| | |
|---|---|
| **To:** | Nevada Division of Environmental Protection<br>Nevada Environmental Response Trust |
| **Cc:** | Nevada Environmental Response Trust Stakeholders |
| **From:** | Jeff Lance |
| **Date:** | March 23, 2016 |
| **Subject:** | NERT – GWETS Operation Monthly Report – February 2016 |

At the request of the Nevada Environmental Response Trust (Trust), Envirogen Technologies Inc. (ETI) provides this summary of the groundwater extraction and treatment system (GWETS) operation and performance during February 2016.

## Summary of GWETS Operation

Envirogen Technologies, Inc. (ETI) mechanically operated the GWETS normally in February 2016. There was a planned outage for Lift Station 2 that required the AWF & SWF to be shutdown that occured on February 17, 2016. The flow rate to the plant averaged approximately 905 gallons per minute (gpm) during February 2016. At the end of the month, the GW-11 Pond volume was at 43.5 million gallons (MG), which would allow 13.1 days of available additional storage in event of an emergency plant shutdown with continued well field pumping. The water volume stored in the GW-11 Pond decreased approximately 0.6 MG from the end of January. Figure 1 in this report depicts the actual and projected GW-11 pond volumes and additional storage available.

The influent perchlorate concentration to the FBR plant averaged 93 mg/L for the month, with a maximum concentration of 110 mg/L.

Analytical data indicate that the permitted effluent discharges at GWETS Outfall 001 were within the NPDES permitted numerical discharge limits (Please see Attachment A, prepared by Ramboll Environ).

## Enhanced Operational Metrics

Tetra Tech completed final punch list items for the Enhanced Operational Metrics project. Final project items are presented in more detail under the GWETS Upgrades and Facility Projects section below.

Tables 1 and 2 provide a summary of the current GWETS operational metrics that provide data for flow rates, perchlorate and chromium concentrations, and mass removal. Figure 2 presents historical perchlorate and chromium mass flux.

## Operational Issues

All routine plant repairs conducted by ETI were performed in accordance with the NERT Perchlorate Treatment System Henderson, Nevada Operations Manual. The following is a list of operational issues and major repairs and/or equipment replaced during this reporting period.

1. GW-11 Pond

    - GW-11 Pond Leak Detection System: ETI has developed a plan to repair the NE riser pipe to enable the pump to be set at its proper depth. ETI anticipates implementation of the repair by March 25, 2016.
    - ETI is preparing to install four dedicated generators at each pond corner to reduce the effort required to complete the leak detection pumping procedures. Installation is scheduled to be complete March 30, 2016.

2. Biological Plant

    - The Plant operated with no interruptions or unplanned diversions for the month of February.
    - Planned Shut Down:
        i. All of the lift stations, SWF and AWF well fields were turned off from 6:45 am until 3:00 pm on February 17, 2016 to allow for a new transformer to be relocated at Lift Station 2.

3. Spill

    - No reportable spills occurred in February 2016.

4. Maintenance

    - Major maintenance performed by ETI in the month included:
        i. Replaced the pump & motor on well IW- Z
        ii. Replaced the pump starter on well IW- Y
        iii. Rebuilt media transfer pumps for FBR's 1 & 2
        iv. Replaced sludge pump on North DAF
        v. South DAF was sand blasted to remove coating and performed an inspection that resulted in numerous repairs to be made on the sides and bottom of the tank.
        vi. FBR 8 had new diffuser nozzles installed
        vii. Isolation valves for the GAC vessels repaired.

    - Preventative Maintenance completed or being performed by ETI in the month included:
        i. Infrared survey was performed on all major electrical components to identify loose connections and defective components. Repairs were made as they were discovered.

ii. Evaluation of PC-133 and IWF flow meter and totalizer communication.

iii. Perform scheduled preventive maintenance on bed height pumps.

- Outstanding or ongoing maintenance and repairs from the previous month are outlined below:
  i. FBR 8 is offline and currently in the rehabilitation process and all forward flow is being sent to FBRs 5 and 6, on-going from last month.

## GWETS Upgrades and Facility Projects

The following is a summary of the initiatives in-progress during the reporting period at the direction of the Trust:

1. AP-5 Solids Removal
   In March an investigation will be performed on the berms to determine the safety of walking on the berm due to potential presence of elevated concentrations of perchlorate.
2. Enhanced Operational Metrics
   ETI has taken control of the system. Punch list items have been addressed and a list of recommendations for system improvements that were outside of Tetra Techs' original scope has been forwarded to the Trust for review and approval. Following budget confirmation, a schedule for implementation of these improvements will be developed. The specified spare parts (excluding one replacement flow meter covered under warranty), Operation and Maintenance Manuals, and as-built drawings have been delivered to ETI.
3. GWETS Data Accessibility (GWETS/NET)
   Tetra Tech is working with the Trust to implement a read-only web interface that will allow the Trust and other users designated by the Trust to access select GWETS operational data to enable real-time decision making. Tetra Tech is coordinating with the Trust's IT consultant to develop a proposed approach for implementation in Q4 2016.
4. Tetra Tech is preparing design drawings for installation of a stilling well in GW-11. The stilling well will house an electronic transducer that will transmit water level data to the control room in the D1 Bldg. Design details are expected to be completed in March 2016 with system installation in April or May 2016.

