

MEMO

To: Nevada Division of Environmental Protection
Nevada Environmental Response Trust

Cc: Nevada Environmental Response Trust Stakeholders

From: David Bohmann, Deena Garland

Date: January 20, 2016

Subject: NERT – GWETS Operation Monthly Report – December 2015

At the request of the Nevada Environmental Response Trust (Trust), Tetra Tech, Inc. (Tetra Tech) provides this summary of the groundwater extraction and treatment system (GWETS) operation and oversight tasks performed during December 2015.

Summary of GWETS Operation

Envirogen Technologies, Inc. (ETI) reports that the GWETS mechanically operated normally in December 2015 with the exception of the Fluidized Bed Reactor (FBR) plant interruption events described in more detail below. The flow rate to the plant averaged approximately 894 gallons per minute (gpm) during December 2015. At the end of the month, the GW-11 Pond volume was 43.4 million gallons (MG), which would allow 13.2 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 increased approximately 0.3 MG from the end of November. 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 76 mg/L for the month, with a maximum concentration of 85 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 ENVIRON).

Enhanced Operational Metrics

Tetra Tech testing and transfer of operations to ETI was completed in December. The completion of punch list items and other administrative project close out matters will continue into January 2016. 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: Tetra Tech prepared a procedure for repair of the NE sump riser pipe and reinforcement of the NW, SE, and SW sump riser pipes. The Trust is currently in discussion with Envirogen to implement the proposed repairs.
- Boatman Bugs: Windy and rainy conditions at the site caused stirring of GW-11 and created pond conditions that supported a Boatman Bug population bloom. The bloom lasted for five days and plugged the automatic strainers. GW-11 was bypassed and the strainers were offline for five days until the bug population declined enough to resume normal operations on December 17, 2015.

2. Biological Plant

- Power Shut Down: The operation of the FBRs was interrupted by more than 6-hours on December 7, 2015. The interruption was due to accidental power shut down of the biological plant PLC while attempting to reset a breaker associated with the exterior lights on the FBR pad. While the plant was down, ETI diverted effluent flow to GW-11 until normal operations resumed on December 8 at 5:15am to avoid any excursions of the NPDES effluent permit limits. NDEP received email notification of this shut down on December 10, 2015.
- Planned Shut Down: The biological plant experienced a planned shut down on December 10, 2015 to allow for maintenance activities to be completed on a leaking pipe under one of the Granulated Activated Carbon (GAC) units within the secondary containment structure at the EQ area. NDEP received advance notification of this planned shut down on the morning of December 10, 2015.

3. Spill

- No reportable spills occurred in December 2015.

4. Maintenance

- Major maintenance that was performed or completed in the month included:
 - i. ETI added new fittings and a hose to PC99R3.
 - ii. ETI installed a new motor and pump on well I-AR.
 - iii. ETI installed the P1302B pump and motor.

- Preventative Maintenance completed or being performed in the month included:
 - i. New gaskets were installed on a valve on the withdrawal piping from GW-11 going to P-101A and B.
 - ii. Packing was added and tightened on the SLMW flush valve for the GACs.
 - iii. A new backflush actuator was installed on the strainer.
 - iv. Media Return Pump P3011 was rebuilt and is back online.
 - v. The DAF Vessel D-551 was drained and inspected.
 - vi. The seal for DAF Pressure Pump – P551 seal was received and installed.
 - vii. The Effluent Booster Pump P-1302B and motor were installed.
 - viii. ETI added a water system to the polymer mixer at the DAF to improve flow through the static mixer.
 - ix. ETI installed a manual bleed valve on the Compressed Air Receiver Tank until a new switch is received.

- Outstanding or ongoing maintenance and repairs from the previous month are outlined below:
 - i. FBRs 7 and 8 are currently in the rehabilitation process and all forward flow is being sent to FBRs 5 and 6.
 - ii. The pneumatic cylinder on the East Filter Press needs to be serviced. ETI is currently in the process of replacing the airlines to the plate switch. The press can still operate and the plates can be moved manually while work is being completed.

