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# WEEKLY REPORT – RED & BONITA BULKHEAD TEST

| | |
|---|---|
| **DATE: September 17-23, 2020** | **REPORT NO: 11** |
| **TEST PHASE: Phase 3, Filling to 200 ft Head and Phase 4, Drain Down** | **TO: Kerry Guy, James Hou** |
| **PREPARED BY: Christoph Goss, PhD, PE, Morley Beckman, PE, and Erinn Johnson** | **FROM: Deere & Ault, Mountain Studies Institute, U.S. Environmental Protection Agency, Environmental Restoration, and Weston Solutions** |

## Actions Taken This Week:

- From 9/17 to 9/20, the globe valve remained closed to raise the pressure from 50 feet of head to 200 feet of head (Phase 3). Head rose from about 181 feet to 184 feet during the first part of this test period.
- On Saturday, 9/19, slug tests were performed during the site wide sampling event with USGS and MSI.
- On Monday, 9/21 around 9:15 am, the globe valve was opened and Phase 4 (Drain Down) began.
- Pressure readings were taken on regular basis at the pressure gauge by the Red & Bonita (R&B) portal, and at the pressure gauges by the R&B bulkhead.
- Daily R&B adit inspections and adit flume measurements were performed by ER.
- Weekly inspections were performed by MSI at all sites listed in the R&B Bulkhead Test Execution Plan and at new emergent flow locations (Attachment B).
- Flow rates and pressures from various on-site instruments were monitored and recorded.
- Water samples from the R&B drain conveyance line were taken on 9/22/20 at 14:00. These samples will be tested in the laboratory.

## Items Pending Resolution:

- Adjust R&B pipe flow sensor settings to transmit higher flow data to data logger.

## Key Observations:

- Phase 3 (filling behind the bulkhead to 200') ended on September 21st, 2020, allowing approximately four weeks to drain down the level in Red & Bonita before the start of winter weather conditions.
- The final pressure behind the bulkhead at the end of Phase 3 was 184.4 feet of head.
- When the globe valve was opened to begin the drain down phase, there was an initial surge of turbid water for about five minutes. Following this initial flush, the water flowed very clear, as is typical for R&B discharge water.
- The flowmeter measuring discharge out of Red & Bonita estimated 400-450 gpm this week. Flowmeter was measuring 400 gpm consistently on the datalogger but 465 on the actual sensor. The issue appears to be a programming limitation that caps the maximum signal at 400 gpm. MSI will update the programming. Until then,

flows can be calculated by subtracting the Gold King flows from the total plant flows. Readings from the direct sensor compares well (within 20 gpm) of the plant flows.

- Flow rates at Gold King continue with daily fluctuation cycles between approximately 305 to 350 gpm (Figure 1). Average daily flow rates continue to be less volatile than prior to 9/9/20, and are generally increasing almost 340 gpm daily. The flow rates generally correspond with flow rates measured at the treatment plant.
- The data from American Tunnel will not be updated this week because of an issue with the instrumentation. The data is still being collected however it cannot be received without repair of the equipment.
- The Mogul Mine data was collected this week and appears to be following its seasonal downward trend.
- Water levels in NFPZ-1 following typical seasonal cycle (Figure 4). Level in NFPZ-1 peaked in mid-August and is dropping as part of the typical cycle.
- ATPZ-2 (water level behind American Tunnel Bulkhead 3) remaining fairly steady (Figure 4). Slight increase in ATPZ-2 level in the past few weeks – this will continue to be monitored in future weeks.
- Good agreement between pressure gauges at R&B portal and bulkhead.
- Flows through Flume 1 side drift were measuring between 1.7 gpm and 2.1 gpm prior to the opening of the Globe valve. The flows have decreased to approximately 1.5 gpm after opening (Figure 5).
- Flows from Flume 2 in the main adit near station 2+30 increased from 1.7 to 8.3 gpm prior to opening they have now decreased to about 5.5 gpm (Figure 5).
- Flows from Flume 3 at the bulkhead remained around 1 gpm (Figure 5), relatively unchanged from last week. Until the globe valve was opened. The flows have decreased to about 0.7 gpm.
- Seepage from the back within R&B has decreased within 25 ft of the bulkhead after the globe valve was opened.
- Pressure readings from VWP in good agreement with pressure gauges.
- Overall planned seeps and springs monitoring locations are unchanged or experiencing seasonal reduced flows.
- Twenty-nine newly identified seep and spring locations prior to the bulkhead closure showing recent emergent flow. Several of these are monitoring locations which have previously been sampled (prior to 2019) or have evidence of prior flow. A total of 24 of them are newly named locations. Four additional locations were discovered this week. These additional seepage locations are in five key areas:
    - Along Cement Creek, between the fen at the base of Red & Bonita and the confluence with the North Fork Cement Creek (SS415-SS417 – Formerly Outflow 0.9, 0.5, 1 and 2)
    - Near the intersection of the North Fork of Cement Creek and Cement Creek or along CR53 (SS400-SS405, SS407 -SS412, SS418, SS420)
    - Southeast of the American Tunnel portal (SS406, SS413, SS419, SS055)
    - Along the road to Natalie Occidental (CR-52) (SS414, SS016, SS017 – new this week: SS422 & SS423).
    - A new location of seepage was discovered this week in the Adam's Mine drainage (SS421) this is the first new seepage location farther north of the R&B portal.

  These are described in Attachment B.
- Ensero saw a flow increase on the range of 600 gallons per minutes once the R&B water reached the Interim Water Treatment Plant. Initially, this new flush of water created highly turbid water to be discharged out of the one clarifier that was operational. Quickly the plant's second clarifier was brought online, in parallel with the other clarifier, and the turbidity numbers dropped rapidly to below 3 NTUs. The plant has been operating smoothly since Monday afternoon. The pH of the Gold King water has been around 3.75 recently. With the addition of the R&B water which has been around a pH of 5.5, the combined influent to the plant has been right around 4.0.
- Figure 8 overlays seepage observations locations with previously mapped areas of ferricrete, manganocrete and bog occurrences. Ferricrete is a natural phenomenon consisting of surficial deposits cemented in place by iron oxyhydroxide. The surficial deposits serve as flow paths and precipitation sites for iron-rich water derived from the oxidation of pyrite. Ferricrete deposits generally indicate areas of long-standing acidic groundwater expression at the ground surface. Ferricrete conditions have existed in the area before, during and after mining. The fact that

seepage observations generally align with areas of ferricrete supports the theory that seepage is largely following pre-existing pathways, as groundwater returns to pre-mining levels during the bulkhead test.

- USGS Slug testing completed at 9 locations. Metals testing will be forthcoming.

**Actions for Next Week:**

- Continue to monitor the pressure behind the bulkhead while drain down and treatment of outflow water continues.
- Drain at 300-600 gpm depending on plant performance. Rate will be adjusted slowly in close coordination with plant operators.
- Measure pressure gauges and pipe sensor in R&B dail (ER).
- Three time per week take flume measurements in R&B (ER).
- Bi-weekly inspections of some sampling sites and emergent flow sites in the area (MSI).
- Monitoring to detect newly identified seepage/outflow sites in the area (MSI) and possible opportunistic sampling at these sites.
- Ensero will be jetting lines to plant. Flows from R&B may have to be slowed or stopped.

**Observations by Location at Originally Planned Sites (See Bulkhead Test Execution Plan):**

| Location | Observations |
|---|---|
| Adams Mine | Dry. No changes observed. |
| Adams Mine – North Adit | No changes observed. |
| Adit 268-20 | No changes observed. |
| Adit 268-21 | No changes observed. |
| American Tunnel | No changes observed. Barologger not downloading. |
| ATPZ-2 | Well was pumped for sampling on 9/14/20, appears to be at normal levels. |
| Blackhawk Mine | No changes observed. Visited on 9/7/20. |
| Gladstone Seeps & Springs | No changes observed. |
| Gold King Level 7 | No changes observed. |
| Lead Carbonate Mine | No changes observed. Visited on 9/7/20. |
| Mogul Mine | Slightly drier. Barologger reinstalled on 9/17/20. |
| Mogul Mine – South Adits | No changes observed. |
| Natalie / Occidental | After IROD work to improve gate with hinge and remove debris, the water cleared out allowing views further in showing collapsed timber set; new mine timber and lagging removed from grate. |
| NFPZ-1 | Well was pumped for sampling on 9/14/20, appears to be at normal levels. |
| North Fork Seeps & Springs | Flow in North Fork has increased between stream gauge CCSG5 and seeps by NFPZ1. |
| Pride of Bonita | No changes in flow observed. |
| Red & Bonita | See key observations above. |
| Red & Bonita / Adams Mine Gulch Seeps & Springs | Seasonal flows decreasing. |
| Terry Tunnel | No changes observed. |

