

# MEMO

---

**To:** Nevada Division of Environmental Protection  
Nevada Environmental Response Trust

---

**Cc:** Nevada Environmental Response Trust Stakeholders

---

**From:** Andrew Harley/Tt

---

**Date:** June 20, 2015

---

**Subject:** NERT – GWETS Operation Monthly Report – May 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 May 2015.

### Summary of GWETS Operation

Envirogen Technologies, Inc. (ETI) reports that the GWETS mechanically operated normally in May 2015, with the exception of a leak on the effluent pipe on May 7<sup>th</sup>, as discussed below. The flow rate to the plant averaged approximately 856 gallons per minute (gpm) during May 2015. At the end of the month, the GW-11 Pond volume was 48.1 million gallons (MG), which would allow 10 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 1.44 MG from the end of April.

Figure 1 in this report depicts the actual and projected GW-11 pond volumes and additional storage available. The actual pond volumes were higher than the calculated volumes predicted for the reporting period because withdrawals from the pond were reduced during rehabilitation of the Dissolved Air Floatation (DAF) system. Under the predicted operating conditions, pond outflows were projected to exceed inflows by approximately 50 gpm causing a relatively rapid decline in the pond volume. Restrictions during DAF system repairs limited the withdrawals to essentially equal the inflow rate. Thus, the decrease in pond volume during the reporting period was only due to evaporation. Based on the volume projection graph in Figure 1, GW-11 pond volume will continue to decrease and return to greater than 15 days of available storage during July 2015. The actual date at which this level of storage is achieved is dependent on when the DAF rehabilitation is completed and the higher pond withdrawal rates are restored.

The influent perchlorate concentration to the Fluidized Bed Reactor (FBR) plant averaged 105 mg/L for the month, with a maximum concentration of 120 mg/L.

Analytical data indicate that 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 continues to move forward with the approved Enhanced Operational Metrics program to add instruments, controls, data acquisition systems, along with various other technical upgrades to improve the efficiency of GWETS data collection and reporting. An implementation schedule is presented in more detail under the GWETS Upgrades and Facility Projects section below.

The attached 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. The attached 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:** On behalf of the Trust, Tetra Tech continues to evaluate how to repair the northeast leak detection pipes so that the correct depth can be determined for the extraction pump. The timeline for the repair may be lengthy due to the on-going use of the GW-11 pond.
- **Based on guidance received from NDEP, new Standard Operating Procedures (SOP)** were developed to provide improved estimates of the leakage rate across the pond's primary liner. In accordance with the new SOPs, leakage rate tests were completed in each of the corner sump wells in May 2015. The recorded daily leakage rates ranged from 32.2 to 68.2 gallons/acre-day. In comparison, the lowest leakage rate threshold provided in NDEP's Guidance Document for the Design of a Lined Wastewater Holding Pond is 125 gallon/acre-day.
- **Dye Tracer Test:** Dye testing using the down gradient piezometers in the north berm to evaluate the integrity of the pond's secondary liner was completed during the month of May. Dye was added to both the northeast and northwest sumps on April 22, 2015. As of June 10, 2015, no dye has been detected in any of the monitoring wells downgradient of the sumps. As of the date of this memorandum, and based on the results of the dye tracer testing, the integrity of the secondary liner appears to be sound.
- **Diversions:** There were two periods of diversion to GW-11 during the month of May. The May 7<sup>th</sup> diversion lasted for 15 hours and added approximately 717,000 gallons to

GW-11. The May 31<sup>st</sup> diversion lasted for 5 hours and added approximately 260,000 gallons to GW-11. Details related these diversions are described under the Maintenance section below.

## 2. Maintenance

- Major maintenance that was performed or completed in the month included:
  - i. On May 31<sup>st</sup>, the feed line was replaced on the FBR 2 Electron Donor Assembly Pump – P732. Influent flow was diverted to GW-11 for approximately 5 hours during the repair.
  - ii. Sandblasting was continued on DAF Vessel D551 and a new coating will be installed in June. This rehabilitation process results in no impact to the treatment process due to full DAF redundancy.
  
