. Table 2 summarizes the water-level changes for the alluvial wells and shows the maximum water-level increase and decrease within each group. Well AMC-10 has been dry since its installation. The water-level variations seen in well LP-15 are the result of the continued dewatering activities undertaken by MR to lower alluvial water levels. Graphs showing responses to pumping in well LP-15, and water levels for wells LP-15 and LP-16 are included on the accompanying compact disk; current and previous pumping influences are shown. Pressure transducers have been installed in wells LP-12, LP-13, and LP-16 to better monitor water-level fluctuations related to dewatering activities; hydrographs for these wells are included on the compact disk.

Well Series (No. Wells)	No. Wells Water Level Increased	No. Wells Water Level Decreased	Max. Water-Level Increase	Max. Water-Level Decrease
LP (14)	7	7	0.50	-0.51
MR97 (4)	4	0	0.47	—
AMC (7)	2	4	0.20	-0.31
GS (6)	6	0	0.27	—
AMW (3)	1	2	0.34	-0.21
BMF05 (4)	1	3	0.01	-0.10

Table 2. East Camp Alluvial Well Water-Level Changes.

Hydrographs for wells LP-1-LP-2-LP-4, LP-9-LP-10, and LP-14-LP-15-LP-16, showing the long-term trends are included on the accompanying compact disk. These wells are reflective of the general alluvial system within the active mine area and show greater variability, the result of historic and current mine operations and seasonal trends. Water levels in basin alluvial wells (wells outside the active mine area) increased at a majority of sites this month in response to seasonal climatic conditions.

A total of 24 alluvial wells within the East Camp system are equipped with pressure transducers to record water-level changes every hour. These detailed records provide information on the daily and seasonal changes that occur within the regional groundwater system. Copies of the monthly and long-term hydrographs for each of these sites are included on the accompanying compact disk. Influences from on-going dewatering activities are noticeable on these graphs.

Figure 1 shows daily average water levels for wells LP-14, AMC-8, and BMF05-3. Well LP-14 is located on the southern edge of the mine property, well AMC-8 is just south of LP-14 outside the mine area, and well BMF05-3 is farther south in the basin. Wells LP-14 and AMC-8 have shown periodic influences from mining activities while well BMF05-3 is outside the area of influence of current or historic mining activity. An increasing water-level trend (long-term) was noticeable in wells LP-14 and AMC-8 from 2003-2011 followed by a decline from 2012-2015, before rising in 2016. Water levels steadily declined through mid-2017 before leveling off and declining the later part of the year; water-level responses in both wells are similar. Water-levels in well BMF05-3 depict a more seasonal trend, with little overall net water-level change. The influence of irrigation wells near sites

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BMF05-3 and BMF05-4 during the summer and fall months is apparent on the monthly well hydrographs.

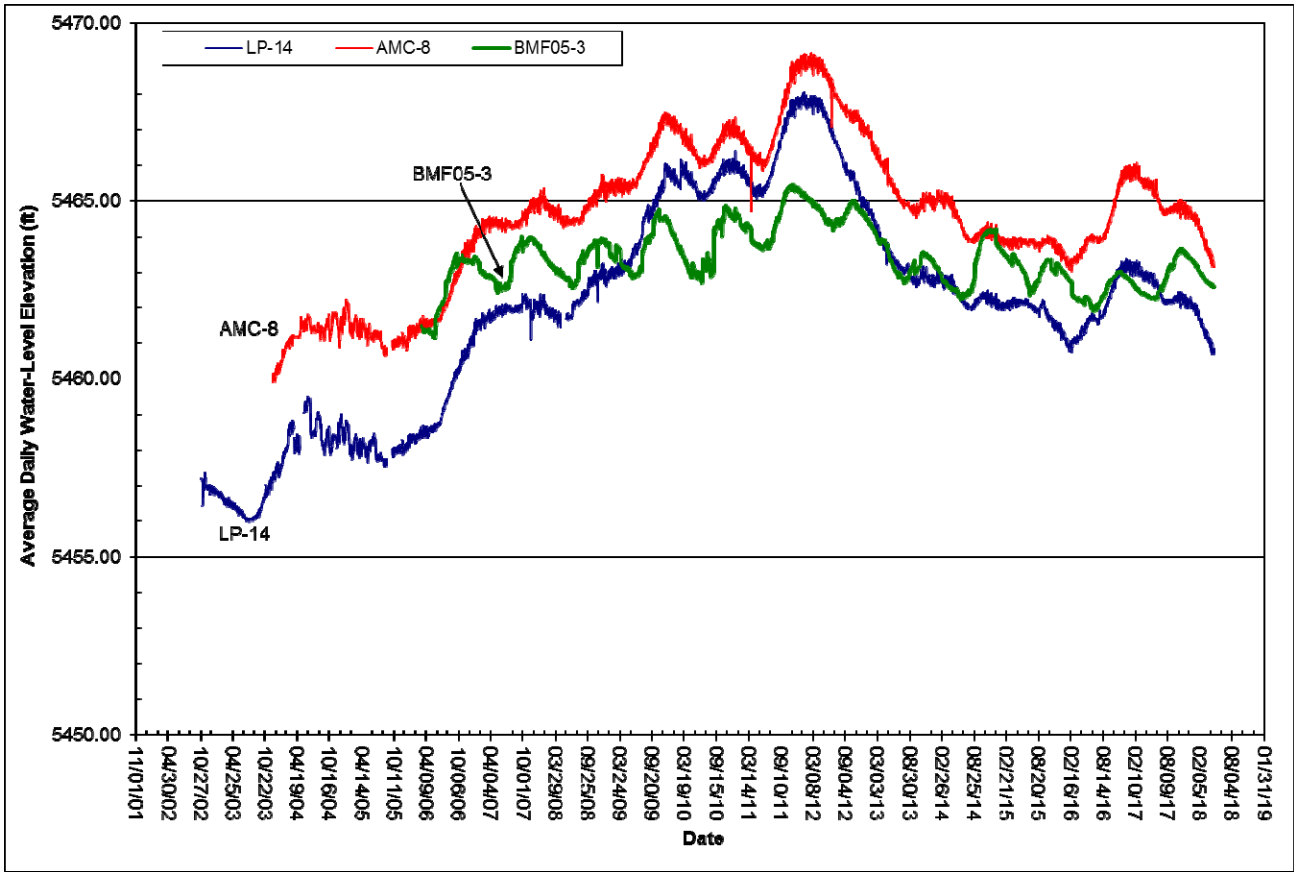

Figure 1. Hydrograph showing water-level elevations for alluvial wells LP-14, AMC-8, and BMF05-3.

The GS-series wells are three pairs of nested wells, a shallow and a deep well, within the alluvial aquifer. Figure 2 is a hydrograph showing the water levels for wells GS-41S and GS-41D. The water-level changes shown on this graph are similar to those for the other two groups of nested wells; water levels increase from snowmelt in late-spring and precipitation during the summer followed by water-level declines in the fall and winter.

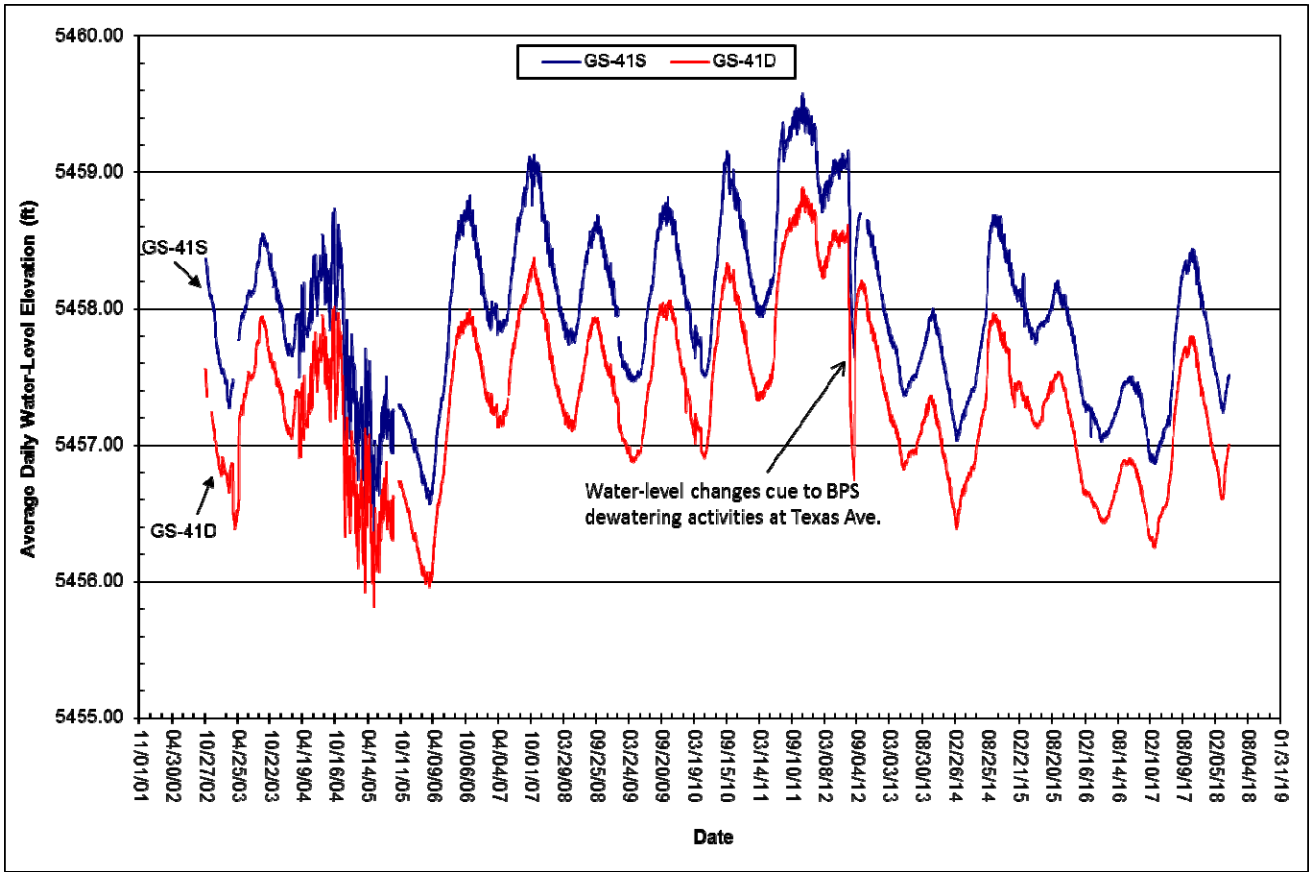

Figure 2. Hydrograph showing water-level elevations for alluvial wells GS-41S and GS-41D.

East Camp Mine and Bedrock System

The East Camp bedrock system consists of 6 underground mines, 13 bedrock wells within the active mine area, and 3 bedrock wells outside the active mine area. The latter wells are located at Hebgen, Parrot, and Belmont parks. The Berkeley Pit is also considered part of the East Camp bedrock monitoring system. Due to an obstruction in the Granite Mountain - mine shaft, no water-level was obtained at that site this month.

The 1994 Record of Decision (ROD) and 2002 Consent Decree (CD) established the maximum level that water in the East Camp bedrock system is allowed to rise to, and is based upon fourteen compliance points within that system. The compliance points are bedrock wells A, C, D-1, D-2, G, J, and Belmont well #2, plus the following mine shafts: Anselmo, Steward, Pilot Butte, Granite Mountain, Lexington, Kelley, and Continental Pit, or its monitoring well located at the Sarsfield Shaft. Under the conditions contained in the CD, the water level in the bedrock system cannot exceed the Critical Water Level (CWL) of 5,410 ft elevation at any of the compliance points, ensuring that the water level in the Berkeley Pit remains the lowest point within the East Camp bedrock system. Table 3 contains the most recent monthly water levels for selected compliance points and the Berkeley Pit, and the depth below the CWL. Currently, the water level is highest in the Pilot Butte Mine, with the water level 39.46 ft. below the CWL.

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Compliance Point	Monthly Water Level (ft)	Depth Below CWL (ft)
Anselmo Mine	5,368.32	41.68
Granite Mountain Mine	NR	—
Pilot Butte Mine	5,370. 54	39.46
Kelley Mine	5,358.24	51.76
Belmont Well #2	5,357. 95	52.05
Well A	5,358.54	51.46
Well C	5,352.51	57.49
Well G	5,362.24	47.76
Berkeley Pit	5,346.38	63.62

Table 3. Selected Compliance Points Monthly Water-Level Elevation and Depth Below Critical Water Level (CWL).

Copies of water-level data and graphs from selected sites are attached and included on the accompanying compact disk. Table 4 summarizes the water-level changes for the past month within the East Camp bedrock system, along with the maximum changes within each group of monitoring sites.

Monitoring Sites (No. Mines/Wells)	No. Sites Water Level Increased	No. Sites Water Level Decreased	Max. Water-Level Increase	Max. Water-Level Decrease
Mine Shafts (6)	5	—	0.65	—
Bedrock Wells within Active Mine Area (13)**	12	0	0.69	—
Bedrock Wells outside Active Mine Area (3)	2	1	0.69	-3.68

**Includes Belmont Well #2; well DDH-1 plugged, no water level obtained.
Table 4. East Camp Bedrock Water-Level Changes.

Within the East Camp bedrock system, a total of 10 wells and 5 mine shafts are equipped with pressure transducers that record hourly water-level changes. A transducer was installed in Belmont Well #2 the end of October 2017 to acquire additional water level data at this POC site.

Copies of the monthly and long-term hydrographs for each site are included with the accompanying compact disk. Figure 3 is a hydrograph showing a comparison of daily average water-level elevations for wells A, C, and G. Water levels continue an upward trend, reflecting groundwater recovery from historic dewatering associated with past mining practices.

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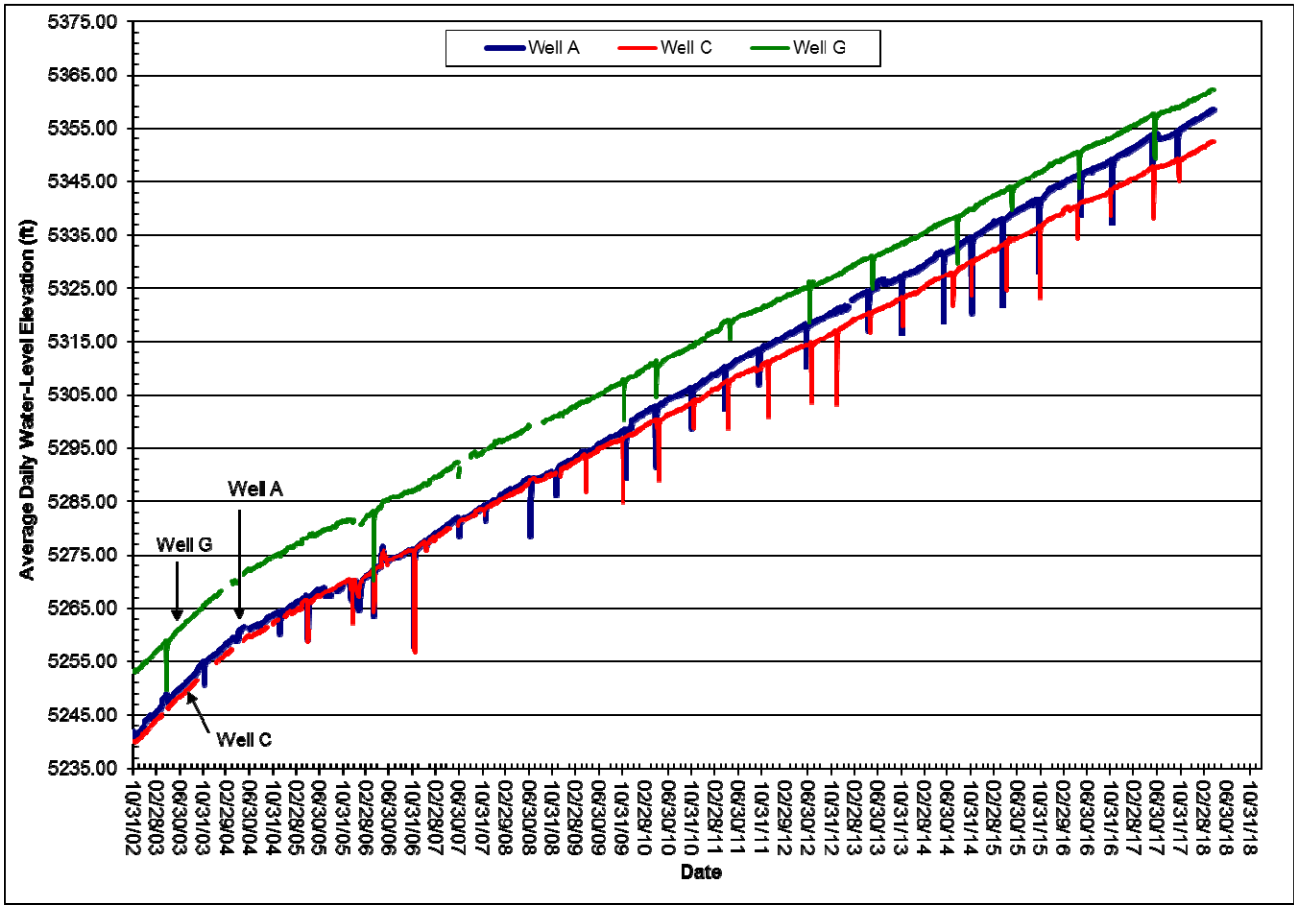

Figure 3. Hydrograph showing water-level elevations for bedrock wells A, C, and G.

West Camp System

The West Camp monitoring system consists of three underground mines: Emma, Ophir, Travona, and six monitoring wells. Table 5 summarizes the water-level changes for the past month within the West Camp bedrock system, along with the maximum changes within each group of monitoring sites.

Monitoring Sites (No. Mines/Wells)	No. Sites Water Level Increased	No. Sites Water Level Decreased	Max. Water-Level Increase	Max. Water-Level Decrease
Mine Shafts (3)	0	3	—	-0.13
Bedrock Wells (6)	2	4	2.47	-3.98

Table 5. West Camp Bedrock Water-Level Changes.

(Continued - page 7)

The ROD and CD established a CWL for the West Camp bedrock system of 5,435 ft, to be maintained at well BMF96-1D; the current water level is over 12 ft. below the West Camp's compliance point. Water levels in the West Camp underground mine system are controlled by pumping groundwater from well WCP-1, which is completed in the Travona Mine 800-level workings (approx. 500 ft below ground surface). More than 21.6 acre-ft of water was pumped this past month.

Six monitoring wells and two mines in the West Camp are equipped with pressure transducers that record water-level changes every hour. Two of the wells (BMF96-1D and BMF96-1S) are located adjacent to the WCP-1, with well BMF96-1D completed in the same mine workings as WCP-1; well BMF96-1S is completed in the shallow, weathered bedrock. Figure 4 is a hydrograph showing average daily water levels for the two mines and well BMF96-1D through April 2018. The water-level variations seen in these sites are the direct result of pumping changes relating to Butte Priority Soils (BPS) activities. Pumping rates during April varied between 170 and 180 gpm.

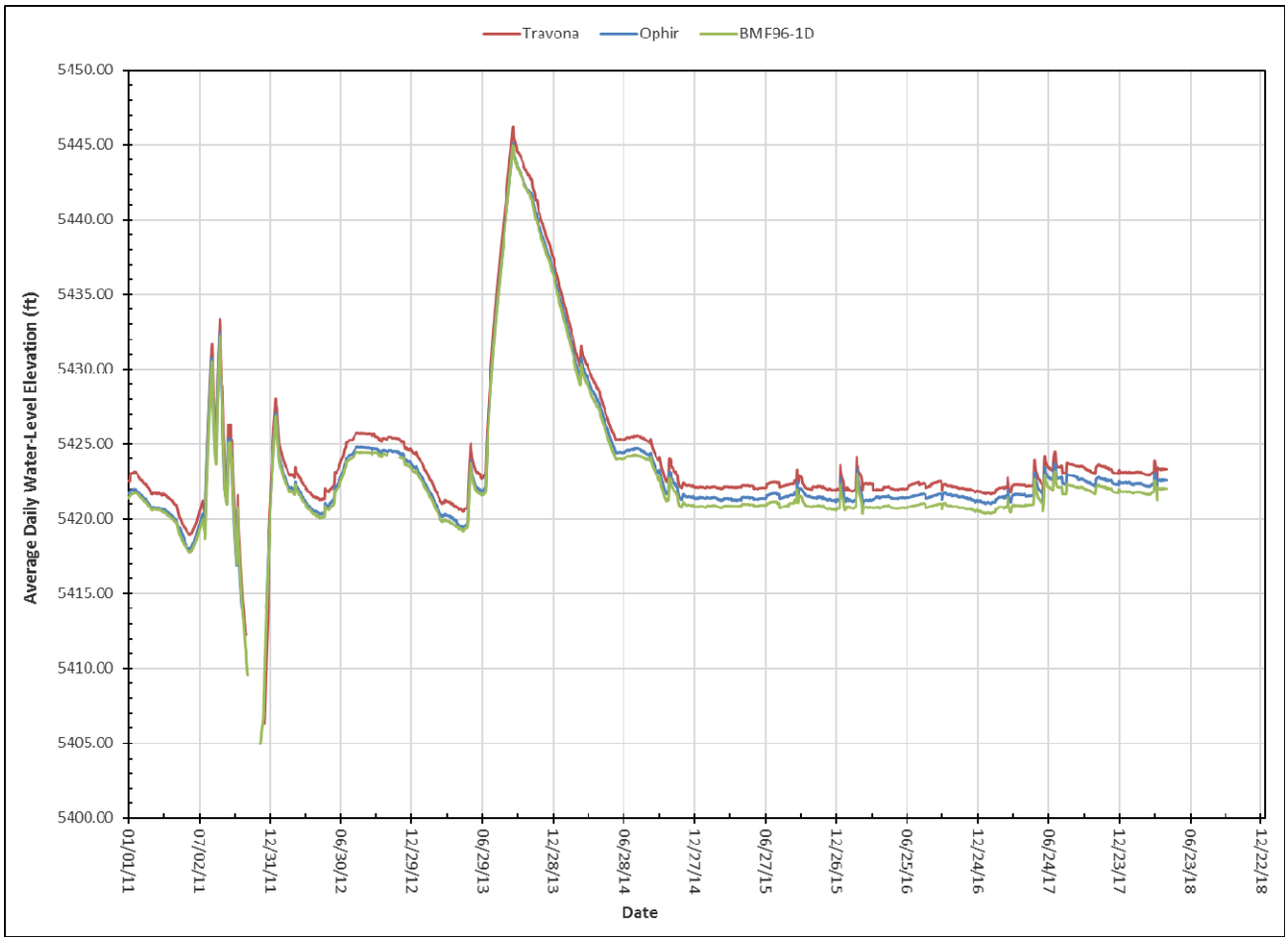

Figure 4. Water-level comparisons for the West Camp underground system.