## Equipment Availability Tracking

ETI operators continue to update the equipment tracking form on a weekly basis at a minimum, or whenever there is a change in the status of key equipment. During regular site visits, Tetra Tech field personnel verify the entries on the form, including both the operating status and confirmation of the inventory of required shelf spares. The equipment tracking form is included as Attachment B.

## GWETS Staffing

ETI continues with 24-hour staffing of the GWETS at the direction of the Trust and continues to follow the security procedures in the Standard Operating Procedures (SOP).

# Tables

## Operational Metrics

| Nevada Environmental Response Trust I Groundwater Extraction and Treatment System I Monthly Stakeholder Metrics | | | | |
|---|---|---|---|---|
| **Location ID** | **Average Flow Rate (gpm)** | **Perchlorate (mg/L)[2]** | **Chromium TR (mg/L)[2]** | **Chromium(VI) (mg/L)[2,5]** |
| SWF Total Extraction[3] | 536[1] | 11 | 0.002 | Future Metric |
| AWF Total Extraction[3] | 251[1] | 139 | 0.32 | Future Metric |
| IWF Total Extraction[3] | 54[1] | 635 | 7.91 | Future Metric |
| GWTP Effluent[4] | 52 | 753 | 0.16 | ND |
| GW-11 Influent | 848 | 110 | 0.10 | 0.062 |
| GW-11 Effluent/ FBR Influent[4] | 905 | 93 | 0.07 | 0.05 |

Notes:

TR = Total Recoverable; ND = not detectable above laboratory method detection limit (Chromium (VI) = 0.25 ug/L).

1: Sum of daily average flow for individual wells.

2: All concentrations reported are monthly flow weighted averages.

3: Perchlorate and chromium TR sampled monthly, values reported from TestAmerica.

4: Perchlorate, chromium TR and chromium (VI) sampled weekly, values reported from TestAmerica.

5: Hexavalent chromium will be analyzed and reported monthly beginning in the March 2016 report.

| Nevada Environmental Response Trust I Groundwater Extraction and Treatment System I Monthly Stakeholder Metrics | | |
|---|---|---|
| **Location ID** | **Perchlorate (lbs/month)[1]** | **Chromium TR (lbs/month)[1]** |
| SWF Total Extraction | 2,052 | 0.4 |
| AWF Total Extraction | 12,152 | 30 |
| IWF Total Extraction | 12,013 | 150 |
| GWTP Effluent | 13,630 | 3 |
| GW-11 Influent | 32,561 | 30 |
| GW-11 Effluent/FBR Influent | 27,513 | 19 |

Notes:

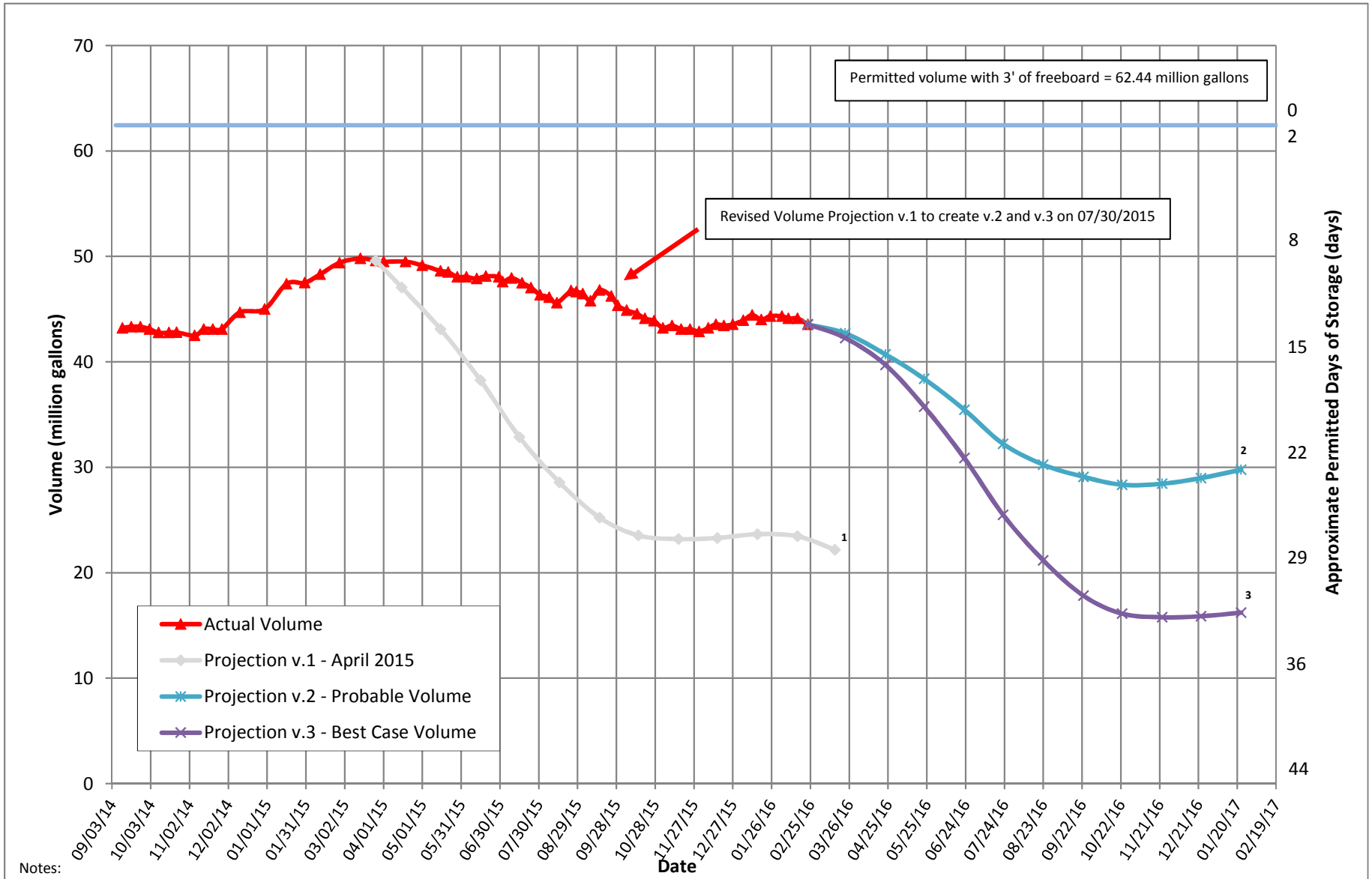
TR = Total Recoverable.