- On May 7, 2015 a glued joint on the 8-inch effluent pipe at the north side of the equalization area failed. Less than 50 gallons of water were discharged and absorbed into the ground immediately under the effluent pipe and the discharge did not reach any drainages or waterways. The effluent flow was diverted to GW-11 for 15 hours during the installation of a new 8-inch pipe with flanges at the site of the leaking joint. Described in more detail below, as a result of this spill, ETI implemented 24/7 staffing of the plant.
  
- Preventative Maintenance completed or being performed in the month included:
  - i. The PC-150 ¾ hp pump motor was replaced with a ½ hp motor.
  - ii. The Variable Frequency Drive (VFD) for Interceptor Booster Pump B was reset and the pump is running in automatic mode.
  - iii. The motor pulley for the Groundwater Treatment Plant (GWTP) air compressor was repaired.
  - iv. The mechanical seal for Raw Water Feed Pump – P102B was returned to the manufacturer for repairs.
  - v. Seal water lines were repaired for Second Stage FBR pumps P3015, P3016, and P301A.
  - vi. Filter Reject Pump P1701B repairs are complete and the pump is ready for installation and testing.
  - vii. ETI has ordered replacement parts for the flow meter on the electron donor tank.

## 3. Outstanding maintenance and repairs from the previous month are outlined below:

- ETI continues the rehabilitation process on FBR 5 and 6. This is an ongoing process as ETI expects to return these units to operation when the processing of the AP-5 slurry begins in the first quarter of 2016.

- An air hose remains in place to bypass carbon steel lines that are corroded at the DAF Pressure Tanks and Pressure Pump P551. ETI met with contractors in May and are waiting to receive bids for new isolation valves to move forward in the replacement project.
- A new pressure regulator was received for the compressed air receiver tank. ETI is waiting for a planned FBR plant shut down to replace the regulator. Because ETI does not deem replacing the regulator as a critical maintenance activity, ETI will coordinate the shutdown with other required maintenance activities. This future shutdown of the FBR plant will not require the well fields to be shut down.

### **GWETS Upgrades and Facility Projects**

The following is a summary of 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 Phase II AP-5 Solids Removal project. The first procurement packages were completed and distributed to potential bidders in May. Tetra Tech is continuing on to the next phase of design. Coordination between Tetra Tech and NDEP, ETI, and the Trust on this project is ongoing.

2. Enhanced Operational Metrics

Tetra Tech is continuing work with the Trust to obtain access to areas where existing pipelines may be located outside of areas covered by the Trust's lease with the City of Henderson at the Athens Road Well Field and the Trust's easements with Basic Environmental at the Seep Well Field. Final equipment installation bids were received from contractors. The total cost forecast indicated a significant cost increase due to additional items and improvements to increase system reliability, compatibility, and future expansion capability as well as higher than expected installation pricing quotes from approved contractors. At the direction of the Trust and NDEP, work continues while the budget is analyzed and amended. Construction activities are scheduled for June and July 2015. Phased activation of the operational metrics upgrades will continue through the end of September 2015, with all data available in October, barring any schedule delays.

### **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 continue to 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 June 1, 2015, is attached (Please see Attachment B).

### **GWETS Staffing**

As of May 7, 2015, ETI began 24-hour staffing of the GWETS at the direction of the Trust. The 24/7 staffing began immediately following the spill reported on May 7, 2015 so that ETI could ensure the repair of the effluent line was satisfactory and perform an additional plant pipe check. ETI 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 May.

### **Tetra Tech Activities**

Tetra Tech conducted calls with ETI to review operation of the GWETS on May 7<sup>th</sup>, May 14<sup>th</sup>, and May 28<sup>th</sup>. Tetra Tech was on-site on May 20<sup>th</sup> and communicated with ETI staff during that time. Becki Dano, CEM, performed visits to the GWETS on May 1<sup>st</sup>, 8<sup>th</sup>, 15<sup>th</sup>, 22<sup>nd</sup>, and 29<sup>th</sup>. Ms. Dano also reviewed permit and sampling forms for the entire month to ensure each 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) <sup>2</sup>	Chromium TR (mg/L) <sup>2</sup>	Chromium(VI) (mg/L) <sup>2,8</sup>
SWF Total Extraction <sup>5</sup>	526 <sup>1</sup>	11	0.000	Future Metric
AWF Total Extraction <sup>5</sup>	286 <sup>1</sup>	152	0.38	Future Metric
IWF Total Extraction <sup>6</sup>	67 <sup>1</sup>	902	7.37	Future Metric
GWTP Effluent <sup>7</sup>	72	938	1.24	ND
GW-11 Influent <sup>4</sup>	856 <sup>3</sup>	Future Metric	Future Metric	Future Metric
GW-11 Effluent/ FBR Influent <sup>7</sup>	856	105	0.04	29.00