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Outer Camp Systems

The Outer Camp monitoring system consists of two underground mines and bedrock well in the vicinity of each mine. Water levels increased at all four sites during April. The Outer Camp has no CWL or compliance monitoring points. Water levels in this area are assumed to be at or near pre-mining levels. Continuous water levels are monitored in the Orphan Boy and Marget Ann mines and Tech well by pressure transducers.

In addition to the four groundwater-monitoring sites, a seep (spring), referred to as the Green Lake Seep, is monitored for the quantity of water flowing from it. The flow from this site was 115 gpm this month.

Water-Quality Sampling

The monthly water sample was collected from the HSB drainage. Copies of results through March 2018 (sample collected 3/27/18) are attached.

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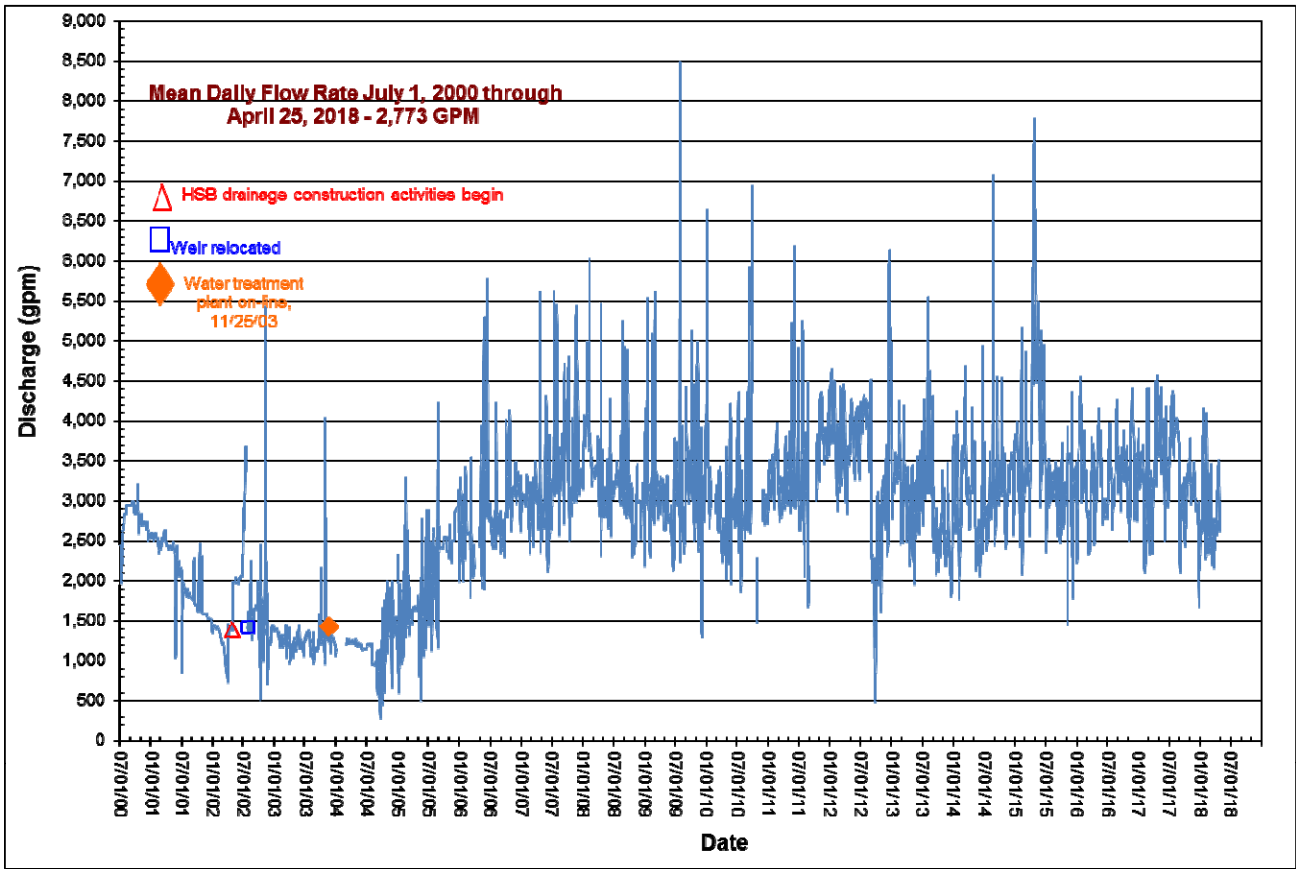
Attachment 1 Horseshoe Bend Drainage Monthly Flow Statistics

Monthly Statistics	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	July-17	Aug-17	Sept-17	Oct-17	Nov-17	Dec-17
Mean Flow (gpm)	3472	3093	2756	3627	3896	3258	3821	3869	2867	2963	3260	2771
Min Flow (gpm)	3153	2109	2327	3051	3344	2499	3362	3533	2106	2425	2963	1678
Max Flow (gpm)	3907	4404	3378	4567	4411	4185	4376	4323	3311	3466	3789	3177
Total Flow (MG)	150.0	129.2	119.1	146.2	190.7	136.0	154.1	189.4	119.7	140.8	131.4	119.7
Monthly Statistics	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	July-18	Aug-18	Sept-18	Oct-18	Nov-18	Dec-18
Mean Flow (gpm)	2888	2706	2646	2890								
Min Flow (gpm)	2141	2278	2166	2391								
Max Flow (gpm)	4164	4093	3458	3502								
Total Flow (MG)	120.6	128.6	102.9	120.7								

(Continued - page 10)

Attachment 2- Horseshoe Bend Drainage Flow Graphs



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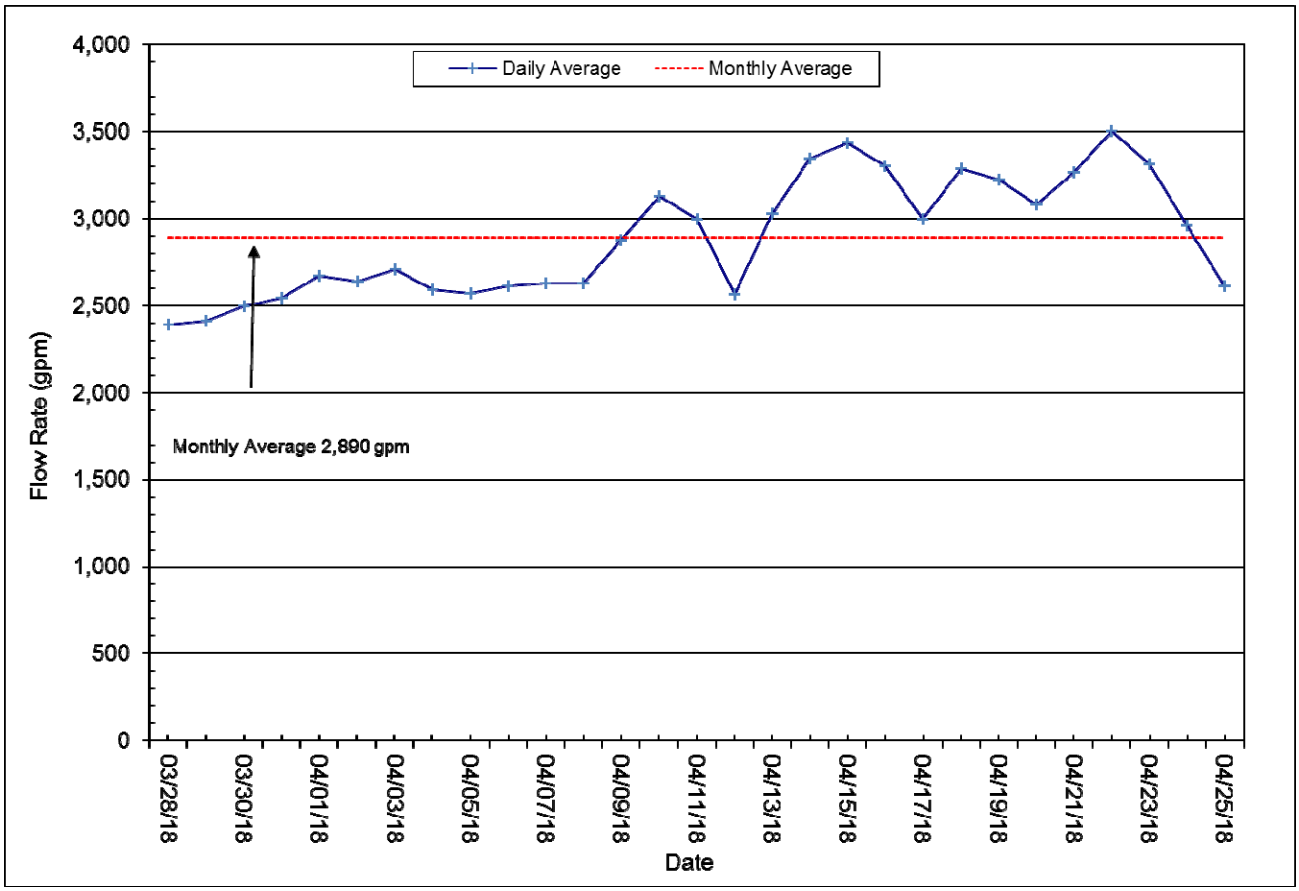


April 2018 Horseshoe Bend Flow Rate.

Montana Bureau of Mines and Geology
East Camp Alluvial Water-Level Elevations
Site Name/Monthly Elevations

DATE	LP-01	ELEV.	MO. DIFF	LP-02	ELEV.	MO. DIFF	LP-03	ELEV.	MO. DIFF	LP-04	ELEV.	MO. DIFF	LP-05	ELEV.	MO. DIFF	LP-06	ELEV.	MO. DIFF
MO/YR	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)
	TD-200'	SI-177-197'		TD-162'	SI-129.5-159.5'		TD-55.20'	SI-32-52'		TD-150'	SI-128-148'		TD-231'	SI-189-229'		TD-115'	SI-92.2-112.2'	
(MP Elev.)		5619.70			5624.70			5566.00			5585.50			5583.90			5713.18	
Jan-16	148.69	5471.01	-0.01	150.00	5474.70	0.03	P&A			111.99	5473.51	0.14	133.75	5450.15	-0.25	P&A		
Feb-16	148.70	5471.00	-0.01	150.02	5474.68	-0.02	P&A			111.97	5473.53	0.02	133.88	5450.02	-0.13	P&A		
Mar-16	149.00	5470.70	-0.30	150.29	5474.41	-0.27	P&A			111.68	5473.82	0.29	134.29	5449.61	-0.41	P&A		
Apr-16	148.70	5471.00	0.30	149.92	5474.78	0.37	P&A			111.41	5474.09	0.27	133.53	5450.37	0.76	P&A		
May-16	147.79	5471.91	0.91	148.93	5475.77	0.99	P&A			111.15	5474.35	0.26	133.31	5450.59	0.22	P&A		
Jun-16	147.88	5471.82	-0.09	148.99	5475.71	-0.06	P&A			111.20	5474.30	-0.05	133.55	5450.35	-0.24	P&A		
Jul-16	147.81	5471.89	0.07	149.01	5475.69	-0.02	P&A			111.11	5474.39	0.09	133.52	5450.38	0.03	P&A		
Aug-16	147.38	5472.32	0.43	148.54	5476.16	0.47	P&A			110.95	5474.55	0.16	133.43	5450.47	0.09	P&A		
Sep-16	147.39	5472.31	-0.01	148.61	5476.09	-0.07	P&A			111.05	5474.45	-0.10	133.62	5450.28	-0.19	P&A		
Oct-16	147.17	5472.53	0.22	148.61	5476.09	0.00	P&A			111.09	5474.41	-0.04	133.60	5450.30	0.02	P&A		
Nov-16	146.67	5473.03	0.50	147.98	5476.72	0.63	P&A			110.81	5474.69	0.28	133.28	5450.62	0.32	P&A		
Dec-16	146.73	5472.97	-0.06	148.07	5476.63	-0.09	P&A			111.00	5474.50	-0.19	133.62	5450.28	-0.34	P&A		
Yearly Change			**1.95**			**1.96**						**1.13**			**-0.12**			
Jan-17	146.93	5472.77	-0.20	148.44	5476.26	-0.37	P&A			111.27	5474.23	-0.27	133.86	5450.04	-0.24	P&A		
Feb-17	145.88	5473.82	1.05	147.27	5477.43	1.17	P&A			110.58	5474.92	0.69	132.31	5451.59	1.55	P&A		
Mar-17	146.23	5473.47	-0.35	147.74	5476.96	-0.47	P&A			110.99	5474.51	-0.41	132.75	5451.15	-0.44	P&A		
Apr-17	145.70	5474.00	0.53	147.17	5477.53	0.57	P&A			110.68	5474.82	0.31	132.41	5451.49	0.34	P&A		
May-17	145.79	5473.91	-0.09	147.37	5477.33	-0.20	P&A			110.96	5474.54	-0.28	132.63	5451.27	-0.22	P&A		
Jun-17	145.46	5474.24	0.33	147.03	5477.67	0.34	P&A			110.99	5474.51	-0.03	132.55	5451.35	0.08	P&A		
Jul-17	145.37	5474.33	0.09	147.28	5477.42	-0.25	P&A			110.97	5474.53	0.02	132.61	5451.29	-0.06	P&A		
Aug-17	145.11	5474.59	0.26	147.04	5477.66	0.24	P&A			110.82	5474.68	0.15	132.63	5451.27	-0.02	P&A		
Sep-17	145.21	5474.49	-0.10	147.23	5477.47	-0.19	P&A			110.92	5474.58	-0.10	132.85	5451.05	-0.22	P&A		
Oct-17	144.62	5475.08	0.59	146.57	5478.13	0.66	P&A			110.40	5475.10	0.52	132.43	5451.47	0.42	P&A		
Nov-17	144.83	5474.87	-0.21	146.88	5477.82	-0.31	P&A			110.59	5474.91	-0.19	132.64	5451.26	-0.21	P&A		
Dec-17	144.53	5475.17	0.30	146.51	5478.19	0.37	P&A			110.32	5475.18	0.27	132.54	5451.36	0.10	P&A		
Yearly Change			**2.20**			**1.56**						**0.68**			**1.08**			
Jan-18	144.39	5475.31	0.14	146.41	5478.29	0.10	P&A			110.37	5475.13	-0.05	132.74	5451.16	-0.20	P&A		
Feb-18	144.31	5475.39	0.08	146.34	5478.36	0.07	P&A			110.08	5475.42	0.29	132.38	5451.52	0.36	P&A		
Mar-18	144.43	5475.27	-0.12	146.50	5478.20	-0.16	P&A			110.14	5475.36	-0.06	132.56	5451.34	-0.18	P&A		
Apr-18	144.37	5475.33	0.06	146.35	5478.35	0.15	P&A			110.05	5475.45	0.09	132.06	5451.84	0.50	P&A		
May-18																		
Jun-18																		
Jul-18																		
Aug-18																		
Sep-18																		
Oct-18																		
Nov-18																		
Dec-18																		
Yearly Change			**0.16**			**0.16**						**0.27**			**0.48**			

Montana Bureau of Mines and Geology
East Camp Alluvial Water-Level Elevations
Site Name/Monthly Elevations

DATE	LP-07	ELEV.	MO. DIFF	LP-08	ELEV.	MO. DIFF	LP-09	ELEV.	MO. DIFF	LP-10	ELEV.	MO. DIFF	LP-11	ELEV.	MO. DIFF	LP-12	ELEV.	MO. DIFF
MO/YR	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)
	TD-101.50'	SI-93-98'		TD-100'	SI-81-96'		TD-107'	SI-82-102'		TD-169'	SI-132-162'		TD-284'	SI-247-277'		TD-133'	SI-110-130'	
(MP Elev.)		5617.00			5577.29			5561.52			5609.12			5609.61			5543.82	
Jan-16	98.35	5518.65	-0.25	94.13	5483.16	0.32	86.92	5474.60	-0.88	131.00	5478.12	-0.55	Plugged and abandoned			81.26	5462.56	-0.37
Feb-16	98.34	5518.66	-0.13	94.15	5483.14	-0.02	86.90	5474.62	0.02	131.27	5477.85	-0.27	Plugged and abandoned			81.55	5462.27	-0.29
Mar-16	98.96	5518.04	-0.41	94.58	5482.71	-0.43	87.68	5473.84	-0.78	131.37	5477.75	-0.10	Plugged and abandoned			81.49	5462.33	0.06
Apr-16	98.37	5518.63	0.76	93.75	5483.54	0.83	86.85	5474.67	0.83	132.08	5477.04	-0.71	Plugged and abandoned			81.39	5462.43	0.10
May-16	98.34	5518.66	0.22	93.59	5483.70	0.16	86.77	5474.75	0.08	131.10	5478.02	0.98	Plugged and abandoned			81.14	5462.68	0.25
Jun-16	98.36	5518.64	-0.24	93.58	5483.71	0.01	86.81	5474.71	-0.04	131.73	5477.39	-0.63	Plugged and abandoned			81.21	5462.61	-0.07
Jul-16	98.28	5518.72	0.03	93.66	5483.63	-0.08	86.91	5474.61	-0.10	131.90	5477.22	-0.17	Plugged and abandoned			81.05	5462.77	0.16
Aug-16	98.30	5518.70	0.09	93.45	5483.84	0.21	86.86	5474.66	0.05	131.81	5477.31	0.09	Plugged and abandoned			80.88	5462.94	0.17
Sep-16	98.40	5518.60	-0.19	93.61	5483.68	-0.16	87.03	5474.49	-0.17	132.03	5477.09	-0.22	Plugged and abandoned			80.66	5463.16	0.22
Oct-16	98.34	5518.66	0.02	93.72	5483.57	-0.11	87.32	5474.20	-0.29	132.08	5477.04	-0.05	Plugged and abandoned			80.69	5463.13	-0.03
Nov-16	98.25	5518.75	0.32	93.77	5483.52	-0.05	87.05	5474.47	0.27	131.98	5477.14	0.10	Plugged and abandoned			80.56	5463.26	0.13
Dec-16	98.21	5518.79	-0.34	93.84	5483.45	-0.07	87.18	5474.34	-0.13	132.17	5476.95	-0.19	Plugged and abandoned			80.54	5463.28	0.02
Yearly Change			**-0.12**			**0.61**			**-1.14**			**-1.72**						**0.35**
Jan-17	98.23	5518.77	-0.24	94.21	5483.08	-0.37	86.82	5474.70	0.36	132.37	5476.75	-0.20	Plugged and abandoned			80.50	5463.32	0.04
Feb-17	98.23	5518.77	1.55	93.99	5483.30	0.22	86.68	5474.84	0.14	132.14	5476.98	0.23	Plugged and abandoned			80.51	5463.31	-0.01
Mar-17	98.22	5518.78	-0.44	94.41	5482.88	-0.42	87.26	5474.26	-0.58	132.47	5476.65	-0.33	Plugged and abandoned			80.90	5462.92	-0.39
Apr-17	98.25	5518.75	0.34	94.28	5483.01	0.13	86.83	5474.69	0.43	132.39	5476.73	0.08	Plugged and abandoned			80.81	5463.01	0.09
May-17	98.24	5518.76	-0.22	94.76	5482.53	-0.48	86.99	5474.53	-0.16	132.61	5476.51	-0.22	Plugged and abandoned			81.11	5462.71	-0.30
Jun-17	98.25	5518.75	0.08	94.82	5482.47	-0.06	86.95	5474.57	0.04	132.72	5476.40	-0.11	Plugged and abandoned			81.36	5462.46	-0.25
Jul-17	98.25	5518.75	-0.06	94.81	5482.48	0.01	86.65	5474.87	0.30	132.68	5476.44	0.04	Plugged and abandoned			81.58	5462.24	-0.22
Aug-17	98.29	5518.71	-0.02	94.83	5482.46	-0.02	86.23	5475.29	0.42	132.84	5476.28	-0.16	Plugged and abandoned			81.62	5462.20	-0.04
Sep-17	98.27	5518.73	-0.22	94.75	5482.54	0.08	86.48	5475.04	-0.25	132.74	5476.38	0.10	Plugged and abandoned			81.69	5462.13	-0.07
Oct-17	98.31	5518.69	0.42	94.26	5483.03	0.49	85.95	5475.57	0.53	132.94	5476.18	-0.20	Plugged and abandoned			81.45	5462.37	0.24
Nov-17	98.29	5518.71	-0.21	94.37	5482.92	-0.11	86.64	5474.88	-0.69	132.88	5476.24	0.06	Plugged and abandoned			81.80	5462.02	-0.35
Dec-17	98.29	5518.71	0.10	94.09	5483.20	0.28	86.53	5474.99	0.11	132.83	5476.29	0.05	Plugged and abandoned			81.79	5462.03	0.01
Yearly Change			**1.08**			**-0.25**			**0.65**			**-0.66**						**-1.25**
Jan-18	98.21	5518.79	-0.20	93.86	5483.43	0.23	86.75	5474.77	-0.22	132.99	5476.13	-0.16	Plugged and abandoned			81.98	5461.84	-0.19
Feb-18	98.22	5518.78	0.36	93.67	5483.62	0.19	86.78	5474.74	-0.03	132.90	5476.22	0.09	Plugged and abandoned			82.32	5461.50	-0.34
Mar-18	98.21	5518.79	-0.18	93.59	5483.70	0.08	86.97	5474.55	-0.19	132.99	5476.13	-0.09	Plugged and abandoned			82.53	5461.29	-0.21
Apr-18	98.21	5518.79	0.50	93.44	5483.85	0.15	86.77	5474.75	0.20	133.30	5475.82	-0.31	Plugged and abandoned			82.87	5460.95	-0.34
May-18																		
Jun-18																		
Jul-18																		
Aug-18																		
Sep-18																		
Oct-18																		
Nov-18																		
Dec-18																		
Yearly Change			**0.48**			**0.65**			**-0.24**			**-0.47**						**-1.08**

Montana Bureau of Mines and Geology
East Camp Alluvial Water-Level Elevations
Site Name/Monthly Elevations