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

Tetra Tech is moving forward with the design to remove the AP-5 pond solids, wash the solids to remove perchlorate salts, and relocate the perchlorate containing water to a large storage tank for eventual treatment in the GWETS. Evaluation and coordination between Tetra Tech, ETI, the Trust and NDEP on this project is ongoing. Additional AP-5 material sampling for off-site analysis and testing was conducted the week of December 7. Tank purchase is on hold pending test results.

2. Enhanced Operational Metrics

Testing and transfer of operations to ETI was completed on December 18, 2015. The punch-List is being finalized for resolution of remaining items. Spare parts, Operation and Maintenance Manuals and As-Built documents for close-out are being prepared to issue to ETI.

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 confirming the inventory of required shelf spares. The equipment tracking form submitted by ETI to Tetra Tech on December 29, 2015 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).

GWETS Security

During weekly calls, ETI notifies Tetra Tech of any issues with GWETS security. There were no GWETS security issues reported during the month of December.

Tetra Tech Activities

Tetra Tech conducted calls with ETI to review operation of the GWETS on December 3rd, 10th, and 17th. No call was held on Christmas Eve or New Year's Eve. Kyle Hansen, CEM, performed the GWETS oversight and review activities on December 7th, 14th, 21st, and 28th. Mr. Hansen also reviewed permit and sampling forms for the entire month to ensure each form was correct and up-to-date, checked equipment status, and verified shelf spare inventory.

Summary

Based on our review of available and relevant information, Tetra Tech concurs with ETI's management of the GWETS during the reporting period. No additional involvement from either the Trust or Tetra Tech is recommended at this time.

Tables

Operational Metrics

Nevada Environmental Response Trust Groundwater Extraction and Treatment System 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	518 ¹	12	0.002	Future Metric
AWF Total Extraction ³	270 ¹	158	0.37	Future Metric
IWF Total Extraction ³	58 ¹	866	7.56	Future Metric
GWTP Effluent ⁴	56	799	0.21	ND
GW-11 Influent	694	110	0.13	0.045
GW-11 Effluent/ FBR Influent ⁴	894	76	0.04	ND

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 2016.

Nevada Environmental Response Trust Groundwater Extraction and Treatment System Monthly Stakeholder Metrics		
Location ID	Perchlorate (lbs/month) ¹	Chromium TR (lbs/month) ¹
SWF Total Extraction	2,377	0
AWF Total Extraction	15,907	37
IWF Total Extraction	17,519	153
GWTP Effluent	16,817	4
GW-11 Influent	28,469	34
GW-11 Effluent/FBR Influent	19,615	11