**Observations by Location at Seepage Sites Not Originally Planned for Monitoring - Opportunistically Added:**

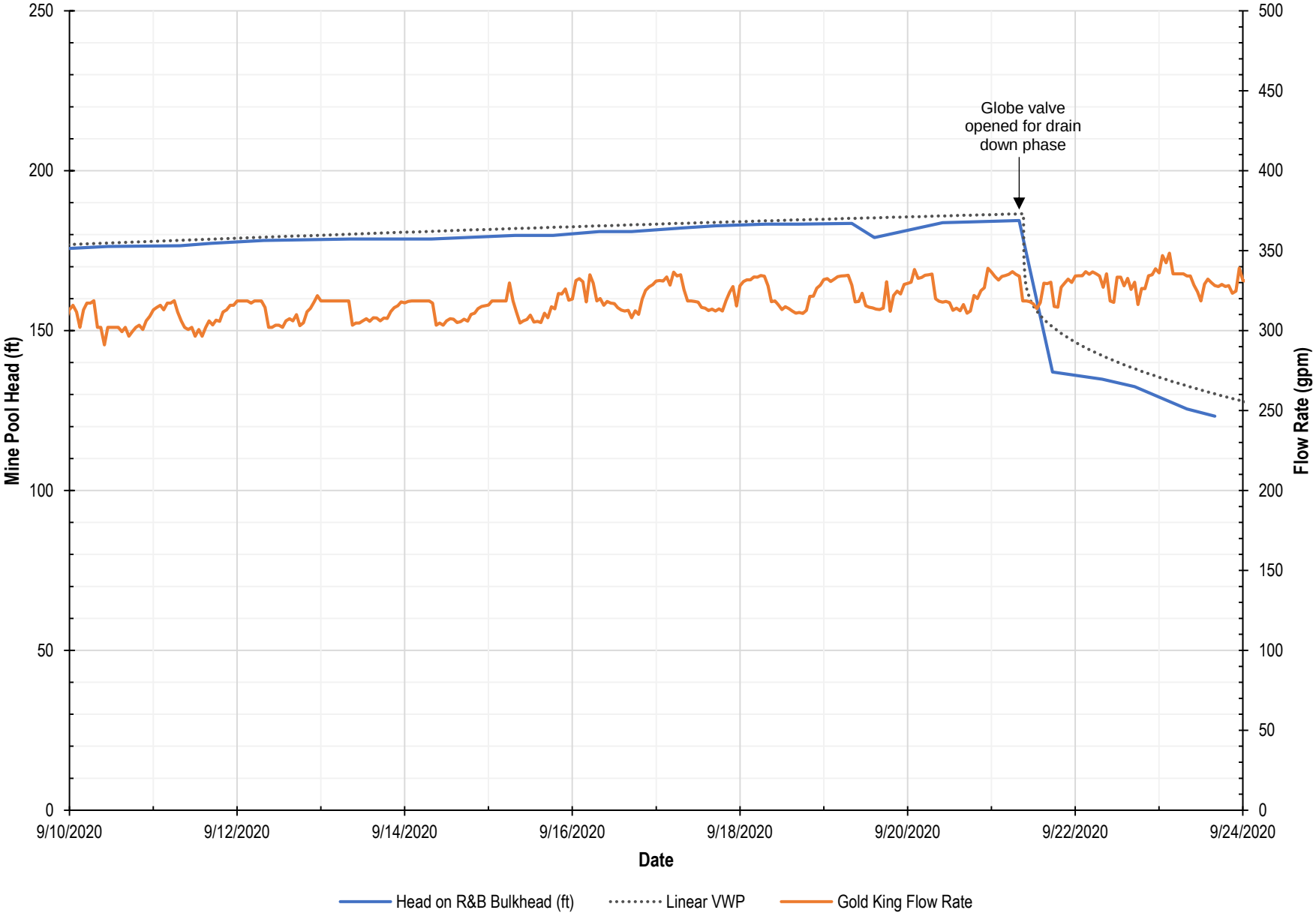
| Location | Observations |
|---|---|
| SS416, SS415, SS417 (Outflows #1, 2, 0.5 & 0.9) Base of Red & Bonita | An increase in flow at SS415 of about 2 gpm. SS417 had measurable flow this week. SS416 remained relatively unchanged. |
| SS400-SS405 and SS407-SS412, SS418, SS420, along Cement Creek and the Mogul Mine Road (CR 53) | New seep location last week was discovered, SS420, flow remains to low to sample. No other major changes since last week. |
| SS055, SS419, SS413, SS406 near American Tunnel | Flows remain relatively unchanged from last week in SS406, SS413 & SS419. Field parameters for SS406 are similar to that of the American Tunnel. SS055 was not observed this week. |
| SS414, SS016-SS017 and SS422-SS423 along CR 52 | New seepage locations discovered this week, SS422 – between SS016 & SS017, and SS423 – below SS422 South of house on CR 52. SS423 has measurable flow at about 1.3 gpm. No other major changed from last week. |
| Adams Mine Drainage (SS421) | Dripping at approximately once per 15 seconds. |

**Figure 1:** Head Behind Red & Bonita Bulkhead and Gold King Flows vs. Time (Current Testing Period)
**Figure 2:** Gold King Flow and Red & Bonita Head vs. Time (Full Testing Period)
**Figure 3:** Adit Flows and Piezometers vs. Time
**Figure 4**: NFPZ-1 and ATPZ-2 vs. Time
**Figure 5**: Red & Bonita Adit Flume Flows
**Figure 6**: Red & Bonita Plan & Profile with Estimated Groundwater Table
**Figure 7:** Red & Bonita Extended Plan & Profile with Estimated Groundwater Table
**Figure 8:** Cement Creek Area, Study of Ferricrete, Manganocrete, and Iron Bog Occurrences by USGS

**Attachment A:** Photographs, September 17-23, 2020
**Attachment B:** Weekly Summary Report of MSI Observations (table and maps)