DATE MO/YR	LP-13 SWL (FT)	ELEV. (FT)	MO. DIFF (FT)	LP-14 SWL (FT)	ELEV. (FT)	MO. DIFF (FT)	LP-15 SWL (FT)	ELEV. (FT)	MO. DIFF (FT)	LP-16 SWL (FT)	ELEV. (FT)	MO. DIFF (FT)	*LP-17 SWL (FT)	ELEV. (FT)	MO. DIFF (FT)	LP-17R SWL (FT)	ELEV. (FT)	MO. DIFF (FT)
	TD-242'	SI-219-239'		TD-108.5'	SI-85-105'		TD-242.5'	SI-218.3-238.3'		TD-126'	SI-103.4-123.4'		TD-222'	SI-201-226'		TD-222'	SI-17-221'	
(MP Elev.)		5543.05			5525.68	5526.36		5520.23			5519.88			5623.34	5621.54		5619.09	
Jan-16	89.55	5453.50	-0.37	65.44	5460.92	-0.53	207.99	5312.24	-3.11	96.98	5422.90	-0.41	P&A			176.77	5442.32	-0.36
Feb-16	89.53	5453.52	0.02	65.42	5460.94	0.02	211.03	5309.20	-3.04	97.23	5422.65	-0.25	P&A			177.23	5441.86	-0.46
Mar-16	89.76	5453.29	-0.23	65.22	5461.14	0.20	209.92	5310.31	1.11	97.40	5422.48	-0.17	P&A			177.47	5441.62	-0.24
Apr-16	89.76	5453.29	0.00	65.03	5461.33	0.19	211.48	5308.75	-1.56	97.49	5422.39	-0.09	P&A			177.62	5441.47	-0.15
May-16	89.61	5453.44	0.15	64.72	5461.64	0.31	215.00	5305.23	-3.52	97.47	5422.41	0.02	P&A			177.51	5441.58	0.11
Jun-16	89.75	5453.30	-0.14	64.73	5461.63	-0.01	215.00	5305.23	0.00	97.49	5422.39	-0.02	P&A			177.66	5441.43	-0.15
Jul-16	88.46	5454.59	1.29	64.51	5461.85	0.22	201.72	5318.51	13.28	96.07	5423.81	1.42	P&A			177.17	5441.92	0.49
Aug-16	89.40	5453.65	-0.94	64.30	5462.06	0.21	NR			96.82	5423.06	-0.75	P&A			177.27	5441.82	-0.10
Sep-16	89.18	5453.87	0.22	63.94	5462.42	0.36	NR			96.77	5423.11	0.05	P&A			177.33	5441.76	-0.06
Oct-16	88.97	5454.08	0.21	63.57	5462.79	0.37	205.87	5314.36	-4.15	96.50	5423.38	0.27	P&A			177.23	5441.86	0.10
Nov-16	88.89	5454.16	0.08	63.48	5462.88	0.09	NR			96.58	5423.30	-0.08	P&A			176.95	5442.14	0.28
Dec-16	88.83	5454.22	0.06	63.19	5463.17	0.29	NR			96.58	5423.30	0.00	P&A			176.74	5442.35	0.21
Yearly Change			**0.35**			**1.72**			**-0.99**			**-0.01**			**0.00**			**-0.33**
Jan-17	88.86	5454.19	-0.03	63.48	5462.88	-0.29	NR			96.53	5423.35	0.05	P&A			176.65	5442.44	0.09
Feb-17	88.84	5454.21	0.02	63.14	5463.22	0.34	NR			96.28	5423.60	0.25	P&A			176.68	5442.41	-0.03
Mar-17	88.93	5454.12	-0.09	63.59	5462.77	-0.45	NR			96.12	5423.76	0.16	P&A			176.67	5442.42	0.01
Apr-17	88.99	5454.06	-0.06	63.46	5462.90	0.13	NR			96.17	5423.71	-0.05	P&A			176.64	5442.45	0.03
May-17	89.07	5453.98	-0.08	63.62	5462.74	-0.16	211.95	5308.28	-6.08	96.07	5423.81	0.10	P&A			176.85	5442.24	-0.21
Jun-17	89.03	5454.02	0.04	63.85	5462.51	-0.23	NR			96.09	5423.79	-0.02	P&A			176.93	5442.16	-0.08
Jul-17	89.07	5453.98	-0.04	64.20	5462.16	-0.35	NR			95.97	5423.91	0.12	P&A			176.81	5442.28	0.12
Aug-17	88.98	5454.07	0.09	64.11	5462.25	0.09	NR			95.87	5424.01	0.10	P&A			176.76	5442.33	0.05
Sep-17	88.97	5454.08	0.01	64.09	5462.27	0.02	NR			95.81	5424.07	0.06	P&A			176.76	5442.33	0.00
Oct-17	88.69	5454.36	0.28	63.94	5462.42	0.15	NR			95.51	5424.37	0.30	P&A			176.43	5442.66	0.33
Nov-17	88.78	5454.27	-0.09	64.34	5462.02	-0.40	NR			95.62	5424.26	-0.11	P&A			176.73	5442.36	-0.30
Dec-17	88.56	5454.49	0.22	64.25	5462.11	0.09	176.60	5343.63	35.35	95.22	5424.66	0.40	P&A			176.50	5442.59	0.23
Yearly Change			**0.27**			**-1.06**			**29.27**			**1.36**			**0.00**			**0.24**
Jan-18	88.84	5454.21	-0.28	64.64	5461.72	-0.39	177.93	5342.30	-1.33	95.35	5424.53	-0.13	P&A			176.55	5442.54	-0.05
Feb-18	89.01	5454.04	-0.17	64.98	5461.38	-0.34	178.19	5342.04	-0.26	95.46	5424.42	-0.11	P&A			176.76	5442.33	-0.21
Mar-18	89.05	5454.00	-0.04	65.29	5461.07	-0.31	177.53	5342.70	0.66	95.11	5424.77	0.35	P&A			176.73	5442.36	0.03
Apr-18	89.31	5453.74	-0.26	65.47	5460.89	-0.18	178.04	5342.19	-0.51	95.33	5424.55	-0.22	P&A			176.97	5442.12	-0.24
May-18																		
Jun-18																		
Jul-18																		
Aug-18																		
Sep-18																		
Oct-18																		
Nov-18																		
Dec-18																		
Yearly Change			**-0.75**			**-1.22**			**-1.44**			**-0.11**			**0.00**			**-0.47**

Montana Bureau of Mines and Geology
1997 Alluvial Wells - Periodic Water-Level Measurements
Montana Resources, Butte, MT

GWIC ID	166372			166373			166374			166375		
	97-1			97-2			97-3			97-4		
Date	SWL	Elevation*	Change	SWL	Elevation*	Change	SWL	Elevation*	Change	SWL	Elevation*	Change
	MP-ToS(ft)	5561.35	(ft)	MP-CT(ft)	5577.42	(ft)	MP-CT(ft)	5591.18	(ft)	MP-CT(ft)	5576.80	(ft)
07/28/16	42.47	5518.88	0.60	22.35	5555.07	0.02	6.71	5584.47	-0.14	25.37	5551.43	-0.17
08/30/16	42.51	5518.84	-0.04	21.93	5555.49	0.42	6.81	5584.37	-0.10	25.53	5551.27	-0.16
09/29/16	42.73	5518.62	-0.22	22.07	5555.35	-0.14	6.81	5584.37	0.00	25.80	5551.00	-0.27
11/02/16	43.10	5518.25	-0.37	22.39	5555.03	-0.32	6.82	5584.36	-0.01	26.03	5550.77	-0.23
12/02/16	43.32	5518.03	-0.22	22.35	5555.07	0.04	6.91	5584.27	-0.09	25.44	5551.36	0.59
12/28/16	43.70	5517.65	-0.38	22.47	5554.95	-0.12	7.11	5584.07	-0.20	25.54	5551.26	-0.10
01/27/17	43.79	5517.56	-0.09	22.41	5555.01	0.06	7.21	5583.97	-0.10	24.91	5551.89	0.63
02/28/17	43.35	5518.00	0.44	21.64	5555.78	0.77	6.36	5584.82	0.85	25.19	5551.61	-0.28
03/28/17	43.61	5517.74	-0.26	21.99	5555.43	-0.35	5.89	5585.29	0.47	25.51	5551.29	-0.32
04/26/17	42.88	5518.47	0.73	21.07	5556.35	0.92	5.44	5585.74	0.45	25.25	5551.55	0.26
06/02/17	42.94	5518.41	-0.06	21.68	5555.74	-0.61	5.75	5585.43	-0.31	25.02	5551.78	0.23
06/29/17	43.02	5518.33	-0.08	21.91	5555.51	-0.23	5.87	5585.31	-0.12	24.80	5552.00	0.22
07/27/17	42.99	5518.36	0.03	21.91	5555.51	0.00	5.83	5585.35	0.04	24.90	5551.90	-0.10
08/30/17	43.19	5518.16	-0.20	22.14	5555.28	-0.23	5.98	5585.20	-0.15	25.27	5551.53	-0.37
09/27/17	43.60	5517.75	-0.41	22.32	5555.10	-0.18	6.24	5584.94	-0.26	25.78	5551.02	-0.51
10/31/17	43.76	5517.59	-0.16	22.07	5555.35	0.25	6.24	5584.94	0.00	25.63	5551.17	0.15
11/28/17	43.84	5517.51	-0.08	22.04	5555.38	0.03	6.12	5585.06	0.12	25.51	5551.29	0.12
12/27/17	44.23	5517.12	-0.39	22.46	5554.96	-0.42	6.11	5585.07	0.01	24.86	5551.94	0.65
01/26/18	43.87	5517.48	0.36	21.96	5555.46	0.50	6.09	5585.09	0.02	23.71	5553.09	1.15
02/28/18	44.12	5517.23	-0.25	22.23	5555.19	-0.27	6.20	5584.98	-0.11	24.86	5551.94	-1.15
03/27/18	44.08	5517.27	0.04	22.31	5555.11	-0.08	5.76	5585.42	0.44	24.64	5552.16	0.22
04/25/18	43.76	5517.59	0.32	21.84	5555.58	0.47	5.31	5585.87	0.45	24.39	5552.41	0.25
Total Change			**3.67**			**3.47**			**0.95**			**4.52**

* Elevations are based on MR survey data using AMC datum, corrected to USGS.

Montana Bureau of Mines and Geology
Butte Mine Flooding Monitoring

GWIC ID		4597			4604			4611		
	DATE	AMC-5 SWL	Elevation	Mo Change	AMC-6 SWL	Elevation	Mo Change*	AMC-8 SWL	Elevation	Mo Change
			5509.21			5492.48	5489.62		5524.03	
	01/29/15	70.56	5438.65	0.53	30.82	5458.80	0.02	59.27	5464.76	-0.32
	02/24/15	70.28	5438.93	0.28	30.84	5458.78	-0.02	59.29	5464.74	-0.02
	03/30/15	70.09	5439.12	0.19	30.87	5458.75	-0.03	59.63	5464.40	-0.34
	04/30/15	70.07	5439.14	0.02	31.08	5458.54	-0.21	59.55	5464.48	0.08
	05/27/15	70.24	5438.97	-0.17	31.11	5458.51	-0.03	59.37	5464.66	0.18
	06/29/15	70.33	5438.88	-0.09	31.14	5458.48	-0.03	59.37	5464.66	0.00
	07/29/15	70.27	5438.94	0.06	31.13	5458.49	0.01	59.53	5464.50	-0.16
	08/28/15	70.08	5439.13	0.19	31.02	5458.60	0.11	59.50	5464.53	0.03
	09/29/15	70.22	5438.99	-0.14	30.98	5458.64	0.04	59.46	5464.57	0.04
	10/29/15	70.43	5438.78	-0.21	31.04	5458.58	-0.06	59.35	5464.68	0.11
	11/25/15	71.21	5438.00	-0.78	31.32	5458.30	-0.28	59.69	5464.34	-0.34
	01/05/16	71.97	5437.24	-0.76	31.71	5457.91	-0.39	59.84	5464.19	-0.15
Annual WL Change				**-0.88**			**-0.87**			**-0.89**
	01/26/16	72.41	5436.80	-0.44	31.95	5457.67	-0.24	60.07	5463.96	-0.23
	02/22/16	72.74	5436.47	-0.33	32.17	5457.45	-0.22	60.06	5463.97	0.01
	03/29/16	73.04	5436.17	-0.30	32.34	5457.28	-0.17	59.85	5464.18	0.21
	04/26/16	73.22	5435.99	-0.18	32.50	5457.12	-0.16	59.66	5464.37	0.19
	05/25/16	73.32	5435.89	-0.10	32.60	5457.02	-0.10	59.36	5464.67	0.30
	06/30/16	73.38	5435.83	-0.06	32.49	5457.13	0.11	59.31	5464.72	0.05
	07/26/16	73.18	5436.03	0.20	32.27	5457.35	0.22	59.37	5464.66	-0.06
	08/31/16	72.92	5436.29	0.26	32.01	5457.61	0.26	59.12	5464.91	0.25
	09/30/16	72.74	5436.47	0.18	31.90	5457.72	0.11	58.72	5465.31	0.40
	10/28/16	72.76	5436.45	-0.02	31.84	5457.78	0.06	57.89	5466.14	0.83
	11/25/16	72.80	5436.41	-0.04	31.88	5457.74	-0.04	57.67	5466.36	0.22
	12/27/16	72.81	5436.40	-0.01	31.98	5457.64	-0.10	57.38	5466.65	0.29
Annual WL Change				**-0.84**			**-0.27**			**2.46**
	01/26/17	72.85	5436.36	-0.04	32.12	5457.50	-0.14	57.68	5466.35	-0.30
	02/27/17	72.94	5436.27	-0.09	32.21	5457.41	-0.09	57.54	5466.49	0.14
	03/28/17	73.03	5436.18	-0.09	32.22	5457.40	-0.01	57.75	5466.28	-0.21
	04/25/17	73.04	5436.17	-0.01	32.26	5457.36	-0.04	57.85	5466.18	-0.10
	05/31/17	73.13	5436.08	-0.09	32.16	5457.46	0.10	58.02	5466.01	-0.17
	06/26/17	73.11	5436.10	0.02	32.01	5457.61	0.15	58.20	5465.83	-0.18
	07/26/17	73.05	5436.16	0.06	31.70	5457.92	0.31	58.62	5465.41	-0.42
	08/30/17	72.91	5436.30	0.14	31.39	5458.23	0.31	58.47	5465.56	0.15
	09/27/17	72.87	5436.34	0.04	31.23	5458.39	0.16	58.55	5465.48	-0.08
	10/30/17	72.72	5436.49	0.15	31.24	5458.38	-0.01	58.41	5465.62	0.14
	11/27/17	72.80	5436.41	-0.08	31.40	5458.22	-0.16	58.52	5465.51	-0.11
	12/27/17	72.81	5436.40	-0.01	31.56	5458.06	-0.16	58.69	5465.34	-0.17
Annual WL Change				**0.00**			**0.42**			**-1.31**
	01/25/18	72.87	5436.34	-0.06	31.83	5457.79	-0.27	59.06	5464.97	-0.37
	02/26/18	72.99	5436.22	-0.12	32.07	5457.55	-0.24	59.32	5464.71	-0.26
	03/26/18	73.02	5436.19	-0.03	32.09	5457.53	-0.02	59.77	5464.26	-0.45
	04/24/18	73.03	5436.18	-0.01	32.19	5457.43	-0.10	60.08	5463.95	-0.31
	05/30/18									
	06/30/18									
	07/30/18									
	08/30/18									
	09/30/18									
	10/30/18									
	11/30/18									
	12/30/18									
Annual WL Change				**-0.22**			**-0.63**			**-1.39**

* Well AMC-06 measuring point elevation changed Oct 04, re-surveyed Jan-10

Montana Bureau of Mines and Geology
Butte Mine Flooding Monitoring

GWIC ID		155569			4656			4673		
	DATE	AMC-10			AMC-12			AMC-13		
		SWL	Elevation	Mo Change	SWL	Elevation	Mo Change	SWL	Elevation	Mo Change
			5511.26			5479.58			5475.34	
	01/29/15	DRY			21.61	5457.97	-0.22	19.91	5455.43	-0.23
	02/24/15	DRY			21.67	5457.91	-0.06	19.96	5455.38	-0.05
	03/30/15	DRY			21.85	5457.73	-0.18	20.14	5455.20	-0.18
	04/30/15	DRY			21.96	5457.62	-0.11	20.93	5454.41	-0.79
	05/27/15	DRY			22.01	5457.57	-0.05	20.22	5455.12	0.71
	06/29/15	DRY			21.86	5457.72	0.15	20.09	5455.25	0.13
	07/29/15	DRY			21.73	5457.85	0.13	19.99	5455.35	0.10
	08/28/15	DRY			21.61	5457.97	0.12	19.92	5455.42	0.07
	09/29/15	DRY			21.52	5458.06	0.09	19.80	5455.54	0.12
	10/29/15	DRY			21.67	5457.91	-0.15	19.99	5455.35	-0.19
	11/25/15	DRY			21.85	5457.73	-0.18	20.17	5455.17	-0.18
	01/05/16	DRY			22.17	5457.41	-0.32	20.44	5454.90	-0.27
Annual WL Change				**0.00**			**-0.78**			**-0.76**
	01/26/16	DRY			22.36	5457.22	-0.19	20.58	5454.76	-0.14
	02/22/16	DRY			22.48	5457.10	-0.12	20.66	5454.68	-0.08
	03/29/16	DRY			22.63	5456.95	-0.15	20.75	5454.59	-0.09
	04/26/16	DRY			22.72	5456.86	-0.09	20.80	5454.54	-0.05
	05/25/16	DRY			22.77	5456.81	-0.05	20.79	5454.55	0.01
	06/30/16	DRY			22.61	5456.97	0.16	20.62	5454.72	0.17
	07/26/16	DRY			22.43	5457.15	0.18	20.45	5454.89	0.17
	08/31/16	DRY			22.19	5457.39	0.24	20.26	5455.08	0.19
	09/30/16	DRY			22.14	5457.44	0.05	20.27	5455.07	-0.01
	10/28/16	DRY			22.13	5457.45	0.01	20.23	5455.11	0.04
	11/25/16	DRY			22.28	5457.30	-0.15	20.37	5454.97	-0.14
	12/27/16	DRY			22.44	5457.14	-0.16	20.53	5454.81	-0.16
Annual WL Change				**0.00**			**-0.27**			**-0.09**
	01/26/17	DRY			22.68	5456.90	-0.24	20.77	5454.57	-0.24
	02/27/17	DRY			22.78	5456.80	-0.10	20.80	5454.54	-0.03
	03/28/17	DRY			22.75	5456.83	0.03	20.66	5454.68	0.14
	04/25/17	DRY			22.69	5456.89	0.06	20.60	5454.74	0.06
	05/31/17	DRY			22.41	5457.17	0.28	20.27	5455.07	0.33
	06/26/17	DRY			21.96	5457.62	0.45	19.81	5455.53	0.46
	07/26/17	DRY			21.62	5457.96	0.34	19.59	5455.75	0.22
	08/30/17	DRY			21.44	5458.14	0.18	19.52	5455.82	0.07
	09/27/17	DRY			21.38	5458.20	0.06	19.48	5455.86	0.04
	10/30/17	DRY			21.55	5458.03	-0.17	19.74	5455.60	-0.26
	11/27/17	DRY			21.75	5457.83	-0.20	19.90	5455.44	-0.16
	12/27/17	DRY			21.99	5457.59	-0.24	20.12	5455.22	-0.22
Annual WL Change				**0.00**			**0.45**			**0.41**
	01/25/18	DRY			22.21	5457.37	-0.22	20.33	5455.01	-0.21
	02/26/18	DRY			22.46	5457.12	-0.25	20.54	5454.80	-0.21
	03/26/18	DRY			22.46	5457.12	0.00	20.48	5454.86	0.06
	04/24/18	DRY			22.29	5457.29	0.17	20.28	5455.06	0.20
	05/30/18									
	06/30/18									
	07/30/18									
	08/30/18									
	09/30/18									
	10/30/18									
	11/30/18									
	12/30/18									
Annual WL Change				**0.00**			**-0.30**			**-0.16**

Montana Bureau of Mines and Geology
Butte Mine Flooding Monitoring

GWIC ID	4702		
DATE	AMC-15 SWL	Elevation	Mo Change
		5559.00	
01/29/15	91.94	5467.06	0.20
02/24/15	91.83	5467.17	0.11
03/30/15	92.03	5466.97	-0.20
04/30/15	92.32	5466.68	-0.29
05/27/15	92.51	5466.49	-0.19
06/29/15	92.71	5466.29	-0.20
07/29/15	93.03	5465.97	-0.32
08/28/15	93.14	5465.86	-0.11
09/29/15	93.04	5465.96	0.10
10/29/15	92.81	5466.19	0.23
11/25/15	92.63	5466.37	0.18
01/05/16	92.58	5466.42	0.05
Annual WL Change			**-0.44**
01/26/16	92.64	5466.36	-0.06
02/22/16	92.95	5466.05	-0.31
03/29/16	93.16	5465.84	-0.21
04/26/16	93.21	5465.79	-0.05
05/25/16	93.23	5465.77	-0.02
06/30/16	93.56	5465.44	-0.33
07/26/16	93.56	5465.44	0.00
08/31/16	93.69	5465.31	-0.13
09/30/16	93.71	5465.29	-0.02
10/28/16	93.49	5465.51	0.22
11/25/16	93.41	5465.59	0.08
12/27/16	93.04	5465.96	0.37
Annual WL Change			**-0.46**
01/26/17	93.23	5465.77	-0.19
02/27/17	93.16	5465.84	0.07
03/28/17	93.16	5465.84	0.00
04/25/17	93.29	5465.71	-0.13
05/31/17	93.32	5465.68	-0.03
06/26/17	93.34	5465.66	-0.02
07/26/17	93.61	5465.39	-0.27
08/30/17	93.48	5465.52	0.13
09/27/17	93.31	5465.69	0.17
10/30/17	92.88	5466.12	0.43
11/27/17	92.84	5466.16	0.04
12/27/17	92.62	5466.38	0.22
Annual WL Change			**0.42**
01/25/18	92.70	5466.30	-0.08
02/26/18	92.77	5466.23	-0.07
03/26/18	92.88	5466.12	-0.11
04/24/18	92.99	5466.01	-0.11
05/30/18			
06/30/18			
07/30/18			
08/30/18			
09/30/18			
10/30/18			
11/30/18			
12/30/18			
Annual WL Change			**-0.37**