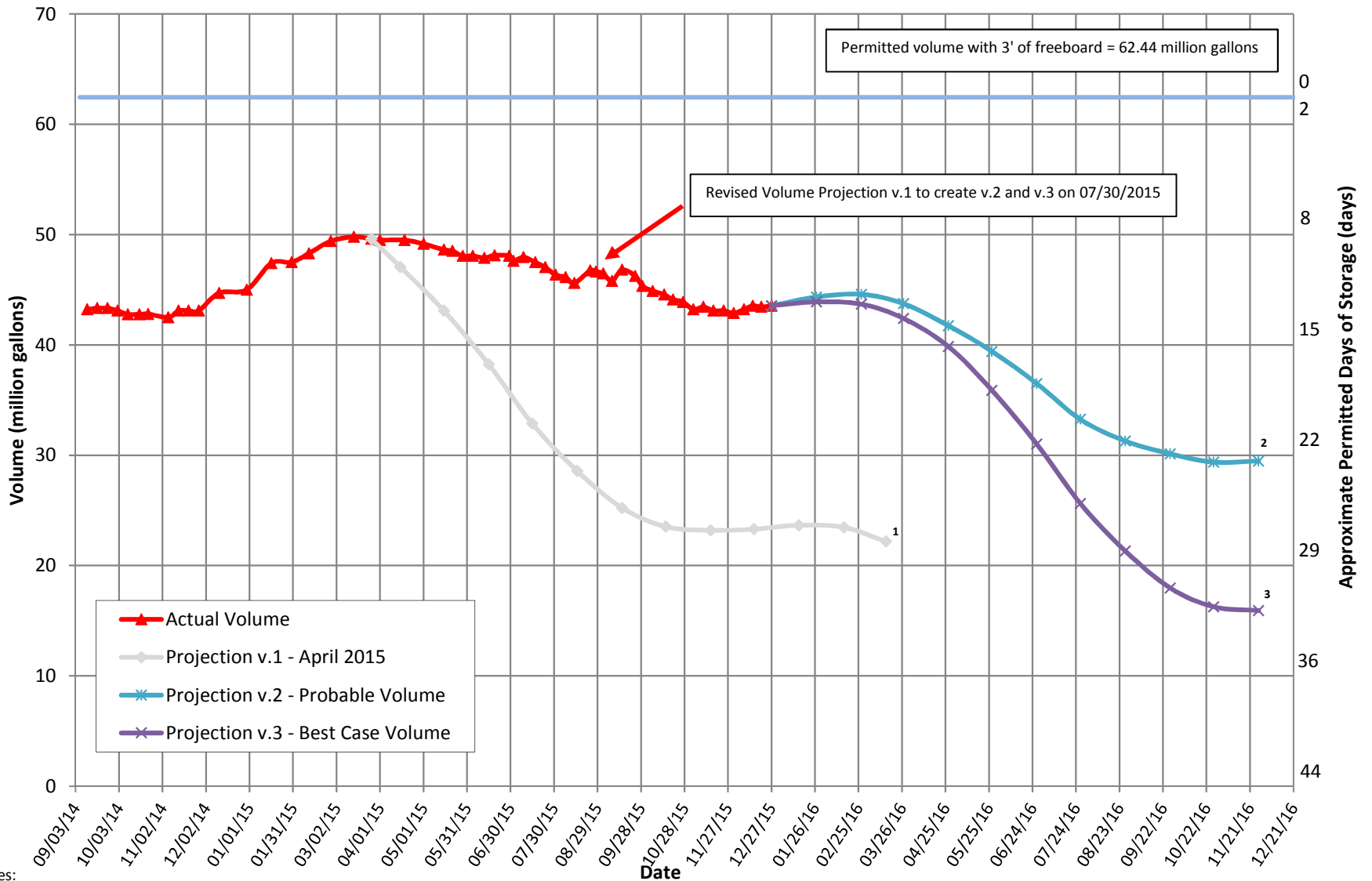
Notes:

TR = Total Recoverable.