# FIGURES

FIGURE 1: Head on Red & Bonita Bulkhead and Gold King Flow Rate



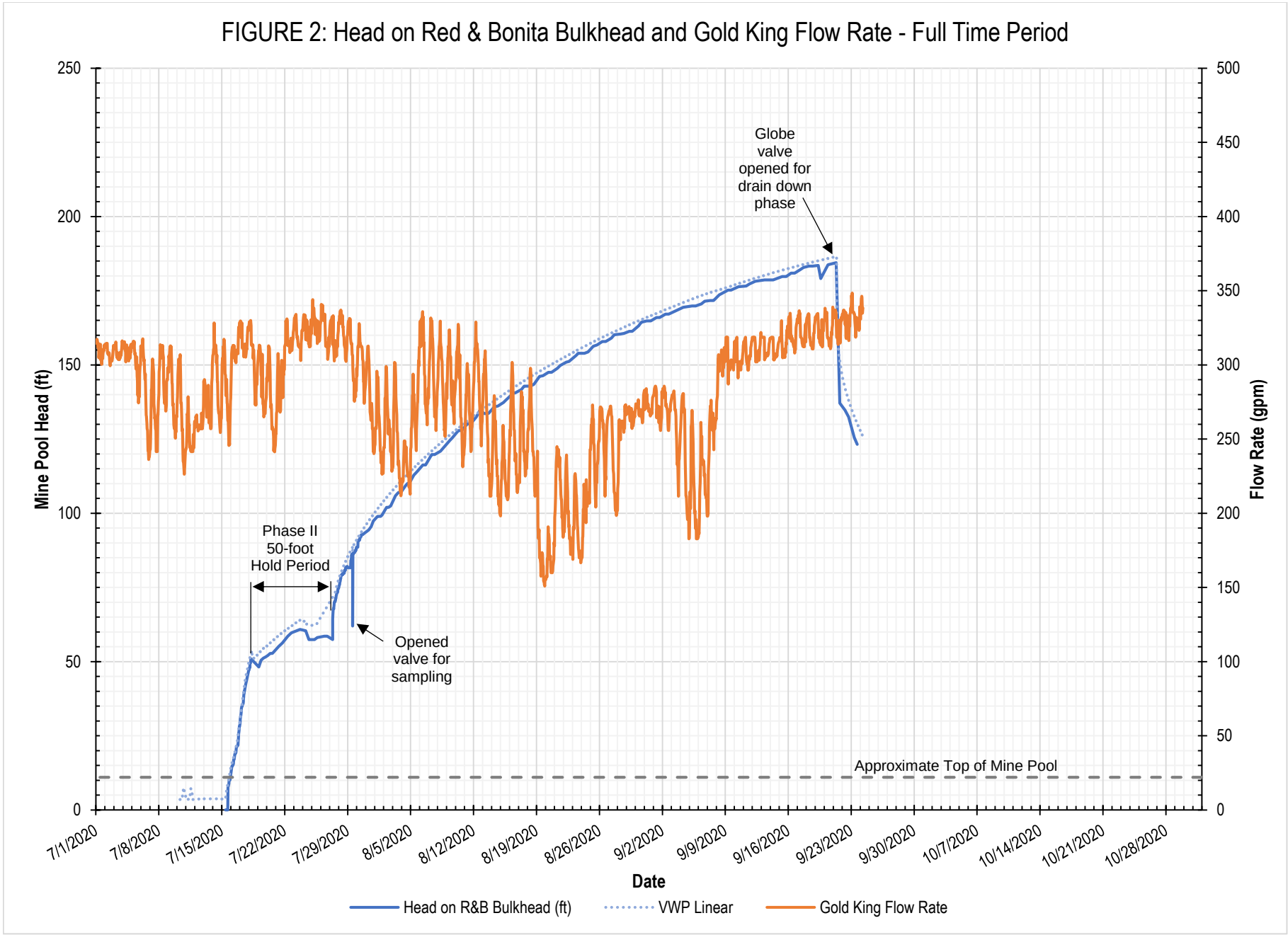
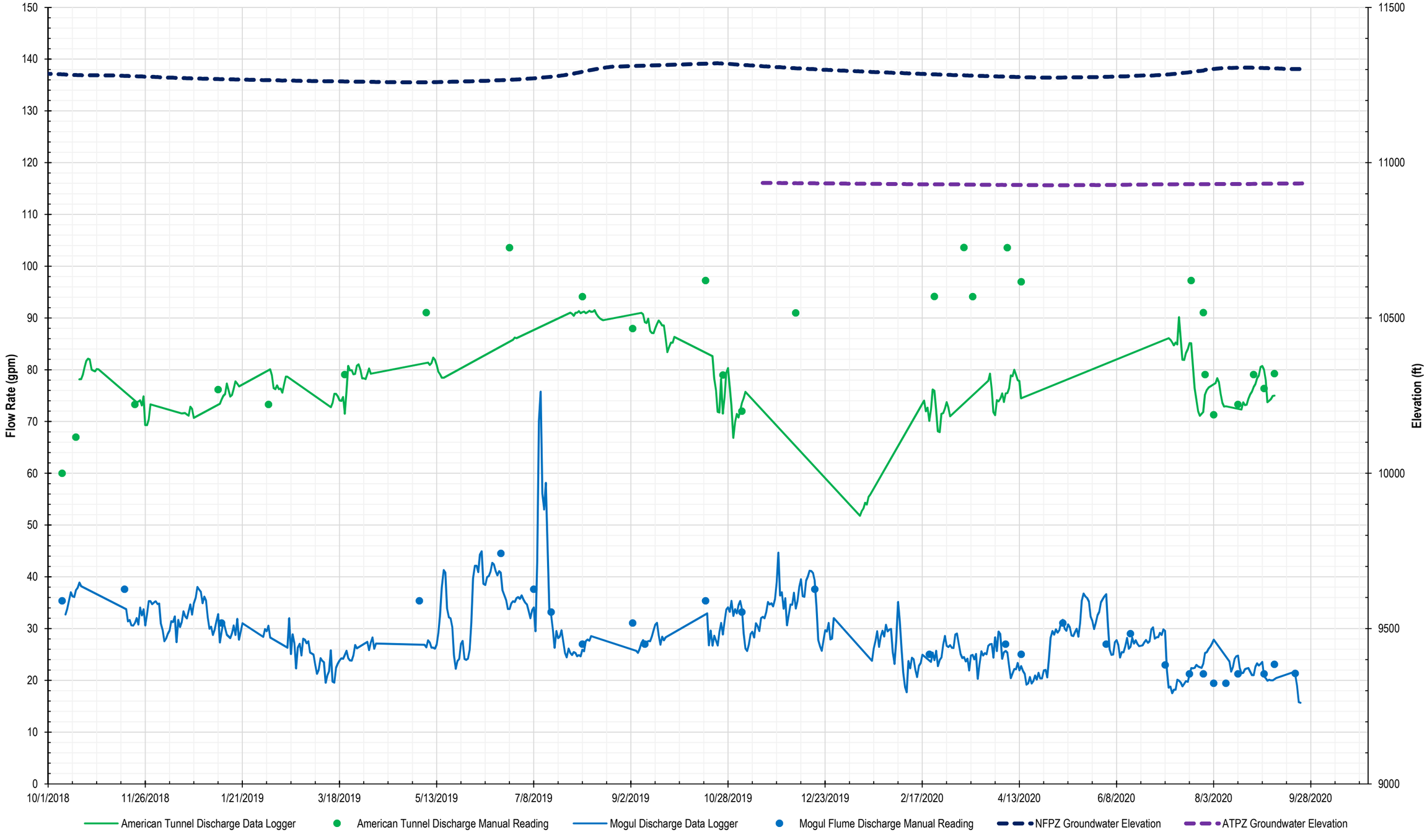
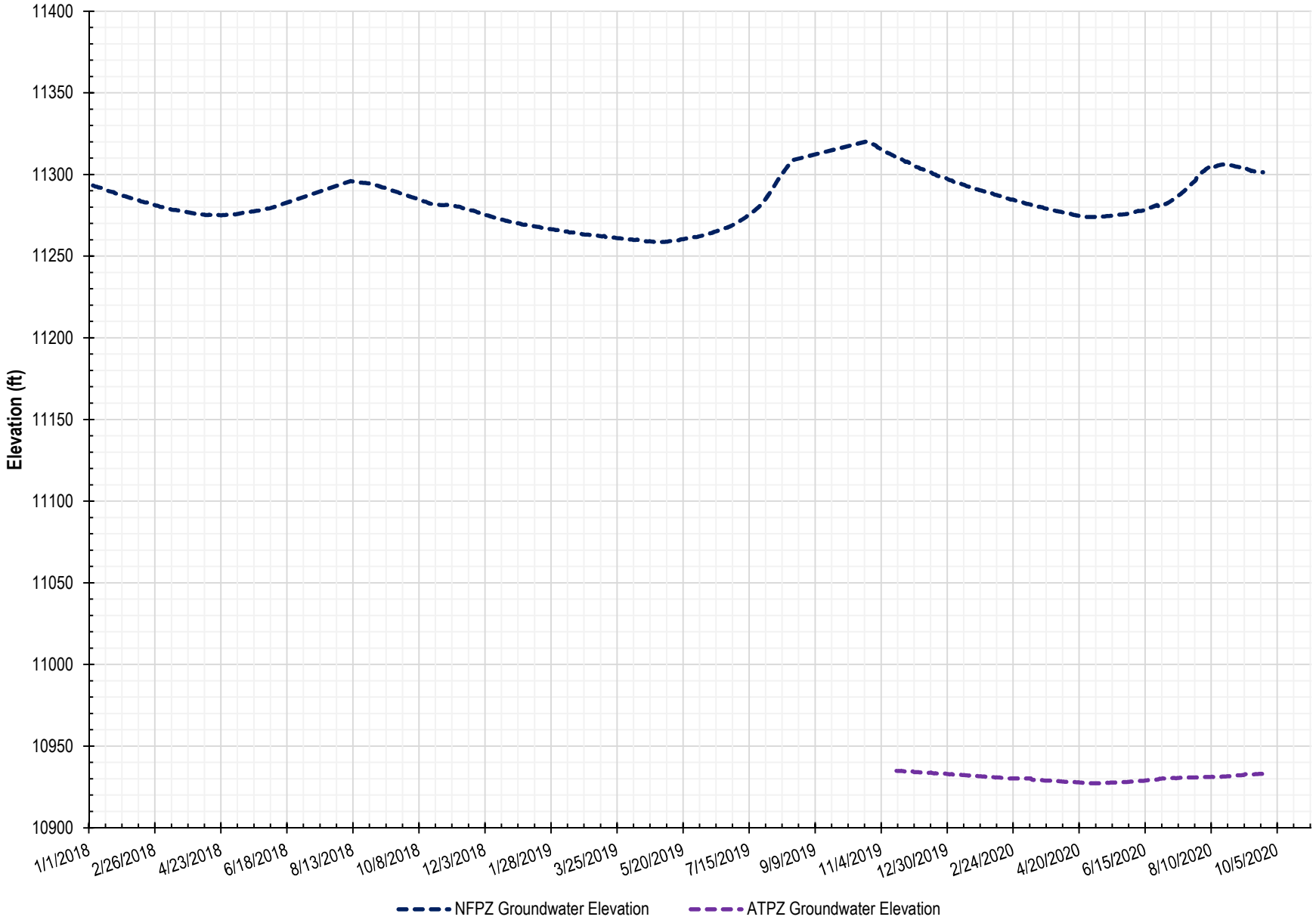


FIGURE 2: Head on Red & Bonita Bulkhead and Gold King Flow Rate - Full Time Period
Mine Pool Head (ft)
Flow Rate (gpm)
Date
Globe valve opened for drain down phase
Phase II 50-foot Hold Period
Opened valve for sampling
Approximate Top of Mine Pool
Head on R&B Bulkhead (ft)
VWP Linear
Gold King Flow Rate