Montana Bureau of Mines and Geology
Butte Mine Flooding Monitoring

GWIC ID	150401 GS-41S			150402 GS-41D			150409 GS-44S		
	SWL	ELEV.	Mo. Diff	SWL	ELEV.	Mo. Diff	SWL	ELEV.	Mo. Diff
		5491.90	(ft)		5491.30	5491.39		5476.20	**5478.45**
01/25/16	34.51	5457.39	-0.24	34.56	5456.83	-0.22	21.73	5456.72	-0.15
02/22/16	34.61	5457.29	-0.10	34.64	5456.75	-0.08	21.84	5456.61	-0.11
03/28/16	34.68	5457.22	-0.07	34.71	5456.68	-0.07	21.99	5456.46	-0.15
04/26/16	34.75	5457.15	-0.07	34.77	5456.62	-0.06	22.03	5456.42	-0.04
05/23/16	34.83	5457.07	-0.08	34.86	5456.53	-0.09	22.04	5456.41	-0.01
06/27/16	34.77	5457.13	0.06	34.78	5456.61	0.08	21.78	5456.67	0.26
07/26/16	34.68	5457.22	0.09	34.66	5456.73	0.12	21.56	5456.89	0.22
08/30/16	34.50	5457.40	0.18	34.46	5456.93	0.20	21.26	5457.19	0.30
09/30/16	34.44	5457.46	0.06	34.45	5456.94	0.01	21.25	5457.20	0.01
10/28/16	34.43	5457.47	0.01	34.44	5456.95	0.01	21.30	5457.15	-0.05
11/25/16	34.53	5457.37	-0.10	34.54	5456.85	-0.10	21.46	5456.99	-0.16
12/27/16	34.61	5457.29	-0.08	34.66	5456.73	-0.12	21.68	5456.77	-0.22
Yearly Change			**-0.34**			**-0.32**			**-0.10**
01/26/17	34.89	5457.01	-0.28	34.91	5456.48	-0.25	21.97	5456.48	-0.29
02/24/17	34.99	5456.91	-0.10	34.98	5456.41	-0.07	22.07	5456.38	-0.10
03/27/17	34.93	5456.97	0.06	34.87	5456.52	0.11	21.98	5456.47	0.09
04/25/17	34.80	5457.10	0.13	34.77	5456.62	0.10	21.90	5456.55	0.08
05/31/17	34.57	5457.33	0.23	34.52	5456.87	0.25	21.56	5456.89	0.34
06/26/17	34.15	5457.75	0.42	34.10	5457.29	0.42	20.98	5457.47	0.58
07/26/17	33.77	5458.13	0.38	33.76	5457.63	0.34	20.60	5457.85	0.38
08/30/17	33.61	5458.29	0.16	33.63	5457.76	0.13	20.39	5458.06	0.21
09/27/17	33.51	5458.39	0.10	33.53	5457.86	0.10	20.41	5458.04	-0.02
10/30/17	33.62	5458.28	-0.11	33.72	5457.67	-0.19	20.73	5457.72	-0.32
11/27/17	33.86	5458.04	-0.24	33.88	5457.51	-0.16	21.01	5457.44	-0.28
12/28/17	34.04	5457.86	-0.18	34.13	5457.26	-0.25	21.26	5457.19	-0.25
Yearly Change			**0.57**			**0.53**			**0.42**
01/25/18	34.26	5457.64	-0.22	34.32	5457.07	-0.19	21.54	5456.91	-0.28
02/26/18	34.54	5457.36	-0.28	34.60	5456.79	-0.28	21.79	5456.66	-0.25
03/26/18	34.60	5457.30	-0.06	34.52	5456.87	0.08	21.82	5456.63	-0.03
04/24/18	34.33	5457.57	0.27	34.33	5457.06	0.19	21.59	5456.86	0.23
05/30/18									
06/30/18									
07/30/18									
08/30/18									
09/30/18									
10/30/18									
11/30/18									
12/30/18									
Yearly Change			**-0.29**			**-0.20**			**-0.33**

Measuring point elevations changed October 2008 for wells GS-44S, GS-44D, GS-46S, and GS-46D

Montana Bureau of Mines and Geology
Butte Mine Flooding Monitoring

GWIC ID	150411 GS-44D			150412 GS-46S			150413 GS-46D		
	SWL	ELEV.	Mo. Diff	SWL	ELEV.	Mo. Diff	SWL	ELEV.	Mo. Diff
		5476.20	**5478.48**		5483.80	**5486.18**		5484.00	**5486.32**
01/25/16	22.52	5455.96	-0.15	27.12	5459.06	-0.14	27.17	5459.15	-0.17
02/22/16	22.59	5455.89	-0.07	27.37	5458.81	-0.25	27.38	5458.94	-0.21
03/28/16	22.71	5455.77	-0.12	27.61	5458.57	-0.24	27.57	5458.75	-0.19
04/26/16	22.76	5455.72	-0.05	27.76	5458.42	-0.15	27.69	5458.63	-0.12
05/23/16	22.76	5455.72	0.00	27.87	5458.31	-0.11	27.79	5458.53	-0.10
06/27/16	22.61	5455.87	0.15	27.75	5458.43	0.12	27.71	5458.61	0.08
07/26/16	22.41	5456.07	0.20	27.46	5458.72	0.29	27.43	5458.89	0.28
08/30/16	22.18	5456.30	0.23	27.10	5459.08	0.36	27.16	5459.16	0.27
09/30/16	22.18	5456.30	0.00	27.03	5459.15	0.07	27.08	5459.24	0.08
10/28/16	22.17	5456.31	0.01	27.02	5459.16	0.01	27.01	5459.31	0.07
11/25/16	22.31	5456.17	-0.14	27.16	5459.02	-0.14	27.11	5459.21	-0.10
12/27/16	22.49	5455.99	-0.18	27.31	5458.87	-0.15	27.22	5459.10	-0.11
Yearly Change			**-0.12**			**-0.33**			**-0.22**
01/26/17	22.73	5455.75	-0.24	27.53	5458.65	-0.22	27.42	5458.90	-0.20
02/24/17	22.79	5455.69	-0.06	27.71	5458.47	-0.18	27.57	5458.75	-0.15
03/27/17	22.68	5455.80	0.11	27.79	5458.39	-0.08	27.63	5458.69	-0.06
04/25/17	22.62	5455.86	0.06	27.78	5458.40	0.01	27.64	5458.68	-0.01
05/31/17	22.40	5456.08	0.22	27.64	5458.54	0.14	27.50	5458.82	0.14
06/26/17	21.82	5456.66	0.58	27.26	5458.92	0.38	27.17	5459.15	0.33
07/26/17	21.54	5456.94	0.28	26.66	5459.52	0.60	26.69	5459.63	0.48
08/30/17	21.43	5457.05	0.11	26.28	5459.90	0.38	26.37	5459.95	0.32
09/27/17	21.38	5457.10	0.05	26.16	5460.02	0.12	26.22	5460.10	0.15
10/30/17	21.64	5456.84	-0.26	26.31	5459.87	-0.15	26.31	5460.01	-0.09
11/27/17	21.83	5456.65	-0.19	26.57	5459.61	-0.26	26.53	5459.79	-0.22
12/28/17	22.08	5456.40	-0.25	26.82	5459.36	-0.25	26.75	5459.57	-0.22
Yearly Change			**0.41**			**0.49**			**0.47**
01/25/18	22.31	5456.17	-0.23	27.07	5459.11	-0.25	26.97	5459.35	-0.22
02/26/18	22.53	5455.95	-0.22	27.34	5458.84	-0.27	27.22	5459.10	-0.25
03/26/18	22.51	5455.97	0.02	27.53	5458.65	-0.19	27.39	5458.93	-0.17
04/24/18	22.31	5456.17	0.20	27.50	5458.68	0.03	27.38	5458.94	0.01
05/30/18									
06/30/18									
07/30/18									
08/30/18									
09/30/18									
10/30/18									
11/30/18									
12/30/18									
Yearly Change			**-0.23**			**-0.68**			**-0.63**

Measuring point elevations changed October 2008 for wells GS-44S, GS-44D, GS-46S, and GS-46D

Montana Bureau of Mines and Geology
Butte Mine Flooding Monitoring

GWIC ID	137598			247722			166182		
	AMW-8			AMW-20			AMW-22		
	SWL	ELEV.	Mo. Diff	SWL	Elev	Mo. Diff	SWL	ELEV.	Mo. Diff
		5496.34	**5496.05**	5486.78	5487.27	(ft)		5497.42	(ft)
01/25/16	37.99	5458.06	-0.26	28.40	5458.87	-0.33	39.24	5458.18	-0.19
02/22/16	38.16	5457.89	-0.17	28.46	5458.81	-0.06	39.44	5457.98	-0.20
03/28/16	38.25	5457.80	-0.09	28.73	5458.54	-0.27	39.64	5457.78	-0.20
04/26/16	38.37	5457.68	-0.12	28.93	5458.34	-0.20	39.76	5457.66	-0.12
05/23/16	38.50	5457.55	-0.13	29.00	5458.27	-0.07	39.88	5457.54	-0.12
06/27/16	38.48	5457.57	0.02	28.57	5458.70	0.43	39.84	5457.58	0.04
07/26/16	38.39	5457.66	0.09	28.27	5459.00	0.30	39.73	5457.69	0.11
08/30/16	38.23	5457.82	0.16	27.79	5459.48	0.48	39.46	5457.96	0.27
09/30/16	38.10	5457.95	0.13	27.79	5459.48	0.00	39.33	5458.09	0.13
10/28/16	38.06	5457.99	0.04	28.04	5459.23	-0.25	39.28	5458.14	0.05
11/25/16	38.12	5457.93	-0.06	28.19	5459.08	-0.15	39.12	5458.30	0.16
12/27/16	38.17	5457.88	-0.05	28.32	5458.95	-0.13	39.11	5458.31	0.01
Yearly Change			**-0.44**			**-0.25**			**-0.06**
01/26/17	38.37	5457.68	-0.20	28.69	5458.58	-0.37	39.17	5458.25	-0.06
02/24/17	38.55	5457.50	-0.18	28.95	5458.32	-0.26	39.26	5458.16	-0.09
03/27/17	38.51	5457.54	0.04	28.89	5458.38	0.06	39.34	5458.08	-0.08
04/25/17	38.46	5457.59	0.05	28.81	5458.46	0.08	39.37	5458.05	-0.03
05/31/17	38.32	5457.73	0.14	28.71	5458.56	0.10	39.35	5458.07	0.02
06/26/17	38.02	5458.03	0.30	28.33	5458.94	0.38	39.24	5458.18	0.11
07/26/17	37.63	5458.42	0.39	28.10	5459.17	0.23	38.97	5458.45	0.27
08/30/17	37.38	5458.67	0.25	28.08	5459.19	0.02	38.60	5458.82	0.37
09/27/17	37.31	5458.74	0.07	28.07	5459.20	0.01	38.37	5459.05	0.23
10/30/17	37.32	5458.73	-0.01	28.12	5459.15	-0.05	38.33	5459.09	0.04
11/27/17	37.51	5458.54	-0.19	28.44	5458.83	-0.32	38.45	5458.97	-0.12
12/28/17	37.68	5458.37	-0.17	28.56	5458.71	-0.12	38.64	5458.78	-0.19
Yearly Change			**0.49**			**-0.24**			**0.47**
01/25/18	37.89	5458.16	-0.21	28.77	5458.50	-0.21	38.83	5458.59	-0.19
02/26/18	38.08	5457.97	-0.19	28.96	5458.31	-0.19	39.07	5458.35	-0.24
03/26/18	38.22	5457.83	-0.14	28.29	5458.98	0.67	39.13	5458.29	-0.06
04/24/18	37.88	5458.17	0.34	28.50	5458.77	-0.21	39.34	5458.08	-0.21
05/30/18									
06/30/18									
07/30/18									
08/30/18									
09/30/18									
10/30/18									
11/30/18									
12/30/18									
Yearly Change			**-0.20**			**0.06**			**-0.70**

Montana Bureau of Mines and Geology
Butte Mine Flooding Monitoring

GWIC ID	222920			222921			224152		
	BMF05-1			BMF05-2			BMF05-3		
	SWL	ELEV.	Mo. Diff	SWL	ELEV.	Mo. Diff	SWL	ELEV.[1)]	Mo. Diff
		5481.95	(ft)		5504.96	(ft)	5501.29	5500.17	(ft)
01/25/16	23.90	5458.05	-0.22	43.60	5461.36	-0.19	37.32	5462.85	-0.19
02/22/16	24.05	5457.90	-0.15	43.72	5461.24	-0.12	37.81	5462.36	-0.49
03/28/16	24.26	5457.69	-0.21	43.83	5461.13	-0.11	37.87	5462.30	-0.06
04/26/16	24.42	5457.53	-0.16	43.86	5461.10	-0.03	37.79	5462.38	0.08
05/23/16	23.61	5458.34	0.81	43.92	5461.04	-0.06	37.96	5462.21	-0.17
06/27/16	24.36	5457.59	-0.75	43.98	5460.98	-0.06	38.10	5462.07	-0.14
07/26/16	24.13	5457.82	0.23	43.85	5461.11	0.13	37.91	5462.26	0.19
08/30/16	23.88	5458.07	0.25	43.69	5461.27	0.16	37.63	5462.54	0.28
09/30/16	23.79	5458.16	0.09	43.51	5461.45	0.18	37.41	5462.76	0.22
10/28/16	23.79	5458.16	0.00	43.26	5461.70	0.25	37.22	5462.95	0.19
11/25/16	23.88	5458.07	-0.09	43.13	5461.83	0.13	37.24	5462.93	-0.02
12/27/16	24.11	5457.84	-0.23	43.12	5461.84	0.01	37.32	5462.85	-0.08
Yearly Change			**-0.43**			**0.29**			**-0.19**
01/26/17	24.29	5457.66	-0.18	43.22	5461.74	-0.10	37.53	5462.64	-0.21
02/24/17	24.41	5457.54	-0.12	43.24	5461.72	-0.02	37.66	5462.51	-0.13
03/27/17	24.41	5457.54	0.00	43.28	5461.68	-0.04	37.76	5462.41	-0.10
04/25/17	24.43	5457.52	-0.02	43.36	5461.60	-0.08	37.84	5462.33	-0.08
05/31/17	24.21	5457.74	0.22	43.38	5461.58	-0.02	37.88	5462.29	-0.04
06/26/17	23.87	5458.08	0.34	43.32	5461.64	0.06	37.69	5462.48	0.19
07/26/17	23.56	5458.39	0.31	43.21	5461.75	0.11	37.59	5462.58	0.10
08/30/17	23.34	5458.61	0.22	42.90	5462.06	0.31	37.06	5463.11	0.53
09/27/17	23.24	5458.71	0.10	42.68	5462.28	0.22	36.69	5463.48	0.37
10/30/17	23.31	5458.64	-0.07	42.52	5462.44	0.16	36.54	5463.63	0.15
11/27/17	23.51	5458.44	-0.20	42.64	5462.32	-0.12	36.68	5463.49	-0.14
12/28/17	23.68	5458.27	-0.17	42.82	5462.14	-0.18	36.85	5463.32	-0.17
Yearly Change			**0.43**			**0.30**			**0.47**
01/25/18	23.93	5458.02	-0.25	42.99	5461.97	-0.17	37.02	5463.15	-0.17
02/26/18	24.15	5457.80	-0.22	43.32	5461.64	-0.33	37.31	5462.86	-0.29
03/26/18	24.12	5457.83	0.03	43.47	5461.49	-0.15	37.48	5462.69	-0.17
04/24/18	24.11	5457.84	0.01	43.55	5461.41	-0.08	37.58	5462.59	-0.10
05/30/18									
06/30/18									
07/30/18									
08/30/18									
09/30/18									
10/30/18									
11/30/18									
12/30/18									
Yearly Change			**-0.43**			**-0.73**			**-0.73**

1) Measuring point elevation changed April 2006 when well fitted with s

Montana Bureau of Mines and Geology
Butte Mine Flooding Monitoring

GWIC ID	224153		
	BMF05-4		
	SWL	ELEV.	Mo. Diff
		5542.37	(ft)
01/25/16	76.41	5465.96	-0.33
02/22/16	76.45	5465.92	-0.04
03/28/16	76.57	5465.80	-0.12
04/26/16	76.60	5465.77	-0.03
05/23/16	76.74	5465.63	-0.14
06/27/16	76.95	5465.42	-0.21
07/26/16	77.08	5465.29	-0.13
08/30/16	77.14	5465.23	-0.06
09/30/16	77.08	5465.29	0.06
10/28/16	76.83	5465.54	0.25
11/25/16	76.74	5465.63	0.09
12/27/16	76.19	5466.18	0.55
Yearly Change			**-0.11**
01/26/17	76.61	5465.76	-0.42
02/24/17	76.56	5465.81	0.05
03/27/17	76.58	5465.79	-0.02
04/25/17	76.70	5465.67	-0.12
05/31/17	76.77	5465.60	-0.07
06/26/17	76.85	5465.52	-0.08
07/26/17	77.07	5465.30	-0.22
08/30/17	76.91	5465.46	0.16
09/27/17	76.65	5465.72	0.26
10/30/17	76.24	5466.13	0.41
11/27/17	76.16	5466.21	0.08
12/28/17	76.04	5466.33	0.12
Yearly Change			**0.15**
01/25/18	75.97	5466.40	0.07
02/26/18	76.22	5466.15	-0.25
03/26/18	76.41	5465.96	-0.19
04/24/18	76.49	5465.88	-0.08
05/30/18			
06/30/18			
07/30/18			
08/30/18			
09/30/18			
10/30/18			
11/30/18			
12/30/18			
Yearly Change			**-0.45**

urface mount cap.

Montana Bureau of Mines and Geology
Bedrock Water-Level Elevations
East Camp Mines and Bedrock Wells
Site Name/Monthly Elevations

DATE	ANSELMO*	ELEV	MO. DIFF	BELMONT	ELEV	MO. DIFF	BERKELEY PIT	MO. DIFF	GRANITE MTN	ELEV	MO. DIFF	KELLEY	ELEV	MO. DIFF	STEWARD	ELEV	MO. DIFF	WELL A	ELEV	MO. DIFF
MO/YR	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	ELEV (FT)(1)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)
(MP Elev)	5783.80	5782.10			5604.00					6051.80		5877.52	5905.34	5906.27		5856.45			5525.00	5526.51
Jan-16	428.91	5353.19	0.59	NA			5331.91	0.64	706.40	5345.40	0.67	563.38	5342.89	0.66	508.09	5348.36	0.48	182.57	5343.94	0.27
Feb-16	428.56	5353.54	0.35	NA			5332.68	0.77	705.98	5345.82	0.42	562.96	5343.31	0.42	507.75	5348.70	0.34	181.99	5344.52	0.58
Mar-16	427.86	5354.24	0.70	NA			5333.37	0.69	705.29	5346.51	0.69	562.27	5344.00	0.69	507.09	5349.36	0.66	181.21	5345.30	0.78
Apr-16	427.36	5354.74	0.50	NA			5333.68	0.31	704.73	5347.07	0.56	561.92	5344.35	0.35	506.58	5349.87	0.51	180.60	5345.91	0.61
May-16	426.88	5355.22	0.48	NA			5333.98	0.30	704.19	5347.61	0.54	561.41	5344.86	0.51	506.04	5350.41	0.54	179.59	5346.92	1.01
Jun-16	426.38	5355.72	0.50	NA			5334.19	0.21	703.79	5348.01	0.40	561.00	5345.27	0.41	505.62	5350.83	0.42	179.74	5346.77	-0.15
Jul-16	426.16	5355.94	0.22	NA			5334.36	0.17	NR			560.71	5345.56	0.29	505.34	5351.11	0.28	179.38	5347.13	0.36
Aug-16	425.89	5356.21	0.27	NA			5334.67	0.31	NR			560.25	5346.02	0.46	505.04	5351.41	0.30	178.81	5347.70	0.57
Sep-16	425.27	5356.83	0.62	NA			5334.97	0.30	NR			559.69	5346.58	0.56	504.34	5352.11	0.70	178.52	5347.99	0.29
Oct-16	424.41	5357.69	0.86	NA			5335.73	0.76	NR			558.71	5347.56	0.98	503.38	5353.07	0.96	177.88	5348.63	0.64
Nov-16	423.75	5358.35	0.66	NA			5336.24	0.51	NR			558.02	5348.25	0.69	502.88	5353.57	0.50	176.97	5349.54	0.91
Dec-16	423.32	5358.78	0.43	NA			5336.79	0.55	NR			557.43	5348.84	0.59	502.26	5354.19	0.62	176.41	5350.10	0.56
Yearly Change			6.18					5.52			3.28			6.61			6.31			6.43
Jan-17	422.88	5359.22	0.44	NA			5337.67	0.88	NR			556.90	5349.37	0.53	501.80	5354.65	0.46	176.08	5350.43	0.33
Feb-17	422.49	5359.61	0.39	NA			5338.80	1.13	NR			556.43	5349.84	0.47	501.33	5355.12	0.47	175.15	5351.36	0.93
Mar-17	421.53	5360.57	0.96	NA			5339.30	0.50	NR			555.62	5350.65	0.81	500.38	5356.07	0.95	174.64	5351.87	0.51
Apr-17	420.92	5361.18	0.61	NA			5339.78	0.48	NR			555.56	5350.71	0.06	499.97	5356.48	0.41	173.83	5352.68	0.81
May-17	420.24	5361.86	0.68	NA			5340.27	0.49	NR			554.74	5351.53	0.82	499.44	5357.01	0.53	172.94	5353.57	0.89
Jun-17	418.68	5363.42	1.56	NA			5340.81	0.54	NR			553.55	5352.72	1.19	NR	0.00	0.00	172.58	5353.93	0.36
Jul-17	419.07	5363.03	-0.39	NA			5341.21	0.40	NR			552.65	5353.62	0.90	498.55	5357.90	0.89	173.38	5353.13	-0.80
Aug-17	418.62	5363.48	0.45	NA			5341.64	0.43	NR			552.26	5354.01	0.39	498.25	5358.20	0.30	173.09	5353.42	0.29
Sep-17	418.21	5363.89	0.41	NA			5342.29	0.65	NR			551.88	5354.39	0.38	497.63	5358.82	0.62	172.67	5353.84	0.42
Oct-17	417.38	5364.72	0.83	NA			5342.86	0.57	NR			551.16	5355.11	0.72	496.75	5359.70	0.88	171.73	5354.78	0.94
Nov-17	416.81	5365.29	0.57	NA			5343.32	0.46	NR			550.65	5355.62	0.51	496.26	5360.19	0.49	171.20	5355.31	0.53
Dec-17	416.21	5365.89	0.60	NA			5344.04	0.72	NR			550.16	5356.11	0.49	495.78	5360.67	0.48	170.47	5356.04	0.73
Yearly Change			7.11					7.25			0.00			7.27			6.48			5.94
Jan-18	415.63	5366.47	0.58	NA			5344.58	0.54	NR			549.68	5356.59	0.48	495.27	5361.18	0.51	169.87	5356.64	0.60
Feb-18	415.07	5367.03	0.56	NA			5345.09	0.51	NR			549.14	5357.13	0.54	494.74	5361.71	0.53	169.21	5357.30	0.66
Mar-18	414.49	5367.61	0.58	NA			5345.63	0.54	NR			548.64	5357.63	0.50	494.15	5362.30	0.59	168.66	5357.85	0.55
Apr-18	413.78	5368.32	0.71	NA			5346.38	0.75	NR			548.03	5358.24	0.61	493.50	5362.95	0.65	167.97	5358.54	0.69
May-18																				
Jun-18																				
Jul-18																				
Aug-18																				
Sep-18																				
Oct-18																				
Nov-18																				
Dec-18																				
Yearly Change			2.43					2.34			0.00			2.13			2.28			2.50

* Measuring point elevation changed 3/91.

Dec 1992 Kelley Mine SWL is 1/21/93 measurement.

Kelley Mine measuring point changed 6/99; 11/08 measuring point elevation change.

(1) 12/97 Berkeley Pit water level adjusted based upon Cashell Engineers survey data. Correction lowered water-level 1.11ft.