## Notes:

TR = Total Recoverable; NA = Not Available; 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: Flow has historically been a calculated metric, but Tetra Tech transitioned to flow meter measurement beginning on April 27, 2015.

4: Tetra Tech is currently working on a sampling plan with ETI to collect the new GW-11 influent samples.

5: Perchlorate sampled monthly, chromium TR sampled quarterly, values reported from TestAmerica.

6: Perchlorate and chromium TR sampled quarterly, values reported from TestAmerica.

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

8: Hexavalent chromium will be analyzed and reported monthly beginning in 2015 as part of the Enhanced Operational Metrics project.

Nevada Environmental Response Trust   Groundwater Extraction and Treatment System   Monthly Stakeholder Metrics		
Location ID	Perchlorate (lbs/month) <sup>1</sup>	Chromium TR (lbs/month) <sup>1</sup>
SWF Total Extraction	2,112	0.09
AWF Total Extraction	16,182	41
IWF Total Extraction	22,579	184
GWTP Effluent	25,246	33
GW-11 Influent <sup>2</sup>	Future Metric	Future Metric
GW-11 Effluent/FBR Influent	33,525	13

Notes:

TR = Total Recoverable; NA = Not Available.

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

2: Tetra Tech is currently working with ETI to create sampling plan for the GW-11 influent tap.