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

Figures

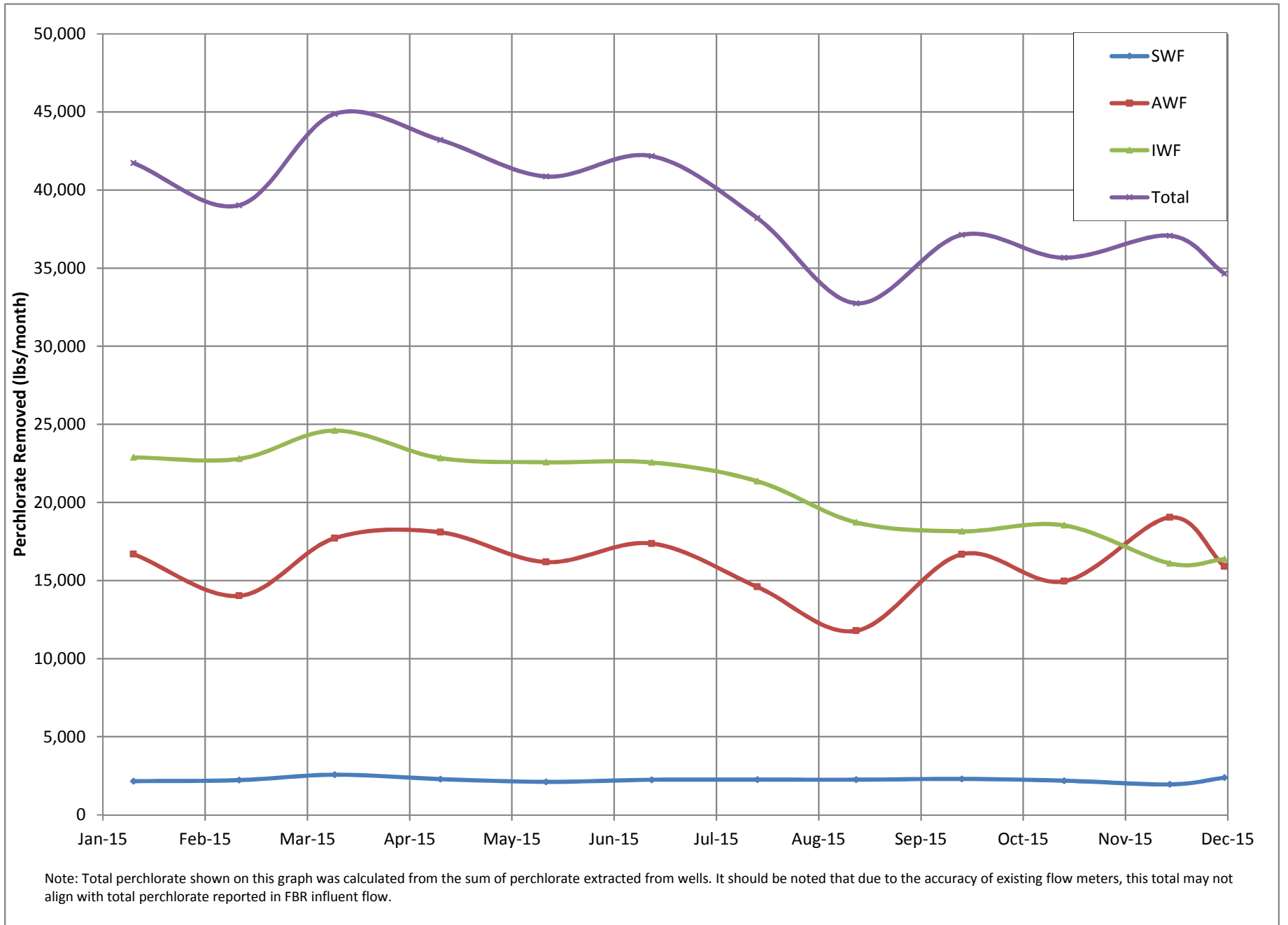
Operational Metrics



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



Attachment A

NPDES Tracking Sheet (Prepared by ENVIRON)

Continuous		Daily samples, composited weekly	
Flow Rate		Perchlorate	
30-Day Avg. (MGD)	Daily Maximum (MGD)	30-Day Avg. (ug/L)	30-Day Avg. (lbs/day)
1.45	1.75	18	0.22

Weekly samples								
pH	Hexavalent Chromium	Total Chromium	Total Suspended Solids (TSS)		Total Iron		Total Ammonia as N	Total Phosphorus as P
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)
6.5 to 9.0	0.01	0.1	135	1,634	10	121.03	40	20

Weekly samples, collected separately			Quarterly sample	
BOD ₅ (inhibited)			Manganese	
30-Day Avg. (mg/L)	Daily Max. (mg/L)	30-Day Avg. (lbs/day)	30-Day Avg. (mg/L)	30-Day Avg. (lbs/day)
25	40	254	5	60.52