SWL - Static water-level, in feet, below ground surface
ELEV - Water-level elevation, in feet USGS Datum)
NA - No water-level available due to access problems or obstructions

Montana Bureau of Mines and Geology
Bedrock Water-Level Elevations
East Camp Mines and Bedrock Wells
Site Name/Monthly Elevations

DATE	WELL B	ELEV	MO. DIFF	WELL C	ELEV	MO. DIFF	WELL D-1	ELEV	MO. DIFF	WELL D-2	ELEV	MO. DIFF	WELL E	ELEV	MO. DIFF	WELL F	ELEV	MO. DIFF	WELL G	ELEV	MO. DIFF
MO/YR	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)
(MP Elev)		5557.82			5578.00			5591.54			5579.50			5562.40			5487.48			5537.56	
Jan-16	151.45	5406.37	-0.13	239.42	5338.58	0.35	250.72	5340.82	0.33	239.43	5340.07	0.19	166.15	5396.25	-0.39	33.78	5453.70	-0.40	188.87	5348.69	0.21
Feb-16	151.00	5406.82	0.45	238.95	5339.05	0.47	250.34	5341.20	0.38	238.81	5340.69	0.62	165.81	5396.59	0.34	33.98	5453.50	-0.20	188.42	5349.14	0.45
Mar-16	150.38	5407.44	0.62	238.33	5339.67	0.62	249.51	5342.03	0.83	238.20	5341.30	0.61	165.22	5397.18	0.59	34.12	5453.36	-0.14	187.78	5349.78	0.64
Apr-16	150.01	5407.81	0.37	237.78	5340.22	0.55	248.92	5342.62	0.59	237.64	5341.86	0.56	164.85	5397.55	0.37	34.20	5453.28	-0.08	187.21	5350.35	0.57
May-16	149.52	5408.30	0.49	237.12	5340.88	0.66	248.22	5343.32	0.70	236.71	5342.79	0.93	164.33	5398.07	0.52	34.31	5453.17	-0.11	187.43	5350.13	-0.22
Jun-16	149.06	5408.76	0.46	236.77	5341.23	0.35	247.83	5343.71	0.39	236.52	5342.98	0.19	164.33	5398.07	0.00	34.38	5453.10	-0.07	186.35	5351.21	1.08
Jul-16	148.81	5409.01	0.25	236.27	5341.73	0.50	247.59	5343.95	0.24	236.24	5343.26	0.28	164.04	5398.36	0.29	34.16	5453.32	0.22	185.76	5351.80	0.59
Aug-16	148.79	5409.03	0.02	235.88	5342.12	0.39	246.83	5344.71	0.76	235.55	5343.95	0.69	163.67	5398.73	0.37	33.97	5453.51	0.19	185.34	5352.22	0.42
Sep-16	148.48	5409.34	0.31	235.61	5342.39	0.27	246.65	5344.89	0.18	235.38	5344.12	0.17	163.54	5398.86	0.13	33.85	5453.63	0.12	185.12	5352.44	0.22
Oct-16	149.04	5408.78	-0.56	234.71	5343.29	0.90	247.41	5344.13	-0.76	234.17	5345.33	1.21	162.87	5399.53	0.67	33.71	5453.77	0.14	184.31	5353.25	0.81
Nov-16	146.79	5411.03	2.25	234.09	5343.91	0.62	245.00	5346.54	2.41	233.58	5345.92	0.59	162.33	5400.07	0.54	33.66	5453.82	0.05	183.68	5353.88	0.63
Dec-16	146.41	5411.41	0.38	233.63	5344.37	0.46	244.74	5346.80	0.26	233.26	5346.24	0.32	162.27	5400.13	0.06	33.73	5453.75	-0.07	183.18	5354.38	0.50
Yearly Change			4.91			6.14			6.31			6.36			3.49			-0.35			5.90
Jan-17	146.07	5411.75	0.34	233.09	5344.91	0.54	244.45	5347.09	0.29	232.81	5346.69	0.45	162.04	5400.36	0.23	33.84	5453.64	-0.11	182.64	5354.92	0.54
Feb-17	145.42	5412.40	0.65	232.37	5345.63	0.72	243.36	5348.18	1.09	232.23	5347.27	0.58	161.23	5401.17	0.81	33.95	5453.53	-0.11	181.98	5355.58	0.66
Mar-17	145.33	5412.49	0.09	232.02	5345.98	0.35	243.17	5348.37	0.19	231.80	5347.70	0.43	161.27	5401.13	-0.04	34.11	5453.37	-0.16	181.65	5355.91	0.33
Apr-17	144.80	5413.02	0.53	231.27	5346.73	0.75	242.92	5348.62	0.25	228.91	5350.59	2.89	160.77	5401.63	0.50	34.02	5453.46	0.09	180.92	5356.64	0.73
May-17	144.40	5413.42	0.40	230.48	5347.52	0.79	241.68	5349.86	1.24	230.21	5349.29	-1.30	161.97	5400.43	-1.20	33.86	5453.62	0.16	180.14	5357.42	0.78
Jun-17	143.88	5413.94	0.52	230.24	5347.76	0.24	241.04	5350.50	0.64	229.61	5349.89	0.60	160.29	5402.11	1.68	34.01	5453.47	-0.15	180.35	5357.21	-0.21
Jul-17	150.23	5407.59	-6.35	230.05	5347.95	0.19	240.60	5350.94	0.44	229.23	5350.27	0.38	160.77	5401.63	-0.48	33.61	5453.87	0.40	179.52	5358.04	0.83
Aug-17	150.22	5407.60	0.01	229.75	5348.25	0.30	240.19	5351.35	0.41	228.89	5350.61	0.34	160.53	5401.87	0.24	33.36	5454.12	0.25	179.26	5358.30	0.26
Sep-17	153.41	5404.41	-3.19	229.35	5348.65	0.40	239.82	5351.72	0.37	228.41	5351.09	0.48	160.36	5402.04	0.17	33.29	5454.19	0.07	178.94	5358.62	0.32
Oct-17	148.91	5408.91	4.50	228.95	5349.05	0.40	238.97	5352.57	0.85	227.73	5351.77	0.68	159.88	5402.52	0.48	33.03	5454.45	0.26	178.38	5359.18	0.56
Nov-17	148.17	5409.65	0.74	228.27	5349.73	0.68	238.59	5352.95	0.38	227.10	5352.40	0.63	159.58	5402.82	0.30	33.17	5454.31	-0.14	177.91	5359.65	0.47
Dec-17	147.43	5410.39	0.74	227.71	5350.29	0.56	238.01	5353.53	0.58	226.69	5352.81	0.41	159.30	5403.10	0.28	33.27	5454.21	-0.10	177.42	5360.14	0.49
Yearly Change			-1.02			5.92			6.73			6.57			2.97			0.46			5.76
Jan-18	146.69	5411.13	0.74	227.16	5350.84	0.55	237.61	5353.93	0.40	226.10	5353.40	0.59	158.91	5403.49	0.39	33.51	5453.97	-0.24	176.89	5360.67	0.53
Feb-18	145.90	5411.92	0.79	226.55	5351.45	0.61	236.87	5354.67	0.74	225.43	5354.07	0.67	158.57	5403.83	0.34	33.64	5453.84	-0.13	176.29	5361.27	0.60
Mar-18	145.52	5412.30	0.38	225.96	5352.04	0.59	236.49	5355.05	0.38	225.03	5354.47	0.40	158.47	5403.93	0.10	33.74	5453.74	-0.10	175.84	5361.72	0.45
Apr-18	145.09	5412.73	0.43	225.49	5352.51	0.47	235.92	5355.62	0.57	224.64	5354.86	0.39	158.35	5404.05	0.12	33.67	5453.81	0.07	175.32	5362.24	0.52
May-18																					
Jun-18																					
Jul-18																					
Aug-18																					
Sep-18																					
Oct-18																					
Nov-18																					
Dec-18																					
Yearly Change			2.34			2.22			2.09			2.05			0.95			-0.40			2.10

SWL - Static water-level, in feet, below ground surface
ELEV - Water-level elevation, in feet USGS Datum)
NA - No water-level available due to access problems or obstructions
East Camp-Bdr-Sites-SWL

Montana Bureau of Mines and Geology
Bedrock Water-Level Elevations
East Camp Mines and Bedrock Wells
Site Name/Monthly Elevations

DATE	WELL H	ELEV	MO. DIFF	WELL J	ELEV	MO. DIFF	DDH-1	ELEV	MO. DIFF	DDH-2	ELEV	MO. DIFF	DDH-4	ELEV	MO. DIFF	DDH-5	ELEV	MO. DIFF	DDH-8	ELEV	MO. DIFF
MO/YR	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)****	(FT)	(FT)	SWL (FT)	(FT)	(FT)
(MP Elev)		5572.82		5530.03	5530.99			5509.60			5583.60			5545.41			5519.56	5523.75		5518.40	
Jan-16	Plugged&abandoned			196.85	5334.14	0.41	plugged			244.61	5338.99	0.37				Plugged&abandoned			138.90	5379.50	0.01
Feb-16	Plugged&abandoned			196.18	5334.81	0.67	plugged			244.11	5339.49	0.50				Plugged&abandoned			138.60	5379.80	0.30
Mar-16	Plugged&abandoned			195.65	5335.34	0.53	plugged			243.40	5340.20	0.71				Plugged&abandoned			138.11	5380.29	0.49
Apr-16	Plugged&abandoned			195.04	5335.95	0.61	plugged			242.80	5340.80	0.60				Plugged&abandoned			137.75	5380.65	0.36
May-16	Plugged&abandoned			194.41	5336.58	0.63	plugged			242.06	5341.54	0.74				Plugged&abandoned			137.28	5381.12	0.47
Jun-16	Plugged&abandoned			194.12	5336.87	0.29	plugged			241.78	5341.82	0.28				Plugged&abandoned			137.25	5381.15	0.03
Jul-16	Plugged&abandoned			193.84	5337.15	0.28	plugged			241.57	5342.03	0.21				Plugged&abandoned			137.04	5381.36	0.21
Aug-16	Plugged&abandoned			193.35	5337.64	0.49	plugged			240.96	5342.64	0.61				Plugged&abandoned			136.29	5382.11	0.75
Sep-16	Plugged&abandoned			192.58	5338.41	0.77	plugged			240.66	5342.94	0.30				Plugged&abandoned			136.16	5382.24	0.13
Oct-16	Plugged&abandoned			191.84	5339.15	0.74	plugged			239.53	5344.07	1.13				Plugged&abandoned			135.53	5382.87	0.63
Nov-16	Plugged&abandoned			191.21	5339.78	0.63	plugged			238.88	5344.72	0.65				Plugged&abandoned			135.11	5383.29	0.42
Dec-16	Plugged&abandoned			190.65	5340.34	0.56	plugged			239.37	5344.23	-0.49				Plugged&abandoned			134.89	5383.51	0.22
Yearly Change						6.61						5.61									4.02
Jan-17	Plugged&abandoned			190.14	5340.85	0.51	plugged			237.99	5345.61	1.38				Plugged&abandoned			134.63	5383.77	0.26
Feb-17	Plugged&abandoned			189.52	5341.47	0.62	plugged			237.25	5346.35	0.74				Plugged&abandoned			133.96	5384.44	0.67
Mar-17	Plugged&abandoned			188.88	5342.11	0.64	plugged			236.62	5346.98	0.63				Plugged&abandoned			133.77	5384.63	0.19
Apr-17	Plugged&abandoned			188.16	5342.83	0.72	plugged			235.68	5347.92	0.94				Plugged&abandoned			133.11	5385.29	0.66
May-17	Plugged&abandoned			187.34	5343.65	0.82	plugged			235.08	5348.52	0.60				Plugged&abandoned			132.61	5385.79	0.50
Jun-17	Plugged&abandoned			186.82	5344.17	0.52	plugged			234.43	5349.17	0.65				Plugged&abandoned			132.21	5386.19	0.40
Jul-17	Plugged&abandoned			186.53	5344.46	0.29	plugged			234.30	5349.30	0.13				Plugged&abandoned			132.16	5386.24	0.05
Aug-17	Plugged&abandoned			186.23	5344.76	0.30	plugged			234.03	5349.57	0.27				Plugged&abandoned			132.43	5385.97	-0.27
Sep-17	Plugged&abandoned			185.71	5345.28	0.52	plugged			233.57	5350.03	0.46				Plugged&abandoned			132.29	5386.11	0.14
Oct-17	Plugged&abandoned			185.00	5345.99	0.71	plugged			232.88	5350.72	0.69				Plugged&abandoned			131.88	5386.52	0.41
Nov-17	Plugged&abandoned			184.35	5346.64	0.65	plugged			232.24	5351.36	0.64				Plugged&abandoned			131.53	5386.87	0.35
Dec-17	Plugged&abandoned			183.85	5347.14	0.50	plugged			231.70	5351.90	0.54				Plugged&abandoned			131.03	5387.37	0.50
Yearly Change						6.80						7.67									3.86
Jan-18	Plugged&abandoned			183.18	5347.81	0.67	plugged			231.08	5352.52	0.62				Plugged&abandoned			130.52	5387.88	0.51
Feb-18	Plugged&abandoned			182.61	5348.38	0.57	plugged			231.48	5352.12	-0.40				Plugged&abandoned			130.07	5388.33	0.45
Mar-18	Plugged&abandoned			182.04	5348.95	0.57	plugged			229.92	5353.68	1.56				Plugged&abandoned			129.82	5388.58	0.25
Apr-18	Plugged&abandoned			181.40	5349.59	0.64	plugged			229.28	5354.32	0.64				Plugged&abandoned			129.33	5389.07	0.49
May-18																					
Jun-18																					
Jul-18																					
Aug-18																					
Sep-18																					
Oct-18																					
Nov-18																					
Dec-18																					
Yearly Change						2.45						2.42									1.70

**** Measuring point elevation changed 7/96, due to reclamation activities.

SWL - Static water-level, in feet, below ground surface
ELEV - Water-level elevation, in feet USGS Datum)
NA - No water-level available due to access problems or obstructions

Montana Bureau of Mines and Geology
Bedrock Water-Level Elevations
East Camp Mines and Bedrock Wells
Site Name/Monthly Elevations

DATE	LEXINGTON	ELEV	MO. DIFF	MISSOULA	ELEV	MO. DIFF	PILOT BUTTE	ELEV	MO. DIFF	BELMONT 1	ELEV	MO. DIFF	BELMONT 2	ELEV	MO. DIFF
MO/YR	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)	SWL (FT)	(FT)	(FT)
(MP Elev)		6216.59			6030.00			6056.98			5600.82			5602.72	
Jan-16	864.49	5352.10	0.52	NA			701.41	5355.57	0.63	132.10	5468.72	-3.45	260.23	5342.49	0.19
Feb-16	864.08	5352.51	0.41	NA			701.01	5355.97	0.40	136.73	5464.09	-4.63	259.66	5343.06	0.57
Mar-16	863.45	5353.14	0.63	NA			700.35	5356.63	0.66	142.88	5457.94	-6.15	258.97	5343.75	0.69
Apr-16	862.92	5353.67	0.53	NA			699.75	5357.23	0.60	146.52	5454.30	-3.64	258.21	5344.51	0.76
May-16	862.45	5354.14	0.47	NA			699.20	5357.78	0.55	149.44	5451.38	-2.92	257.72	5345.00	0.49
Jun-16	861.94	5354.65	0.51	NA			698.65	5358.33	0.55	148.52	5452.30	0.92	257.15	5345.57	0.57
Jul-16	861.72	5354.87	0.22	NA			698.45	5358.53	0.20	140.61	5460.21	7.91	256.91	5345.81	0.24
Aug-16	861.37	5355.22	0.35	NA			698.17	5358.81	0.28	134.23	5466.59	6.38	256.46	5346.26	0.45
Sep-16	860.80	5355.79	0.57	NA			697.59	5359.39	0.58	131.24	5469.58	2.99	256.11	5346.61	0.35
Oct-16	859.92	5356.67	0.88	NA			696.73	5360.25	0.86	127.81	5473.01	3.43	254.97	5347.75	1.14
Nov-16	859.21	5357.38	0.71	NA			697.59	5359.39	-0.86	124.24	5476.58	3.57	254.36	5348.36	0.61
Dec-16	858.56	5358.03	0.65	NA			697.15	5359.83	0.44	123.48	5477.34	0.76	253.81	5348.91	0.55
Yearly Change			6.45						4.89			5.17			6.61
Jan-17	858.11	5358.48	0.45	NA			696.63	5360.35	0.52	126.54	5474.28	-3.06	253.52	5349.20	0.29
Feb-17	857.56	5359.03	0.55	NA			696.11	5360.87	0.52	130.43	5470.39	-3.89	252.81	5349.91	0.71
Mar-17	856.78	5359.81	0.78	NA			695.26	5361.72	0.85	133.97	5466.85	-3.54	252.08	5350.64	0.73
Apr-17	856.24	5360.35	0.54	NA			694.67	5362.31	0.59	137.31	5463.51	-3.34	251.31	5351.41	0.77
May-17	855.53	5361.06	0.71	NA			693.74	5363.24	0.93	139.29	5461.53	-1.98	250.39	5352.33	0.92
Jun-17	854.57	5362.02	0.96	NA			692.19	5364.79	1.55	134.97	5465.85	4.32	249.53	5353.19	0.86
Jul-17	854.59	5362.00	-0.02	NA			691.19	5365.79	1.00	122.21	5478.61	12.76	249.49	5353.23	0.04
Aug-17	854.44	5362.15	0.15	NA			690.85	5366.13	0.34	117.54	5483.28	4.67	249.28	5353.44	0.21
Sep-17	854.33	5362.26	0.11	NA			690.73	5366.25	0.12	116.86	5483.96	0.68	248.82	5353.90	0.46
Oct-17	853.63	5362.96	0.70	NA			689.71	5367.27	1.02	116.64	5484.18	0.22	248.11	5354.61	0.71
Nov-17	853.04	5363.55	0.59	NA			689.24	5367.74	0.47	117.71	5483.11	-1.07	247.54	5355.18	0.57
Dec-17	852.42	5364.17	0.62	NA			688.67	5368.31	0.57	117.77	5483.05	-0.06	247.04	5355.68	0.50
Yearly Change			6.14						8.48			5.71			6.77
Jan-18	851.75	5364.84	0.67	NA			688.19	5368.79	0.48	120.58	5480.24	-2.81	246.57	5356.15	0.47
Feb-18	851.15	5365.44	0.60	NA			687.59	5369.39	0.60	125.40	5475.42	-4.82	245.91	5356.81	0.66
Mar-18	850.61	5365.98	0.54	NA			687.09	5369.89	0.50	130.00	5470.82	-4.60	245.44	5357.28	0.47
Apr-18	849.98	5366.61	0.63	NA			686.44	5370.54	0.65	133.68	5467.14	-3.68	244.77	5357.95	0.67
May-18															
Jun-18															
Jul-18															
Aug-18															
Sep-18															
Oct-18															
Nov-18															
Dec-18															
Yearly Change			2.44						2.23			-15.91			2.27

SWL - Static water-level, in feet, below ground surface
ELEV - Water-level elevation, in feet USGS Datum)
NA - No water-level available due to access problems or obstructions

Montana Bureau of Mines and Geology
Butte Mine Flooding Monitoring

GWIC ID		4647			157638			4644		
		Parrot Park Well			Belmont Well #1			Hebgen Park Well		
Agency	Date	SWL(ft)	Elev(ft)	Diff (ft)**	SWL(ft)	Elev(ft)	Diff (ft)**	SWL(ft)	Elev(ft)	Diff (ft)**
	(mm/dd/yy)	(mp=ct)	5520.66		(mp=ct)	5600.82		(mp=ct)	5516.15	
MBMG	01/25/16	114.74	5405.92	-2.31	132.10	5468.72	-3.45	28.28	5487.87	-0.53
MBMG	02/22/16	116.76	5403.90	-2.02	136.73	5464.09	-4.63	28.51	5487.64	-0.23
MBMG	03/28/16	118.30	5402.36	-1.54	142.88	5457.94	-6.15	28.31	5487.84	0.20
MBMG	04/26/16	119.09	5401.57	-0.79	146.52	5454.30	-3.64	28.17	5487.98	0.14
MBMG	05/23/16	119.85	5400.81	-0.76	149.44	5451.38	-2.92	27.91	5488.24	0.26
MBMG	06/27/16	120.47	5400.19	-0.62	148.52	5452.30	0.92	27.39	5488.76	0.52
MBMG	07/26/16	120.69	5399.97	-0.22	140.61	5460.21	7.91	26.86	5489.29	0.53
MBMG	08/30/16	120.09	5400.57	0.60	134.23	5466.59	6.38	26.25	5489.90	0.61
MBMG	09/03/16	119.32	5401.34	0.77	131.24	5469.58	2.99	25.41	5490.74	0.84
MBMG	10/31/16	118.54	5402.12	0.78	127.81	5473.01	3.43	25.26	5490.89	0.15
MBMG	11/28/16	117.92	5402.74	0.62	124.24	5476.58	3.57	25.03	5491.12	0.23
MBMG	12/27/16	117.69	5402.97	0.23	123.48	5477.34	0.76	25.12	5491.03	-0.09
MBMG	01/27/17	117.94	5402.72	-0.25	126.54	5474.28	-3.06	26.10	5490.05	-0.98
MBMG	02/27/17	118.31	5402.35	-0.37	130.43	5470.39	-3.89	26.34	5489.81	-0.24
MBMG	03/27/17	118.64	5402.02	-0.33	133.97	5466.85	-3.54	26.25	5489.90	0.09
MBMG	04/25/17	118.75	5401.91	-0.11	137.31	5463.51	-3.34	26.25	5489.90	0.00
MBMG	05/31/17	118.90	5401.76	-0.15	139.29	5461.53	-1.98	25.49	5490.66	0.76
MBMG	06/26/17	118.81	5401.85	0.09	134.97	5465.85	4.32	23.61	5492.54	1.88
MBMG	07/26/17	115.97	5404.69	2.84	122.21	5478.61	12.76	24.10	5492.05	-0.49
MBMG	08/30/17	115.16	5405.50	0.81	117.54	5483.28	4.67	24.15	5492.00	-0.05
MBMG	09/27/17	111.78	5408.88	3.38	116.86	5483.96	0.68	24.39	5491.76	-0.24
MBMG	10/30/17	113.70	5406.96	-1.92	116.64	5484.18	0.22	24.38	5491.77	0.01
MBMG	11/27/17	114.82	5405.84	-1.12	117.71	5483.11	-1.07	24.66	5491.49	-0.28
MBMG	12/28/17	115.79	5404.87	-0.97	117.77	5483.05	-0.06	24.93	5491.22	-0.27
MBMG	01/26/18	116.62	5404.04	-0.83	120.58	5480.24	-2.81	25.41	5490.74	-0.48
MBMG	02/27/18	117.38	5403.28	-0.76	125.40	5475.42	-4.82	25.84	5490.31	-0.43
MBMG	03/26/18	118.08	5402.58	-0.70	130.00	5470.82	-4.60	26.22	5489.93	-0.38
MBMG	04/24/18	117.99	5402.67	0.09	133.68	5467.14	-3.68	25.53	5490.62	0.69
TOTAL CHANGE ==>			FROM 11/94==>	2.52		FROM 8/96 ==>	-44.76			-4.11