## FIGURE 3: Adit Flows and Water Levels



## FIGURE 4: Groundwater Elevations



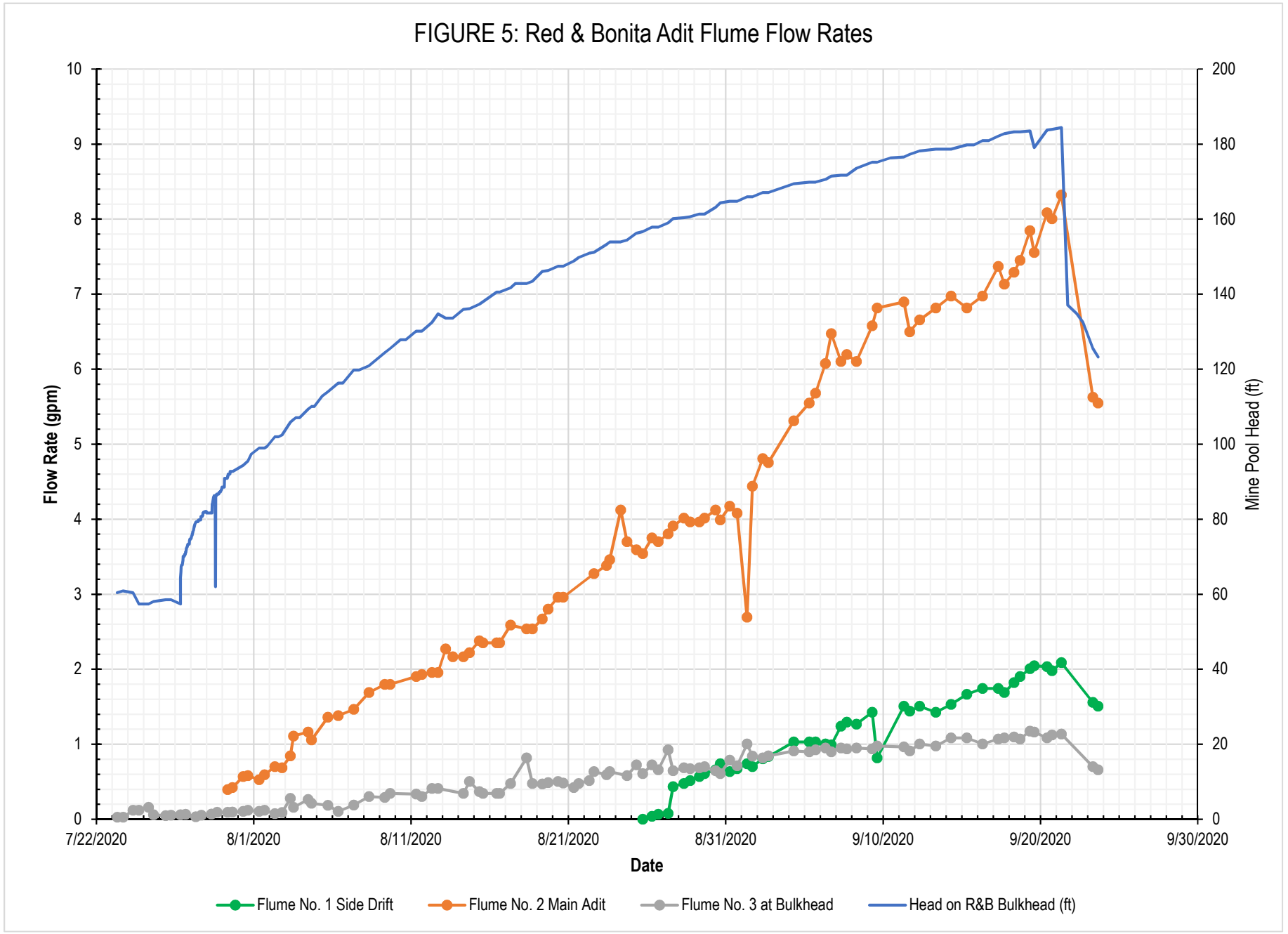
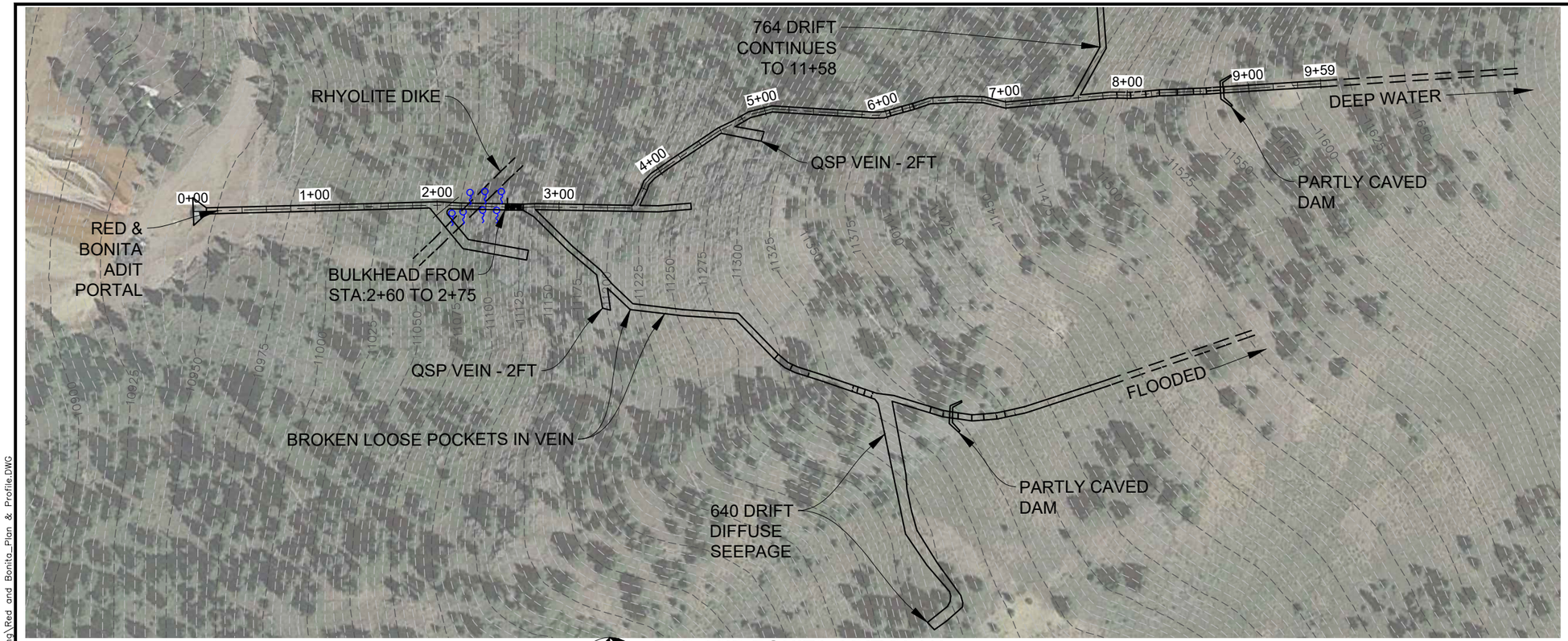
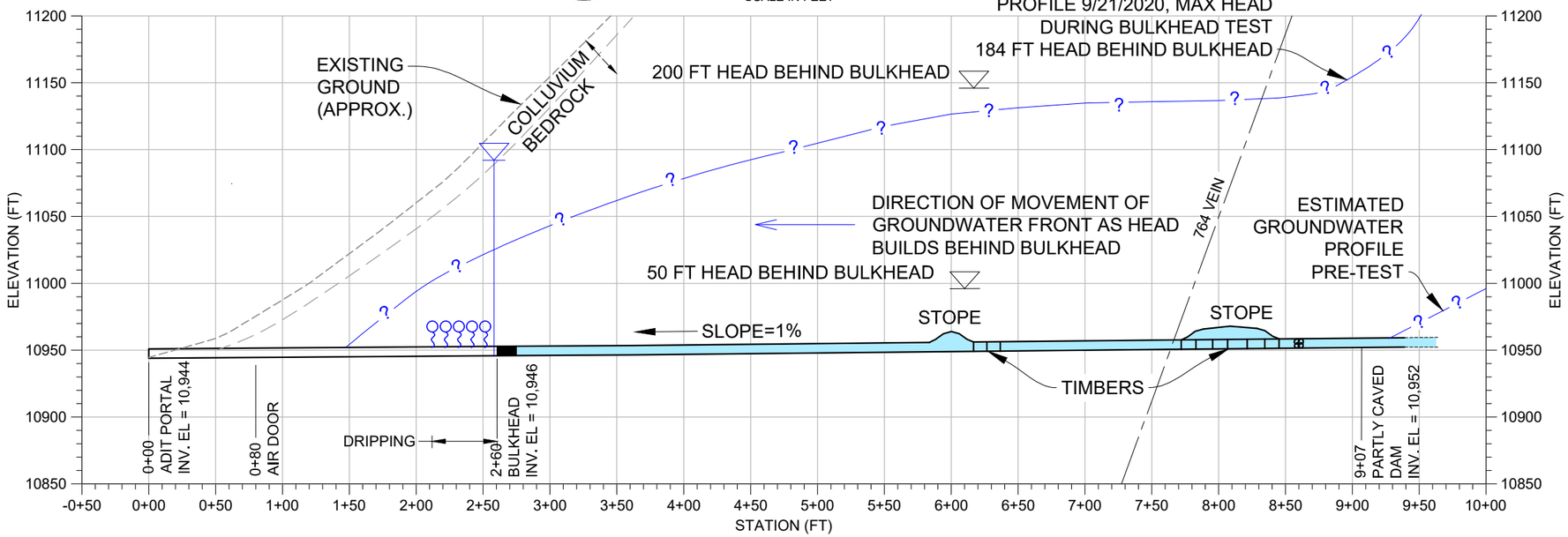


FIGURE 5: Red & Bonita Adit Flume Flow Rates
Flow Rate (gpm)
Mine Pool Head (ft)
Date
7/22/2020
8/1/2020
8/11/2020
8/21/2020
8/31/2020
9/10/2020
9/20/2020
9/30/2020
Flume No. 1 Side Drift
Flume No. 2 Main Adit
Flume No. 3 at Bulkhead
Head on R&B Bulkhead (ft)




## RED AND BONITA ADIT PLAN

0 50 100
SCALE IN FEET




## RED AND BONITA ADIT PROFILE

0 50 100
SCALE IN FEET

***NOTES:***

1. RED AND BONITA ADIT MAP PLAN VIEW BY BRUCE K. STOVER, COLORADO DIVISION OF RECLAMATION, MINING AND SAFETY (DRMS), AUGUST 13, 2013.
2. SURVEY BY ITC RESOURCES JUNE 2020.