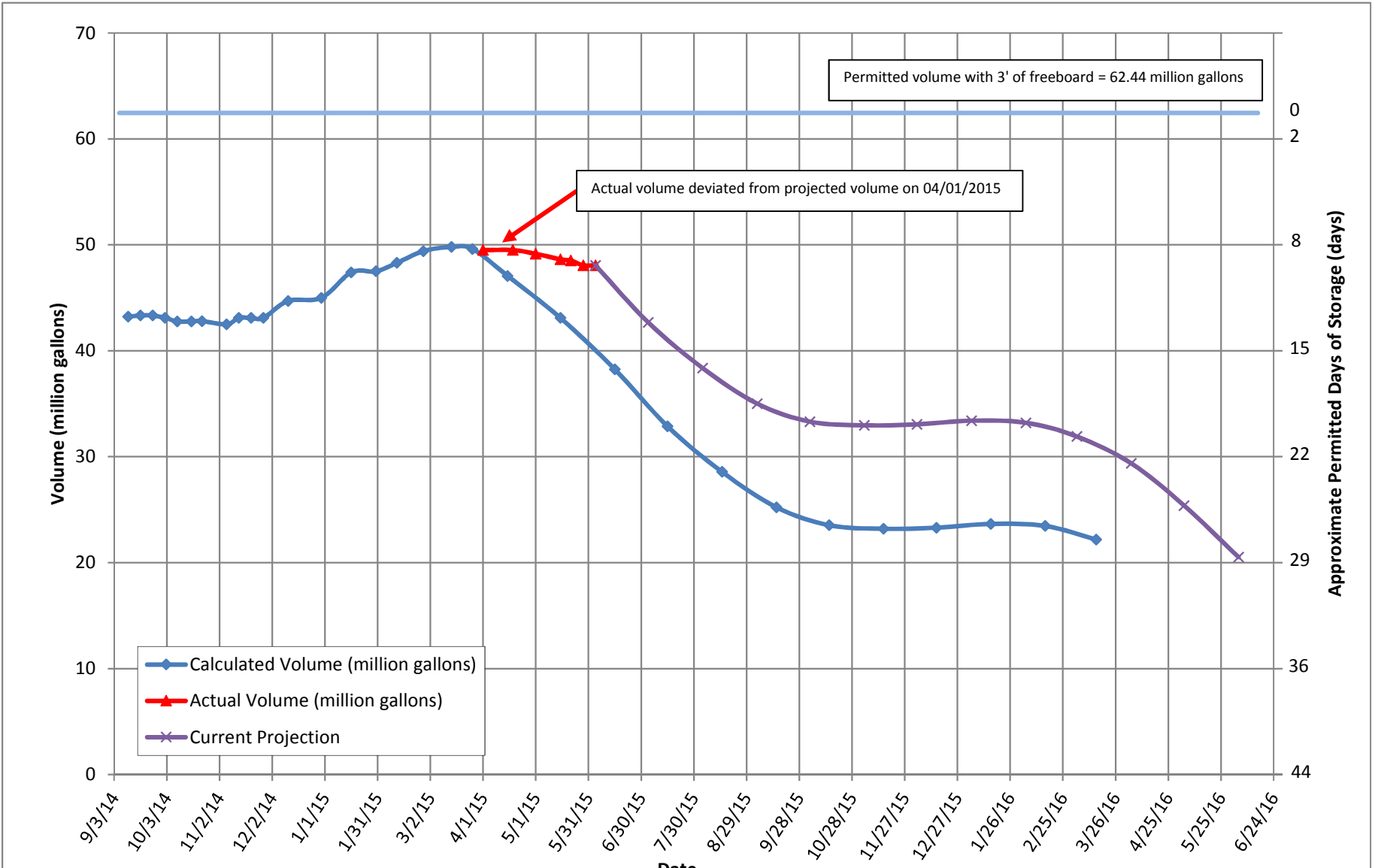


# Figures

## Operational Metrics

Figure 1 - GW-11 Projected vs Actual Pond Volume

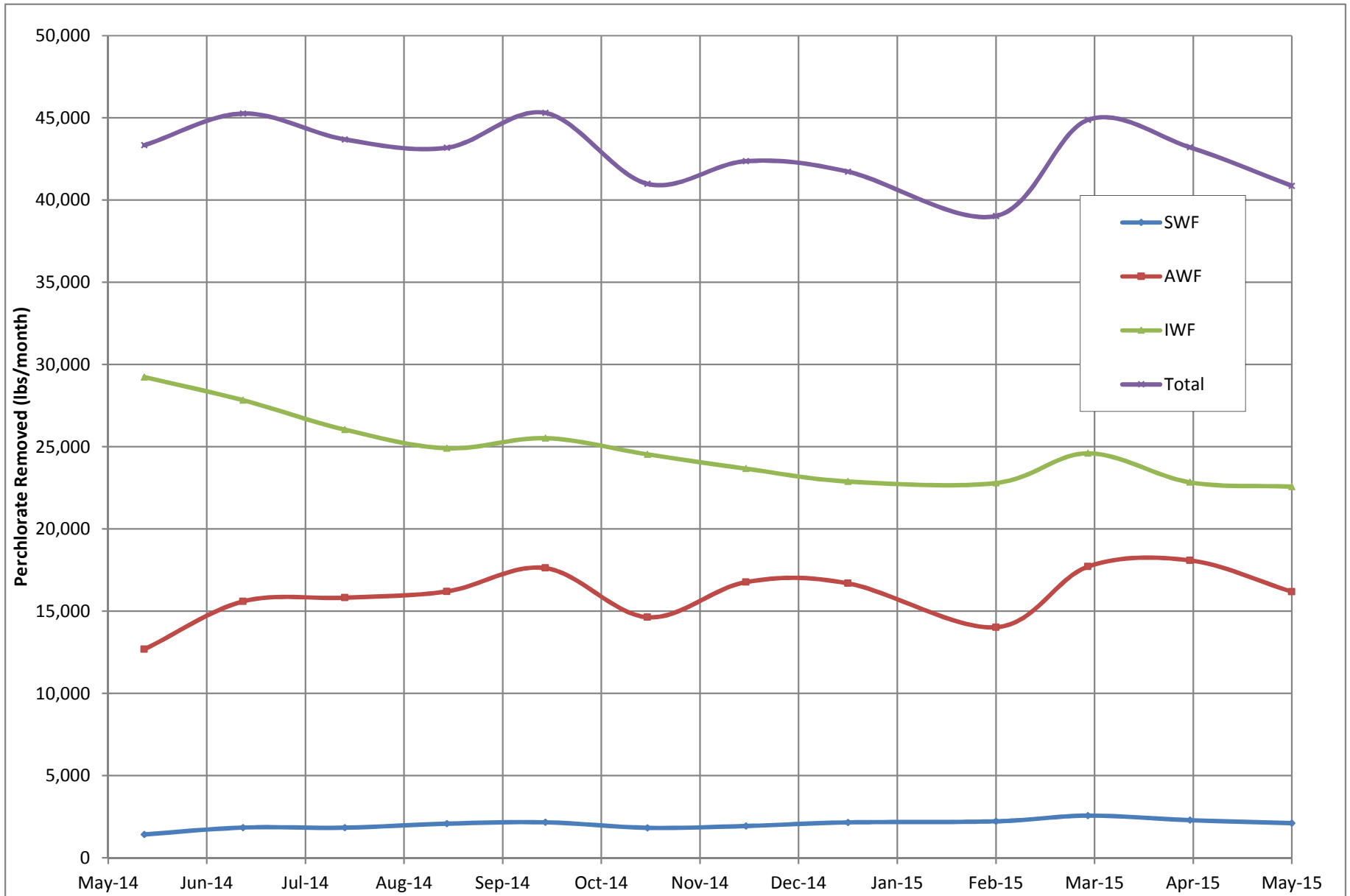
Nevada Environmental Response Trust  
 GW-11 Pond Volume  
 Projected v. Actual  
 Update 06/04/2015