Montana Bureau of Mines and Geology
Butte Mine Flooding
West Camp Water-Levels

SITE NAME/MONTHLY ELEVATIONS

DATE MO/YR (MP Elev)	TRAVONA SWL (FT)	ELEV (FT) 5590.60	MO. DIFF (FT) 5591.98	EMMA SWL (FT)	ELEV (FT) 5636.80	MO. DIFF (FT)	OPHIR SWL (FT)	ELEV (FT) 5530.29	MO. DIFF (FT) 5533.16	WELL 21 SWL (FT)	ELEV (FT) 5471.50	MO. DIFF (FT)	CHESTER STEELE SWL (FT)	ELEV (FT) 5629.57	MO. DIFF (FT)
01/29/14	157.88	5434.10	-3.02	203.66	5433.14	-3.02	99.84	5433.32	-2.99				46.97	5582.60	-1.78
02/26/14	160.88	5431.10	-3.00	206.58	5430.22	-2.92	102.85	5430.31	-3.01				49.19	5580.38	-2.22
03/28/14	163.54	5428.44	-2.66	207.60	5429.20	-1.02	103.87	5429.29	-1.02				50.83	5578.74	-1.64
04/28/14	163.72	5428.26	-0.18	209.08	5427.72	-1.48	105.36	5427.80	-1.49				51.85	5577.72	-1.02
05/30/14	166.14	5425.84	-2.42	211.83	5424.97	-2.75	108.00	5425.16	-2.64				52.99	5576.58	-1.14
06/26/14	166.67	5425.31	-0.53	212.58	5424.22	-0.75	108.74	5424.42	-0.74				39.82	5589.75	13.17
07/30/14	166.42	5425.56	0.25	212.31	5424.49	0.27	108.46	5424.70	0.28				37.76	5591.81	2.06
08/27/14	166.80	5425.18	-0.38	212.54	5424.26	-0.23	108.85	5424.31	-0.39				39.11	5590.46	-1.35
09/24/14	167.94	5424.04	-1.14	213.68	5423.12	-1.14	109.95	5423.21	-1.10				39.69	5589.88	-0.58
10/29/14	168.51	5423.47	-0.57	214.26	5422.54	-0.58	110.51	5422.65	-0.56				40.92	5588.65	-1.23
11/24/14	169.95	5422.03	-1.44	215.70	5421.10	-1.44	111.94	5421.22	-1.43				42.26	5587.31	-1.34
12/22/14	169.82	5422.16	0.13	215.58	5421.22	0.12	111.80	5421.36	0.14				44.18	5585.39	-1.92
Yearly Change			-14.96			-14.94			-14.95			0.00			1.01
01/28/15	169.89	5422.09	-0.07	215.66	5421.14	-0.08	111.82	5421.34	-0.02				46.83	5582.74	-2.65
02/24/15	169.93	5422.05	-0.04	215.67	5421.13	-0.01	111.86	5421.30	-0.04				49.22	5580.35	-2.39
03/25/15	169.87	5422.11	0.06	215.67	5421.13	0.00	111.86	5421.30	0.00				51.31	5578.26	-2.09
04/28/15	169.76	5422.22	0.11	215.60	5421.20	0.07	111.84	5421.32	0.02				40.16	5589.41	11.15
05/27/15	169.96	5422.02	-0.20	215.77	5421.03	-0.17	111.89	5421.27	-0.05				40.90	5588.67	-0.74
06/30/15	169.67	5422.31	0.29	215.40	5421.40	0.37	111.65	5421.51	0.24				43.73	5585.84	-2.83
07/28/15	169.61	5422.37	0.06	215.36	5421.44	0.04	111.60	5421.56	0.05				45.48	5584.09	-1.75
08/26/15	169.68	5422.30	-0.07	215.40	5421.40	-0.04	111.62	5421.54	-0.02				44.27	5585.30	1.21
09/29/15	169.55	5422.43	0.13	215.00	5421.80	0.40	111.19	5421.97	0.43				43.48	5586.09	0.79
10/30/15	169.81	5422.17	-0.26	215.58	5421.22	-0.58	111.76	5421.40	-0.57				43.65	5585.92	-0.17
11/25/15	169.84	5422.14	-0.03	215.58	5421.22	0.00	111.72	5421.44	0.04				45.10	5584.47	-1.45
12/22/15	169.98	5422.00	-0.14	215.73	5421.07	-0.15	111.88	5421.28	-0.16				47.82	5581.75	-2.72
Yearly Change			-0.16			-0.15			-0.08			0.00			-3.64
01/26/16	170.15	5421.83	-0.17	215.89	5420.91	-0.16	111.99	5421.17	-0.11				50.42	5579.15	-2.60
02/26/16	168.99	5422.99	1.16	214.76	5422.04	1.13	110.84	5422.32	1.15				52.33	5577.24	-1.91
03/29/16	170.06	5421.92	-1.07	215.85	5420.95	-1.09	111.87	5421.29	-1.03				54.88	5574.69	-2.55
04/25/16	169.85	5422.13	0.21	215.60	5421.20	0.25	111.70	5421.46	0.17				56.56	5573.01	-1.68
05/24/16	170.03	5421.95	-0.18	215.75	5421.05	-0.15	111.84	5421.32	-0.14				43.08	5586.49	13.48
06/30/16	169.93	5422.05	0.10	215.65	5421.15	0.10	111.77	5421.39	0.07				44.51	5585.06	-1.43
07/26/16	169.73	5422.25	0.20	215.48	5421.32	0.17	111.59	5421.57	0.18				45.90	5583.67	-1.39
08/26/16	169.68	5422.30	0.05	215.61	5421.19	-0.13	111.69	5421.47	-0.10				44.38	5585.19	1.52
09/30/16	169.65	5422.33	0.03	215.39	5421.41	0.22	111.41	5421.75	0.28				43.55	5586.02	0.83
10/28/16	169.89	5422.09	-0.24	215.53	5421.27	-0.14	111.64	5421.52	-0.23				43.58	5585.99	-0.03
11/25/16	170.01	5421.97	-0.12	215.74	5421.06	-0.21	111.80	5421.36	-0.16				44.74	5584.83	-1.16
12/22/16	170.20	5421.78	-0.19	215.94	5420.86	-0.20	112.04	5421.12	-0.24				47.03	5582.54	-2.29
Yearly Change			-0.22			-0.21			-0.16			0.00			0.79
01/26/17	170.37	5421.61	-0.17	216.12	5420.68	-0.18	112.20	5420.96	-0.16				49.33	5580.24	-2.30
02/24/17	169.90	5422.08	0.47	215.62	5421.18	0.50	111.73	5421.43	0.47				51.37	5578.20	-2.04
03/27/17	169.71	5422.27	0.19	215.43	5421.37	0.19	111.56	5421.60	0.17				52.59	5576.98	-1.22
04/25/17	169.76	5422.22	-0.05	215.50	5421.30	-0.07	111.61	5421.55	-0.05				53.73	5575.84	-1.14
05/30/17	169.34	5422.64	0.42	215.11	5421.69	0.39	111.21	5421.95	0.40				52.94	5576.63	0.79
06/26/17	168.59	5423.39	0.75	214.26	5422.54	0.85	110.38	5422.78	0.83				34.18	5595.39	18.76
07/26/17	168.53	5423.45	0.06	214.23	5422.57	0.03	110.45	5422.71	-0.07				29.37	5600.20	4.81
08/28/17	168.38	5423.60	0.15	214.16	5422.64	0.07	110.31	5422.85	0.14				30.31	5599.26	-0.94
09/27/17	168.70	5423.28	-0.32	214.44	5422.36	-0.28	110.70	5422.46	-0.39				33.24	5596.33	-2.93
10/30/17	168.41	5423.57	0.29	214.17	5422.63	0.27	110.43	5422.73	0.27				35.20	5594.37	-1.96
11/27/17	168.61	5423.37	-0.20	214.37	5422.43	-0.20	110.56	5422.60	-0.13				37.09	5592.48	-1.89
12/28/17	168.88	5423.10	-0.27	214.64	5422.16	-0.27	110.78	5422.38	-0.22				35.54	5594.03	1.55
Yearly Change			1.32			1.30			1.26			0.00			11.49
01/25/18	168.86	5423.12	0.02	214.63	5422.17	0.01	110.81	5422.35	-0.03				31.57	5598.00	3.97
02/26/18	169.03	5422.95	-0.17	214.79	5422.01	-0.16	110.96	5422.20	-0.15				28.62	5600.95	2.95
03/26/18	168.56	5423.42	0.47	214.31	5422.49	0.48	110.47	5422.69	0.49				32.54	5597.03	-3.92
04/24/18	168.68	5423.30	-0.12	214.43	5422.37	-0.12	110.60	5422.56	-0.13				36.52	5593.05	-3.98
05/18/18															
06/18/18															
07/18/18															
08/18/18															
09/18/18															
10/18/18															
11/18/18															
12/18/18															
Yearly Change			0.20			0.21			0.18			0.00			-0.98

SWL - STATIC WATER LEVEL, IN FEET, BELOW GROUND SURFACE(MP)

ELEV - WATER LEVEL ELEVATION, IN FEET, ABOVE MEAN SEA LEVEL (USGS DATUM)

NA - NO WATER LEVELS AVAILABLE DUE TO ACCESS PROBLEMS OR OBSTRUCTIONS

Ophir Mine Elevation changed April 2005 after casing repair.

Montana Bureau of Mines and Geology
Butte Mine Flooding Monitoring Data
West Camp Ground-Water Sites

	AMC-21			BMF96-1D			BMF96-1S			BMF96-2			BMF96-3			BMF96-4		
GWIC ID	**4993**			**158224**			**158225**			**158226**			**158231**			**164443**		
Date	**SWL**	**Elev. (ft)**	**Change**	**SWL (gs)**	**Elev. (ft)**	**Change (ft)**	**SWL (gs)**	**Elev. (ft)**	**Change**	**SWL (gs)**	**Elev. (ft)**	**Change**	**SWL (gs)**	**Elev. (ft)**	**Change**	**SWL (gs)**	**Elev. (ft)**	**Change (ft)**
	(ft)	5471.50	(ft)	(ft)	5471.12	5471.59	(ft)	5470.16	(ft)	(ft)	5473.05	(ft)	(ft)	5467.27	(ft)	5490.93	5491.30	5489.20
01/29/14	Plugged			38.58	5433.01	-3.05	21.31	5448.85	-0.69	15.64	5457.41	-0.23	9.81	5457.46	-0.29	44.55	5444.65	-0.89
02/27/14	Plugged			41.73	5429.86	-3.15	22.23	5447.93	-0.92	15.93	5457.12	-0.29	10.15	5457.12	-0.34	46.04	5443.16	-1.49
03/28/14	Plugged			42.72	5428.87	-0.99	20.48	5449.68	1.75	14.09	5458.96	1.84	9.76	5457.51	0.39	47.48	5441.72	-1.44
04/28/14	Plugged			44.54	5427.05	-1.82	20.29	5449.87	0.19	13.78	5459.27	0.31	9.30	5457.97	0.46	48.29	5440.91	-0.81
05/30/14	Plugged			47.02	5424.57	-2.48	20.00	5450.16	0.29	14.04	5459.01	-0.26	8.82	5458.45	0.48	49.50	5439.70	-1.21
06/26/14	Plugged			47.51	5424.08	-0.49	20.02	5450.14	-0.02	13.97	5459.08	0.07	8.52	5458.75	0.30	50.38	5438.82	-0.88
07/30/14	Plugged			47.30	5424.29	0.21	19.18	5450.98	0.84	14.38	5458.67	-0.41	8.36	5458.91	0.16	50.52	5438.68	-0.14
08/27/14	Plugged			47.55	5424.04	-0.25	18.47	5451.69	0.71	13.42	5459.63	0.96	7.50	5459.77	0.86	50.46	5438.74	0.06
09/24/14	Plugged			48.82	5422.77	-1.27	18.95	5451.21	-0.48	13.76	5459.29	-0.34	8.16	5459.11	-0.66	49.88	5439.32	0.58
10/29/14	Plugged			49.40	5422.19	-0.58	19.98	5450.18	-1.03	12.88	5460.17	0.88	8.65	5458.62	-0.49	50.11	5439.09	-0.23
11/24/14	Plugged			50.85	5420.74	-1.45	20.79	5449.37	-0.81	13.57	5459.48	-0.69	9.03	5458.24	-0.38	50.61	5438.59	-0.50
12/22/14	Plugged			50.70	5420.89	0.15	21.06	5449.10	-0.27	13.62	5459.43	-0.05	9.17	5458.10	-0.14	50.87	5438.33	-0.26
01/28/15	Plugged			50.72	5420.87	-0.02	21.56	5448.60	-0.50	13.80	5459.25	-0.18	9.44	5457.83	-0.27	51.37	5437.83	-0.50
02/25/15	Plugged			50.79	5420.80	-0.07	20.58	5449.58	0.98	13.52	5459.53	0.28	9.35	5457.92	0.09	51.45	5437.75	-0.08
03/25/15	Plugged			50.72	5420.87	0.07	21.36	5448.80	-0.78	13.87	5459.18	-0.35	9.61	5457.66	-0.26	51.78	5437.42	-0.33
04/28/15	Plugged			50.60	5420.99	0.12	21.81	5448.35	-0.45	14.08	5458.97	-0.21	9.48	5457.79	0.13	52.49	5436.71	-0.71
05/27/15	Plugged			50.70	5420.89	-0.10	21.45	5448.71	0.36	14.12	5458.93	-0.04	9.10	5458.17	0.38	52.66	5436.54	-0.17
06/30/15	Plugged			50.56	5421.03	0.14	20.33	5449.83	1.12	14.25	5458.80	-0.13	8.95	5458.32	0.15	52.64	5436.56	0.02
07/28/15	Plugged			50.57	5421.02	-0.01	21.09	5449.07	-0.76	14.64	5458.41	-0.39	8.50	5458.77	0.45	52.67	5436.53	-0.03
08/25/15	Plugged			50.55	5421.04	0.02	20.67	5449.49	0.42	14.81	5458.24	-0.17	8.80	5458.47	-0.30	52.12	5437.08	0.55
09/29/15	Plugged			50.30	5421.29	0.25	20.11	5450.05	0.56	14.43	5458.62	0.38	8.60	5458.67	0.20	51.42	5437.78	0.70
10/26/15	Plugged			50.69	5420.90	-0.39	20.23	5449.93	-0.12	14.72	5458.33	-0.29	9.15	5458.12	-0.55	51.05	5438.15	0.37
11/24/15	Plugged			50.71	5420.88	-0.02	20.71	5449.45	-0.48	14.48	5458.57	0.24	9.32	5457.95	-0.17	51.01	5438.19	0.04
12/28/15	Plugged			50.84	5420.75	-0.13	21.88	5448.28	-1.17	14.95	5458.10	-0.47	9.63	5457.64	-0.31	51.42	5437.78	-0.41
01/26/16	Plugged			50.87	5420.72	-0.03	22.79	5447.37	-0.91	15.34	5457.71	-0.39	9.96	5457.31	-0.33	52.17	5437.03	-0.75
02/23/16	Plugged			49.72	5421.87	1.15	22.18	5447.98	0.61	14.14	5458.91	1.20	9.67	5457.60	0.29	52.13	5437.07	0.04
03/29/16	Plugged			50.82	5420.77	-1.10	21.66	5448.50	0.52	14.18	5458.87	-0.04	9.74	5457.53	-0.07	52.38	5436.82	-0.25
04/25/16	Plugged			50.70	5420.89	0.12	21.71	5448.45	-0.05	14.17	5458.88	0.01	9.58	5457.69	0.16	52.52	5436.68	-0.14
05/24/16	Plugged			50.87	5420.72	-0.17	21.57	5448.59	0.14	14.34	5458.71	-0.17	9.43	5457.84	0.15	52.80	5436.40	-0.28
06/28/16	Plugged			50.79	5420.80	0.08	20.49	5449.67	1.08	14.48	5458.57	-0.14	9.17	5458.10	0.26	53.04	5436.16	-0.24
07/26/16	Plugged			50.62	5420.97	0.17	20.29	5449.87	0.20	14.75	5458.30	-0.27	9.01	5458.26	0.16	52.72	5436.48	0.32
08/26/16	Plugged			50.71	5420.88	-0.09	20.08	5450.08	0.21	14.94	5458.11	-0.19	8.82	5458.45	0.19	51.81	5437.39	0.91
10/03/16	Plugged			50.53	5421.06	0.18	20.86	5449.30	-0.78	14.95	5458.10	-0.01	9.01	5458.26	-0.19	50.76	5438.44	1.05
10/28/16	Plugged			50.77	5420.82	-0.24	20.87	5449.29	-0.01	14.58	5458.47	0.37	9.05	5458.22	-0.04	50.89	5438.31	-0.13
11/28/16	Plugged			50.44	5421.15	0.33	20.65	5449.51	0.22	14.52	5458.53	0.06	9.23	5458.04	-0.18	50.68	5438.52	0.21
12/28/16	Plugged			51.10	5420.49	-0.66	21.89	5448.27	-1.24	15.12	5457.93	-0.60	9.61	5457.66	-0.38	51.10	5438.10	-0.42
01/26/17	Plugged			51.25	5420.34	-0.15	22.91	5447.25	-1.02	15.44	5457.61	-0.32	9.85	5457.42	-0.24	51.84	5437.36	-0.74
02/24/17	Plugged			50.80	5420.79	0.45	22.13	5448.03	0.78	13.81	5459.24	1.63	9.62	5457.65	0.23	51.83	5437.37	0.01
03/27/17	Plugged			50.69	5420.90	0.11	20.68	5449.48	1.45	13.24	5459.81	0.57	9.25	5458.02	0.37	51.98	5437.22	-0.15
04/25/17	Plugged			50.62	5420.97	0.07	20.17	5449.99	0.51	13.48	5459.57	-0.24	8.97	5458.30	0.28	52.09	5437.11	-0.11
05/30/17	Plugged			50.22	5421.37	0.40	18.27	5451.89	1.90	12.81	5460.24	0.67	8.24	5459.03	0.73	52.13	5437.07	-0.04
06/26/17	Plugged			49.40	5422.19	0.82	16.67	5453.49	1.60	12.35	5460.70	0.46	7.86	5459.41	0.38	51.50	5437.70	0.63
07/26/17	Plugged			49.50	5422.09	-0.10	18.33	5451.83	-1.66	13.52	5459.53	-1.17	8.18	5459.09	-0.32	50.97	5438.23	0.53
08/28/17	Plugged			49.32	5422.27	0.18	20.42	5449.74	-2.09	14.15	5458.90	-0.63	8.31	5458.96	-0.13	50.26	5438.94	0.71
09/27/17	Plugged			49.61	5421.98	-0.29	21.47	5448.69	-1.05	14.23	5458.82	-0.08	8.47	5458.80	-0.16	50.08	5439.12	0.18
10/30/17	Plugged			49.32	5422.27	0.29	21.62	5448.54	-0.15	14.36	5458.69	-0.13	8.72	5458.55	-0.25	49.80	5439.40	0.28
11/27/17	Plugged			49.50	5422.09	-0.18	21.77	5448.39	-0.15	13.73	5459.32	0.63	8.66	5458.61	0.06	49.80	5439.40	0.00
12/28/17	Plugged			49.76	5421.83	-0.26	22.14	5448.02	-0.37	14.43	5458.62	-0.70	8.98	5458.29	-0.32	50.25	5438.95	-0.45
01/25/18	Plugged			49.75	5421.84	0.01	22.79	5447.37	-0.65	14.56	5458.49	-0.13	9.22	5458.05	-0.24	50.19	5439.01	0.06
02/26/18	Plugged			49.91	5421.68	-0.16	22.77	5447.39	0.02	14.67	5458.38	-0.11	9.37	5457.90	-0.15	50.84	5438.36	-0.65
03/26/18	Plugged			49.44	5422.15	0.47	20.31	5449.85	2.46	11.99	5461.06	2.68	8.87	5458.40	0.50	51.19	5438.01	-0.35
04/24/18	Plugged			49.54	5422.05	-0.10	17.84	5452.32	2.47	12.33	5460.72	-0.34	8.44	5458.83	0.43	51.44	5437.76	-0.25

MP elevations
changed 7/99
(BMF96-1D)
and 7/04
(BMF96-4)

Montana Bureau of Mines and Geology
Butte Mine Flooding Monitoring Data
West Camp Ground-Water Sites