1: Total lbs extracted is calculated from flow weighted average concentration and average flow (see Table 1).

# Figures

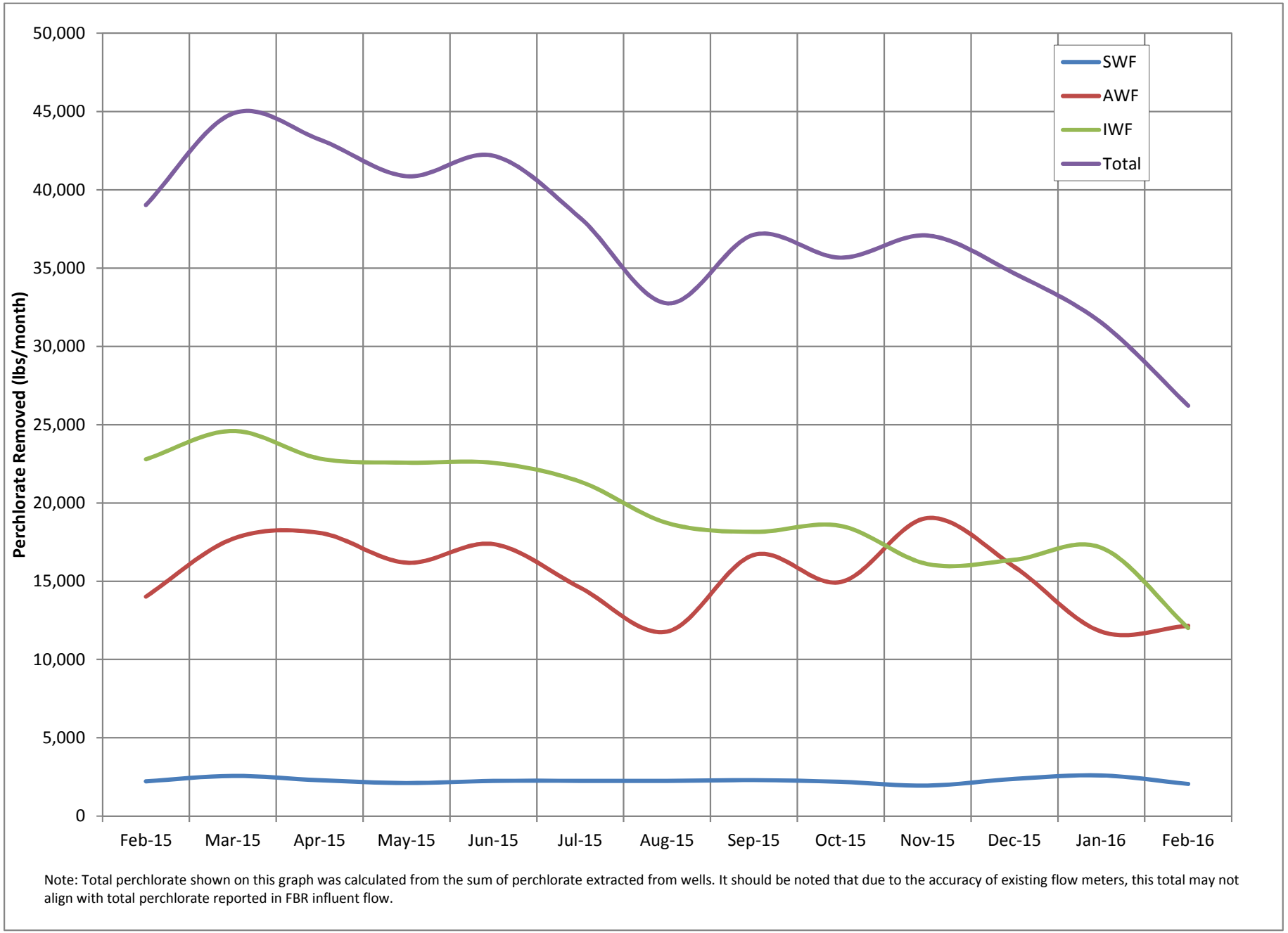
## Operational Metrics

Nevada Environmental Response Trust
GW-11 Pond Volume
Projected v. Actual
Update 2/23/2016




Notes:
1: Monthly GW-11 withdrawals exceed influent flows by approximately 50 gpm.
2: Monthly GW-11 withdrawals exceed influent flows by approximately 20 gpm with seasonally changing influent additions each month (ie.- higher GAC backwash volume in summer).
3: Monthly GW-11 withdrawals exceed influent flows by approximately 50 gpm with an assumed 2.8 million gallons of influent additions each month.
4: Monthly evaporation was calculated using Shevenell, 1996. Statewide Potential Evapotranspiration Maps for Nevada. Nevada Bureau of Mines and Geology Report 48. University of Nevada Reno.
5: Average monthly rainfall was estimated from rain gage 4774 data on TIMET property.