January 2015	1.20	1.39	1.3	0.013	6.59	0.00013	0.021	25	250	4.1	40	2.6	1.5	3.7	6.0	37	0.20	2.1
February 2015	1.34	1.42	1.3	0.014	6.85	0.00013	0.029	21	230	3.3	37	2.5	1.6	6	13	69		
March 2015	1.32	1.38	1.3	0.014	6.71	0.00013	0.043	26	280	4.9	54	7.4	2.0	4.6	9.2	49		
April 2015	1.30	1.34	1.3	0.014	6.83	0.00013	0.0080	13	140	3.4	36	3.4	1.4	1.9	2.9	21	0.090	0.93
May 2015	1.23	1.29	1.3	0.013	6.52	0.00034	0.0060	13	130	3.6	37	2.4	0.7	0.6	1.1	6.4		
June 2015	1.21	1.32	1.3	0.012	6.84	0.00013	0.013	17	170	4.1	41	4.0	2.0	2.3	2.6	23		
July 2015	1.24	1.37	1.3	0.013	6.88	0.00013	0.0049	13	130	3.2	32	2.1	1.0	1.4	1.8	14	0.14	1.5
August 2015	1.31	1.38	1.3	0.014	6.94	0.00013	0.011	18	200	3.6	40	1.6	1.8	3.7	5.9	40		
September 2015	1.35	1.51	1.3	0.014	6.98	0.00013	0.098	7	84	1.5	17	2.1	1.7	2.2	3.2	24		
October 2015	1.37	1.54	1.3	0.014	7.08	0.00029	0.0059	13	150	2.6	30	2.7	0.7	1.4	1.7	16	0.23	2.8
November 2015	1.34	1.44	1.3	0.014	7.12	0.00013	0.014	13	150	2.6	30	1.6	0.9	3.7	6.2	41		
December 2015 (month to date)	1.32	1.43	1.3	0.013	6.86	0.00013	0.0082	19	200	2.7	28	5.9	0.71	4.6	7.7	50		