Notes:

- 1: 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.
- 2: Estimated monthly evaporation and rainfall is listed in Table 3.
- 3: Monthly additions from backwash, diversions, and other influent sources was estimated to be 2.8 million gallons per month based on an average from the last six months that GW-11 has been online.
- 4: Monthly GW-11 effluent flow was estimated to exceed influent flow by 2.2 million gallons per month. For pond volume to decrease the effluent flow must exceed the influent flow by a minimum of 50 gpm.

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)

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 <sub>5</sub> (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	15	160	3.4	36	3.4	1.4	1.9	2.9	21	0.090	0.99
May 2015 (month to date)	1.23	1.29	1.3	0.013	6.55	0.00034	0.0060	11	114	3.8	39	2.5	0.6	0.6	1.1	6.7		

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	10	110	0.38	4.2	--	0.37	4.1	--	0.28	3.1	4/15/2015	1.9	21	0.090	0.99
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)	0.050	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	5/12/2015	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	NA	NA	NA	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	NA	NA	NA	5/26/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5/27/2015	NA	NA		
					6/1/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6/3/2015	NA	NA		

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

NA = Not Available To Date

NS = No Sample

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: June 5, 2015

# Attachment B

## Equipment Tracking Form

Sub-System	P&ID	Description	Status <sup>1</sup>	Checked	Criticality <sup>2</sup>	Notes
<b>Main Plant Equipment</b>						
<b>1</b>		<b>Seep Wells and Lift Station 1</b>				
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			
<b>2</b>		<b>Athens Road Wells and Lift Station 3</b>				
2.01		Athens Road Well Field, 9 wells	Running		3	The PC_150 3/4 hp motor was changed with 1/2 hp motor to achieve better flow.
2.02		Lift Station 3 Lift Pump A	Standby			
2.03		Lift Station 3 Lift Pump B	Running			
2.04		Area in and around Lift Station 3	Running			
<b>3</b>		<b>Lift Station 2 and Transmission Piplines</b>				
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			
<b>4</b>		<b>Interceptor Wells and Cr Treatment Plant</b>				
4.01		IWF Well Field, 30 wells	Running			
4.02		Ferrous Sulfate Feed System	Running			
4.03		Polymer Feed System	Running		3	The debris was cleared from clogged polymer feed line.
4.04		Clarifier	In operation			
4.05		Filter Press	Running			
4.06		GWTP Effluent Tank	In operation			
4.07		Interceptor Booster Pump A	Running			
4.08		Interceptor Booster Pump B	Standby		2	The VFD was reset and the pump is in auto.
4.09		Area In And Around GWTP	Running		2	The area was hooked up to back up air compressor while repairs were made to the main compressor motor pulley. The old compressor is back online.