Figure 2 - Historical Perchlorate Mass Flux




Note: Total perchlorate shown on this graph was calculated from the sum of perchlorate extracted from wells. It should be noted that due to the accuracy of existing flow meters, this total may not align with total perchlorate reported in FBR influent flow.

# Attachment A

## NPDES Tracking Sheet (Prepared by ENVIRON)

**Analytes with Numerical Discharge Limits - NPDES Permit NV0023060**

**WORKING TRACKING SPREADSHEET**
**DRAFT - NOT TO BE SUBMITTED TO AGENCY**

| | Continuous | | Daily samples, composited weekly | | Weekly samples | | | | | | | | | Weekly samples, collected separately | | | Quarterly sample | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flow Rate | | Perchlorate | | pH | Hexavalent Chromium | Total Chromium | Total Suspended Solids (TSS) | | Total Iron | | Total Ammonia as N | Total Phosphorus as P | $BOD_5$ (inhibited) | | | Manganese | |
| | 30-Day Avg. (MGD) | Daily Maximum (MGD) | 30-Day Avg. (ug/L) | 30-Day Avg. (lbs/day) | 30-Day Avg. (S.U.) | Daily Max. (mg/L) | Daily Max. (mg/L) | 30-Day Avg. (mg/L) | 30-Day Avg. (lbs/day) | 30-Day Avg. (mg/L) | 30-Day Avg. (lbs/day) | 30-Day Avg. (lbs/day) | 30-Day Avg. (lbs/day) | 30-Day Avg. (mg/L) | Daily Max. (mg/L) | 30-Day Avg. (lbs/day) | 30-Day Avg. (mg/L) | 30-Day Avg. (lbs/day) |
| | 1.45 | 1.75 | **18** | **0.22** | **6.5 to 9.0** | **0.01** | **0.1** | **135** | **1,634** | **10** | **121.03** | **40** | **20** | **25** | **40** | **254** | **5** | **60.52** |
| **December 2015** | 1.32 | 1.43 | 1.3 | 0.014 | 6.94 | 0.00013 | 0.011 | 16 | 170 | 2.2 | 24 | 3.7 | 0.6 | 8 | 20 | 92 | | |
| **January 2016** | 1.28 | 1.39 | 1.3 | 0.013 | 6.89 | 0.00013 | 0.022 | 24 | 250 | 4.5 | 47 | 9 | 0.25 | 5.8 | 6.5 | 61 | | |
| **February 2016 (month to date)** | 1.30 | 1.41 | 1.3 | 0.014 | 6.98 | 0.00013 | 0.015 | 22 | 240 | 3.7 | 42 | 6 | 0.62 | 4.0 | 6.0 | 45 | | |