JOB NO. 0251.002.00

**RED & BONITA ADIT**

**PLAN & PROFILE**

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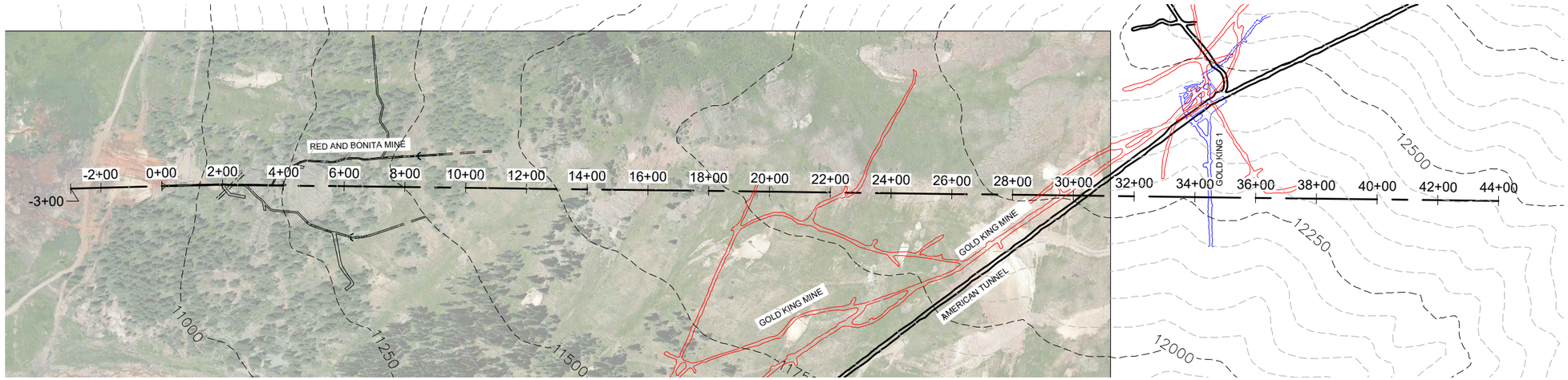
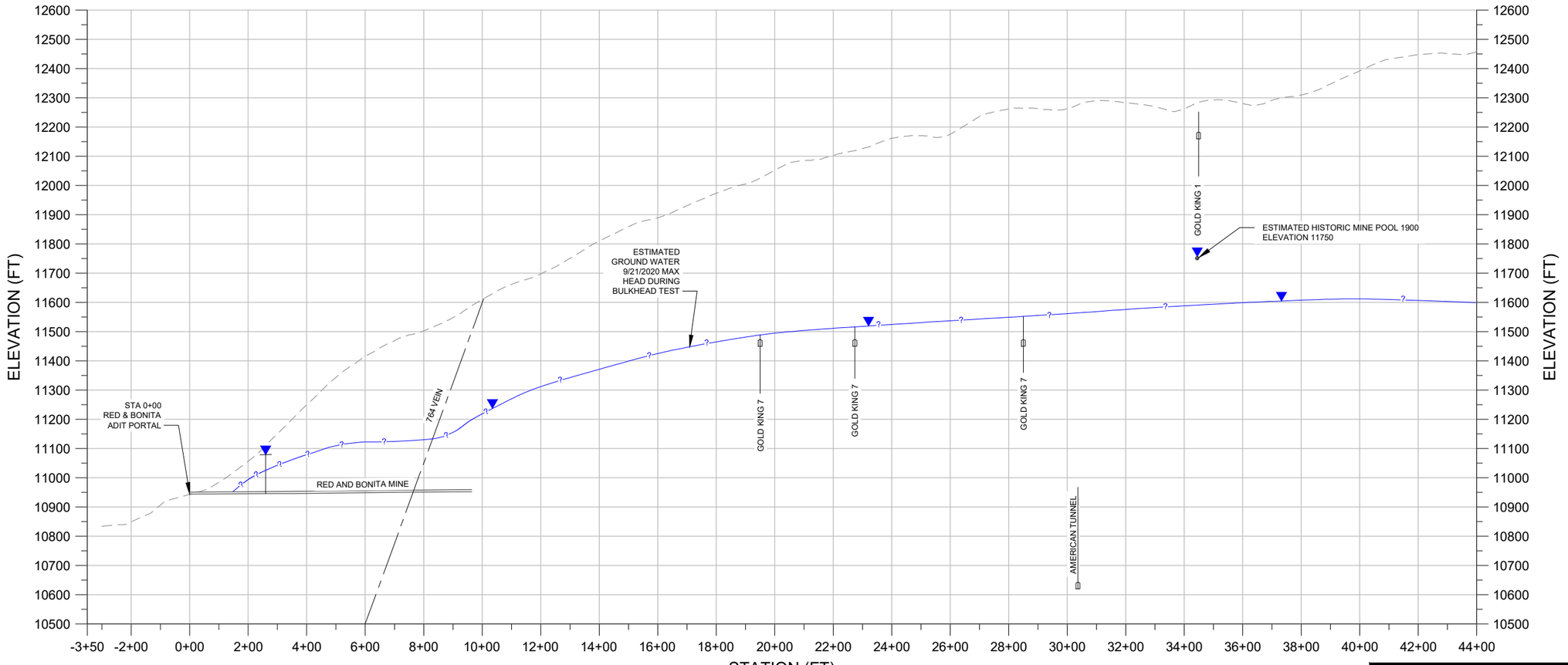
FIGURE NO. **6**

DATE: **SEPT 24, 2020**

SCALE: **AS NOTED**








# *RED AND BONITA EXTENDED PROFILE*

0 200' 400'
SCALE IN FEET
HORIZONTAL AND VERTICAL

JOB NO. 0251.002.00

**RED AND BONITA ADIT**
**CROSS-SECTION**

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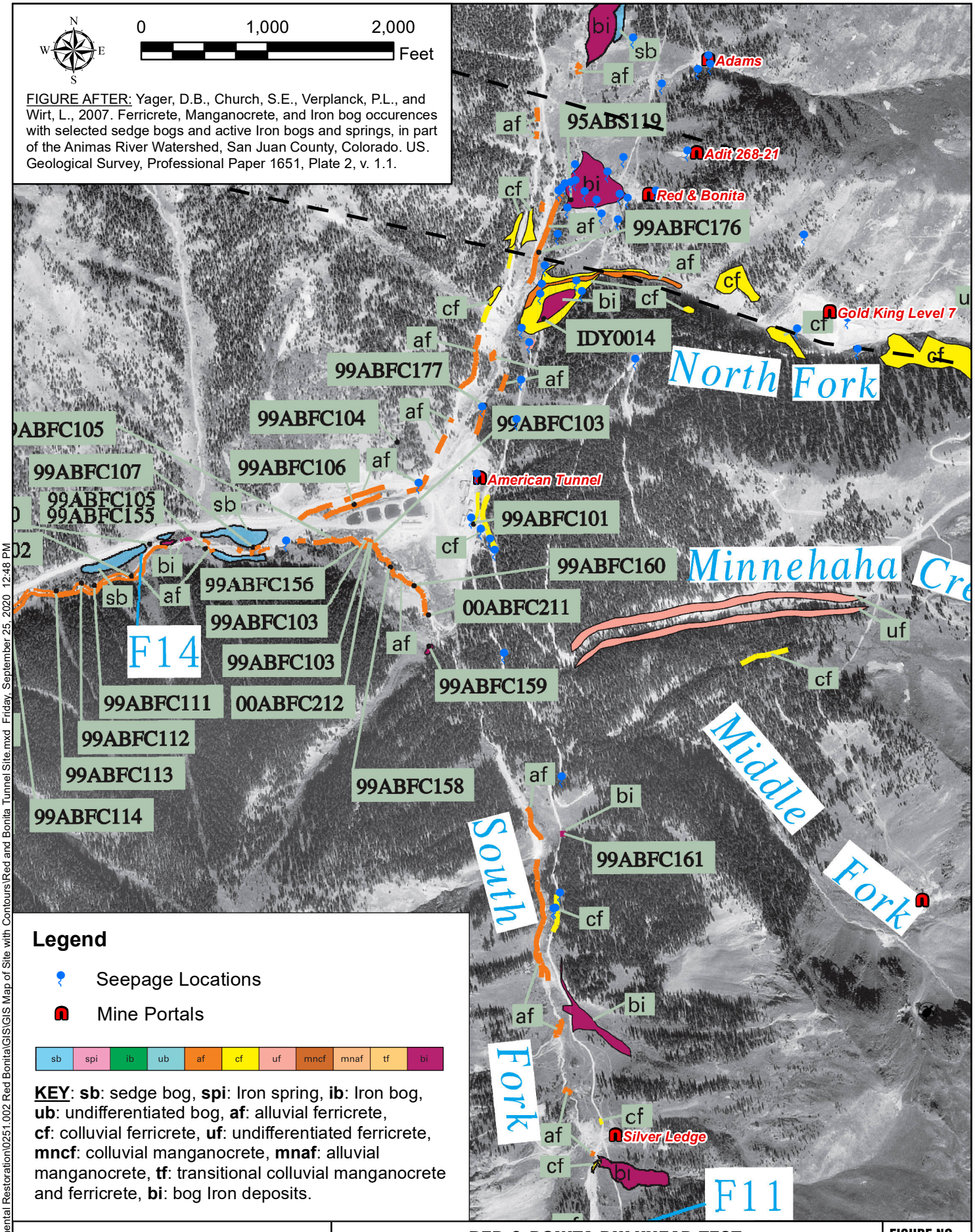
FIGURE NO. **7**

DATE: **SEPT 24, 2020**

SCALE: **AS NOTED**




Q:\0251 Environmental Restoration\0251.002 Red Bonita\GIS\GIS Map of Site with Contours\Red and Bonita Tunnel Site.mxd Friday, September 25, 2020 12:48 PM

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**RED & BONITA BULKHEAD TEST**

Cement Creek Area, Study of Ferricrete, Manganocrete, and Iron Bog Occurrences by USGS

JOB NO: 20C26021.00

SCALE: 1 inch=1,000 feet

FIGURE NO. 8

# ATTACHMENT A: PHOTOGRAPHS

PHOTO 1

DATE TAKEN: 09/21/2020

LOCATION:

Globe Valve, Red & Bonita portal.

COMMENTS:

Crew from ER onsite to open the globe valve. Globe valve is the large red and silver valve on the right. This photo was taken shortly before the valve was opened to begin drain down.

PHOTO 2

DATE TAKEN: 09/21/2020

LOCATION:

Overflow pond by the Red & Bonita portal, taking overflow from the adit.

COMMENTS:

Pond filling at 3.7 gpm on 9/21/20

PHOTO 3

DATE TAKEN: 09/21/2020

LOCATION:

WTP pond at Gladstone

COMMENTS:

Gladstone IWTP pond the day after opening the R&B bulkhead. R&B water coming from the right pipe. Gold King water coming from the left pipe.

PHOTO 4

DATE TAKEN: 09/21/2020

LOCATION:

SS408 at the base of Red & Bonita mine dump

COMMENTS:

Seepage location SS408 at the base of the Red & Bonita mine waste pile. Similar flow to last week, about 1.1 gpm.

PHOTO 5

DATE TAKEN: 09/19/2020

LOCATION:

Cement Creek upstream from Mogul wetland (UC-1331)

COMMENTS:

Performing the slug test with USGS and MSI at site UC-1331

PHOTO 6

DATE TAKEN: 09/19/2020

LOCATION:

Cement Creek between Mogul and Red & Bonita (UC-1827)

COMMENTS:

Performing the slug test with USGS and MSI at site UC-1827

PHOTO 7

DATE TAKEN: 09/19/2020

LOCATION:

Cement Creek South of the Red 7 Bonita flows (UC-2934)

COMMENTS:

Performing the slug test with USGS and MSI at site UC-2934

PHOTO 8

DATE TAKEN: 09/19/2020

LOCATION:

Cement Creek South of the North Fork confluence (UC-3337)

COMMENTS:

Performing the slug test with USGS and MSI at site UC-3337

PHOTO 9

DATE TAKEN: 09/21/2020

LOCATION:

Adams Mine Drainage, Seepage location SS421

COMMENTS:

New seepage location SS421, in the drainage valley below the Adams mine portal.

PHOTO 10

DATE TAKEN: 09/21/2020

LOCATION:

Along CR-52, seepage location SS422

COMMENTS:

New seepage location SS422, along the road to Natalie Occidental (CR-52) between SS016 & SS017.

PHOTO 11

DATE TAKEN: 09/21/2020

LOCATION:

Along CR-52, seepage location SS423

COMMENTS:

New seepage location SS423, along the road to Natalie Occidental (CR-52) South of house on CR 52.