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				
1/4 - 1/10	1/10/2015	ND (<2.5)	1.3	0.010	1/5/2015	6.53	ND (<0.00025)	0.021	24	201	4.8	40	--	0.94	7.9	--	0.083	0.69	1/7/2015	3.1	26	0.20	2.1	
1/11 - 1/17	1/17/2015	ND (<2.5)	1.3	0.013	1/12/2015	6.64	ND (<0.00025)	0.019	19	192	3.9	39	ND (<0.10)	0.05	0.51	--	0.16	1.6	1/14/2015	3.9	39			
1/18 - 1/24	1/24/2015	ND (<2.5)	1.3	0.014	1/19/2015	6.65	ND (<0.00025)	0.018	25	276	3.4	38	--	0.13	1.4	--	0.16	1.8	1/21/2015	1.8	20			
1/25 - 1/31	1/31/2015	ND (<2.5)	1.3	0.013	1/26/2015	6.54	ND (<0.00025)	0.019	30	316	4.1	43	ND (<0.10)	0.05	0.53	--	0.17	1.8	1/28/2015	6.0	63			
2/1 - 2/7	2/7/2015	ND (<2.5)	1.3	0.014	2/2/2015	6.90	ND (<0.00025)	0.010	11	121	1.6	18	--	0.20	2.2	--	0.12	1.3	2/4/2015	4.5	49			
2/8 - 2/14	2/14/2015	ND (<2.5)	1.3	0.014	2/9/2015	6.67	ND (<0.00025)	0.024	17	196	0.66	7.6	--	0.33	3.8	--	0.27	3.1	2/11/2015	5.7	66			
2/15 - 2/21	2/21/2015	ND (<2.5)	1.3	0.014	2/17/2015	6.97	ND (<0.00025)	0.0064	19	212	3.9	44	--	0.21	2.3	--	0.067	0.75	2/18/2015	1.5	17			
2/22 - 2/28	2/28/2015	ND (<2.5)	1.3	0.014	2/23/2015	6.85	ND (<0.00025)	0.029	36	401	7.1	79	--	0.16	1.8	--	0.12	1.3	2/25/2015	13	145			
3/1 - 3/7	3/7/2015	ND (<2.5)	1.3	0.013	3/2/2015	6.82	ND (<0.00025)	0.043	42	441	4.9	51	--	0.22	2.3	--	0.25	2.6	3/5/2015	9.2	97			
3/8 - 3/14	3/14/2015	ND (<2.5)	1.3	0.014	3/9/2015	6.89	ND (<0.00025)	0.011	26	296	4.8	55	--	0.44	5.0	--	0.46	5.2	3/11/2015	2.6	30			
3/15 - 3/21	3/21/2015	ND (<2.5)	1.3	0.014	3/16/2015	6.64	ND (<0.00025)	0.0071	23	257	5.0	56	--	0.69	7.7	--	0.066	0.74	3/18/2015	2.2	25			
3/22 - 3/28	3/28/2015	ND (<2.5)	1.3	0.014	3/23/2015	6.64	ND (<0.00025)	0.013	19	211	4.8	53	--	0.71	7.9	--	0.11	1.2	3/25/2015	4.2	47			
3/29 - 4/4	4/4/2015	ND (<2.5)	1.3	0.014	3/30/2015	6.55	ND (<0.00025)	0.0074	20	219	4.9	54	--	1.3	14	ND (<0.025)	0.013	0.14	4/1/2015	2.7	30			
4/5 - 4/11	4/11/2015	ND (<2.5)	1.3	0.013	4/6/2015	6.96	ND (<0.00025)	0.0057	18	193	4.7	50	--	0.27	2.9	--	0.13	1.4	4/8/2015	2.9	31			
4/12 - 4/18	4/18/2015	ND (<2.5)	1.3	0.014	4/13/2015	7.04	ND (<0.00025)	0.0080	4.7	52	0.38	4.2	--	0.37	4.1	--	0.28	3.1	4/15/2015	1.9	21	0.090	0.93	
4/19 - 4/25	4/25/2015	ND (<2.5)	1.3	0.013	4/20/2015	6.62	ND (<0.00025)	0.0046	17	183	4.2	45	--	0.55	5.9	--	0.064	0.69	4/22/2015	0.85	9.1			
4/26 - 5/2	5/2/2015	ND (<2.5)	1.3	0.013	4/27/2015	6.69	ND (<0.00025)	0.0040	14	149	4.3	46	ND (<0.10)	0.05	0.53	--	0.044	0.47	4/29/2015	1.2	13			
5/3 - 5/9	5/9/2015	ND (<2.5)	1.3	0.012	5/4/2015	6.61	ND (<0.00025)	0.0046	8.0	77	3.7	36	--	0.22	2.1	--	0.041	0.39	5/6/2015	ND (<0.50)	0.25	2.4		
5/10 - 5/16	5/16/2015	ND (<2.5)	1.3	0.013	5/12/12015	6.62	ND (<0.00025)	0.0046	12	127	3.9	41	--	0.39	4.1	--	0.098	1.0	5/13/2015	0.57	6.0			
5/17 - 5/23	5/23/2015	ND (<2.5)	1.3	0.013	5/18/2015	6.42	0.00034	0.0060	13	138	3.7	39	--	0.11	1.2	--	0.030	0.32	5/20/2015	1.1	12			