| Daily Grab Sample Dates | Composite Sample Date | | ug/L | lbs/day | Sample Date | S.U. | mg/L | mg/L | mg/L | lbs/day | mg/L | lbs/day | | mg/L | lbs/day | | mg/L | lbs/day | Sample Date | mg/L | lbs/day | mg/L | lbs/day |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/29 - 12/5 | 12/5/2015 | ND (<2.5) | 1.3 | 0.014 | 11/30/2015 | 7.00 | ND (<0.00025) | 0.014 | 21 | 239 | 4.4 | 50 | ND (<0.10) | 0.05 | 0.57 | ND (<0.025) | 0.013 | 0.14 | 12/2/2015 | 7.7 | 88 | | |
| 12/6 - 12/12 | 12/12/2015 | ND (<2.5) | 1.3 | 0.012 | 12/7/2015 | 6.85 | ND (<0.00025) | 0.0082 | 19 | 190 | 3.5 | 35 | -- | 0.23 | 2.3 | ND (<0.025) | 0.013 | 0.12 | 12/9/2015 | 4.2 | 42 | | |
| 12/13 - 12/19 | 12/19/2015 | ND (<2.5) | 1.3 | 0.015 | 12/14/2015 | 6.86 | ND (<0.00025) | 0.0075 | 18 | 211 | 1.8 | 21 | -- | 0.81 | 9.5 | -- | 0.11 | 1.3 | 12/16/2015 | 1.8 | 21 | | |
| 12/20 - 12/26 | 12/26/2015 | ND (<2.5) | 1.3 | 0.014 | 12/21/2014 | 7.10 | ND (<0.00025) | 0.0090 | 19 | 208 | 3.1 | 34 | -- | 0.14 | 1.5 | -- | 0.036 | 0.39 | 12/23/2015 | 7.4 | 81 | | |
| 12/27 - 1/2 | 1/2/2016 | ND (<2.5) | 1.3 | 0.014 | 12/29/2015 | 6.94 | ND (<0.00025) | 0.011 | 6.6 | 75 | 0.51 | 5.8 | -- | 0.14 | 1.6 | -- | 0.060 | 0.68 | 12/30/2015 | 20 | 227 | | |
| 1/3 - 1/9 | 1/9/2016 | ND (<2.5) | 1.3 | 0.013 | 1/4/2016 | 6.92 | ND (<0.00025) | 0.0070 | 18 | 193 | 3.9 | 42 | -- | 0.32 | 3.4 | -- | 0.028 | 0.30 | 1/6/2016 | 5.7 | 61 | | |
| 1/10 - 1/16 | 1/16/2016 | ND (<2.5) | 1.3 | 0.013 | 1/11/2016 | 7.02 | ND (<0.00025) | 0.022 | 25 | 260 | 5.0 | 52 | -- | 1.8 | 19 | ND (<0.025) | 0.013 | 0.13 | 1/13/2016 | 6.5 | 68 | | |
| 1/17 - 1/23 | 1/23/2016 | ND (<2.5) | 1.3 | 0.013 | 1/19/2016 | 6.62 | ND (<0.00025) | 0.016 | 30 | 311 | 5.1 | 53 | -- | 0.96 | 10 | ND (<0.025) | 0.013 | 0.13 | 1/20/2016 | 6.0 | 62 | | |
| 1/24 - 1/30 | 1/30/2016 | ND (<2.5) | 1.3 | 0.013 | 1/25/2016 | 7.01 | ND (<0.00025) | 0.014 | 23 | 255 | 3.8 | 42 | -- | 0.19 | 2.1 | -- | 0.040 | 0.44 | 1/27/2016 | 4.8 | 53 | 0.26 | 2.9 |
| 1/31 - 2/6 | 2/6/2016 | ND (<2.5) | 1.3 | 0.014 | 2/1/2016 | 6.94 | ND (<0.00025) | 0.015 | 35 | 394 | 4.5 | 51 | -- | 0.18 | 2.0 | -- | 0.059 | 0.66 | 2/3/2016 | 6.0 | 68 | | |
| 2/7 - 2/13 | 2/13/2016 | ND (<2.5) | 1.3 | 0.013 | 2/9/2016 | 7.18 | ND (<0.00025) | 0.013 | 16 | 181 | 3.8 | 43 | -- | 0.98 | 11 | -- | 0.059 | 0.67 | 2/10/2016 | 2.5 | 28 | | |
| 2/13 - 2/20 | 2/20/2016 | NA | NA | NA | 2/15/2016 | 6.82 | ND (<0.00025) | 0.0092 | 14 | 158 | 2.8 | 32 | -- | 0.33 | 3.7 | -- | 0.048 | 0.54 | 2/17/2016 | 3.4 | 38 | | |
| 2/21 - 2/27 | 2/27/2016 | NA | NA | NA | 2/22/2016 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 2/24/2016 | NA | NA | | |
| | | | | | 3/1/2016 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3/2/2016 | NA | NA | | |

Note: All analytical responsibilities are performed by TestAmerica Laboratories, Inc. (TestAmerica) in Irvine, California, unless otherwise indicated.

NA = Not Available To Date

ND = Not Detected above laboratory reporting limit; concentration in adjacent cell to right is one-half the reporting limit (per Permit condition)
-- = Analyte detected; see column adjacent to right
Last Updated: March 4, 2016

# Attachment B

## Equipment Tracking Form

Report Date: Feb 29 2016

| Sub-System | P&ID | Description | Status[1] | Checked | Criticality[2] | Notes |
|---|---|---|---|---|---|---|
| | | **Main Plant Equipment** | | | | |
| **1** | | **Seep Wells and Lift Station 1** | | | | |
| *1.01* | | *Seep Well Field, 9 wells* | Running | | | |
| *1.02* | | *Lift Station 1 Lift Pump A* | Standby | | | |
| *1.03* | | *Lift Station 1 Lift Pump B* | Running | | | |
| *1.04* | | *Area in and around Lift Station 1* | Running | | | |
| **2** | | **Athens Road Wells and Lift Station** 3 | | | | |
| *2.01* | | *Athens Road Well Field, 9 wells* | Running | | | |
| *2.02* | | *Lift Station 3 Lift Pump A* | Running | | | |
| *2.03* | | *Lift Station 3 Lift Pump B* | Standby | | | |
| *2.04* | | *Area in and around Lift Station 3* | Running | | | |
| **3** | | **Lift Station *2* and Transmission Piplines** | | | | |
| *3.01* | | *Influent Pipline* | In operation | | | |
| *3.02* | | *Effluent Pipeline* | Running | | | |
| *3.03* | | *Lift Station 2 Lift Pump A* | Running | | | |
| *3.04* | | *Lift Station 2 Lift Pump B* | Standby | | | |
| *3.05* | | *Area in and around Lift Station 2* | Running | | | |
| **4** | | **Interceptor Wells and Cr Treatment Plant** | | | | |
| *4.01* | | *IWF Well Field, 30 wells* | Running | | 2 | Replaced pump and motor in IW - K , motor starter IW-J |
| *4.02* | | *Ferrous Sulfate Feed System* | Running | | | |
| *4.03* | | *Polymer Feed System* | Running | | | |
| *4.04* | | *Clarifier* | In operation | | | |
| *4.05* | | *Filter Press* | Running | | | |
| *4.06* | | *GWTP Effluent Tank* | In operation | | | |
| *4.07* | | *Interceptor Booster Pump A* | Standby | | | |
| *4.08* | | *Interceptor Booster Pump B* | Running | | 3 | Replaced the discharge hose and installed cam lock fitting |
| *4.09* | | *Area In And Around GWTP* | Running | | | |
| **5** | | **Equalization Area and GW-11 Pond** | | | | |
| *5.01* | PID10A | *Pond GW-11* | In operation | | | |
| *5.02* | PID10A | *Pond Water Pump - P101A* | Running | | | |
| *5.03* | PID10A | *Pond Water Pump - P101B* | Maintenance | | | |
| *5.04* | PID10A | *Equalization Tanks* | In operation | | | |