	WCPW-1		Chester Steele		WC Extraction Well Data							
GWIC ID	184133		4773									
Date	SWL (gs)	Elev. (ft) Change	SWL (gs)	Elev. (ft)	Change	Reading	Diff	Daily Avg.	Pump Rate	Monthly Average Pumping Rate	Monthly Total Pumped	Monthly Total Pumped
		5471.35	(ft)	5629.57	(ft)		(gallons)	(gallons)	(gpm)	(gpm)	(Gallons)	(Acre-Ft)
01/29/14	NA		46.97	5582.60	-1.78	NA	7,686,769	265,061	184	184	7,686,769	23.59
02/27/14	NA		49.19	5580.38	-2.22	NA	6,311,313	217,631	151	151	6,311,313	19.37
03/28/14	NA		50.83	5578.74	-1.64	NA	6,249,720	215,508	150	150	6,249,720	19.18
04/28/14	NA		51.85	5577.72	-1.02	NA	8,122,388	262,013	182	182	8,122,388	24.93
05/30/14	NA		52.99	5576.58	-1.14	NA	6,656,922	208,029	144	144	6,656,922	20.43
06/26/14	NA		39.82	5589.75	13.17	NA	6,256,137	231,709	161	161	6,256,137	19.20
07/30/14	NA		37.76	5591.81	2.06	NA	7,953,084	233,914	162	162	7,953,084	24.41
08/27/14	NA		39.11	5590.46	-1.35	NA	7,075,619	252,701	175	175	7,075,619	21.71
09/24/14	NA		39.69	5589.88	-0.58	NA	8,471,121	302,540	210	210	8,471,121	26.00
10/29/14	NA		40.92	5588.65	-1.23	NA	10,407,807	297,366	207	207	10,407,807	31.94
11/24/14	NA		42.26	5587.31	-1.34	NA	8,045,781	309,453	215	215	8,045,781	24.69
12/22/14	NA		44.18	5585.39	-1.92	NA	9,114,920	260,426	181	181	9,114,920	27.97
01/28/15	NA		46.83	5582.74	-2.65	NA	7,105,053	263,150	183	183	7,105,053	21.80
02/25/15	NA		49.22	5580.35	-2.39	NA	6,829,580	243,914	169	169	6,829,580	20.96
03/25/15	NA		51.31	5578.26	-2.09	NA	7,734,949	276,248	192	192	7,734,949	23.74
04/28/15	NA		40.16	5589.41	11.15	NA	5,722,244	168,301	117	117	5,722,244	17.56
05/27/15	NA		40.90	5588.67	-0.74	NA	5,470,047	188,622	131	131	5,470,047	16.79
06/30/15	NA		43.73	5585.84	-2.83	NA	6,940,926	204,145	142	142	6,940,926	21.30
07/28/15	NA		45.48	5584.09	-1.75	NA	5,988,507	213,875	149	149	5,988,507	18.38
08/25/15	NA		44.27	5585.30	1.21	NA	6,754,700	241,239	168	168	6,754,700	20.73
09/29/15	NA		43.48	5586.09	0.79	NA	8,853,840	252,967	176	176	8,853,840	27.17
10/26/15	NA		43.65	5585.92	-0.17	NA	7,437,206	275,452	191	191	7,437,206	22.82
11/24/15	NA		45.10	5584.47	-1.45	NA	6,819,909	235,169	163	163	6,819,909	20.93
12/28/15	NA		47.82	5581.75	-2.72	NA	7,775,304	228,685	159	159	7,775,304	23.86
01/26/16	NA		50.42	5579.15	-2.60	NA	5,632,320	194,218	135	135	5,632,320	17.28
02/23/16	NA		52.33	5577.24	-1.91	NA	5,077,449	181,337	126	126	5,077,449	15.58
03/29/16	NA		54.88	5574.69	-2.55	NA	6,926,015	197,886	137	137	6,926,015	21.26
04/25/16	NA		56.56	5573.01	-1.68	NA	5,197,616	192,504	134	134	5,197,616	15.95
05/24/16	NA		43.08	5586.49	13.48	NA	5,181,567	178,675	124	124	5,181,567	15.90
06/28/16	NA		44.51	5585.06	-1.43	NA	6,561,620	187,475	130	130	6,561,620	20.14
07/26/16	NA		45.90	5583.67	-1.39	NA	5,690,808	203,243	141	141	5,690,808	17.46
08/26/16	NA		44.38	5585.19	1.52	NA	8,181,122	263,907	183	183	8,181,122	25.11
10/03/16	NA		43.55	5586.02	0.83	NA	8,811,943	231,893	161	161	8,811,943	27.04
10/28/16	NA		43.58	5585.99	-0.03	NA	7,039,616	281,585	196	196	7,039,616	21.60
11/28/16	NA		44.74	5584.83	-1.16	NA	6,741,637	217,472	151	151	6,741,637	20.69
12/28/16	NA		47.03	5582.54	-2.29	NA	7,914,721	263,824	183	183	7,914,721	24.29
01/26/17	NA		49.33	5580.24	-2.30	NA	6,023,230	207,698	144	144	6,023,230	18.48
02/24/17	NA		51.37	5578.20	-2.04	NA	5,695,825	196,408	136	136	5,695,825	17.48
03/27/17	NA		52.59	5576.98	-1.22	NA	7,048,176	227,361	158	158	7,048,176	21.63
04/25/17	NA		53.73	5575.84	-1.14	NA	5,582,824	192,511	134	134	5,582,824	17.13
05/30/17	NA		52.94	5576.63	0.79	NA	5,304,941	151,570	105	105	5,304,941	16.28
06/26/17	NA		34.18	5595.39	18.76	NA	7,827,145	289,894	201	201	7,827,145	24.02
07/26/17	NA		29.37	5600.20	4.81	NA	10,552,627	351,754	244	244	10,552,627	32.38
08/28/17	NA		30.31	5599.26	-0.94	NA	13,720,006	415,758	289	289	13,720,006	42.11
09/27/17	NA		33.24	5596.33	-2.93	NA	10,374,456	345,815	240	240	10,374,456	31.84
10/30/17	NA		35.20	5594.37	-1.96	NA	9,477,726	287,204	199	199	9,477,726	29.09
11/27/17	NA		37.09	5592.48	-1.89	NA	10,560,111	377,147	262	262	10,560,111	32.41
12/28/17	NA		35.54	5594.03	1.55	NA	7,936,423	256,014	178	178	7,936,423	24.36
01/25/18	NA		31.57	5598.00	3.97	NA	9,573,614	341,915	237	237	9,573,614	29.38
02/26/18	NA		28.62	5600.95	2.95	NA	7,307,262	228,352	159	159	7,307,262	22.43
03/26/18	NA		32.54	5597.03	-3.92	NA	6,963,105	248,682	173	173	6,963,105	21.37
04/24/18	NA		36.52	5593.05	-3.98	NA	7,051,286	243,148	169	169	7,051,286	21.64

MP elevations changed 7/99 (BMF96-1D) and 7/04 (BMF96-4)

Montana Bureau of Mines and Geology
Butte Mine Flooding Monitoring Data
West Camp Ground-Water Sites

GWIC ID	Date	Comments
	01/29/14	WCP pumping rate increased to Approx. 155 gpm on 12/31/13.
	02/27/14	Pumping rate increased to approx.160 gpm on 2/18/14.
	03/28/14	WCP Shutdown on 3/9/14 due to increased influent flows, restarted on 3/11/14; 160 gpm.
	04/28/14	Flow data from Pioneer records. Q~160-170 gpm.
	05/30/14	Flow data from Pioneer records. WCP-1 reached 5425.00 on 5/25/14. Q~160-165.
	06/26/14	Flow data from Pioneer records. WCP-1 pumping rate was reduced to approximately 150 gpm on 6/9/14.
	07/30/14	WCP pumping rate increased to 170 gpm to maintain the WCP water elevation at approx. 5424.00 (amsl-
	08/27/14	WCP pumping rate 170 gpm. Data from Pioneer.
	09/24/14	9/4/14 pumping increased to 210-220 for STP dewatering. Flow data from Pioneer.
	10/29/14	Flow data from Pioneer records
	11/24/14	Flow data from Pioneer records. Q~180-190 gpm.
	12/22/14	Flow data from Pioneer records. Q~175 gpm.
	01/28/15	Flow data from Pioneer records. Q~170 gpm.
	02/25/15	Flow data from Pioneer records. Q~160 gpm.
	03/25/15	Flow data from Pioneer records. Q~160 gpm.
	04/28/15	Flow data from Pioneer records. Q~140 gpm. STP dewatering completed.
	05/27/15	Flow data from Pioneer records. Q~135-140 gpm.
	06/30/15	Flow data from Pioneer records. Q~140 gpm.
	07/28/15	Flow data from Pioneer records. Q~140 gpm.
	08/25/15	Flow data from Pioneer records. Q~165-175 gpm.
	09/29/15	Flow data from Pioneer records. Q~165-175 gpm.
	10/26/15	Flow data from Pioneer records. Q~165-175 gpm.
	11/24/15	Flow data from Pioneer records. Q~165-175 gpm.
	12/28/15	Flow data from Pioneer records. Q~165-175 gpm.
	01/26/16	Flow data from Pioneer records. Q~140 gpm.
	02/23/16	Flow data from Pioneer records. Q~125 gpm.
	03/29/16	Flow data from Pioneer records. Q~135 gpm.
	04/25/16	Flow data from Pioneer records. Q~129 gpm.
	05/24/16	Flow data from Pioneer records. Q~128 gpm.
	06/28/16	Flow data from Pioneer records. Q~131 gpm.
	07/26/16	Flow data from Pioneer records. Q~141 gpm.
	08/26/16	Flow data from Pioneer records. Q~162 gpm.
	10/03/16	Flow data from Pioneer records. Q~176 gpm.
	10/28/16	Flow data from Pioneer records. Q~174 gpm.
	11/28/16	Flow data from Pioneer records. Q~167 gpm.
	12/28/16	Flow data from Pioneer records. Q~156 gpm.
	01/26/17	Flow data from Pioneer records. Q~148 gpm.
	02/24/17	Flow data from Pioneer records. Q~141 gpm.
	03/27/17	Flow data from Pioneer records. Q~140 gpm.
	04/25/17	Flow data from Pioneer records. Q~138 gpm.
	05/30/17	Flow data from Pioneer records. Q~130 gpm.
	06/26/17	Flow data from Pioneer records. Q~154 gpm.
	07/26/17	Flow data from Pioneer records. Q~262 gpm.
	08/28/17	Flow data from Pioneer records. Q~269 gpm.
	09/27/17	Flow data from Pioneer records. Q~257 gpm.
	10/30/17	Flow data from Pioneer records. Q~234 gpm.
	11/27/17	Flow data from Pioneer records. Q~209 gpm.
	12/28/17	Flow data from Pioneer records. Q~197 gpm.
	01/25/18	Flow data from Pioneer records. Q~190 gpm.
	02/26/18	Flow data from Pioneer records. Q~181 gpm.
	03/26/18	Flow data from Pioneer records. Q~175 gpm.
	04/24/18	Flow data from Pioneer records. Q~175 gpm.

MP elevations
changed 7/99
(BMF96-1D)
and 7/04
(BMF96-4)

MBMG
Outer Camp

GWIC ID	4732				4725				892116				4822			
				MAS	Well			S-4				Tech Well				Orphan Boy
DATE (mmddyy)	MAS SWL (ft)	Elev (ft)	Diff (ft)	Yearly Change	S-4 SWL (ft)	Elev (ft)	Diff (ft)	Yearly Change	Tech Well SWL (ft)	Elev (ft)	Diff (ft)	Yearly Change	Orphan Boy SWL (ft)	Elev (ft)	Diff (ft)	Yearly Change
		6304.00				6290				5650.00	5651.86			5689.66	5691.25	
01/22/16	79.80	6224.20	-0.20		61.57	6228.43	-0.60		73.89	5577.97	-0.50		109.32	5581.93	-0.33	
02/24/16	80.36	6223.64	-0.56		61.80	6228.20	-0.23		73.93	5577.93	-0.04		109.42	5581.83	-0.10	
03/28/16	80.25	6223.75	0.11		61.95	6228.05	-0.15		73.62	5578.24	0.31		109.16	5582.09	0.26	
04/26/16	79.91	6224.09	0.34		61.68	6228.32	0.27		73.47	5578.39	0.15		108.95	5582.30	0.21	
05/23/16	79.74	6224.26	0.17		61.07	6228.93	0.61		73.24	5578.62	0.23		108.82	5582.43	0.13	
06/28/16	79.55	6224.45	0.19		60.58	6229.42	0.49		72.82	5579.04	0.42		108.63	5582.62	0.19	
07/27/16	79.51	6224.49	0.04		60.33	6229.67	0.25		72.71	5579.15	0.11		108.64	5582.61	-0.01	
08/29/16	79.36	6224.64	0.15		59.94	6230.06	0.39		72.39	5579.47	0.32		108.68	5582.57	-0.04	
09/30/16	79.33	6224.67	0.03		59.69	6230.31	0.25		72.41	5579.45	-0.02		108.63	5582.62	0.05	
10/28/16	79.37	6224.63	-0.04		59.56	6230.44	0.13		72.31	5579.55	0.10		108.72	5582.53	-0.09	
11/28/16	79.26	6224.74	0.11		59.41	6230.59	0.15		72.13	5579.73	0.18		108.62	5582.63	0.10	
12/27/16	79.64	6224.36	-0.38		59.73	6230.27	-0.32		72.68	5579.18	-0.55		108.84	5582.41	-0.22	
Yearly Change				**-0.04**				**1.24**				**0.71**				**0.15**
01/30/17	79.84	6224.16	-0.20		59.87	6230.13	-0.14		73.05	5578.81	-0.37		109.09	5582.16	-0.25	
02/24/17	79.95	6224.05	-0.11		60.07	6229.93	-0.20		73.71	5578.15	-0.66		109.24	5582.01	-0.15	
03/30/17	79.43	6224.57	0.52		59.32	6230.68	0.75		73.46	5578.40	0.25		108.95	5582.30	0.29	
04/25/17	78.81	6225.19	0.62		59.24	6230.76	0.08		73.37	5578.49	0.09		108.72	5582.53	0.23	
05/25/17	78.47	6225.53	0.34		59.26	6230.74	-0.02		72.63	5579.23	0.74		108.29	5582.96	0.43	
06/26/17	77.33	6226.67	1.14		58.98	6231.02	0.28		71.22	5580.64	1.41		106.98	5584.27	1.31	
07/26/17	77.12	6226.88	0.21		57.64	6232.36	1.34		73.53	5578.33	-2.31		105.39	5585.86	1.59	
08/28/17	76.78	6227.22	0.34		56.15	6233.85	1.49		72.96	5578.90	0.57		104.94	5586.31	0.45	
09/26/17	76.69	6227.31	0.09		55.44	6234.56	0.71		72.91	5578.95	0.05		105.02	5586.23	-0.08	
10/31/17	76.52	6227.48	0.17		54.78	6235.22	0.66		72.98	5578.88	-0.07		105.21	5586.04	-0.19	
11/30/17	76.66	6227.34	-0.14		54.88	6235.12	-0.10		73.01	5578.85	-0.03		105.32	5585.93	-0.11	
12/27/17	76.67	6227.33	-0.01		54.97	6235.03	-0.09		73.36	5578.50	-0.35		105.75	5585.50	-0.43	
Yearly Change				**2.97**				**4.76**				**-0.68**				**3.09**
01/25/18	76.93	6227.07	-0.26		55.39	6234.61	-0.42		73.79	5578.07	-0.43		105.94	5585.31	-0.19	
02/27/18	77.04	6226.96	-0.11		55.60	6234.40	-0.21		73.93	5577.93	-0.14		106.46	5584.79	-0.52	
03/26/18	NR				NR				73.95	5577.91	-0.02		106.51	5584.74	-0.05	
04/24/18	76.93	6227.07	0.11		55.51	6234.49	0.09		72.60	5579.26	1.35		105.37	5585.88	1.14	
05/30/18																
06/30/18																
07/30/18																
08/30/18																
09/30/18																
10/30/18																
11/30/18																
12/30/18																
Yearly Change				**-0.26**				**-0.54**				**0.76**				**0.38**

Orphan Boy Mine elevation changed following February 2005 survey, due to installation of casing into mine shaft for monitoring purposes.

Butte Mine Flooding
Outer Camp Water-Levels

Periodic Monitoring

ORPHAN BOY AREA

DATE (mmddyy)	Orphan Boy SWL(ft)	Elevation* (ft)	Mo. Diff. (ft)	Orphan Boy Yearly Change	Seep Flow(gpm)
		5689.66	**5691.25**		
01/28/15	110.58	5580.67	-0.15		51.30
02/25/15	109.74	5581.51	0.84		47.70
03/15/15	109.35	5581.90	0.39		17.00
04/28/15	109.22	5582.03	0.13		21.50
05/27/15	109.14	5582.11	0.08		40.80
06/30/15	108.36	5582.89	0.78		19.30
07/28/15	108.62	5582.63	-0.26		47.70
08/25/15	108.73	5582.52	-0.11		47.70
09/28/15	108.83	5582.42	-0.10		21.50
10/26/15	108.76	5582.49	0.07		19.30
11/24/15	108.79	5582.46	-0.03		12.00
12/22/15	108.99	5582.26	-0.20	1.44	10.00
01/22/16	109.32	5581.93	-0.33		21.50
02/24/16	109.42	5581.83	-0.10		26.30
03/28/16	109.16	5582.09	0.26		32.00
04/26/16	108.95	5582.30	0.21		44.20
05/23/16	108.82	5582.43	0.13		51.30
06/28/16	108.63	5582.62	0.19		55.20
07/27/16	108.64	5582.61	-0.01		63.30
08/29/16	108.68	5582.57	-0.04		86.70
09/30/16	108.63	5582.62	0.05		86.70
10/28/16	108.72	5582.53	-0.09		76.80
11/28/16	108.62	5582.63	0.10		63.30
12/27/16	108.84	5582.41	-0.22	0.15	40.80
01/30/17	109.09	5582.16	-0.25		55.20
02/24/17	109.24	5582.01	-0.15		72.20
03/30/17	108.95	5582.30	0.29		72.20
04/25/17	108.72	5582.53	0.23		72.20
05/25/17	108.29	5582.96	0.43		97.00
06/26/17	106.98	5584.27	1.31		115.00
07/26/17	105.39	5585.86	1.59		115.00
08/28/17	104.94	5586.31	0.45		115.00
09/26/17	105.02	5586.23	-0.08		115.00
10/31/17	105.21	5586.04	-0.19		115.00
11/30/17	105.32	5585.93	-0.11		115.00
12/27/17	105.75	5585.50	-0.43	3.09	NR
01/25/18	105.94	5585.31	-0.19		NR
02/27/18	106.46	5584.79	-0.52		NR
03/26/18	106.51	5584.74	-0.05		115.00
04/24/18	105.37	5585.88	1.14		115.00

Yearly Change			**0.15**	**Mean Q**	**22.07**
Total Change**		**27.02**	**26.64**	**Min Q**	**3.75**

* Elevation data is based upon USGS topo map interpretation

** Total change based on elevation differences is greater than that calculated by monthly differences due to break in data.

Montana Bureau of Mines and Geology
Horseshoe Bend Drainage
Water Quality Data

05/08/18
Horseshoe Bend Drainage
M#:125744

			PHYSICAL PARAMETERS								DISSOLVED CONCENTRATION							DISSOLVED CONCENTRATION							
			FIELD					LAB																	
Collector/	Date	Time	Discharge	pH	SC	Temp	Eh	pH	SC	Hardness	Alkalinity	Ca	Mg	Na	K	Fe	Mn	SiO_2	HCO_3	CO_3	Cl	SO_4	NO_2-N	NO_3-N	F
Lab Analyzer	(mm/dd/yy)	(HRS)	(gpm)		(uMHOS)	(C)	(MV)		(uMHOS)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
MBMG	07/16/15	10:45	3,460	3.62	6,650	15.5	561	3.56	7,070	3,019	0.0	437	468	84	6.7	423	137	89.9	0.0	0.0	13.3	6,680	<0.05	<0.05	31.91
MBMG	08/27/15	14:55	3,405	3.32	6,550	16.0	558	3.24	7,690	2,919	0.0	434	446	73	6.8	436	143	91.1	0.0	0.0	14.7	6,454	0.43	0.31	22.38
MBMG	09/29/15	13:55	2,460	3.02	5,825	14.5	604	3.21	6,880	2,570	0.0	442	357	73	8.8	283	114	81.0	0.0	0.0	14.9	5,548	0.42	0.28	19.88
MBMG	10/21/15	16:00	3,085	3.61	6,205	12.6	556	3.38	7,980	2,656	0.0	413	395	68	7.7	256	327	81.9	0.0	0.0	15.5	6,035	0.42	0.35	16.22
MBMG	11/12/15	12:01	NA	3.56	6,950	9.1	562	3.52	7,800	3,093	0.0	437	487	69	6.7	335	361	85.3	0.0	0.0	16.3	7,570	0.46	0.25	29.52
MBMG	12/18/15	12:00	3,390	3.48	6,020	6.3	574	3.32	7,490	2,687	0.0	437	388	74	8.5	426	138	80.5	0.0	0.0	13.3	5,512	<0.05	<0.05	22.28
MBMG	01/11/16	15:12	3,475	3.59	5,550	6.3	578	3.34	7,320	2,508	0.0	439	343	76	9.9	215	275	90.7	0.0	0.0	13.3	5,036	<0.05	<0.05	19.67
MBMG	02/04/16	13:28	3,475	3.73	5,665	7.5	563	3.19	7,210	2,576	0.0	450	353	75	8.9	321	130	76.8	0.0	0.0	13.2	4,963	<0.05	<0.05	18.98
MBMG	03/04/16	15:06	3,300	3.44	5,055	14.1	617	3.35	5,560	2,308	0.0	457	284	82	12.5	146	104	77.7	0.0	0.0	13.5	4,141	<0.05	<0.05	15.02
MBMG	04/29/16	14:00	3,132	2.97	6,695	13.7	573	2.97	6,960	2,900	0.0	446	434	74	7.9	346	129	85.6	0.0	0.0	13.3	5,820	<0.05	<0.05	24.23
MBMG	05/12/16	11:35	3,560	3.70	7,235	12.3	580	3.05	7,450	2,836	0.0	401	446	61	4.9	436	131	85.5	0.0	0.0	13.6	6,638	<0.05	<0.05	27.24
MBMG	06/03/16	15:30	2,800	3.35	5,395	22.9	612	3.31	5,930	2,277	0.0	428	293	73	10.9	229	121	80.5	0.0	0.0	13.5	4,714	<0.05	<0.05	17.64
MBMG	07/14/16	14:55	3,130	3.23	5,290	21.4	612	3.22	5,680	2,344	0.0	454	294	77	10.2	211	106	71.6	0.0	0.0	14.3	4,624	<0.05	<0.05	19.51
MBMG	08/03/16	10:15	2,883	3.10	5,600	14.7	619	3.22	5,960	2,471	0.0	450	327	81	9.8	266	117	77.4	0.0	0.0	14.6	5,035	<0.05	0.33	21.86
MBMG	09/16/16	14:45	3,826	3.22	6,690	14.2	606	3.13	7,160	2,838	0.0	425	431	75	6.7	383	130	90.3	0.0	0.0	14.8	6,437	<0.05	<0.05	25.82
MBMG	10/10/16	14:35	3,737	3.28	5,905	12.1	604	3.12	6,450	2,566	0.0	435	360	74	8.4	276	114	81.5	0.0	0.0	14.3	5,352	<0.05	<0.05	22.67
MBMG	11/04/16	15:00	3,215	3.10	4,990	13.8	575	3.28	5,340	2,429	0.0	463	309	80	11.1	194	104	79.9	0.0	0.0	15.0	4,578	<0.05	0.31	17.96
MBMG	12/02/16	11:13	4,190	3.31	6,715	6.7	583	3.19	7,040	2,866	0.0	425	438	67	6.2	520	151	92.8	0.0	0.0	14.0	6,163	<0.05	<0.05	28.30
MBMG	01/11/17	10:58	3,475	3.55	5,950	3.2	551	3.66	6,270	2,702	0.0	432	394	78	6.5	385	121	84.1	0.0	0.0	13.8	5,565	<0.05	<0.05	27.73
MBMG	01/30/17	12:25	3,826	3.34	5,970	7.2	577	3.23	6,580	2,720	0.0	420	406	70	5.9	448	126	94.5	0.0	0.0	13.9	5,888	<0.05	<0.05	30.05
MBMG	02/28/17	15:11	5,148	3.15	6,570	6.7	605	3.26	7,300	2,986	0.0	436	461	70	5.9	402	133	90.3	0.0	0.0	16.5	6,339	<0.05	0.30	26.50
MBMG	03/30/17	11:57	3,216	2.94	6,020	11.6	625	3.14	7,230	2,857	0.0	432	423	72	6.3	384	144	89.5	0.0	0.0	14.1	5,961	<0.05	<0.05	29.60
MBMG	04/27/17	13:02	3,826	3.18	6,410	10.4	616	3.17	6,940	2,838	0.0	426	431	70	5.2	365	133	101.6	0.0	0.0	14.0	6,059	<0.05	<0.05	29.54
MBMG	06/02/17	10:27	3,915	2.43	6,090	15.4	604	3.10	5,990	2,610	0.0	425	376	68	6.2	339	121	94.6	0.0	0.0	12.2	5,290	<0.05	0.26	10.35
MBMG	06/29/17	10:04	3,300	3.06	5,715	14.6	591	3.06	5,790	2,519	0.0	445	342	76	8.1	299	115	77.6	0.0	0.0	12.2	4,848	<0.05	0.28	10.04
MBMG	07/27/17	13:31	3,740	3.23	6,185	17.6	588	3.03	6,000	2,765	0.0	458	394	76	6.2	333	120	94.5	0.0	0.0	13.6	5,598	<0.05	<0.05	23.75
MBMG	08/30/17	14:23	3,740	3.39	6,070	17.7	562	3.20	6,105	2,609	0.0	433	371	72	6.8	340	120	89.2	0.0	0.0	13.7	5,369	<0.05	<0.05	23.41
MBMG	09/28/17	10:14	3,720	3.67	6,255	9.9	577	3.05	6,240	2,554	0.0	408	376	73	5.4	349	118	88.9	0.0	0.0	16.0	5,831	<0.05	<0.05	21.71
MBMG	10/31/17	13:46	4,007	4.07	6,445	6.9	550	3.14	6,425	2,742	0.0	432	404	73	5.7	371	122	91.7	0.0	0.0	12.9	5,900	<0.05	<0.05	13.47
MBMG	11/28/17	10:58	3,387	4.34	6,450	3.1	531	3.11	6,430	2,734	0.0	440	397	74	5.7	354	117	87.4	0.0	0.0	13.5	5,836	<0.05	<0.05	21.52
MBMG	12/28/17	14:50	2,256	2.88	6,380	3.1	600	3.08	6,380	2,679	0.0	433	388	74	6.0	340	116	85.8	0.0	0.0	13.6	5,913	<0.05	<0.05	21.11
MBMG	01/26/18	14:50	3,215	3.04	4,220	6.2	586	3.30	5,675	2,381	0.0	439	312	75	9.1	268	111	82.0	0.0	0.0	13.5	5,053	<0.05	<0.05	16.47
MBMG	02/28/18	11:37	2,965	3.30	5,700	5.1	553	3.45	5,820	2,506	0.0	446	338	79	8.3	291	106	79.1	0.0	0.0	16.6	4,923	<0.05	<0.05	23.07
MBMG	03/27/18	10:54	2,885	2.89	5,300	7.8	608	3.10	5,620	2,306	0.0	434	297	76	9.4	250	104	78.3	0.0	0.0	13.5	4,906	<0.05	0.25	15.54
Mean Value			2,837	3.27	5,332	11.5	548	3.01	5,836	2,507	0	444	338	78	9.1	312	123	78	0.0	0.0	15.57	5,510	1.6	0.3	16.95
Maximum Value			6,350	5.65	9,010	22.9	821	3.96	11,540	3,763	15	555	655	100	13.0	937	361	102	0.0	0.0	33.60	13,453	9.8	0.5	48.61
Minimum Value			820	1.52	1,523	2.2	286	2.14	3,920	1,882	0	395	106	61	1.5	97	77	56	0.0	0.0	8.69	3,010	0.2	0.1	1.24
Number Readings			224	221	225	224	218	223	222	228	226	229	229	229	228	229	229	221	221	221	157	221	19	42	214