PHOTO 12

DATE TAKEN: 09/21/2020

LOCATION:

Upslope side of R&B access road, seepage location SS424

COMMENTS:

New seepage location SS424

# ATTACHMENT B: MSI OBSERVATION SUMMARY

**Weekly Inspection Report 9/17-9/22/2020**

| Event Date | Event Time | Location ID | Location Description | Sample Description | Temp (C) | Specific Conductivity (µS/cm) | pH | Flow (cfs) | Flow (GPM) | Observations |
|---|---|---|---|---|---|---|---|---|---|---|
| 9/17/2020 | 12:09 | A38 | Terry Tunnel | No sample taken. | 6.8 | 978 | 4.6 | n/a | n/a | No noticeable changes since last visit. |
| 9/19/2020 | 17:00 | CC01B | Mogul Mine | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals/Isotopes | 5.8 | 1308 | 3.69 | 0.0497 | 22.306851 | No noticeable changes since last visit. Barologger stolen. Back-up installed on 9/17/20. |
| 9/19/2020 | 8:00 | CC03C | Red and Bonita | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals/Isotopes | 6.5 | 1531 | 5.79 | n/a | n/a | No flow. BH pressure 79 psi (sampled from bulkhead pressure valve) |
| 9/19/2020 | 11:15 | CC19 | American Tunnel | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals/Isotopes | 8.1 | 2000 | 4.46 | 0.1766 | 79.263378 | No noticeable changes since last visit. Barologger not downloading. |
| 9/19/2020 | 9:45 | CCSG-1 | Cement Creek below Gladstone at Steel Bridge | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals/Isotopes | 5 | 903 | 5.76 | 4.458 | 2000.88414 | Stage Height .72. No noticeable changes since last visit. |
| 9/19/2020 | 10:00 | CCSG-3 | Cement Creek at Gladstone (at culvert) | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals/Isotopes | 5.9 | 1059 | 3.62 | 1.292 | 579.88836 | Stage Height .37. No noticeable changes since last visit. |
| 9/19/2020 | 12:10 | CCSG-5 | North Fork Cement Creek near mouth | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals/Isotopes | 7.3 | 1507 | 2.99 | 0.0545 | 24.461235 | Stage Height .64. No noticeable changes since last visit. |
| 9/19/2020 | 13:16 | CCSG-6 | Cement Creek above Red & Bonita (immediately above) | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals/Isotopes | 8.7 | 589.7 | 5.01 | 0.591 | 265.25853 | Stage Height .98. No noticeable changes since last visit. |
| 9/19/2020 | 16:10 | CCSG-7 | Cement Creek below Mogul Gage (below braided portion) | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals/Isotopes | 9.3 | 540 | 3.93 | 0.49 | 219.9267 | Stage Height .72. No noticeable changes since last visit. |

**Weekly Inspection Report 9/17-9/22/2020**

| Event Date | Event Time | Location ID | Location Description | Sample Description | Temp (C) | Specific Conductivity (µS/cm) | pH | Flow (cfs) | Flow (GPM) | Observations |
|---|---|---|---|---|---|---|---|---|---|---|
| 9/19/2020 | 13:00 | SS417 | R&B Outflow Channel | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals/Isotopes | 5.9 | 1601 | 2.96 | 0.001854 | 0.83213082 | Sample collected per RC request |
| 9/19/2020 | 17:25 | UC1331 | Above Mogul inflow | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals | 9.3 | 328 | 5.31 | 0.268 | 120.28644 | USGS Tracer Test Location on Cement Creek |
| 9/19/2020 | 15:15 | UC1703 | Above SS250 | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals | 9.5 | 536 | 4.05 | 0.5 | 224.415 | USGS Tracer Test Location on Cement Creek |
| 9/19/2020 | 14:40 | UC1827 | Below SS250 | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals | 9.2 | 554 | 5.4 | 0.563 | 252.69129 | USGS Tracer Test Location on Cement Creek |
| 9/19/2020 | 14:10 | UC2335 | Upstream Mace's fen | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals | 8.5 | 585 | 5.41 | 0.528 | 236.98224 | USGS Tracer Test Location on Cement Creek |
| 9/19/2020 | 12:10 | UC2934 | Above N Fork | Sample & Duplicate Taken - Alk/Anions/Dissolved Metals/Total Metals | 8.8 | 662 | 3.99 | 0.712 | 319.56696 | USGS Tracer Test Location on Cement Creek |
| 9/19/2020 | 11:00 | UC3337 | Above AT inflow | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals | 6.6 | 804 | 3.83 | 0.0712 | 31.956696 | USGS Tracer Test Location on Cement Creek |
| 9/21/2020 | 10:09 | Adit_2 | Dry adit south of SS129, near Adams | No sample taken. | n/a | n/a | n/a | n/a | n/a | Dry. No noticeable changes since last visit. |
| 9/21/2020 | 10:39 | Adit_268-20 | Located between Adams and Adit 268-21 | No sample taken. | n/a | n/a | n/a | n/a | n/a | Dry. No noticeable changes since last visit. |

**Weekly Inspection Report 9/17-9/22/2020**

| Event Date | Event Time | Location ID | Location Description | Sample Description | Temp (C) | Specific Conductivity (µS/cm) | pH | Flow (cfs) | Flow (GPM) | Observations |
|---|---|---|---|---|---|---|---|---|---|---|
| 9/21/2020 | 10:46 | Adit_268-21 | Located between R&B and Adams | No sample taken. | n/a | n/a | n/a | n/a | n/a | Dry. No noticeable changes since last visit. |
| 9/22/2020 | 12:07 | CC03C | Red and Bonita Mine | No sample taken. | 3.7 | 1310 | 5.8 | 0.0476 | 21.364308 | No noticeable changes since last visit. |
| 9/22/2020 | 13:23 | CC06 | Gold King Level 7 | No sample taken. | 7.7 | 1675 | 3.02 | n/a | n/a | No noticeable changes since last visit. |
| 9/22/2020 | 12:31 | CC19 | American Tunnel | No sample taken. | 7.7 | 2110 | 3.61 | 0.1702 | 76.390866 | No noticeable changes since last visit. |
| 9/21/2020 | 11:51 | RBPZ01 | R&B fen below R&B Mine | No sample taken. | n/a | n/a | n/a | n/a | n/a | Dry. stick down 115.4cm. stick up 8.0cm. No noticeable changes since last visit. |
| 9/21/2020 | 11:27 | RBPZ02 | R&B fen below R&B Mine | No sample taken. | n/a | n/a | n/a | n/a | n/a | Stick up 43.6cm Stick down 81.7cm Wet. No noticeable changes since last visit. |
| 9/21/2020 | 11:38 | RBPZ03 | R&B fen below R&B Mine | No sample taken. | n/a | n/a | n/a | n/a | n/a | Wet. stick down 48.2 Stick up 43.9. No noticeable changes since last visit. |
| 9/21/2020 | 13:47 | SS016 | Historic SS016, South Fork Cement Creek | No sample taken. | 6.5 | 318 | 4.31 | 0.011653 | 5.23021599 | No noticeable changes since last visit. |
| 9/21/2020 | 14:07 | SS017 | Historic SS017, South Fork Cement Creek | No sample taken. | 8 | 381 | 4.13 | 0.000294 | 0.13195602 | No noticeable changes since last visit. |

**Weekly Inspection Report 9/17-9/22/2020**

| Event Date | Event Time | Location ID | Location Description | Sample Description | Temp (C) | Specific Conductivity (µS/cm) | pH | Flow (cfs) | Flow (GPM) | Observations |
|---|---|---|---|---|---|---|---|---|---|---|
| 9/21/2020 | 9:06 | SS060 | Cement Creek above North Fork | No sample taken. | 5.2 | 123.2 | 4.56 | 0.001261 | 0.56597463 | No noticeable changes since last visit. |
| 9/21/2020 | 10:52 | SS062 | Cement Creek above North Fork | No sample taken. | 5.3 | 671 | 5.45 | 0.004662 | 2.09244546 | Flow measurement taken 10 m upstream of power pole. No noticeable changes since last visit. |
| 9/22/2020 | 13:54 | SS067 | Cement Creek above North Fork | No sample taken. | 6.1 | 896 | 3.84 | 0.003456 | 1.55115648 | Conductivity may be off. Screen issues. No sample taken. |
| 9/22/2020 | 13:34 | SS084 | North Fork Cement Creek | No sample taken. | n/a | n/a | n/a | n/a | n/a | No noticeable changes since last visit. |
| 9/21/2020 | 13:11 | SS086 | Above AT below N Fork | No sample taken. | 7.4 | 1326 | 2.69 | 0.000702 | 0.31507866 | No noticeable changes since last visit. |
| 9/21/2020 | 8:44 | SS105 | Mogul South Mine | No sample taken. | 4.6 | 971.4 | 5.71 | 431.2 | 193535.496 | Ha-0.28ft. Hb-0.05ft 1inch baski. |
| 9/21/2020 | 10:28 | SS127 | Adams Mine | No sample taken. | n/a | n/a | n/a | n/a | n/a | Dry. No noticeable changes since last visit. |
| 9/21/2020 | 9:54 | SS128 | Pride of Bonita Mine | No sample taken. | n/a | n/a | n/a | n/a | n/a | Dry. No noticeable changes since last visit. |
| 9/21/2020 | 10:00 | SS129 | 73m SW of Pride of Bonita Mine | No sample taken. | n/a | n/a | n/a | n/a | n/a | Dry. No noticeable changes since last visit. |