[1]Status Codes
Running - Unit is in operation
Standby - Spare or duplicate, not currently in operation
Maintenance - Out of service for maintenance
Off - Not currently needed for use, but can be placed in service

| Sub-System | P&ID | Description | Status[1] | Checked | Criticality[2] | Notes |
|---|---|---|---|---|---|---|
| *5.05* | PID10A | *Area in and Around EQ* | In operation | | | |
| *5.06* | PID10A | *Raw Water Feed Pump - P102A* | Running | | | |
| *5.07* | PID10A | *Raw Water Feed Pump - P102B* | Standby | | | |
| *5.08* | PID10A | *F-101 Filters* | Running | | | |
| *5.09* | PID10B | *Carbon Absorber - LGAC 201A* | Running | | | |
| *5.10* | PID10B | *Carbon Absorber - LGAC 201B* | Running | | | |
| *5.11* | PID10B | *Carbon Absorber - LGAC 201C* | Running | | | |
| **6** | | **First Stage FBRs A, 1** *& 2* | | | | |
| *6.01* | PID14 | *FBR A* | Running | | | |
| *6.02* | PID14 | *Separator Tank - 1401* | Running | | | |
| *6.03* | PID14 | *Media Return Pump - P 1401* | Running | | | |
| *6.04* | PID14 | *P1401A* | Standby | | | |
| *6.05* | PID01A | *P1401B* | Running | | | |
| *6.06* | PID01A | *FBR 1* | Running | | | |
| *6.07* | PID02A | *FBR 2* | Running | | | |
| *6.08* | PID01A | *First Stage Separator Tank - T2011* | Running | | | |
| *6.09* | PID01A | *Media Return Pump - P2011* | Running | | 3 | Rebuilt pump |
| *6.10* | PID01A | *First Stage FBR Pump - P1011* | Standby | | | |
| *6.11* | PID01A | *First Stage FBR Pump - P1012* | Running | | | |
| *6.12* | PID01A | *First Stage FRB Pump - P101A* | Running | | | |
| *6.13* | PID07A | *FBR A pH Feed Pump - P71A* | Off | | | |
| *6.14* | PID07A | *FBR 1 pH Feed Pump - P711* | Off | | | |
| *6.15* | PID07A | *FBR 2 pH Feed Pump - P712* | Off | | | |
| *6.16* | PID07A | *FBR A Nutrient (Urea) Feed Pump - P72A* | Off | | | |
| *6.17* | PID07A | *FBR 1 Nutrient (Urea) Feed Pump - P721* | Off | | | |
| *6.18* | PID07A | *FBR 2 Nutrient (Urea) Feed Pump - P722* | Off | | | |
| *6.19* | PID15 | *FBR A Nutrient (Phos Acid) Feed Pump - P1520A* | Running | | | |
| *6.20* | PID15 | *FBR 1 Nutrient (Phos Acid) Feed Pump - P1521* | Running | | | |
| *6.21* | PID15 | *FBR 2 Nutrient (Phos Acid) Feed Pump - P1522* | Running | | | |
| *6.22* | PID07B | *FBR A Electron Donor Assembly Pump - P73A* | Running | | | |
| *6.23* | PID07B | *FBR 1 Electron Donor Assembly Pump - P731* | Running | | | |
| *6.24* | PID07B | *FBR 2 Electron Donor Assembly Pump - P732* | Running | | | |
| **7** | | **First Stage FBRs 3** *& 4* | | | | |
| *7.01* | PID01B | *FBR 3* | Off | | | |
| *7.02* | PID01B | *FBR 4* | Off | | | |