5/24 - 5/30	5/30/2015	ND (<2.5)	1.3	0.013	5/26/2015	6.44	ND (<0.00025)	0.0046	18	187	3.0	31	--	0.23	2.4	--	0.088	0.92	5/27/2015	0.52	5.4			
5/31 - 6/6	6/6/2015	ND (<2.5)	1.3	0.012	6/1/2015	6.57	ND (<0.00025)	ND (<0.013)	10	95	3.8	36	--	0.24	2.3	--	0.070	0.66	6/3/2015	2.6	25			
6/7 - 6/13	6/13/2015	ND (<2.5)	1.3	0.013	6/8/2015	6.74	ND (<0.00025)	0.013	21	211	6.9	69	--	0.91	9.1	--	0.26	2.6	6/10/2015	1.6	16			
6/14 - 6/20	6/20/2015	ND (<2.5)	1.3	0.013	6/15/2015	7.21	ND (<0.00025)	0.0088	9.5	98	2.0	21	--	0.27	2.8	--	0.26	2.7	6/17/2015	2.6	27			
6/21 - 6/27	6/27/2015	ND (<2.5)	1.3	0.013	6/22/2015	6.98	ND (<0.00025)	0.0068	22	224	4.2	43	--	0.18	1.8	--	0.17	1.7	6/24/2015	2.3	23			
6/28 - 7/4	7/4/2015	ND (<2.5)	1.3	0.013	6/29/2015	6.70	ND (<0.00025)	0.0061	23	240	3.6	38	--	0.39	4.1	--	0.22	2.3	7/1/2015	1.5	16			
7/5 - 7/11	7/11/2015	ND (<2.5)	1.3	0.011	7/6/2015	6.79	ND (<0.00025)	0.0049	14	126	3.5	32	--	0.20	1.8	--	0.11	1.0	7/9/2015	0.93	8.4	0.14	1.5	
7/12 - 7/18	7/18/2015	ND (<2.5)	1.3	0.014	7/14/2015	7.55	ND (<0.00025)	ND (<0.0025)	13	143	2.5	27	--	0.19	2.1	--	0.066	0.73	7/15/2015	1.5	16			
7/19 - 7/25	7/25/2015	ND (<2.5)	1.3	0.014	7/20/2015	6.48	ND (<0.00025)	ND (<0.0025)	9.4	105	2.7	30	--	0.27	3.0	--	0.063	0.70	7/22/2015	1.2	13			
7/26 - 8/1	8/1/2015	ND (<2.5)	1.3	0.013	7/27/2015	6.68	ND (<0.00025)	0.0046	15	154	3.9	40	--	0.13	1.3	--	0.16	1.6	7/29/2015	1.8	19			
8/2 - 8/8	8/8/2015	ND (<2.5)	1.3	0.014	8/3/2015	7.65	ND (<0.00025)	0.0048	18	202	3.7	42	--	0.21	2.4	--	0.13	1.5	8/5/2015	2.7	30			
8/9 - 8/15	8/15/2015	ND (<2.5)	1.3	0.013	8/11/2015	6.83	ND (<0.00025)	0.011	26	276	5.0	53	--	0.25	2.7	--	0.17	1.8	8/12/2015	5.9	63			
8/16 - 8/22	8/22/2015	ND (<2.5)	1.3	0.013	8/17/2015	6.66	ND (<0.00025)	0.0062	15	159	3.2	34	--	0.20	2.1	--	0.33	3.5	8/19/2015	3.1	33			
8/23 - 8/29	8/29/2015	ND (<2.5)	1.3	0.014	8/24/2015	6.84	ND (<0.00025)	ND (<0.0025)	14	156	3.4	38	ND (<0.10)	0.05	0.56	--	0.11	1.2	8/26/2015	2.9	32			
8/30 - 9/5	9/5/2015	ND (<2.5)	1.3	0.014	8/31/2015	6.73	ND (<0.00025)	ND (<0.0025)	18	195	2.9	31	ND (<0.10)	0.05	0.54	--	0.11	1.2	9/2/2015	2.2	24			
9/6 - 9/12	9/12/2015	ND (<2.5)	1.3	0.013	9/8/2015	6.89	ND (<0.00025)	0.0070	2.9	31	2.6	28	--	0.29	3.1	--	0.28	3.0	9/9/2015	1.7	18			
9/13 - 9/19	9/19/2015	ND (<2.5)	1.3	0.014	9/14/2015	6.93	ND (<0.00025)	0.098	15	169	0.27	3.0	ND (<0.10)	0.05	0.56	ND (<0.025)	0.013	0.14	9/16/2015	3.2	36			
9/20 - 9/26	9/26/2015	ND (<2.5)	1.3	0.015	9/21/2015	7.34	ND (<0.00025)	0.0038	3.7	44	1.9	22	--	0.26	3.1	--	0.092	1.1	9/23/2015	1.9	22			
9/27 - 10/3	10/3/2015	ND (<2.5)	1.3	0.015	9/28/2015	6.75	ND (<0.00025)	0.0030	8.0	93	1.4	16	--	0.13	1.5	--	0.21	2.5	9/30/2015	1.8	21			
10/4 - 10/10	10/10/2015	ND (<2.5)	1.3	0.014	10/5/2015	6.95	ND (<0.00025)	0.0059	14	158	3.4	38	--	0.17	1.9	--	0.10	1.1	10/7/2015	1.3	15			
10/11 - 10/17	10/17/2015	ND (<2.5)	1.3	0.015	10/12/2015																			