<sup>1</sup>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 <sup>1</sup>	Checked	Criticality <sup>2</sup>	Notes
<b>5</b>		<b>Equalization Area and GW-11 Pond</b>				
5.01	PID10A	Pond GW-11	In operation			
5.02	PID10A	Pond Water Pump - P101A	Standby			
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			
5.06	PID10A	Raw Water Feed Pump - P102A	Running			
5.07	PID10A	Raw Water Feed Pump - P102B	Maintenance		3	The mechanical seal was returned to the manufacturer for further repairs.
5.08	PID10B	Carbon Absorber - LGAC 201A	Running			
5.09	PID10B	Carbon Absorber - LGAC 201B	Running			
5.10	PID10B	Carbon Absorber - LGAC 201C	Running			
<b>6</b>		<b>First Stage FBRs A, 1 &amp; 2</b>				
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			
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	Standby			
6.14	PID07A	FBR 1 pH Feed Pump - P711	Standby			
6.15	PID07A	FBR 2 pH Feed Pump - P712	Standby			
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		3	The check ball was replaced at the injection point.
6.23	PID07B	FBR 1 Electron Donor Assembly Pump - P731	Running		3	The check ball was replaced at the injection point.
6.24	PID07B	FBR 2 Electron Donor Assembly Pump - P732	Running		2	The feed line was replaced going into the FBR.

<sup>1</sup>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 <sup>1</sup>	Checked	Criticality <sup>2</sup>	Notes
<b>7</b>		<b>First Stage FBRs 3 &amp; 4</b>				
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			
<b>8</b>		<b>Second Stage FBRs 5 &amp; 6</b>				
8.01	PID03A	FBR 5	Off		3	
8.02	PID03A	FBR 6	Off		4	Currently transferring carbon from the bottom of the FBRs.
8.03	PID03C	Second Stage Separator Tank - T3011	Off			
8.04	PID03A	Media Return Pump - P3011	Off			
8.05	PID03A	Second Stage FBR Pump - P3015	Off			The seal water lines were repaired.
8.06	PID03A	Second Stage FBR Pump - P3016	Off			The seal water lines were repaired.
8.07	PID03A	Second Stage FBR Pump - P301A	Off			The seal water lines were repaired.
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	Off			
8.13	PID07B	FBR 6 Electron Donor Assembly Pump - P736	Off			

<sup>1</sup>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 <sup>1</sup>	Checked	Criticality <sup>2</sup>	Notes
<b>9</b>		<b>Second Stage FBRs 7 &amp; 8</b>				
9.01	PID03B	FBR 7	Running			
9.02	PID03B	FBR 8	Running			
9.03	PID03D	Second Stage Separator Tank - T3012	Running			
9.04	PID03B	Media Return Pump - P3012	Running			
9.05	PID03B	Second Stage FBR Pump - P3017	Running			
9.06	PID03B	Second Stage FBR Pump - P3018	Running			
9.07	PID03B	Second Stage FBR Pump - P302A	Standby			
9.08	PID07A	FBR 7 pH Feed Pump - P717	Standby			
9.09	PID07A	FBR 8 pH Feed Pump - P718	Standby			
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	Running			
9.13	PID07B	FBR 8 Electron Donor Assembly Pump - P738	Running			
<b>10</b>		<b>Aeration and DAF System</b>				
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		4	ETI is currently waiting for the quote.
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	Maintenance		3	Sandblasting has been resumed and coating should be installed soon.
10.15	PID05	DAF Pressure Pump - P551	Maintenance		4	ETI is currently waiting for the quote.
10.16	PID05	DAF Float Pump - P552	Standby			
10.17	PID05	Screw Conveyor Drive	Standby			
10.18	PID05	Skimmer Drive	Running			