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| Sub-System | P&ID | Description | Status[1] | Checked | Criticality[2] | Notes |
|---|---|---|---|---|---|---|
| *7.03* | PID02B | *First Stage Separator Tank - T2012* | Off | | | |
| *7.04* | PID01B | *Media Return Pump - P2012* | Off | | | |
| *7.05* | PID01B | *First Stage FBR Pump - P1013* | Off | | | |
| *7.06* | PID01B | *First Stage FRB Pump - P1014* | Off | | | |
| *7.07* | PID01B | *First Stage FBR Pump - P102A* | Off | | | |
| *7.08* | PID07A | *FBR 3 pH Feed Pump - P713* | Off | | | |
| *7.09* | PID07A | *FBR 4 pH Feed Pump - P714* | Off | | | |
| *7.10* | PID07A | *FBR 3 Nutrient (Urea) Feed Pump - P723* | Off | | | |
| *7.11* | PID07A | *FBR 4 Nutrient (Urea) Feed Pump - P 724* | Off | | | |
| *7.12* | PID15 | *FBR 3 Nutrient (Phos Acid) Feed Pump - P1523* | Off | | | |
| *7.13* | PID15 | *FBR 4 Nutrient (Phos Acid) Feed Pump - P1524* | Off | | | |
| *7.14* | PID07B | *FBR 3 Electron Donor Assembly Pump - P733* | Off | | | |
| *7.15* | PID07B | *FBR 4 Electron Donor Assembly Pump - P734* | Off | | | |
| **8** | | **Second Stage FBRs 5** & 6 | | | | |
| *8.01* | PID03A | *FBR 5* | Running | | | |
| *8.02* | PID03A | *FBR 6* | Running | | | |
| *8.03* | PID03C | *Second Stage Separator Tank - T3011* | Running | | | |
| *8.04* | PID03A | *Media Return Pump - P3011* | Running | | 3 | Pump taken off line and repaired |
| *8.05* | PID03A | *Second Stage FBR Pump - P3015* | Running | | | |
| *8.06* | PID03A | *Second Stage FBR Pump - P3016* | Standby | | | |
| *8.07* | PID03A | *Second Stage FBR Pump - P301A* | Running | | | |
| *8.08* | PID07A | *FBR 5 pH Feed Pump - P715* | Off | | | |
| *8.09* | PID07A | *FBR 6 pH Feed Pump - P716* | Off | | | |
| *8.1* | PID07A | *FBR 5 Nutrient (Urea) Feed Pump - P725* | Off | | | |
| *8.11* | PID07A | *FBR 6 Nutrient (Urea) Feed Pump - P726* | Off | | | |
| *8.12* | PID07B | *FBR 5 Electron Donor Assembly Pump - P735* | Running | | | |
| *8.13* | PID07B | *FBR 6 Electron Donor Assembly Pump - P736* | Running | | | |
| **9** | | **Second Stage FBRs 7** & 8 | | | | |
| *9.01* | PID03B | *FBR 7* | Off | | | |
| *9.02* | PID03B | *FBR 8* | Off | | 4 | Replaced diffuser ends and lateral pipeing repaired |
| *9.03* | PID03D | *Second Stage Separator Tank - T3012* | Off | | | |
| *9.04* | PID03B | *Media Return Pump - P3012* | Off | | | |
| *9.05* | PID03B | *Second Stage FBR Pump - P3017* | Off | | | |
| *9.06* | PID03B | *Second Stage FBR Pump - P3018* | Off | | | |
| *9.07* | PID03B | *Second Stage FBR Pump - P302A* | Off | | | |

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| Sub-System | P&ID | Description | Status[1] | Checked | Criticality[2] | Notes |
|---|---|---|---|---|---|---|
| *9.08* | PID07A | *FBR 7 pH Feed Pump - P717* | Off | | | |
| *9.09* | PID07A | *FBR 8 pH Feed Pump - P718* | Off | | | |
| *9.10* | PID07A | *FBR 7 Nutrient (Urea) Feed Pump - P727* | Off | | | |
| *9.11* | PID07A | *FBR 8 Nutrient (Urea) Feed Pump - P728* | Off | | | |
| *9.12* | PID07B | *FBR 7 Electron Donor Assembly Pump - P737* | Off | | | |
| *9.13* | PID07B | *FBR 8 Electron Donor Assembly Pump - P738* | Off | | | |
| **10** | | **Aeration and DAF System** | | | | |
| *10.01* | PID04 | *Aeration Tank* | In operation | | | |
| *10.02* | PID04 | *Aeration Blower - B401* | Running | | | |
| *10.03* | PID04 | *Biofilter* | In operation | | | |
| *10.04* | PID04 | *Nutrient Solution* | Running | | | |
| *10.05* | PID04 | *Biofilter Sump* | Running | | | |
| *10.06* | PID04 | *Nutrient Pump - P401* | Running | | | |
| *10.07* | PID04 | *Biofilter Sump Pump - P402A* | Standby | | | |
| *10.09* | PID04 | *Biofilter Blower* | Running | | | |
| *10.10* | PID05 | *DAF Pressure Tanks* | Out of service | | | |
| *10.11* | PID05 | *DAF Vessel - D501* | Maintenance | | 2 | Repairs made to tank side and bottom, recoating of interior to follow repairs |
| *10.12* | PID05 | *DAF Pressure Pump - P501* | Maintenance | | | |
| *10.13* | PID05 | *DAF Float Pump - P502* | Maintenance | | | |
| *10.14* | PID05 | *DAF Vessel - D551* | Running | | | |
| *10.15* | PID05 | *DAF Pressure Pump - P551* | Running | | 3 | New casing gasket on order. |
| *10.16* | PID05 | *DAF Float Pump - P552* | Running | | | |
| *10.17* | PID05 | *Screw Conveyer Drive* | Standby | | | |
| *10.18* | PID05 | *Skimmer Drive* | Running | | | |
| **11** | | **Pumping System (Old Effluent)** | | | | |
| *11.01* | PID06 | *Effluent Tank 601* | In operation | | | |
| *11.02* | PID06 | *Effluent Pump - P601* | Standby | | | |
| *11.03* | PID06 | *Effluent Pump - P602* | Running | | | |
| **12** | | **Sand Filter System** | | | | |
| *12.01* | PID17 | *Sand Filter* | Running | | | |
| *12.02* | PID17 | *Filter Reject Tank* | In operation | | | |
| *12.03* | PID17 | *Filter Reject Pump - P1701A* | Standby | | | |
| *12.04* | PID17 | *Filter Reject Pump - P1701B* | Standby | | | |
| **13** | | **Effluent Tank and Pumping** | | | | |