**Weekly Inspection Report 9/17-9/22/2020**

| Event Date | Event Time | Location ID | Location Description | Sample Description | Temp (C) | Specific Conductivity (µS/cm) | pH | Flow (cfs) | Flow (GPM) | Observations |
|---|---|---|---|---|---|---|---|---|---|---|
| 9/22/2020 | 13:25 | SS130 | Salomon Group | No sample taken. | n/a | n/a | n/a | n/a | n/a | No noticeable changes since last visit. |
| 9/21/2020 | 11:10 | SS236 | Cement Creek above North Fork | No sample taken. | 9.3 | 760 | 3.73 | 0.008264 | 3.70913112 | No noticeable changes since last visit. |
| 9/21/2020 | 9:31 | SS300 | Cement Creek above North Fork | No sample taken. | 7.4 | 1149 | 5.78 | 0.027546 | 12.3634712 | No noticeable changes since last visit. |
| 9/22/2020 | 12:13 | SS301 | Cement Creek above AT | No sample taken. | 6.6 | 2020 | 2.64 | 0.006363 | 2.85590529 | No noticeable changes since last visit. |
| 9/21/2020 | 13:18 | SS400 | East side of road, above SS086 | No sample taken. | 7.2 | 1046 | 2.8 | 0.000388 | 0.17414604 | No noticeable changes since last visit. |
| 9/21/2020 | 12:14 | SS401 | East side of road, above SS086 | No sample taken. | 6.8 | 1351 | 3.29 | 0.000433 | 0.19434339 | No noticeable changes since last visit. |
| 9/21/2020 | 12:14 | SS402 | South side of NFPZ adjacent to CCSG5 | No sample taken. | 5.2 | 1874 | 2.17 | 0.000497 | 0.22306851 | No noticeable changes since last visit. |
| 9/21/2020 | 11:58 | SS404 | Culvert north of North Fork Cement Creek | No sample taken. | 5.8 | 745.6 | 3.12 | 0.001264 | 0.56732112 | No noticeable changes since last visit. |
| 9/22/2020 | 11:30 | SS405 | East side of road, south of North Fork Cement Creek | No sample taken. | 7 | 2320 | 2.59 | 0.002071 | 0.92952693 | No noticeable changes since last visit. |

**Weekly Inspection Report 9/17-9/22/2020**

| Event Date | Event Time | Location ID | Location Description | Sample Description | Temp (C) | Specific Conductivity (µS/cm) | pH | Flow (cfs) | Flow (GPM) | Observations |
|---|---|---|---|---|---|---|---|---|---|---|
| 9/22/2020 | 9:48 | SS406 | 100m right of CC19 | No sample taken. | 5.7 | 1800 | 3.15 | 0.000662 | 0.29712546 | Conductivity varies across seep from 1700 to 2400. |
| 9/21/2020 | 10:41 | SS407 | Below R&B Mine | No sample taken. | 6.5 | 2430 | 2.59 | 0.003496 | 1.56910968 | No noticeable changes since last visit. |
| 9/21/2020 | 10:34 | SS408 | Below R&B Mine | No sample taken. | 5.8 | 2810 | 2.54 | 0.002543 | 1.14137469 | No noticeable changes since last visit. |
| 9/21/2020 | 8:54 | SS409 | East side of CR53 | No sample taken. | n/a | n/a | n/a | n/a | n/a | No noticeable changes since last visit. |
| 9/21/2020 | 11:32 | SS410 | West Side of Cement Creek | No sample taken. | 6.7 | 1233 | 3.41 | 0.000648 | 0.29084184 | No noticeable changes since last visit. |
| 9/21/2020 | 13:47 | SS412 | Above AT along CR53 | No sample taken. | 14 | 2540 | 2.17 | n/a | n/a | No noticeable changes since last visit. |
| 9/22/2020 | 9:59 | SS413 | Corner of CR53 and CR51 | No sample taken. | 6.1 | 1531 | 2.83 | 0.002472 | 1.10950776 | No noticeable changes since last visit. |
| 9/22/2020 | 10:25 | SS415 | R&B Outflow Channel | Sample & Duplicate Taken - Alk/Anions/Dissolved Metals/Total Metals | 9.9 | 1173 | 2.15 | 0.013349 | 5.99143167 | No noticeable changes since last visit. |
| 9/21/2020 | 11:40 | SS416 | R&B Outflow Channel | No sample taken. | 5.8 | 1556 | 2.98 | 0.000177 | 0.07944291 | No noticeable changes since last visit. |

**Weekly Inspection Report 9/17-9/22/2020**

| Event Date | Event Time | Location ID | Location Description | Sample Description | Temp (C) | Specific Conductivity (µS/cm) | pH | Flow (cfs) | Flow (GPM) | Observations |
|---|---|---|---|---|---|---|---|---|---|---|
| 9/21/2020 | 11:58 | SS417 | R&B Outflow Channel | No sample taken. | 8.4 | 1517 | 3.06 | 0.001554 | 0.69748182 | No noticeable changes since last visit. |
| 9/22/2020 | 11:00 | SS418 | North tongue of North Fork | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals/Isotopes | 4.5 | 1815 | 4.05 | 0.000076 | 0.03411108 | No noticeable changes since last visit. |
| 9/22/2020 | 9:10 | SS419 | Culvert between SS055 and SS413 | Sample & Duplicate Taken - Alk/Anions/Dissolved Metals/Total Metals | 5.7 | 1391 | 4.32 | 0.006158 | 2.76389514 | No noticeable changes since last visit. |
| 9/21/2020 | 8:44 | SS420 | Downslope on Gladstone of R&B waste rock pile. Expresses on upslope side of road. Not enough water for flow | No sample taken. | n/a | n/a | n/a | n/a | n/a | No noticeable changes since last visit. |
| 9/21/2020 | 10:31 | SS421 | Headwall in drainage between 127 and Adams (127.5) | No sample taken. | n/a | n/a | n/a | n/a | n/a | Not enough flow. only a very slow drip. (about one drop per 15 seconds). |
| 9/21/2020 | 13:55 | SS422 | Emergence in between SS16 and 17 on upslope side of road. Not enough water for flow or field parameters. | No sample taken. | n/a | n/a | n/a | n/a | n/a | New emergence. Not enough water for flow or field parameters. |
| 9/22/2020 | 13:00 | SS423 | Below SS422 South of house on CR52 | Sample Taken - Alk/Anions/Dissolved Metals/Total Metals/Isotopes | 4.9 | 717.8 | 6.53 | 0.002882 | 1.29352806 | Did not see it on old seeps map but it has flowed in the past. |

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**Weekly Inspection Report 9/17-9/22/2020**

| Event Date | Event Time | Location ID | Location Description | Sample Description | Temp (C) | Specific Conductivity (µS/cm) | pH | Flow (cfs) | Flow (GPM) | Observations |
|---|---|---|---|---|---|---|---|---|---|---|
| 9/22/2020 | 10:14 | SS424 | Upslope side of R&B access road approximately 70 meters past gate on upslope side. | No sample taken. | n/a | n/a | n/a | n/a | n/a | Upslope side of R&B access road approximately 70 meters past gate on upslope side. Not enough water for flow or field parameters. |