<sup>1</sup>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 <sup>1</sup>	Checked	Criticality <sup>2</sup>	Notes
<b>11</b>		<b>Pumping System (Old Effluent)</b>				
11.01	PID06	Effluent Tank 601	In operation			
11.02	PID06	Effluent Pump - P601	Running			
11.03	PID06	Effluent Pump - P602	Running			
<b>12</b>		<b>Sand Filter System</b>				
12.01	PID17	Sand Filter	Running			
12.02	PID17	Filter Reject Tank	In operation			
12.03	PID17	Filter Reject Pump - P1701A	Running			
12.04	PID17	Filter Reject Pump - P1701B	Standby		3	The pump is assembled and ready for installation and testing.
<b>13</b>		<b>Effluent Tank and Pumping</b>				
13.01	PID10C	UV Effluent Tank	Running			
13.02	PID10C	Effluent Booster Pump - P1302A	Running			
13.03	PID10C	Effluent Booster Pump - P1302B	Running			
13.04	PID10C	Area Around Effluent and North D-1	Running		3	The new valve has been received and is not critical to the process. The blind flanges are currently installed and present no risk. PDM sump pump has been tied into the Seimans computer and will work in auto.
<b>14</b>		<b>Solids Collection and Pressing System</b>				
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			
14.09	PID09	Filtrate Tank	In operation			
14.10	PID09	Filtrate Tank Effluent (recycle) Pump - P903	Running			

<sup>1</sup>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 <sup>1</sup>	Checked	Criticality <sup>2</sup>	Notes
<b>Chemical Systems</b>						
<b>15</b>		<b>Electron Donor System</b>				
15.01	PID07B	<i>Electron Donor Tank</i>	In operation		3	The flow meter is inoperable and readings are being collected manually while waiting for new parts.
15.02	PID07B	<i>Booster Pump P739A</i>	Standby			
15.03	PID07B	<i>Booster Pump P739B</i>	Running			
17	PID07C	<b>Micro Nutrient System</b>	In operation			
18	PID07C	<b>Hydrogen Peroxide System</b>	In operation			
19	PID07C	<b>De-Foam System</b>	In operation			
20	PID15	<b>Nutrient (Phosphoric Acid) System</b> (Tank only - pumps included in FBRs)	In operation			
21	PID07A	<b>Nutrient (Urea) System</b> (Tank only - pumps included in FBRs)	In operation			
22	PID07A	<b>pH System</b> (Tank and effluent pH feed pump only - other pumps included in FBRs)	In operation			
23	PID07C	<b>Ferric Chloride System</b>	In operation			
24	PID07B	<b>Polymer Systems - DAF</b>	In operation			
25	PID09	<b>Polymer System - Solids Dewatering</b> (2 tanks, 2 centrifugal pumps, mixer, volumetric feeder)	In operation			
<b>Utility Systems</b>						
<b>26</b>		<b>Compressed Air System</b>				
26.01	PID08	<i>West Compressor</i>	Running			
26.02	PID08	<i>East Compressor</i>	Running			
26.03	PID08	<i>O2 Compressor</i>	Running			
26.04	PID08	<i>Compressed Air Receiver Tank</i>	In operation		4	The regulator has been received. ETI is waiting to shut down the plant in order to replace the unit as well as additional parts. New valves and piping have also been built to replace rusted and damaged valves.
26.05	PID08	<i>Air Dryer</i>	Running			
26.06	PID08	<i>Oil Removal Filter</i>	In operation			
26.07	PID08	<i>Particulate Filter</i>	In operation			
27	PID16	<b>Oxygen System</b>	In operation			
28		<b>GWETS Plant Controls/ Siemens Controls</b>	In operation			
29		<b>Well Control System/ Allen Bradley Controls</b>	In operation			
30		<b>MCC FBR Pad</b>	In operation			
31		<b>MCC in D-1</b>	In operation			
32		<b>MCC in EQ area</b>	In operation			

<sup>1</sup>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 <sup>1</sup>	Checked	Criticality <sup>2</sup>	Notes
<b>Miscellaneous Systems</b>						
33		Operations Office/Network	In operation			
34		Laboratory Analyzers	In operation			
35		Security Systems	In operation			
<b>Shelf Spares</b>						
		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			

<sup>1</sup> 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

<sup>1</sup> 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  
    - Tasks performed to either improve the existing equipment (i.e., testing new options)  
 4 = Low                              - Minor repairs that in no way alter the performance of the plant

**Tanks, Pipelines, Ponds**

In operation  
 Out of service

**Spares**

In stock

<sup>1</sup> 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