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| Sub-System | P&ID | Description | Status[1] | Checked | Criticality[2] | Notes |
|---|---|---|---|---|---|---|
| *13.01* | PID10C | *UV Effluent Tank* | Running | | | |
| *13.02* | PID10C | *Effluent Booster Pump - P1302A* | Running | | | |
| *13.03* | PID10C | *Effluent Booster Pump - P1302B* | Standby | | | |
| *13.04* | PID10C | *Area Around Effluent and North D-1* | Running | | | |
| **14** | | **Solids Collection and Pressing System** | | | | |
| *14.01* | PID16 | *Sludge Storage Tank* | In operation | | | |
| *14.02* | PID16 | *Solids Storage Effluent Pump - P1601* | Running | | | |
| *14.03* | PID16 | *Solids Cond. Tank* | In operation | | | |
| *14.04* | PID09 | *Sludge Mixer* | Running | | | |
| *14.05* | PID09 | *Filter Press Pump - P901* | Running | | | |
| *14.06* | PID09 | *Filter Press Pump - P902* | Running | | | |
| *14.07* | PID09 | *West Press* | Standby | | | |
| *14.08* | PID09 | *East Press* | Running | | 4 | Calling J-press to perform repairs on components of the press system. Press is still operational. |
| *14.09* | PID09 | *Filtrate Tank* | In operation | | | |
| *14.10* | PID09 | *Filtrate Tank Effluent (recycle) Pump - P903* | Running | | | |
| | | **Chemical Systems** | | | | |
| **15** | | **Electron Donor System** | | | | |
| *15.01* | PID07B | *Electron Donor Tank* | In operation | | | |
| *15.02* | PID07B | *Booster Pump P739A* | Running | | | |
| *15.03* | PID07B | *Booster Pump P739B* | Standby | | | |
| **17** | PID07C | **Micro Nutrient System** | In operation | | | |
| **18** | PID07C | **Hydrogen Peroxide System** | In operation | | | |
| **19** | PID07C | **De-Foam System** | In operation | | | |
| **20** | PID15 | **Nutrient (Phosphoric Acid) System** (Tank only - pumps included in FBRs) | In operation | | | |
| **21** | PID07A | **Nutrient (Urea) System** (Tank only - pumps included in FBRs) | In operation | | | |
| **22** | PID07A | **pH System** (Tank and effluent pH feed pump only - other pumps included in FBRs) | In operation | | | |
| **23** | PID07C | **Ferric Chloride System** | In operation | | | |
| **24** | PID07B | **Polymer Systems - DAF** | In operation | | | |
| **25** | PID09 | **Polymer System - Solids Dewatering** (2 tanks, 2 centrifugal pumps, mixer, volumetric feeder) | In operation | | | |
| | | **Utility Systems** | | | | |
| **26** | | **Compressed Air System** | | | | |

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| Sub-System | P&ID | Description | Status[1] | Checked | Criticality[2] | Notes |
|---|---|---|---|---|---|---|
| *26.01* | PID08 | *West Compressor* | Running | | | |
| *26.02* | PID08 | *East Compressor* | Running | | | |
| *26.03* | PID08 | *O2 Compressor* | Running | | | |
| *26.04* | PID08 | *Compressed Air Receiver Tank* | In operation | | 3 | *installed manual bleed valve until new switch is received.* |
| *26.05* | PID08 | *Air Dryer* | Running | | | |
| *26.06* | PID08 | *Oil Removal Filter* | In operation | | | |
| *26.07* | PID08 | *Particulate Filter* | In operation | | | |
| **27** | PID16 | **Oxygen System** | In operation | | | |
| **28** | | **GWETS Plant Controls/ Siemens Controls** | In operation | | | |
| **29** | | **Well Control System/ Allen Bradley Controls** | In operation | | | |
| **30** | | **MCC FBR Pad** | In operation | | | |
| **31** | | **MCC in D-1** | In operation | | | |
| **32** | | **MCC in EQ area** | In operation | | | |
| | | **Miscellanous Systems** | | | | |
| **33** | | **Operations Office/Network** | In operation | | | |
| **34** | | **Laboratory Analyzers** | In operation | | | |
| **35** | | **Security Systems** | In operation | | | |
| | | **Shelf Spares** | | | | |
| | | Media Return Pump Rebuid Kit | In stock | | | |
| | | pH Feed Pump | In stock | | | |
| | | Nutrient Feed Pump | In stock | | | |
| | | Electron Donor Feed Pump | In stock | | | |
| | | Phosphoric Acid Feed Pump | In stock | | | |
| | | Interceptor Well Pumps (4 each) | In stock | | | |
| | | Seep Well Pump (1 each, same as Athens so total of 2) | In stock | | | |
| | | Athens Road Well Pump<br>(1 each, same as Seep so total of 2) | In stock | | | |

[1] Status Codes

| Equipment | |
|---|---|
| Running | Unit is in operation |
| Standby | Duplicate or installed spare, not currently operating |
| Maintenance | Out for repairs or maintenance |
| Off | Not currently needed, but available |

[1] Criticality Codes

| | |
|---|---|
| 1 = Critical | Cannot continue with operation until repairs made |
| 2 = Important | Can still operate safely and in compliance with permits, but risks are increased |
| 3 = Moderate | Work needs to be performed, but plant can still operate with redundancy that is in place |
| 4 = Low | - Tasks performed to either improve the existing equipment (i.e., testing new options)<br>- Minor repairs that in no way alter the performance of the plant |

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