Attachment B

Equipment Tracking Form

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		2	ETI added new boreline fittings and hose to PC-99R3
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 Pipeline	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	ETI installed a new motor and pump on well I-AR.
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			
4.09		Area In And Around GWTP	Running			

¹Status 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		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	Running			
5.04	PID10A	Equalization Tanks	In operation			
5.05	PID10A	Area in and Around EQ	In operation		3	ETI installed new gaskets on a GW-11 valve going to P-101A and B. ETI added and tightened the packing on the SLMW flush valve for the GACs.
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		3	A new backflush actuator was installed on strainer.
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	Maintenance			
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			
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			

¹Status 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
6.23	PID07B	FBR 1 Electron Donor Assembly Pump - P731	Running			
6.24	PID07B	FBR 2 Electron Donor Assembly Pump - P732	Running			

¹Status 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
7		First Stage FBRs 3 & 4				
7.01	PID01B	FBR 3	Off			
7.02	PID01B	FBR 4	Off			
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	Maintenance		3	The pump has been rebuilt and is back online.
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			

¹Status 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
9		Second Stage FBRs 7 & 8				
9.01	PID03B	FBR 7	Off		4	The carbon transfer is complete. The rehabilitation process continues to progress.
9.02	PID03B	FBR 8	Off		4	The carbon transfer is complete. The rehabilitation process continues to progress.
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			
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	In operation			
10.11	PID05	DAF Vessel - D501	Running			
10.12	PID05	DAF Pressure Pump - P501	Running			
10.13	PID05	DAF Float Pump - P502	Running			
10.14	PID05	DAF Vessel - D551	Running		3	The DAF was drained and the vessel inspected.
10.15	PID05	DAF Pressure Pump - P551	Running		3	The seal was received and installed.
10.16	PID05	DAF Float Pump - P552	Running			
10.17	PID05	Screw Conveyor Drive	Standby			
10.18	PID05	Skimmer Drive	Running			

¹Status 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
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	Running			
13		Effluent Tank and Pumping				
13.01	PID10C	UV Effluent Tank	Running			
13.02	PID10C	Effluent Booster Pump - P1302A	Running			
13.03	PID10C	Effluent Booster Pump - P1302B	Maintenance		2	The pump and motor were installed.
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		3	The plate shifter work is ongoing.
14.09	PID09	Filtrate Tank	In operation			
14.10	PID09	Filtrate Tank Effluent (recycle) Pump - P903	Running			

¹Status 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
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		3	ETI added a water system to the polymer mixer to improve flow through static mixer.
25	PID09	Polymer System - Solids Dewatering (2 tanks, 2 centrifugal pumps, mixer, volumetric feeder)	In operation			
Utility Systems						
26		Compressed Air System				
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	ETI installed a manual bleed valve until a 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			

¹Status 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
Miscellaneous Systems						
33		Operations Office/Network	In operation			
34		Laboratory Analyzers	In operation			
35		Security Systems	In operation			
Shelf Spares						
		Media Return Pump Rebuild 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 (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)
 - Minor repairs that in no way alter the performance of the plant

Tanks, Pipelines, Ponds

In operation
 Out of service

Spares

In stock

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