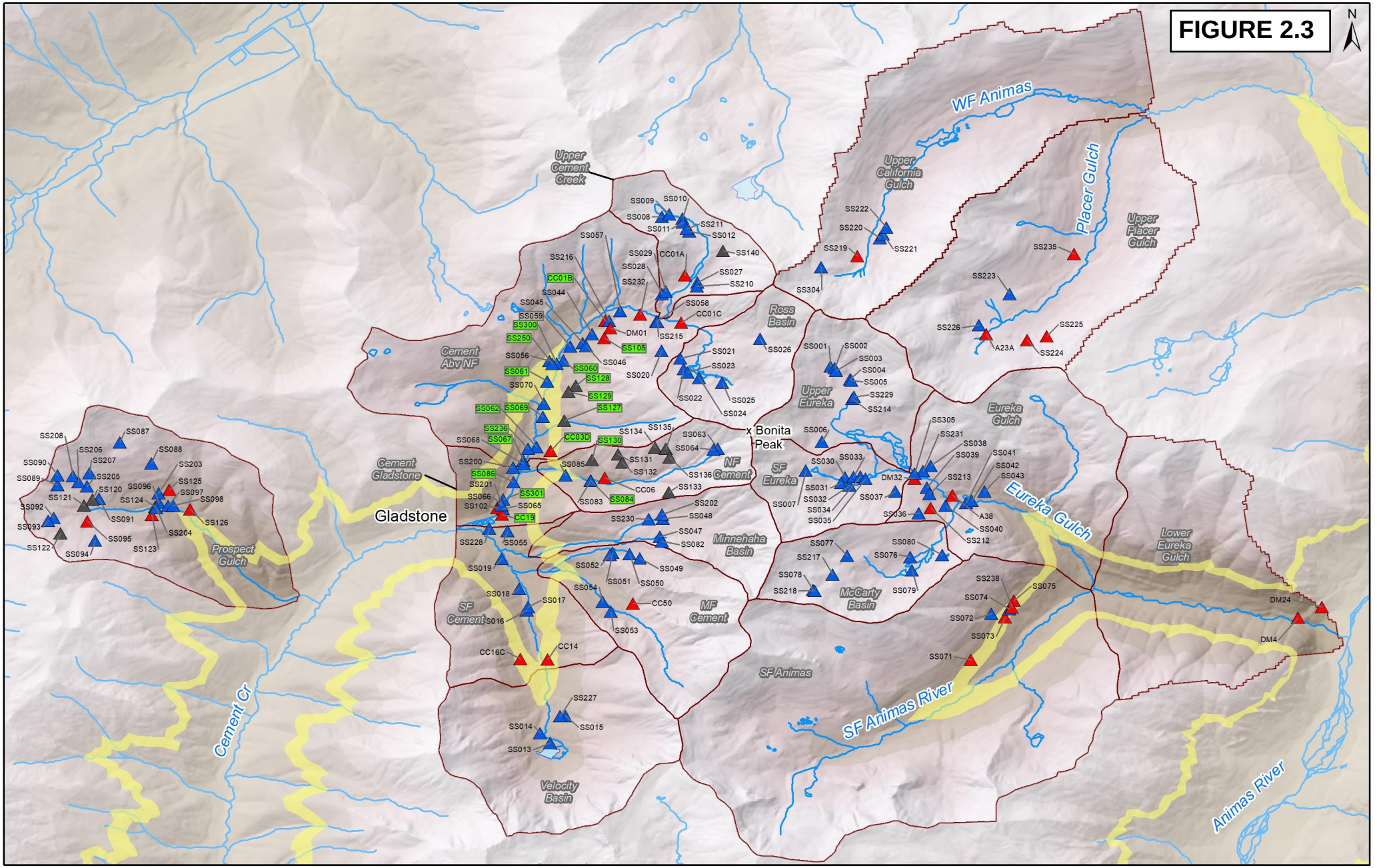
FIGURE 2.3
N
WF Animas
Upper Cement Creek
Upper California Gulch
Placer Gulch
Upper Placer Gulch
Ross Basin
Cement Abv NF
Upper Eureka
Eureka Gulch
Bonita Peak
Cement Gladstone
Gladstone
NF Cement
SF Eureka
Eureka Gulch
Lower Eureka Gulch
Prospect Gulch
Minnehaha Basin
McCarty Basin
SF Cement
MF Cement
SF Animas
SF Animas River
Cement Cr
Velocity Basin
Animas River
BPMD
Seeps, Springs, & Draining Mines 2016-18
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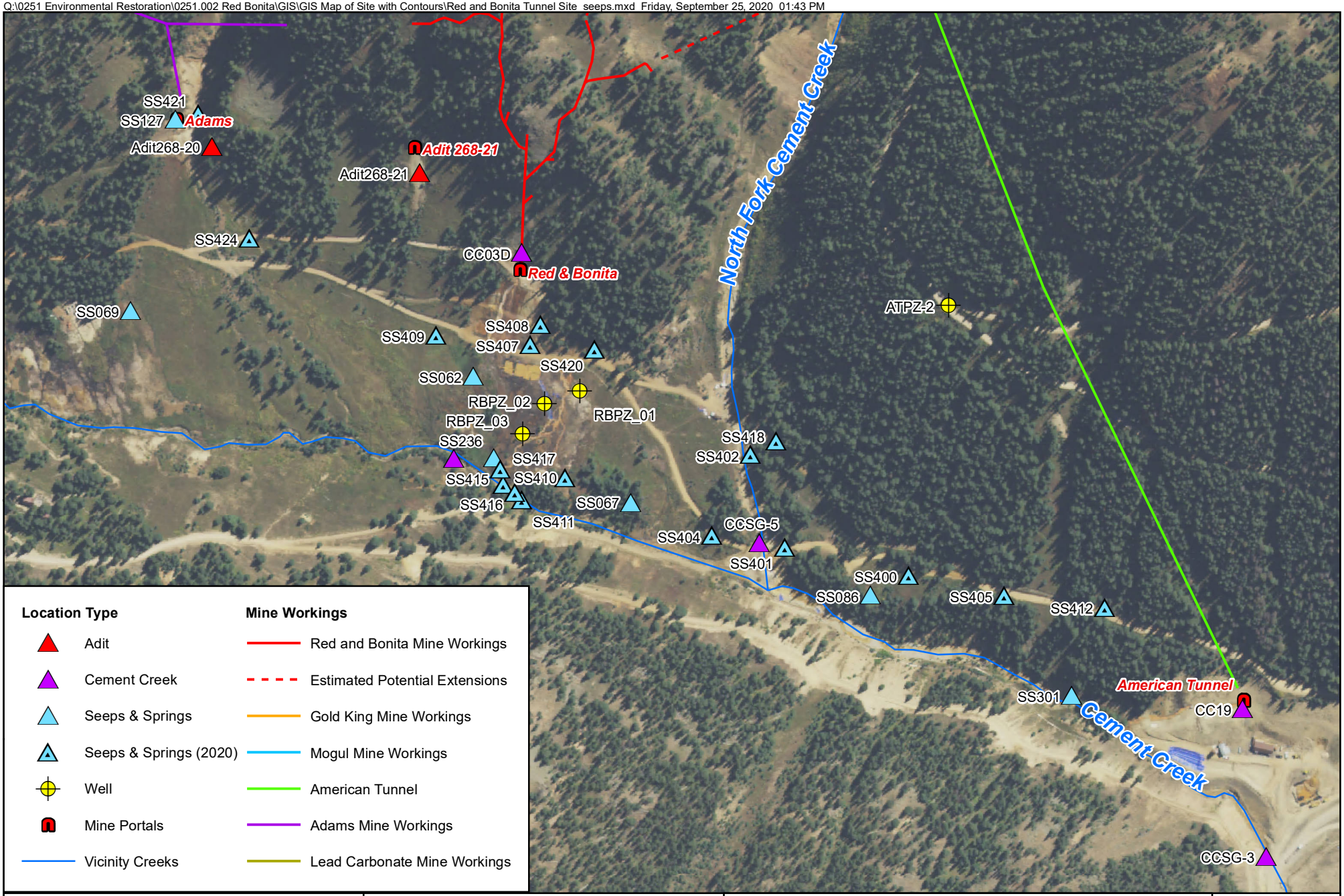
Locations sampled 2016-18
Draining Mine
Dry Mine
Seep/Spring
200' Elevation Band Above Red & Bonita Mine
Sub-basins focused on for this report
Locations sampled 2016-18 selected to be sampled in 2020
0
0.5
1
2
3
4
Miles
San Miguel County
Ouray County
Hinsdale County
Dolores County
San Juan County
Montezuma County
La Plata County
Archuleta County
Colorado
New Mexico

Q:\0251 Environmental Restoration\0251.002 Red Bonita\GIS\GIS Map of Site with Contours\Red and Bonita Tunnel Site_seeps.mxd Friday, September 25, 2020 01:43 PM




N

0 400 800 Feet

DEERE & AULT
A SCHNABEL ENGINEERING COMPANY

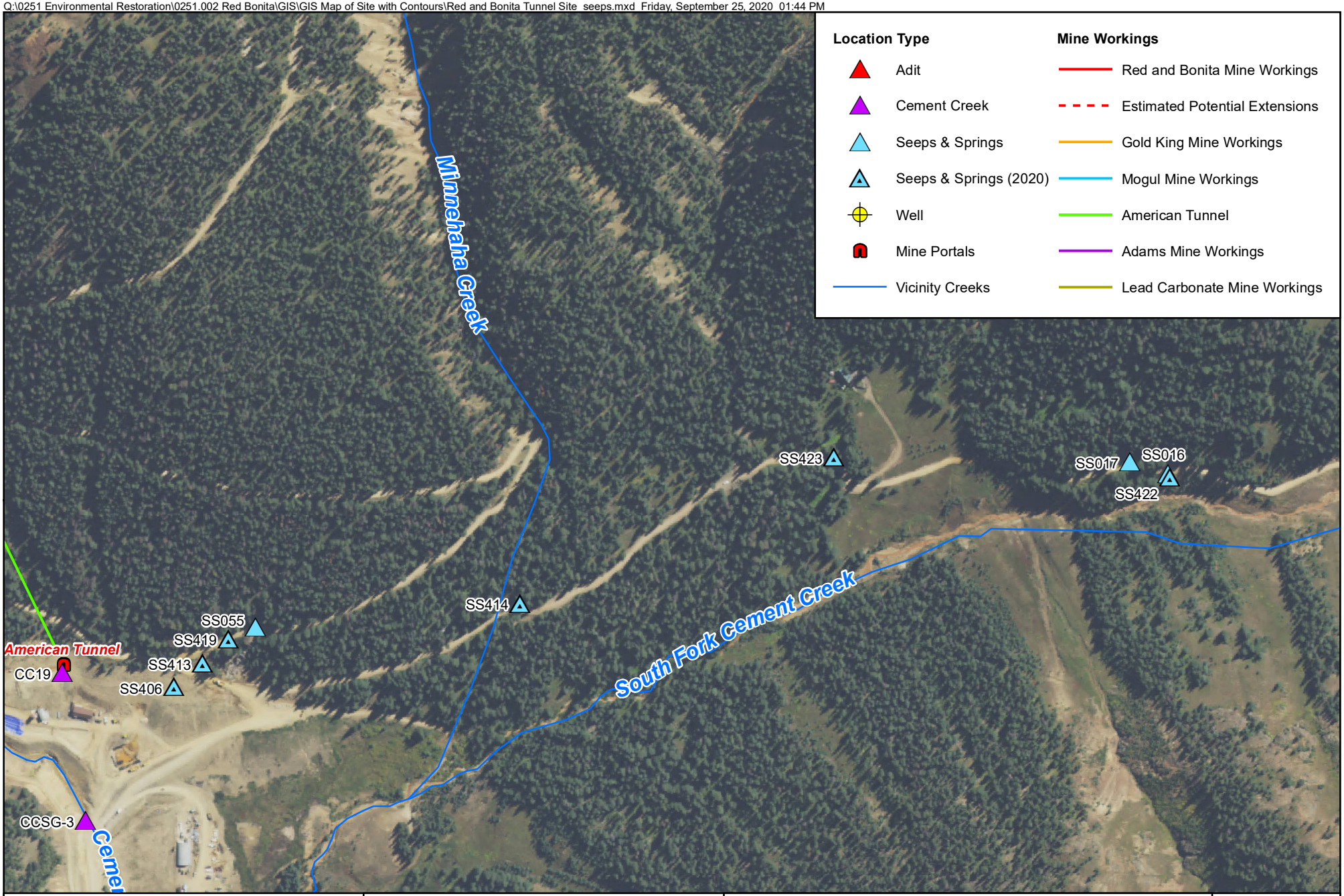
# RED & BONITA BULKHEAD TEST
## MONITORING LOCATIONS

JOB NO: 20C26021.00

SCALE: 1 inch = 400 feet

FIGURE NO.
B-3

Q:\0251 Environmental Restoration\0251.002 Red Bonita\GIS\GIS Map of Site with Contours\Red and Bonita Tunnel Site  seeps.mxd  Friday, September 25, 2020  01:44 PM

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# RED & BONITA BULKHEAD TEST
## MONITORING LOCATIONS

JOB NO: 20C26021.00

SCALE: 1 inch = 400 feet

FIGURE NO.
B-3