nd/na - not measured or analyzed

Montana Bureau of Mines and Geology
Horseshoe Bend Drainage
Water Quality Data

05/08/18
Horseshoe Bend Drainage
M#:125744

DISSOLVED CONCENTRATION

Collector/ Lab Analyzer	Date (mm/dd/yy)	Al (ug/l)	Ag (ug/l)	As (ug/l)	B (ug/l)	Be (ug/l)	Cd (ug/l)	Cr (ug/l)	Co (ug/l)	Cu (ug/l)	Li (ug/l)	Mo (ug/l)	Ni (ug/l)	Pb (ug/l)	Se (ug/l)	Sr (ug/l)	Ti (ug/l)	Tl (ug/l)	U (ug/l)	V (ug/l)	Zn (ug/l)	Zr (ug/l)
MBMG	07/16/15	299,058	<1.0	2.3	17.7	28.7	918	32.1	1,036	14,634	137.6	<1.0	731	<0.6	13.70	722		<1.0	340	<1.0	310,314	<1.0
MBMG	08/27/15	339,841	4.58	3.2	33.4	37.3	1,220	37.6	1,113	21,228	197.1	3.84	799	2.4	15.86	810		<1.0	427	<1.0	318,725	<1.0
MBMG	09/29/15	217,673	3.2	2.2	22.9	25.0	891	22.0	829	24,253	100.0	6.31	584	2.3	8.86	799		<1.0	257	<1.0	241,778	<1.0
MBMG	10/21/15	300,749	<1.0	4.8	<5.0	42.7	1,118	47.3	1,037	25,221	144.3	<1.0	724	3.2	15.56	815		<1.0	397	<1.0	324,128	<1.0
MBMG	11/12/15	364,745	<1.0	6.2	<5.0	46.3	1,106	56.0	1,177	28,064	157.7	<1.0	850	2.3	16.41	722		<1.0	536	8.66	361,493	<1.0
MBMG	12/18/15	285,785	<1.0	4.6	12.4	30.3	890	29.2	937	36,002	132.3	<1.0	715	2.3	15.07	788		<1.0	324	<1.0	322,454	<1.0
MBMG	01/11/16	229,325	<1.0	3.0	7.5	23.7	932	20.4	818	36,937	85.4	4.07	577	2.3	9.29	896		<1.0	288	<1.0	294,374	<1.0
MBMG	02/04/16	247,269	2.17	2.9	61.8	32.5	1,227	35.7	977	33,807	150.7	22.84	692	3.7	<1.0	956		<1.0	377	3.10	272,108	<1.0
MBMG	03/04/16	149,709	<1.0	6.2	53.8	20.9	1,074	13.2	680	64,205	126.2	10.48	491	2.7	7.77	1,015	54.9	<1.0	232	7.03	207,512	<1.0
MBMG	04/29/16	292,250	<1.0	2.1	131.6	29.1	950	33.8	1,002	34,869	121.0	2.22	699	2.8	8.92	774		<1.0	345	<1.0	280,872	<1.0
MBMG	05/12/16	342,812	<1.0	12.1	85.0	25.4	943	42.7	1,033	28,454	99.5	4.62	757	<0.6	8.00	599		<1.0	414	29.75	295,242	<1.0
MBMG	06/03/16	219,153	<1.0	<1.0	132.2	22.2	1,066	19.5	840	53,246	107.5	<1.0	576	<0.6	5.62	958		<1.0	295	<1.0	250,010	<1.0
MBMG	07/14/16	186,248	<1.0	3.3	6.4	21.5	958	15.4	746	54,518	91.3	3.75	494	2.2	7.74	926	52.1	<1.0	248	3.56	222,039	<1.0
MBMG	08/03/16	214,081	<1.0	3.3	210.4	24.3	900	18.8	812	40,139	105.1	8.00	568	3.8	7.63	849	67.8	<1.0	270	2.26	243,701	<1.0
MBMG	09/16/16	313,281	<1.0	7.5	249.7	28.6	809	34.0	1,004	40,872	113.5	<1.0	687	<0.6	11.57	631	96.9	<1.0	341	11.30	290,837	<1.0
MBMG	10/10/16	251,774	<1.0	5.2	173.2	25.4	812	24.5	830	48,409	98.7	<1.0	579	<0.6	7.68	737	96.9	<1.0	275	9.44	238,568	<1.0
MBMG	11/04/16	179,503	<1.0	5.8	151.1	15.7	808	14.3	699	55,258	74.6	2.19	484	<0.6	7.08	870	76.8	<1.0	211	8.82	220,503	<1.0
MBMG	12/02/16	377,879	<1.0	5.8	227.3	40.5	1,073	43.9	1,186	33,010	186.5	2.25	842	<0.6	14.45	708	72.8	<1.0	480	12.83	332,642	<1.0
MBMG	01/11/17	278,084	2.01	2.7	18.4	28.4	754	30.8	930	14,661	141.1	15.9	698	<0.6	12.35	688	111.8	3.86	320	<1.0	265,585	<1.0
MBMG	01/30/17	306,250	<1.0	<1.0	13.9	29.3	758	27.3	962	17,234	140.5	<1.0	687	<0.6	<1.0	629	93.9	<1.0	315	2.95	276,550	<1.0
MBMG	02/28/17	336,655	2.48	8.1	199.5	36.3	975	43.9	1,061	39,569	144.5	2.49	759	<0.6	10.51	625	81.7	<1.0	403	25.83	288,727	<1.0
MBMG	03/30/17	343,268	<1.0	10.6	146.6	29.9	1,086	43.3	1,072	46,396	129.4	2.94	780	2.1	14.68	696	72.4	<1.0	402	28.30	305,803	<1.0
MBMG	04/27/17	319,160	26.98	8.7	197.2	37.1	1,060	44.4	1,045	44,099	158.4	18.58	761	2.3	12.58	642	68.3	9.37	404	27.73	286,735	<1.0
MBMG	06/02/17	271,375	<1.0	2.8	351.5	23.4	844	25.3	912	23,161	107.9	<1.0	661	<0.6	8.55	656	82.6	<1.0	330	<1.0	257,400	<1.0
MBMG	06/29/17	239,575	<1.0	2.1	27.7	24.6	811	22.9	826	20,599	51.9	<1.0	580	<0.6	7.84	821	98.6	<1.0	277	<1.0	235,300	<1.0
MBMG	07/27/17	281,550	12.04	4.1	18.8	33.1	866	30.6	891	21,640	134.1	2.02	647	<0.6	9.68	681	99.6	<1.0	323	<1.0	254,000	<1.0
MBMG	08/30/17	264,000	19.48	3.1	16.6	29.7	799	30.4	865	15,704	100.0	3.23	631	0.7	10.61	732	107.9	<1.0	285	<1.0	251,350	2.3
MBMG	09/28/17	287,700	2.98	3.3	263.7	36.6	897	40.3	958	21,986	144.0	3.00	674	<0.6	10.58	657	126.7	<1.0	437	2.95	250,400	<1.0
MBMG	10/31/17	299,400	2.57	5.3	355.7	33.0	868	39.7	926	24,576	142.3	4.37	666	4.1	12.02	624	101.0	<1.0	392	11.84	258,300	22.17
MBMG	11/28/17	290,250	2.37	5.2	319.0	35.8	972	46.2	960	26,925	143.9	9.88	688	2.3	13.45	681	121.4	<1.0	376	7.75	249,150	5.12
MBMG	12/28/17	283,850	<1.0	8.1	314.2	35.6	973	56.1	972	22,608	155.5	4.51	656	<0.6	13.67	676	117.7	<1.0	409	16.78	242,150	<1.0
MBMG	01/26/18	225,000	<1.0	3.1	208.9	23.8	788	22.8	732	29,729	116.3	11.72	537	2.7	8.68	806	81.4	<1.0	249	5.98	218,300	3.02
MBMG	02/28/18	225,250	<1.0	<1.0	254.0	24.5	724	24.4	728	17,047	102.7	4.99	534	<0.6	8.41	731	72.5	<1.0	259	<1.0	215,800	1.34
MBMG	03/27/18	187,039	<1.0	1.4	230.4	21.1	759	23.2	724	20,589	100.7	6.48	511	2.4	7.83	836	62.0	<1.0	237	<1.0	206,400	2.53
Mean Value		226,886	7	13.0	105	27.0	1,218	37.0	841	40,746	132	6	592	4.9	17	1,013	55.0	3.25	331	11.6	262,066	9
Maximum Value		657,448	27	66.5	513	52.9	2,151	153.5	1,429	101,000	703	23	1,165	59.1	148	1,327	157	13.20	664	70.1	434,103	23
Minimum Value		92,344	1	0.9	1	11.7	595	10.6	340	10,485	7	1	148	0.6	2	587	1.3	0.23	105	0.8	148,000	1.0
Number Readings		225	22	153	125	201	231	171	231	231	226	38	229	80	155	226	115	9	211	90	231	17

nd/na - not measured or analyzed

Montana Bureau of Mines and Geology
Horseshoe Bend Drainage
Monthly Flow Statistics

	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Mean (gpm)	3,218	2,645	3,499	3,169	2,895	2,673	2,936	3,488	3,045	3,367	2,925	3,467
Min (gpm)	2,373	1,774	2,959	2,634	2,131	2,063	2,381	2,757	2,435	2,591	2,412	3,310
Max (gpm)	4,112	3,696	4,687	4,169	3,746	4,942	4,082	7,073	4,546	4,543	3,445	3,608
Total Flow (MG)	143.9	106.9	156.5	114.3	146.2	100.2	144.0	166.1	131.8	145.7	126.6	115.0

	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15**	Dec-15
Mean (gpm)	3,348	3,229	3,483	4,553	4,996	3,914	3,081	3,182	2,912	2,936	3,349	3,139
Min (gpm)	2,424	2,079	3,052	2,560	3,059	2,915	2,363	3,005	2,473	2,588	1,451	1,789
Max (gpm)	3,991	5,157	4,864	7,778	6,641	5,131	3,657	3,374	3,479	3,726	3,927	4,356
Total Flow (MG)	188.4	121.1	140.7	229.9	201.8	180.7	133.4	133.1	142.8	127.1	77.2	135.6

	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
Mean (gpm)	3,475	3,393	2,779	3,139	3,589	2,887	3,293	3,383	3,421	3,371	3,526	3,341
Min (gpm)	2,223	2,982	2,324	2,446	3,167	2,707	2,656	2,792	2,873	2,791	2,491	2,753
Max (gpm)	4,553	4,137	3,797	3,718	4,160	3,024	3,976	4,264	3,688	3,886	4,410	3,918
Total Flow (MG)	135.1	131.9	136.1	140.1	160.2	124.7	132.8	160.8	152.7	150.5	152.3	149.1

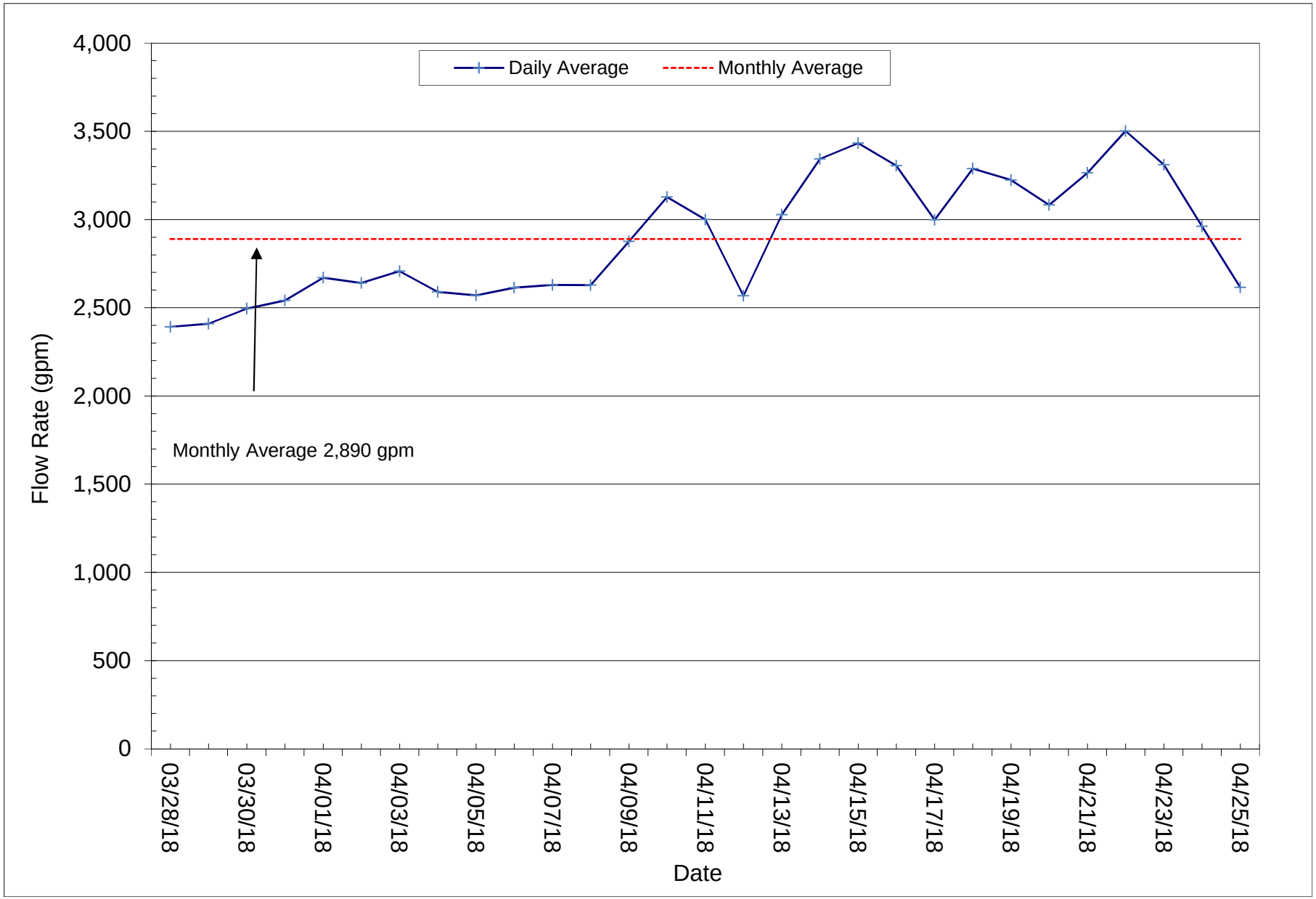
	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Mean (gpm)	3,472	3,093	2,756	3,627	3,896	3,258	3,821	3,869	2,867	2,963	3,260	2,771
Min (gpm)	3,153	2,109	2,327	3,051	3,344	2,499	3,362	3,533	2,106	2,425	2,963	1,678
Max (gpm)	3,907	4,404	3,378	4,567	4,411	4,185	4,376	4,323	3,311	3,466	3,786	3,177
Total Flow (MG)	150.0	129.2	119.1	146.2	190.7	136.0	154.1	189.4	119.7	140.8	131.4	119.7

	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Mean (gpm)	2,888	2,706	2,646	2,890								
Min (gpm)	2,141	2,278	2,166	2,391								
Max (gpm)	4,164	4,093	3,458	3,502								
Total Flow (MG)	120.6	128.6	102.9	120.7								

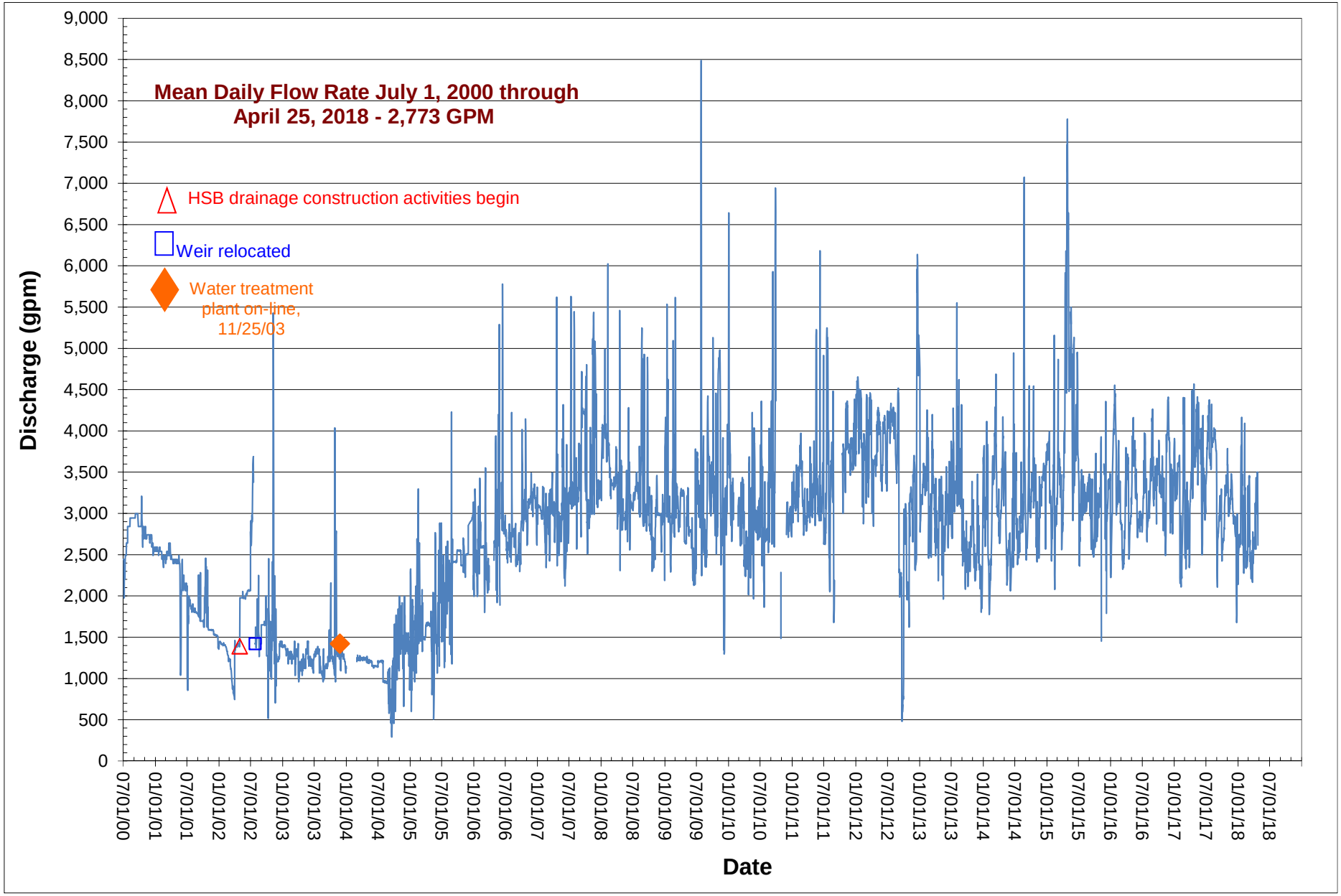
Number of days in each reporting period affect total flow (MG) calculations.
**** New 5-ft rectangular weir installed November 2015; December 2015 radar sensor and staff gauge relocated.**

Data Sources:
7/1/00-7/12/01 MR 24" Flume
7/6/01 90° Weir installed, Transducer installed 7/12/01.
Flume data corrected for submergence.
*Apr-Oct 7, 2002 flow rates are estimates based upon partial transducer readings and field measurements.

Montana Bureau of Mines and Geology
Butte Mine Flooding Monitoring
Horseshoe Bend Drainage
April 2018



Montana Bureau of Mines and Geology
Butte Mine Flooding Annual Report
Horseshoe Bend Drainage



HSB-2016-2018-Data

Horseshoe Bend Drainage Flow Rate.